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with the authors respect*

DIPTERA DANICA

GENERA AND SPECIES

OF FLIES HITHERTO FOUND IN DENMARK

BY

WILLIAM LUNDBECK

PART III
EMPIDIDAE

WITH 141 FIGURES

PUBLISHED AT THE EXPENSE OF THE CARLSBERG FUND

G. E. C. GAD — COPENHAGEN
LONDON: WILLIAM WESLEY AND SON

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PART III

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(ORTHORRHAPHA BRACHYCERA.)

ORTHOGENYA.

Empididae.

Head rather small, more or less globular and more or less arched behind; sometimes the occiput drawn conically out and the head more or less pear-shaped; it is almost equal to the breadth of thorax or a little narrower. Occiput has bristles or hairs. The vertex bears three ocelli and generally small ocellar bristles. Eyes large, generally bare, sometimes hairy; they are either touching in the male and separated in the female, or touching in both sexes, or finally more or less separated in both sexes; in the last case the frons is sometimes narrower in the male than in the female. When the eyes are touching in the male, the facets are in this sex larger above than below, and when touching in both sexes, the facets are larger above in both sexes. Sometimes the eyes are touching below the antennæ. In the middle of the inner eye-margin there is always an incision which may be larger or smaller, sometimes very small and shallow, but always perceptible. The antennæ are inserted near to each other, in or about in the middle; they are three- to five-jointed; the two basal joints are generally short, the first sometimes somewhat elongated; the third joint is longer, compressed but otherwise of somewhat variable shape, from short ovate to somewhat long and band-shaped; it terminates in the five-jointed antennæ with a style or a longer arista, both being two-jointed with a short basal joint; in the four-jointed antennæ the arista is undivided, and in the three-jointed antennæ the third joint tapers into or bears an arista which is not jointed and not articulated to the third joint, but forms in connection with this an undivided joint. The jowls are very small or not at all developed, rarely longer and descending below the eyes. Epistoma is broader or narrower, generally narrow, and, when the eyes are touching below the antennæ, very small. An oral cone is present but small; sometimes, as in *Clinocera*, *Dolichocephala* and *Chersodromia* there seems to be no real oral cone present. Clypeus is generally more or less

horse-shoe-shaped, lying on the front side of the oral cone; sometimes it is not, or not distinctly, separated from the epistoma. The proboscis may vary much in length, from very short to about as long as the body; it is directed downwards or straightly or obliquely forwards, sometimes it is curved somewhat inwards towards the sternum. Labrum is about as long as the proboscis, it is strong, generally high at the base, and semitubular, and it is three-pointed at the apex and often curved downwards. In some genera (*Clinocera*, *Dolichocephala*) it is very broad. Hypopharynx is likewise strong, canaliculated, more or less lancet-like and pointed, and often curved downwards at the apex; it may be incised near the apex in different ways, and sometimes it is very broad at the base and divided into two short lateral lobes and a longer, pointed median process (*Clinocera*, *Dolichocephala*). Maxillæ are present or absent; when present they are generally somewhat delicate, shorter or longer chitinous blades. Maxillary palpi are always present, they are one- or indistinctly two-jointed. Labium almost of the same length as labrum; the labella are shorter or longer, well developed and generally cleft to their base. The connecting membrane at the base of labium is sometimes very long; in rest it is infolded but it is able to be drawn out often to an extent longer than labium itself. Thorax is generally rectangular, sometimes nearly square; it is sometimes very high and much arched above. Prothorax is generally small; sometimes it is more developed and neck-shaped. Metathorax is likewise small, and there seems, at all events generally, to be no chitinised metasternum. The thoracic disc has generally dorso-central and acrostichal bristles or hairs in one or several rows; sometimes the disc is uniformly haired. Humeral, posthumeral, notopleural, supraalar and postalar bristles are generally present, either all or some of them; rarely they are totally absent¹. Scutellum has two or more

¹ I may give here some explanation. The præsutural depression is in the Empids generally large and slightly impressed and often somewhat indistinctly bordered; it is however as a rule not difficult to make it out, at all events by comparison. The bristles placed here I term, in accordance with Girschner, notopleural bristles; (Osten Sacken termed these bristles posthumeral); somewhat behind the humeri there is generally a bristle, my posthumeral bristle; but not rarely there is a bristle more forwards and inwards; it is perhaps more correct to term this the posthumeral and the other the præsutural. The supraalar and postalar bristles need no explanation. I give the explanation because Bezzi (Deutsch. Ent. Zeitschr. 1909. Beiheft, 86) uses other terms. The notopleural bristles he terms præsutural; his posthumeral bristle is, I think, the bristle inwards to the humeri mentioned above (as he says about it: „Posthumeralborsten, oder besser (bei diesen Fliegen) Intrahumeralborsten“); his „Notopleuralborsten oder Posthumeralborsten“ is then my posthumeral bristle; in his

marginal bristles. Metapleura have bristles or short hairs, or they are quite bare. Abdomen is generally more or less slender, sometimes more robust; it consists of eight segments, sometimes the last or two last are hidden. The first dorsal segment is as a rule shorter than the second and sometimes broader. The male genitalia may be of very various construction; they seem always to originate from segments following after the eighth, but they may sometimes influence the shape of one or several of the anterior segments. Often they consist of two pairs of more or less distinctly separated lamellæ forming an upper and a lower forceps, and below there may be a ventral lamella; penis is often more or less thread-like, curved upwards and sinuous; but often the genitalia are differently constructed, so that these parts cannot be discerned, and they may be more or less unsymmetrical. In the female the abdomen is more or less pointed, terminating with a smaller or larger ovipositor generally with two styliform lamellæ at the end. The legs may be very variously developed; they are shorter or longer, often long and slender, especially the hind pair. They show not rarely sexual dimorphism, thus they may in many cases in the male show structural peculiarities such as thickened femora, tibiæ or metatarsi, or they may have spines or tufts of hairs; in the females they may in the genera *Empis* and *Rhamphomyia* often be more or less pennate from scaly hairs. In other cases the legs may show a special development in both sexes, the front coxæ may be elongated, the front or the anterior femora thickened and together with the tibiæ have a special armature making them adapted to raptorial use. The legs are shorter or longer haired and have often bristles to a varying degree. Apical spurs on the tibiæ may be present or absent, but when present they are not large. There are two claws, two well developed pulvilli and a generally small, lobe-, claw- or bristle-shaped empodium, generally bearing bristles; in *Clinocera* the empodium is more or less pulvilliform. The wings have the costa generally reaching only about to the apex, sometimes continuing more or less distinctly all round the margin. The venation may vary greatly; the mediastinal vein reaches the margin or is abbreviated; the subcostal vein is longer or shorter; the cubital vein is either forked or unforked, sometimes the upper branch is connected with the radial vein; there may thus be one to three cubital cells. The discal vein is forked or unforked, and there are three or

introductory remarks he terms it npl., but it seems to me to be the same bristle which he terms ph under *Xanthempis*. If any bristle in the Empids should be termed præsutural it can only be the one I term here the posthumeral bristle.

four posterior cells; discal cell present or absent; when present it is always closed below by the upper branch of the postical vein; it sends two or three veins to the margin, the lowermost being the upper branch of the postical vein; when it sends two veins the upper is in a few cases forked. The basal cells are shorter or longer; they may be of equal length or sometimes the first or on the contrary the second is the longest. The anal cell present or absent, but when present always short, never reaching the margin; it may be shorter, of equal length with, or longer than the second basal cell. Anal vein reaching the margin or abbreviated or quite absent. The lower branch of the postical vein either recurrent and more or less parallel with the wing-margin, or meeting the anal vein at a right angle; when the anal cell is absent the lower postical branch may be present or absent. Stigma present or absent. The axillary lobe large or smaller, sometimes quite absent and the wing more or less cuneiform in shape. Alula generally wanting, sometimes present but very small. — In single cases the wings may be very broad and of curious shape, generally only in the female, and sometimes the venation may be different in the two sexes with regard to the size and shape of the discal cell. In other rare cases the wings may be small, narrow and a little abbreviated. — The alar squamulæ are small, fringed at the margin, very rarely bare; the thoracic squamulæ not developed, but the frenulum more or less distinct, sometimes a little broadened towards the angulus. The halteres not covered. In rest the wings lie parallel over abdomen, one covering the other.

The developmental stages of the *Empididae* are not well known, and for most of the genera they remain still to be discovered. The known larvæ are cylindrical, more or less spindle-shaped; they consist of twelve segments (Beling, Brauer). The head is small and retractile; the mouth parts consist (Brauer) of mandibles and maxillæ with small palpi; there are also small antennæ but no eyes. Most of or all the abdominal segments have on the ventral side small transverse swellings (Kriechschwien). The last segment is more or less rounded and has below on the hinder side a smaller or larger, generally triangular tooth or wart. The larvæ are amphipneustic with small prothoracic and likewise rather small terminal spiracles on the last segment above the tooth mentioned. The pupa is free; it has the antennal sheaths lying below on the front side of the head and directed to each side; above them there are some small tubercles, each with a hair; thorax has generally some long bristles. The abdominal segments have above girdles of small teeth and between them

long bristles or hairs; on the ventral side there are only hairs. There are prothoracic and seven pairs of abdominal spiracles.

The larvæ live in the earth, below leaves on the ground in woods or sometimes in decaying wood; the larva of *Hemerodromia precatória* was found in the mud in a streamlet. They are certainly carnivorous as has been observed in some single cases. The larvæ hibernate, and the transformation to pupa and final development takes place in spring or summer. The species of *Drapetis* however seem to hibernate or at all events to be able to hibernatè as imagos (see under this genus).

The family of *Empididae* is a large one including many genera and species of somewhat varied aspect. They are medium sized to very small flies, from about one to twelve or fourteen millimetres. The colours are dark, grey or yellowish; some few tropical forms are metallic. They are generally characterised by their somewhat small, more or less globular head and the as a rule somewhat slender shape. From the *Asilidae* they may be distinguished by the not excavated vertex, smaller head always without epistomal beard, and by differences in the wing-venation, especially the short, sometimes wanting anal cell. The species of *Clinocera* may show great resemblance to some of the Dolichopodids e. g. the genus *Hydrophorus*, but may be known by the always separated discal and second basal cell. Some of the *Tachydromiinae* e. g. *Chersodromia* show some resemblance to small Anthomyids or Borborids. A good character for the family is also the incision about in the middle of the inner eye-margin; this incision may be small but is always perceptible. The Empids are all rapacious; many direct observations have been recorded, and this way of feeding is also indicated by their strong mouth and not rarely raptorial legs. The prey observed for the single species will be noted in the following. Some species are however also often seen on flowers, probably also here sucking juices. The Empids occur especially in woody more or less humid regions and also in mountainous districts; in dry localities they are more rare in contrast to the Asilids. Some are found on sandy borders of water. They seem especially to be a boreal group, yet many species are in quite recent time recorded from the mountainous districts in South America.

Some species of Empids, especially of the genera *Rhamphomyia*, *Empis* and *Hilara* are seen dancing or swarming in the air above water and also elsewhere; this dancing takes place in connection with the copulation. It seems to be sometimes the males but also sometimes the females which perform the dancing, and at other times also both sexes. The copulation takes then place in the air and is connected with some interesting phenomena. With regard to many species

of the three genera mentioned it has been observed, that the males catch a prey, kill it but do not devour it; on the contrary they carry it with them and meeting a female this gets the prey while the copulation takes place. During the copulation the female sucks the prey, but when the copulation is finished, the female drops the prey. Whether the prey is a means for attracting the females or the animal juices are perhaps of importance for the fecundation, and whether the females also feed in other ways are questions to be solved in the future. Several species of *Hilara* envelop the prey in a web before presenting it to the female. An American species of *Empis* makes a curious frothy balloon at the mating time. For particulars about these phenomena see under the three genera mentioned.

From the palæarctic region about 675 species of Empids are known, and from North America about 440; eleven are recorded to be common to both regions.

I am acquainted with no case of Hymenoptera parasitic on Empids and I have found none recorded in the literature.

Empididae earlier recorded from Denmark. — Kramer (Specim. Insectol. Dan. 1760) has one species, *Empis borealis*. Brünniche (Prodr. Insectol. Siælland. 1761) mentions the same, and in 1763 (Pontoppidan, Dansk. Atl. I) he again mentions only the same. What this species may be cannot be said, perhaps the common *Empis tessellata*. O. F. Müller (Faun. Fridrichsd. 1764) mentions two species, *E. livida* and *flava*, the latter new. The first is perhaps correct, the latter may be one of the species of *Xanthempis*, perhaps *stercorea*. — Fabricius has in 1787 (Mantiss. Insect.) one species, *Empis minuta*. In 1794 (Entom. Syst. IV) he enumerates seven, *Empis clavipes*, *nigripes*, *fuscipes*, *minuta*, *flavipes*, *nigripennis* and *melanocephala*, and in 1805 (Syst. Antl.) he enumerates one more, *E. lineata*, and the species *flavipes*, *fuscipes*, *nigripennis* and *melanocephala* he has now under *Tachydromia*. He has thus eight species for which Denmark is given as locality. The species are all described as new. *E. clavipes* is *Hybos grossipes* L. and *E. lineata* is *E. livida* L. With regard to the other six I may give some explanation. For all six species Fabricius quotes the collections of Tönder-Lund and Sehestedt. In this collection they are also found, and the examination of the species gave the following results: *Empis nigripes*: two specimens present, that on the label is *Rhamphomyia dissimilis*, the other is *Empis vernalis*; *Empis minuta*: the specimen on the label is a *Phora*, the other a *Sciara*; *Tachydromia flavipes*: the specimen on the label has lost the head, but may be this species, the other is *T. pallidiventris*; *Tachydromia fuscipes*: the specimen on the label is *Hilara carinthiaca*, the other is an undetermin-

able *Hilara* but not *fuscipes*; *Tachydromia nigripennis* is *Rhamphomyia nigripennis* (see below under this species), and *Tachydromia melanocephala* is *Chelipoda melanocephala*. — In spite of these results I have made no alterations in the names, and I think it is not advisable to do so, as the old collection of Tönder-Lund and Sehestedt has been removed from the original cases, and even if there is some probability, that the species are those examined by Fabricius, there is on the other hand no absolute certainty. I think it best to consider the types to *nigripes*, *flavipes* and *fuscipes* as lost and in accordance herewith keep the names now in use. With regard to *E. minuta* this never recognised species will have to be abolished, (see below under *Microphorus*). — The five species *Rh. nigripes* and *nigripennis*, *Hilara fuscipes*, *Tachydromia flavipes* and *Chelipoda melanocephala* were thus originally established on Danish specimens. — Stæger records (Krøyer's Tidsskr. IV, 1842, 98) *Ocydromia glabricula* and *Leptopeza flavipes*, and Jacobsen (ibid. 211 and 315) records *Rhamphomyia platyptera* (*marginata*) and *Clinocera bistigma* (*borealis*). — Zetterstedt has (Dipt. Scand. I and VIII) 70 species in all. As he does not mention *Rhamphomyia platyptera*, *nigripes*, *nigripennis*, *Hilara fuscipes*, *Leptopeza flavipes* and *Clinocera bistigma* we thus get in all 76 Danish species known in 1849. — Still there is a list given by Schiødte (Krøyer's Tidsskr. II, 1838—39, 309) enumerating about 23 species, but nothing new is added in it, and besides the determinations cannot be considered as definite, the paper being chiefly an account of excursions; one or two new species are mentioned, but they are *nomina nuda* and must later have been recognised as described. — In the present work 164 species are enumerated.

Table of Subfamilies.

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|--|-----------------------------|
| 1. Anal cell absent or when present (<i>Symballophthalmus</i> , <i>Tachydromia</i>) the anal vein at all events weak; in the latter case the middle femora generally thick; no discal cell; discal vein unforked | 5. <i>Tachydromiinae</i> . |
| — Anal cell present, rarely absent (<i>Hemerodromia raptoria</i> and <i>oratoria</i>) and then the front legs raptorial, the front coxæ almost as long as the thickened femora | 2. |
| 2. Axillary lobe of the wing very small or wanting; front coxæ more or less elongated, always longer than the posterior coxæ | 4. <i>Hemerodromiinae</i> . |
| — Axillary lobe of the wing generally large; front coxæ not elongated | 3. |
| 3. Proboscis short, shorter than the head, when longer directed straightly or obliquely forwards and then the antennæ short and the style very short; cubital vein | |

- unforked; metapleura bare or with very short hairs; thorax rather high and arched 4.
- Proboscis longer, as long as or generally longer than the head, directed downwards; cubital vein forked or unforked, in the latter case the metapleura with bristles; thorax less high and arched 2. *Empidinae*.
4. Anal cell shorter than or about as long as the second basal cell; discal cell present 3. *Ocydromiinae*.
- Anal cell longer than the second basal cell or when shorter no discal cell 1. *Hybotinae*.

1. *Hybotinae*.

Eyes touching in both sexes, the facets in the upper part of the eye larger than below. Antennæ three- or five-jointed, terminating with an arista. Proboscis short. Maxillæ not present, maxillary palpi one-jointed. Thorax very high. Metapleura bare. Cubital vein unforked; discal vein forked or unforked, three or four posterior cells; discal cell present, sending two veins to the margin, or absent. Basal cells of equal length or the second longer than the first; anal cell longer or shorter than the second basal cell; anal vein reaching the margin. Axillary lobe somewhat developed or large. Alula wanting or (*Bicellaria*) small. Stigma present or absent.

Table of Genera.

1. Antennæ three-jointed; discal cell present 1. *Hybos*.
- Antennæ five-jointed; discal cell absent 2.
2. Discal vein not forked; the anal cell longer than the second basal cell; stigma present 2. *Microsania*.
- Discal vein forked (the fork generally not quite complete); the anal cell shorter than the second basal cell; no stigma 3. *Bicellaria*.

1. *Hybos* Meig.

Species of medium size and a slender shape, and of dark, blackish colours. Head somewhat small, nearly globular, slightly arched behind and here with some hairs. The eyes are very large, occupying the whole front side of the head, of reddish brown colour; they are touching in both sexes for a long distance, quite from the antennæ to the vertex, so that there is no frons developed; the facets in the upper half are in both sexes longer than below, and there is a distinct, impressed dividing line between the upper and the lower part. The large facets decrease in size towards the dividing line. The incision in the inner eye-margin distinct. There is a small, prominent vertex with three ocelli and some small bristles. The antennæ are

inserted quite near to each other in the middle of the head. Epistoma is small and narrow, and there are no jowls developed, the eyes reaching quite to the mouth aperture. The antennæ are three-jointed, the two first joints are small and the basal one often difficult to see;



Fig. 1. Antenna of *H. femoratus*. $\times 60$.

it is short, cylindrical and not longer than broad; the second joint is globular; the third is longer, oval and somewhat compressed, and it has at the apex a long arista which, so far as I have been able to see, is not articulated to the joint. The second joint bears bristles. The oral cone is relatively small; clypeus consists of two chitinous lists connected above, stretching about from the epistoma to the base of the labrum. The proboscis is rather short, of the length of or slightly longer than the head is high; it is directed horizontally forwards; labrum is almost of the same length as the proboscis, slender and pointed, a little higher at its insertion; hypopharynx is a pointed blade of about the same length as labrum. Labium is well chitinized, but membranous along the middle line; the labella are small and short, divided in their whole length. I could detect no maxillæ, but there are long, one-jointed maxillary palpi, beset with some long hairs on their lower side. Thorax is somewhat rectangular, very high and strongly arched above; it has a flat, declining part behind; prothorax is developed and neck-shaped, but small, with some hairs above; metathorax is exceedingly small, and there seems to be no metasternum developed. The thoracic disc has rows of hairs, forming more or less distinct dorsocentral and acrostichal rows, and there are notopleural and postalar bristles and two stronger and some small scutellar marginal bristles. The notopleural bristles (generally two stronger and sometimes a third weaker) are placed on a somewhat extended, flattened part which certainly corresponds to the præsutural depression. Besides there are other small hairs on the humeri and the sides of the disc. Metapleura without hairs. Abdomen is somewhat slender, more or less cylindrical in section, but with the venter flat; it is generally borne a little curved. It consists of eight segments; the first dorsal segment is short and a little broader than the following, the second is the longest; the first ventral segment is on the contrary of the same length as the second. In the male the eighth segment is very small and often more or less hidden; it is somewhat unsymmetrical.

The exterior genitalia are very unsymmetrical; in *femoratus* they consist of a somewhat arched plate, lying to the left; this plate bears at the end a small, stalked plate which is directed somewhat upwards and deeply cleft in a fork-shaped way, and also unsymmetrical; opposite to (above) this arched plate lie two pieces forming a kind of forceps. These pieces are swollen and bear some styles at the end, but they are likewise unsymmetrical, one somewhat differently shaped than the other; between these forceps-shaped pieces an elongated opening is left, and at the base of this opening lie two very small, hairy, styliform lamellæ which are somewhat connected in the middle. In the interior lies a brown piece (the penis?). As said the arched plate is always turned to the left and the forceps to the right; I have not been able to decide with certainty which part of the apparatus is the upper and which the lower, but I think the arched plate is in reality ventral and the forceps dorsal. Strobl says (Mitth. Ver. Steierm. 1892, 45) that there is a fork-shaped, stalked, small lamella and above this two small, curved styli, and from this description it can be seen, that he also takes the arched plate to be ventral and the forceps-shaped pieces to be dorsal. In *culiciformis* we find the same pieces lying in the same way, but the arched plate has no fork-shaped process, but is itself deeply but unsymmetrically incised in the end; the forceps-shaped pieces are here very thick and swollen and otherwise somewhat different from those in *femoratus*. In *grossipes* we met with the same apparatus, the arched plate likewise unsymmetrically cleft at the end; the whole apparatus is here small and not swollen, and it is generally less turned than in the other species, thus confirming the view, that the arched plate is ventral. — I do not venture to homologise this curious, unsymmetrical apparatus with the exterior genitalia in *Empis*, *Rhamphomyia* and other genera in which they are symmetrical and consist of two pairs of lamellæ and a small ventral plate; should they be homologous I think that the large, arched plate should correspond to the ventral plate, the forceps-like pieces to the lower lamellæ, and the styliform lamellæ to the upper ones. — In the female the eighth segment is small or hidden, and at the apex there are two small, styliform lamellæ. Of the legs the hind pair is somewhat elongated and the femora somewhat thickened and with rows of spines beneath; in some species the males have the hind femora strongly thickened. The legs are otherwise more or less densely clothed with hairs and have some stronger bristles; the anterior tibiæ have, generally long, apical spurs, the hind tibiæ none. In some species the males have very long hairs on the anterior tibiæ and tarsi. There are two claws.

two pulvilli and a small, narrow, lobe-shaped empodium, bearing bristles and terminating with a longer bristle. The wings are somewhat long, the cubital vein is unforked and thus one cubital cell; the discal vein likewise unforked, thus three posterior cells; a discal cell

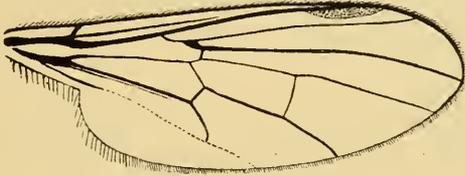


Fig. 2. Wing of *H. femoratus*.

present, sending two veins to the wing-margin, the lower being the upper branch of the postical vein which closes the discal cell below; the anal vein very weak, reaching the margin, the anal cell longer than the second basal cell. Stigma present. Axillary lobe somewhat developed, not large. Alula not developed; alar squamula with long hairs forming a fan.

So far as I am aware the developmental stages to this genus are not known; probably they live in the earth.

The species of *Hybos* are somewhat easily recognised by their slender, somewhat curved abdomen; they have a rather heavy flight. They occur in bushes and in herbage on the ground in woods on humid and somewhat shaded places; they are very often seen sitting just on the points of the leaves. All species occur late in summer and autumn, my earliest date is $27/6$, and this is exceptionally early, and I have taken them to the end of September. They are evidently carnivorous; I have often taken them with prey, generally small Diptera; the prey of the single species is recorded below.

Of the genus 9 species are recorded from the palæarctic region, but as will be seen below I think there are in reality only 4, three of which belong to Europe, all three also occurring in Denmark.

Table of Species.

- | | |
|--|--------------------------|
| 1. Anterior legs reddish; anterior tibiæ and tarsi in the male with long hairs | 2. <i>femoratus</i> . |
| — All legs dark | 2. |
| 2. Notopleural, postalar and scutellar marginal bristles black; in the male anterior tibiæ and tarsi with long hairs, hind femora strongly thickened and genitalia small | 1. <i>grossipes</i> . |
| — Notopleural, postalar and scutellar marginal bristles yellow; in the male anterior tibiæ and tarsi without long hairs, hind femora slightly thickened and genitalia much swollen | 3. <i>culiciformis</i> . |

1. *H. grossipes* L.

1767. Linn. Syst. Nat. XII, 988, 59 (*Musca*). — 1862. Schin. F. A. I, 78. — 1903. Kat. paläarkt. Dipt. II, 219. — *Empis clavipes*: 1794. Fabr. Ent. Syst. IV, 403, 4. — *Hybos funebris*: 1804. Meig. Klass. eur. zweifl. Ins. I, 240, 1, Tab. XI, Fig. 8—13. — 1805. Fabr. Syst. Antl. 145, 1. — 1820. Meig. Syst. Besch. II, 347, 1. — 1842. Zett. Dipt. Scand. I, 234, 1, et 1849. VIII, 2993, 1. et 1859. XIII, 4977, 1. — *Hybos pilipes*: 1820. Meig. Syst. Besch. II, 349, 5.

Male. Epistoma light grey; proboscis and palpi black, the latter with blackish hairs. Occiput dark grey with black bristles. Antennæ black or brownish black. Thorax shining black, but with a short, dense and adpressed brown pubescence, forming a brown pruinosity, so that thorax becomes a little dullish and slightly brownish. The thoracic disc has longitudinal rows of fine, somewhat erect, blackish hairs, forming acrostichal and dorsocentral rows; the hindmost hair in the latter rows, standing just on the margin of the declining hind part of the disc, is somewhat strong. The notopleural and postalar bristles black, and likewise the scutellar marginal bristles. Pleura greyish pruinose. Abdomen shining black, but with a brownish pruinosity like that on thorax, and hence dullish, leaving at most very narrow incisures black, shining; venter similarly coloured. Abdomen is clothed with long, erect, whitish yellow hairs, standing especially on the sides, while the dorsal surface and the venter are short haired; only towards the apex the venter has longer hairs. The exterior genitalia are small, nearly not at all swollen. On the legs the hind femora are very thickened, the ventral side is straight, but the dorsal side rather strongly curved, so that the femora are thickest in the middle. The legs are black, shining, coxæ greyish pruinose; the coxæ have somewhat long, reddish yellow hairs which are placed on the anterior side of the front coxæ, on the outer side of the middle coxæ and on the posterior and outer side of the hind coxæ. The anterior femora have a row of hairs on the ventral side, the middle femora also on the antero-ventral side and a smaller row on the dorsal side; the anterior tibiæ have rows of very long hairs, directed to the various sides except the dorsal, and similar hairs are found on the two first tarsal joints, here especially directed to each side; towards the end of the tarsi the hairs become shorter; the tibiæ have some strong bristles on the dorsal side. The hind femora have three rows of spines on the ventral side, the posterior row is only present on the basal half part; on the anterior side there is a row of bristles; for the rest the hind legs are clothed with shorter and longer hairs long on the ventral side of the femora and on the tibiæ. A separate, dense

and short pubescence is found on the ventral side of the front tibiæ and at the apex on the posterior and ventral side of the hind tibiæ, and below the hind tarsi; the hind metatarsi have some small spines below. All the spines and bristles are black, the hairs blackish or brownish, those on the hind legs brown to pale brown. Wings generally more or less strongly brownish tinged, but sometimes almost clear; veins darker or paler brown, and generally a little thicker in the strongly tinged wings than in the clear. Stigma brown, relatively little conspicuous when the wing is strongly tinged. Halteres pale yellow or whitish yellow.

Female. Anterior tibiæ and tarsi without long hairs; hind femora only slightly thickened.

Length 4—5,5 mm.

Remarks: I think it probable that Meigen has had no clear idea of the sexes in *Hybos*, and that his *H. pilipes* is the male of the present species.

H. grossipes is not uncommon in Denmark, though it seems to be the least common of our species; Ordrup, Dyrehaven, Espergærde, Boserup at Roskilde; in Jutland at Frijsenborg, Rye near Silkeborg and Sæby. The dates are ¹²/₇—²⁰/₈. I have once taken it with a *Phora* as prey; Poulton (Trans. of the Ent. Soc. London, 1906, 379) records it from England with the following prey: *Microplitis ocellata* Bouché, another Braconid, *Sciara* sp., *Typhlocyba quercus* F. and *Psylla* sp.

Geographical distribution: — Europe down into Italy; towards the north into Lapland.

2. *H. femoratus* Müll.

1776. Müll. Zool. Dan. Prodr. 2135 (*Asilus*). — 1862. Schin. F. A. I. 78. — 1903. Kat. paläarkt. Dipt. II. 218. — *Hybos flavipes*: 1804. Meig. Klass. eur. zweifl. Ins. I, 241, 2. — 1805. Fabr. Syst. Antl. 145, 2. — 1820. Meig. Syst. Besch. II, 348, 3, Tab. XXI, Fig. 20. — 1842. Zett. Dipt. Scand. I, 235, 4 et 1859, XIII, 4978, 4. — *Hybos fumipennis*: 1820. Meig. Syst. Besch. II, 349, 4. — 1842. Zett. Dipt. Scand. I, 235, 5. — 1862. Schin. F. A. I, 78. — 1903. Kat. paläarkt. Dipt. II, 219.

Male. Epistoma light grey; proboscis and palpi black, the latter with black hairs. Occiput grey with dark yellow bristles. Antennæ black or brownish black. Thorax black, shining; prothorax, humeri, the whole margin of the disc, the flat, declining part in front of the scutellum and a median, backwards slightly narrowed stripe brownish grey, caused by a very short pubescence; these pubescent parts may be more or less distinct and the median stripe broader or narrower,

but they are always visible. The thoracic disc has somewhat long, yellow hairs, forming indistinct acrostichal and dorsocentral rows, but also the sides of the disc have numerous hairs; the hairs are longest behind, and the hindmost hair in the dorsocentral rows is long and somewhat strong. The notopleural and postalar bristles yellow. Scutellum brownish grey pubescent with yellow marginal bristles. Pleura greyish pruinose. Abdomen black, rather shining, clothed with pale yellow hairs which are long on the sides but short along the middle; venter more sparingly clothed with medium-long hairs. The genitalia somewhat swollen. Legs with the hind femora thickened, the ventral side is straight but the dorsal side curved the femora thus thickest in the middle; the hind tibiæ slightly curved. The anterior legs are reddish, the last tarsal joints brownish and the femora generally more or less darkened along the dorsal side; the hind legs black except the reddish tarsi; the anterior coxæ reddish towards the apex, for the rest blackish, greyish pruinose. The coxæ have long, whitish yellow hairs; the anterior femora are long haired, especially along the ventral side; the anterior tibiæ have rows of very long hairs directed to the various sides except the dorsal, and similar hairs are present on the first tarsal joint; on the other tarsal joints the hairs are shorter; the middle tibiæ have some strong bristles on the dorsal side and a pair of strong apical bristles. The hind femora have three rows of spines on the ventral side and some strong bristles apically on the antero-dorsal side; otherwise the hind legs are densely clothed with long hairs; a separate short, dense pubescence is present on the ventral side of the front tibiæ, apically on the posterior and ventral side of the hind tibiæ and beneath the hind tarsi; the hind metatarsi have some short, black spines beneath, and generally also a pair is found on the following joint. All the spines are black, the strong bristles on the middle tibiæ brownish black; the hairs are all pale yellow. The wings may vary from quite hyaline to somewhat strongly blackish brown tinged, the very base is always clear. The veins may vary from brownish black and thick to rather pale and thin; generally they are thin in the hyaline wings but sometimes however rather thick. Stigma very slightly conspicuous both in the hyaline and the tinged wings. Halteres white to very slightly yellowish.

Female. The anterior legs short haired and the hind femora only slightly thickened.

Length 3,7—5 mm.

The two hitherto generally admitted species *femoratus* Müll. and *fumipennis* Meig. are evidently one; all transitions with regard to the

fumigation of the wings and the strength of the veins are found, and all other characters e. g. also the shape of the exterior genitalia are quite in agreement.

H. femoratus is common in Denmark, occurring on bushes and in low herbage on the ground in woods, on somewhat open, shaded and humid places, and it has been taken from the southernmost parts up to Thisted in Jutland, and on Bornholm. The dates are $^{27}/_6$ (exceptionally early) — $^{23}/_9$. I have not taken this species with prey; Poulton records it (in the work cited above) from England with *Sciara* sp. and *Typhlocyba flammigera* Geoff. as prey.

Geographical distribution: — Europe down into Italy; towards the north into Lapland but rare.

3. *H. culiciformis* Fabr.

1775. Fabr. Syst. Ent. 796, 24 (*Asilus*) et 1794. Ent. Syst. IV, 389, 61 (*Asilus*). — 1804. Meig. Klass. eur. zweifl. Ins. I, 270, 5 (*Asilus*). — 1805. Fabr. Syst. Antl. 172, 40 (*Dasyopogon*). — 1862. Schin. F. A. I, 78. — 1903. Kat. paläarkt. Dipt. II, 219. — *Hybos vitripennis*: 1820. Meig. Syst. Besch. II, 348, 2. — 1842. Zett. Dipt. Scand. I, 234, 3 et 1849. VIII, 2994, 3 et 1859. XIII, 4978, 3. — *Hybos infuscatus*: 1842. Zett. Dipt. Scand. I, 234, 2 p. p. et 1849. VIII, 2993, 2. — 1903. Kat. paläarkt. Dipt. II, 219. — ? *Hybos rufitarsis*: 1849. Zett. Dipt. Scand. VIII, 2994, 2—3. — 1903. Kat. paläarkt. Dipt. II, 220.

Male. Epistoma grey; proboscis and palpi black, the latter with black hairs. Occiput dark grey with black bristles. Antennæ black. Thorax black, shining, but with a brownish pruinosity causing it to be somewhat brownish and a little dullish; the pruinosity is especially dense along the margin. The thoracic disc with longitudinal rows of fine, erect, black hairs, forming dorsocentral and acrostichal rows, the hindmost hairs in the rows long, somewhat strong, and yellow. The notopleural, postalar and scutellar marginal bristles dark yellow. Pleura greyish pruinose. Abdomen black, but with a brownish pruinosity like that on thorax, but leaving the side margins and broad hind margins of the segments black. Abdomen clothed with yellow hairs which are long at the sides but very short along the middle; the last segment with long hairs at the hind margin. Venter with scarce, medium-long, yellow hairs, longer towards the apex. The exterior genitalia strongly swollen. The legs have the hind femora only moderately thickened; the colour of the legs is shining black, the knees indistinctly reddish; coxæ greyish pruinose; the hind femora are less shining than in the two preceding species; sometimes the base of the tarsi or nearly the whole tarsi are more or less reddish, and the same may be the case with the middle tibiæ. The coxæ

have somewhat scarce, yellowish hairs; the anterior femora have a row of fine hairs on the ventral side, the middle femora also a row of stronger hairs on the dorsal side; the anterior tibiæ have rows of not long hairs on various sides; the front tibiæ have some strong bristles on the dorsal side and the middle tibiæ on the dorsal and ventral side, and there are also some long apical spurs; for the rest the anterior legs are clothed with quite short hairs; the anterior tarsi are densely haired with shorter and longer hairs, but there are no such long hairs on the anterior legs as in the two preceding species. The hind femora have three rows of spines below, the posterior row is only present on the basal part; further there is a row on the anterior side; for the rest the hind legs are clothed with shorter and longer hairs, especially there are long, bristle-like hairs on the postero-ventral side of the femora. A separate, short, dense, red pubescence is present on the ventral side of the front tibiæ, at the apex on the postero-ventral side of the hind tibiæ and below the hind tarsi, but there are no spines below the hind tarsi. All the spines and bristles are black, the hairs on the anterior tibiæ brownish to blackish, those on the anterior femora and on the hind legs are paler or darker yellowish to brownish. The wings may vary from quite hyaline to a deep blackish-brown tinge; the veins are brown to dark brown and generally thicker in the strongly tinged wings than in the clear. The stigma is very pale brown to brown. Halteres light yellow.

Female. Except the differences in the exterior genitalia the female quite agrees with the male, and the hind femora are of the same thickness.

Length 4—5,5 mm.

This species resembles to some degree *H. grossipes*, but it is in the male easily distinguished by the swollen genitalia, the absence of long hairs on the anterior legs and the much thinner hind femora, and in both sexes by the broad not pruinose hind margins to the segments and the yellow thoracic and scutellar bristles.

H. culiciformis is rather common on the same places as the preceding species and together with this; I once took it also in numbers on a meadow in a wood, sitting on the flowers of grasses; Ordrup Mose, Dyrehaven, Ermelund, Geel Skov, Tyvekrogen, at Slagelse; on Funen at Hoffmansgave and Veflinge, and on Fænø; in Jutland in Greisdalen and Veile Nørreskow, at Rye and Laven near Silkeborg, at Frijsenborg, Hald near Viborg, Gjerlev near Randers Fjord and at Sæby; finally on Bornholm at Rønne. My dates are $^{31/7}$ — $^{25/9}$; it has been taken in copula on $^{2/8}$ and $^{16/8}$. I have taken this species with *Hilara flavipes*, *Chironomus* sp., and *Sciara* sp. as prey; the *Sciara* was

sucked quite out so that only the empty skin was left; the hole pierced by the *Hybos* was seen in the front end of thorax just behind the head.

Geographical distribution: — Europe down into Italy towards the north to Lapland.

Remarks: As will be seen from the synonymical lists which I have given for the species of *Hybos*, I have united some of the species generally accepted hitherto, but as I am not quite sure with regard to the given synonymy I shall make some remarks about it. With regard to *H. grossipes* I think no doubt may arise, though Schiner says: „Genitalien stark verdickt“, which is so far from being the case, that this species is just the one that has the smallest genitalia. That *H. femoratus* and *fumipennis* are only one species I feel quite sure, and this has also already been suggested by other authors. But with regard to *H. culiciformis* there are great doubts. The species which I call *culiciformis* is with certainty identical with *H. infuscatus* Zett., as I have examined Stæger's type specimens; (as Zetterstedt says: „Stæg. in litt.“ the name is due to Stæger); my reasons for taking it to be identical with *culiciformis* Fabr. are the following: Fabricius founded his *culiciformis* in Syst. Ent. 1775 under *Asilus*; in 1805 in Syst. Antl. he had *clavipes* (= *grossipes*) under *Empis* and *flavipes* (= *femoratus*) and *funebri* (= *grossipes*) under *Hybos*; *culiciformis* on the other hand he placed under *Dasygogon*. About the genus *Hybos* he says: „femoribus posticis saepius incrassatis“, but about the genus *Dasygogon* only: „pedibus validis, cursoriis“; this latter term would among the species of *Hybos* answer just to *culiciformis*. It was Meigen who first noted this, and in 1804 in Klass. eur. zweifl. Ins. he says under *Asilus culiciformis* Fabr. „Sollte diese Art vielleicht eine Bukkelfliege (*Hybos*) sein?“ Taking these facts into consideration I think it probable, that *infuscatus* Zett. is identical with *culiciformis* Fabr., but whether *vitripennis* Meig. in Syst. Besch. and also in Zett. Dipt. Scand. and *culiciformis* in Schiner are really identical with my *culiciformis* I cannot be sure. There is also the possibility, that the species of the mentioned authors is only a *grossipes* with hyaline wings, and with regard to Zetterstedt this view is confirmed by his note (VIII, 2995): „Pedes maris ut in *H. funebri* pilosis“. However this may be, I think the interpretation of *infuscatus* Zett. as *culiciformis* Fabr. is correct, otherwise

culiciformis Fabr. could scarcely be any other species than *grossipes* (= *clavipes* Fabr.) as Meigen interprets it in Syst. Besch., and it seems to me not probable, that Fabricius would have placed the same species in his two genera *Empis* and *Dasypogon*.

The species of *Hybos* have been somewhat confused, and more species have been established than really exist. One of the causes of this is, that species have been founded with the fumigation of the wings as distinguishing character, and this is not possible. I have long series of all three species showing every gradation in the colour of the wings, from quite hyaline to strongly fumigated; also the thickness and colouring of the veins vary; generally the dark wings have the thickest veins, but these may also be thick in the hyaline wings. When the specimens are not quite mature the wings are hyaline, but also specimens which in all other respects seem to be quite mature may have clear wings. Perhaps this fact is in connection with the circumstance, that the species prefer humid and shaded places, and that their wings thus take a relatively long time in getting their definite colour of full maturity. Besides the errors caused by the use of the wings as specific character it would also seem, that the sexes have not always been correctly recognised. I thus think that Meigen's *H. pilipes* is only the male to *grossipes*; also *H. claripennis* Strobl. (Mittheil. Ver. Steiern. 1892, 43), of which the author only knew the male, I am inclined to consider as a clear-winged *grossipes*; it seems to be quite similar to *grossipes* and has the same small exterior genitalia and the long hairs on the anterior legs. For the rest the author places *grossipes*, *femoratus* and *fumipennis* in his group 2 with: „Beine ohne auffallend lange Behaarung“; this I do not understand as the males of these species have long hairs on the anterior legs; it is also seen that he has only had females of *grossipes*; for *femoratus* he says nothing about the sexes, but for *fumipennis* he mentions males, so that he must here have committed some error. Finally I think, that also *H. rufitarsis* Zett. (Dipt. Scand. VIII, 2994, 2—3) may be identical with *culiciformis*; it seems only to differ in the colour of the legs, and I have specimens of *culiciformis* in which there is some reddish colour both on the middle tibiæ and on the tarsi. We thus come to the result, that there are in Europe only the three species of *Hybos* enumerated here.

2. **Microsania** Zett.

Small, dark species. The genus agrees in most respects with *Bicellaria*. The third antennal joint is short ovate and has not the upper margin straight. The end of abdomen is incurved in the male.

The wings have the subcostal vein short; the discal vein unforked and thus three posterior cells; there is however a small vein-rudiment at the apex of the wing, between the cubital and discal vein, indicating the rest of a fork. No discal cell; the basal cells small (the first

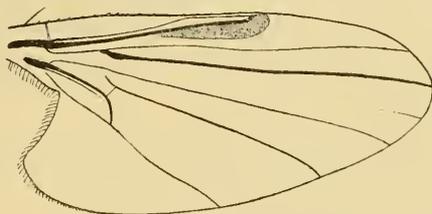


Fig. 3. Wing of *M. stigmatalis*.

in reality open, as the medial cross-vein is wanting); the lower branch of the postical vein not recurrent, meeting the anal vein almost at a right angle; the anal cell longer than the second basal cell; the anal vein reaching the margin. Stigma present.

The developmental stages are not known.

Of the genus 3 species are known from the palæarctic region; one is found in Denmark.

1. *M. stigmatalis* Zett.

1838. Zett. Ins. Lapp. 534, 4, (*Cyrtoma*). — 1842. Zett. Dipt. Scand. I, 334, 1, et 1849. VIII, 3013, 1, et 1859. XIII, 4998, 1. — 1903. Kat. paläarkt. Dipt. II, 220.

Male. Epistoma dark yellowish; occiput dark grey with black hairs. Antennæ dark brownish. Thorax black, slightly brownish pruinose, somewhat shining. Dorsocentral and acrostichal bristles somewhat short, black; notopleural, postalar and scutellar marginal bristles likewise black. Pleura blackish grey, somewhat shining. Abdomen black, somewhat dull, with rather short, blackish hairs. Venter pale. The last joints of abdomen and the genitalia are incurved towards the venter. Legs brownish (more or less pale); the hind tibiæ and the two first joints on the hind tarsi thickened. Femora with short hairs; tibiæ with dorsal and ventral rows of short hairs and with some longer bristles on the dorsal side; tarsi short haired. The hairs blackish or brown, paler on the tarsi. Wings somewhat broad, very slightly tinged, with a bluish reflex; a seam along the posterior margin quite hyaline. Veins pale brown; between the cubital and discal vein there is a small, abbreviated vein-rudiment at the margin, representing an upper branch of the discal vein. Stigma

distinct, brown, lying at the middle of the costa; its hinder border is very distinct and marked and might be mistaken for a vein. Costa is very finely haired or spinulose from the base to the apex of the subcostal vein. Halteres brownish.

Female. I have not seen the female; according to Zetterstedt it is similar to the male, but greyish, and abdomen is not incurved.

Length 2,5 mm.; when the end of abdomen is thought stretched out, the length would be about 3 mm.

M. stigmatalis is very rare, we have only one specimen, a male, the same as that about which Zetterstedt notes that it was taken by Stæger on a window in Copenhagen on ⁴/₁₀ 1841; the above description is made after this specimen.

Geographical distribution:—The species is otherwise only known from Sweden, towards the north to Lapland, and in Finland. Zetterstedt took one specimen at the height of 3000 feet, in the snow. Bondorff speaks of the species flying in the evening near a brook.

3. *Bicellaria* Macq.

Species of small size and generally of black, rarely of pale colour. Head globular, as broad as thorax. Occiput only slightly arched, beset with hairs. The eyes are large, occupying the whole front part



Fig. 4. Antenna of *B. spuria*. $\times 100$.

of the head; they are touching in both sexes quite from the ocelli to the antennæ. The facets in the upper half part are longer than below, and the dividing line is distinct. The incisure in the inner eye-margin is distinct. In the living specimens the eyes are reddish brown, the part with the small facets darker. There are three ocelli on the vertex and a pair of ocellar bristles. The antennæ are inserted near to each other in the middle; they are five-jointed, the basal joint is very short, the second almost globular and bearing bristles, the third is somewhat elongated and compressed; it has a straight upper margin but is somewhat dilated downwards; the two last joints form a terminal arista the basal joint of which is very short. Epistoma narrow. Jowls are not developed. Proboscis is short, directed downwards. Labrum is as long as proboscis, strong, high at the base, curved downwards towards the apex. Hypopharynx is as long as

labrum, likewise strong, canaliculated, curved downwards and pointed. There are no maxillæ, but one-jointed, ovate maxillary palpi with a pair of bristles on the apex. Labium is of the same length as the other parts, the labella are about as long as the basal part, somewhat broad, cleft to their base, and with bristles and a few pseudotracheæ. Thorax is not elongated but almost square or roundish; it is very high and very much arched above. On account of this shape of the thorax the head is situated somewhat downwards on its front end. Prothorax is small, a little neck-shaped; metathorax small. The thoracic disc has uniserial dorsocentral and biserial acrostichal bristles, the former are long behind; besides there are some hairs at the sides of the disc. There are humeral, posthumeral, notopleural, supraalar and postalar bristles, but they are indistinctly discernible between the other hairs and bristles at the sides. Scutellum with a number (about four) of marginal bristles. Metapleura bare. Abdomen slender, consisting of eight segments; the first is small; in the males the eighth segment is small, generally hidden. The male genitalia small; they consist of a small, fork-shaped piece below; on each side there is a somewhat broad lamella, terminating in a small hook, and above

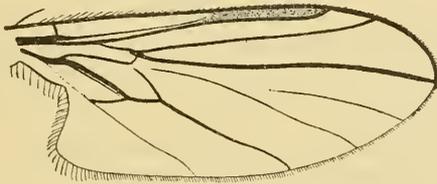


Fig. 5. Wing of *B. spuria*.

there is a pair of small, styli-form lamellæ. In the female the abdomen is pointed and terminates with two small, styli-form lamellæ. The legs are slender, the hind legs the longest; the hind tibiæ often a little thickened towards the apex and the hind metatarsi more or less thickened; the legs have shorter and longer hairs and bristles; middle tibiæ with small apical or subapical spurs. There are two claws, two pulvilli and a small, bristle-shaped empodium with bristles on the lower side; also the claws are hairy. The wings have the mediastinal vein not quite reaching the margin; the cubital vein is unforked, thus one cubital cell; the discal vein is forked, and there are four posterior cells; generally the peduncle of the discal fork is more or less indistinct and the base of the fork is generally incomplete, so that the first and second posterior cells are not completely separated. No discal cell; the second basal cell longer than the first; the lower

branch of the postical vein recurrent, parallel with the margin, and therefore the anal cell shorter than the second basal cell; the anal vein reaching the margin. No stigma but the apical part of the mediastinal cell more or less coloured. Axillary lobe large, the angle almost rectangular. A small alula present, hairy at the margin. Alar squamulæ small, with long, fan-like hairs at the margin.

The developmental stages of this genus are not known, so far as I am aware.

The species of *Bicellaria* are characteristic, especially from the very high and arched thorax. They occur especially in woods on open, somewhat shaded places on bushes and in low herbage, but also on fields and meadows. Poulton records in the work cited above *B. spuria* from England with *Scatopse brevicornis* M. as prey.

Of the genus 6 species are known from the palæarctic region (after *simplicipes* Zett. and *sulcata* Zett. are placed as synonyms to *melaena* Hal. and *spuria* Fall. respectively), but two of these are doubtful; 5 species have hitherto been found in Denmark of which two are here described as new, the total number of palæarctic species thus increasing to 8.

Table of Species.

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|---|------------------------|
| 1. First and second joint of the hind tarsi distinctly thickened; legs long and slender; abdomen in the male greyish æneous, not black haired; halteres dark in the male, yellow in the female..... | 4. <i>nigra</i> . |
| — First and second joint of the hind tarsi slightly or not thickened; abdomen black haired..... | 2. |
| 2. Hind tibiæ not thickened towards the tip..... | 1. <i>melaena</i> . |
| — Hind tibiæ somewhat thickened towards the tip..... | 3. |
| 3. Moderately pilose species, bristles on thorax considerably shorter in front than behind; abdomen in the male velvet black..... | 4. |
| — Strongly pilose species, bristles on thorax almost as long in front as behind; abdomen grey in the male; halteres dark in both sexes..... | 5. <i>pilosa</i> . |
| 4. First and second joint on the hind tarsi not at all thickened, legs rather short; halteres dark in both sexes... | 2. <i>spuria</i> . |
| — First and second joint of the hind tarsi slightly thickened, legs somewhat longer; halteres dark in the male, yellow in the female..... | 3. <i>intermedia</i> . |

1. **B. melaena** Hal.

1863. Haliday, Entom. Mag. 1, 158. (*Cyrtoma*). — 1903. Kat. paläarkt. Dipt. II, 221. — *Cyrtoma simplicipes*: 1842. Zett. Dipt. Scand. I, 331, 4. — 1862. Schin, F. A. I, 76. — *Bicellaria simplicipes*: 1903. Kat. paläarkt. Dipt. II, 221.

Male. Antennæ black. Occiput greyish or brownish black, with blackish hairs. Thorax very high and arched, dull velvet black, a little shining behind; acrostichal and dorsocentral bristles black, very short, but the hindmost (4) dorsocentral bristles long. Scutellum greyish, the scutellar marginal bristles black. Pleura dark grey, not quite dull. Abdomen dull velvet black; venter dark grey, slightly shining. Abdomen somewhat densely hairy with rather long, blackish or brownish hairs; the hairs are longest and erect at the sides. Venter sparingly haired with shorter hairs. Legs slender, black or dark brownish; hind tibiæ not thickened towards the apex, hind tarsi thin and quite simple. Femora with dorsal and ventral rows of short hairs; they are most conspicuous on the hind femora, but also here short; tibiæ with similar, likewise short hairs, and all tibiæ with a few longer bristles on the dorsal side; the front and hind tibiæ have the usual dense, short pubescence, the former on the ventral side, the latter at the apex; the tarsi are short haired. All hairs blackish or brown. Wings brownish tinged, most towards the anterior margin; the more saturated anterior part is distinctly bordered by a line stretching above the cubital vein about parallel with it; the apical part of the mediastinal cell brownish, but only slightly conspicuous. The wings somewhat iridescent. Veins brown, the cubital vein blackish; discal vein weak and pale, its fork generally complete. Halteres black or dark brown.

Female. Less dark than the male. Thorax greyish black, with a slight pruinosity, somewhat shining. Abdomen brownish or greyish black, the hairs shorter and paler than in the male. Wings hyaline, veins lighter than in the male, the discal vein, especially the peduncle, very weak; apical part of the mediastinal cell quite pale. Halteres yellow.

Length 2,7—3 mm.

This species is recognised especially by the quite simple hind tibiæ and tarsi, the short haired legs, and the hyaline wings in the female; as I have examined Stæger's specimens, the identification with *simplicipes* Zett. is certain, and I have no doubt, that it is identical with *melaena* Hal. as the description, which is, to be sure, very short, answers quite well. Zetterstedt says about the wings in the male: „nervis 3 & 4 longitudinalibus ad originem unitis furcam longissimam formantibus“; I do not understand how he has come to this, unless he has been misled by a fold in the wing. — As Zetterstedt says „Stæg. in litteris“ the name *simplicipes* is due to Stæger.

B. melaena is not common in Denmark; Lersøen (Stæger), Tyvekrogen (the author) and on Funen at Odense (H. J. Hansen). My only dates are $\frac{7}{6}$ — $\frac{14}{6}$. Stæger has taken it on Umbelliferae.

Geographical distribution: — The species is only known from middle Sweden to northern Germany, and in England.

2. *B. spuria* Fall.

1816. Fall. Dipt. Suec. Emp. 33, 43 (*Empis*). — 1842. Zett. Dipt. Scand. I, 329, 1 (*Cyrtoma*). — 1862. Schin. F. A. I, 76 (*Cyrtoma*). — 1903. Kat. paläarkt. Dipt. II, 221. — *Cyrtoma atra*: 1824. Meig. Syst. Besch. IV, 2, 1. — *Cyrtoma sulcata*: 1842. Zett. Dipt. Scand. I, 331, 3. — *Bicellaria sulcata*: 1903. Kat. paläarkt. Dipt. II, 221.

Male. Epistoma grey; occiput dark grey with black hairs. Antennæ black. Thorax high, but not so high as in *melaena*, somewhat velvet black, but however slightly shining, with some traces of more shining stripes in the middle. Acrostichal and dorsocentral bristles black, of some length, the hindmost dorsocentral bristles longer. Scutellum somewhat greyish; notopleural, postalar and scutellar marginal bristles black. Pleura dark grey. Abdomen velvet black; venter dark grey. Abdomen is clothed with long, black hairs, longest and erect at the sides; venter with longish, black hairs. Legs somewhat short, black, sometimes brownish black; the hind tibiæ slightly and evenly thickened towards the tip, hind tarsi simple. Femora with dorsal and ventral rows of middle-long hairs, those on the hind femora longest, but they are scarcely as long as the femora are broad; tibiæ with similar hairs which are longest and strongest on the dorsal side of the hind tibiæ; all tibiæ with some stronger bristles on the dorsal side. Tarsi short haired. All hairs black or blackish. The usual, short, dense, red pubescence is present on the ventral side of the front tibiæ and apically on the hind tibiæ. Wings blackish tinged, most towards the anterior margin, and this more saturated part is sharply bounded by a line stretching above the cubital vein, about parallel to it; the wings are somewhat strongly metallic iridescent. Veins black or blackish, the discal vein thin but distinct, the fork often incomplete, the upper branch interrupted at the base. The apical part of the mediastinal cell blackish brown but little conspicuous. Halteres black or brownish black.

Female. Thorax not velvet, but blackish æneous, shining. Abdomen more greyish æneous, slightly shining, shorter haired than in the male. Wings about as in the male, only very little less tinged.

Length 2,7—3,5 mm.

This species is easily distinguished from *melaena* by the not quite simple hind tibiæ and the longer-haired legs; also the hairs on the thoracic disc are longer. The female differs by having the tinged wings with the apical part of the mediastinal cell distinctly coloured, and by the

black halteres. The legs are also more robust in both sexes, and the hind tarsi, though simple, not so thin as in *melaena*. In immature specimens the legs may be brownish and the wings less darkened.

B. spuria is very common in Denmark and has been taken in many localities from the southernmost parts up to Sæby in northern Jutland, and on Bornholm. It occurs in low herbage in thickets and woods and on bushes, generally on somewhat open places, and on meadows in woods; it is also seen outside woods on fields. It occurs during a long period of the summer, my dates are $5/6$ — $13/10$.

Geographical distribution: — Europe down into Spain and Italy; towards the north to northernmost Scandinavia.

3. *B. intermedia* n. sp.

Cyrtoma nigra: 1842. Zett. Dipt. Scand. I, 330, partim, specimina danica.

Male. Epistoma blackish grey; occiput grey with black hairs. Antennæ black. Thorax somewhat velvet black, a little æneous and somewhat shining; the bristles on the disc black, slightly longer than in *spuria*, the hinder dorsocentral bristles likewise long. Scutellum greyish with black marginal bristles. Pleura dark grey. Abdomen velvet black with somewhat long, black hairs, longest and erect at the sides; venter grey, with slightly shorter hairs. Legs black or brownish, longer than in *spuria*; hind tibiæ thickened towards the tip, the two first joints of the hind tarsi slightly thickened. Femora with dorsal and ventral rows of hairs which are longest on the hind femora, and those on the dorsal side are longer than the femora are broad; tibiæ with similar rows the hairs of which are short and dense on the ventral, longer but less dense on the dorsal side; all tibiæ with some longer bristles on the dorsal side. The usual dense, reddish pubescence on front and hind tibiæ present. Tarsi with short hairs, a little longer on the dorsal side of the hind tarsi. All hairs on the legs black. Wings blackish brown tinged, most towards the anterior margin; the more saturated part is bounded almost as in the preceding species. Veins black or brownish black; the discal vein thin but distinct, the fork generally incomplete, the upper branch being more or less interrupted at the base. The apical part of the mediastinal cell brown but little conspicuous. The wings are metallic iridescent, viewed towards the light they are scarcely so dark as the wings of *spuria* and have a more reddish tint. Halteres black or brownish black.

Female. Thorax dark æneous, shining; abdomen dark greyish

æneous, slightly shining; the hairs shorter than in the male, and less dark to pale brownish. Hind tarsi very slightly dilated. Wings about as in the male. Halteres yellowish.

Length 3—3,7 mm.

This species, which is intermediate between *spuria* and *nigra*, is distinguished from *spuria* by the longer and longer-haired legs and the, to be sure slightly but always visibly, thickened joints on the hind tarsi; in the female however this character is of little value; for the rest there are small differences in the pubescence of the legs, the colour of thorax etc.; in the female it is distinguished by the yellow halteres. As in the preceding species immature specimens occur with brownish legs and less dark wings. — Zetterstedt says about specimens sent to him from Stæger under the name of *nigra*, that he thinks they do not belong to this species; most specimens in our collection determined by Stæger as *nigra* were just *intermedia*. I think the species is generally confused partly with *spuria* partly with *nigra*.

B. intermedia is not common and generally not taken in great numbers; Ordrup Mose, Ermelund (Stæger, the author), Dyrehaven, Geel Skov, Tisvilde, and in Jutland in Vejle Nørreskov and Højenbæk Dal (the author). My dates are $21/5$ — $15/9$. It occurs in the same places as *spuria*. When this species is observed in the free, sitting on the leaves, the wings, which then lie one over the other, appear quite and lively red, and the species is very beautiful; the same is, but to a less degree, the case with *spuria*.

Geographical distribution: — The species is hitherto only known from Denmark.

4. *B. nigra* Meig.

1824. Meig. Syst. Besch. IV, 3, 2. (*Cyrtoma*). — 1842. Zett. Dipt. Scand. I, 330, 2, et 1859. XIII, 4997, 2. (*Cyrtoma*). — 1862. Schin. F. A. I, 76. (*Cyrtoma*). — 1903. Kat. paläarkt. Dipt. II, 221.

Male. Epistoma blackish; occiput dark grey with black hairs. Antennæ black or brownish black. Thorax æneous, somewhat shining, with indications of two stripes. The bristles present as usual, black; the hinder dorsocentral bristles long. Scutellum greyish æneous, with black marginal bristles. Pleura grey. Abdomen slender, greyish or dark æneous, somewhat shining; the long hairs not dense, more or less pale brown to pale yellowish; they are short along the middle. Legs long and slender, still longer than in *intermedia*, more or less dark brown to blackish brown. The hind tibiæ relatively strongly thickened towards the tip, the two first joints of the hind tarsi quite

distinctly thickened. The femora have dorsal and ventral rows of hairs which are short on the anterior femora, but long on the hind femora, and those on the dorsal side considerably longer than the femora are broad; the tibiæ with similar rows the hairs of which are dense and short on the ventral side, longer and less dense on the dorsal side; they are longest on the hind tibiæ; all tibiæ have some longer bristles on the dorsal side; the usual dense pubescence on front and hind tibiæ present; tarsi short haired, a little longer on the dorsal side of the hind tarsi. The hairs and bristles are black or blackish. The wings are slightly brownish fumigated with a light reddish tint, and somewhat iridescent; there is a more saturated part at the anterior margin, but it is only slightly pronounced, it is bordered as in the preceding species, but sometimes somewhat indistinctly. Veins darker or paler brown; discal vein thin but distinct, the fork generally incomplete, the upper branch more or less interrupted at the base. The apical part of the mediastinal cell brownish. Halteres more or less pale brown.

Female. Thorax as in the male; abdomen more greyish, the hairs shorter. The two first joints on the hind tarsi a little less thickened. Halteres yellow or dirty yellowish.

Length 3,3—4 mm.

This species is rather easily distinguished from *intermedia* by the longer, more slender and longer-haired legs, and the very distinctly thickened joints on the hind tarsi, as also by the lighter-haired abdomen and the less tinged wings; besides it is generally larger. As mentioned the hind femora are short in *spuria*, longer in *intermedia* and still longer in *nigra*; this may also be seen by counting the long hairs in the dorsal (postero-dorsal) row, *spuria* shows about twelve, *intermedia* about fifteen and *nigra* about twenty two.

B. nigra is in Denmark less common than *spuria*, but it frequents the same localities; Dyrehaven, Geel Skov, Birkerød, Tyvekrogen, Nøddebo, Tisvilde; on Fænø and in Jutland at Hald near Viborg. My dates are ²⁸/₅ to the first part of August.

Geographical distribution; — Northern and middle Europe down into France; towards the north to middle Scandinavia.

5. *B. pilosa* n. sp.

Male. Epistoma blackish; occiput blackish grey with dense, black hairs. Antennæ black. Thorax black, somewhat shining, with an indication of two stripes. The acrostichal and dorsocentral bristles long, and likewise the bristles at the sides of the disc; the hinder bristles not much longer. Scutellum greyish, with strong marginal

bristles; all bristles black. Pleura dark grey. Abdomen somewhat strong, dark grey, dull or very slightly shining, black haired, with erect hairs which are not much longer at the sides than in the middle. Venter similarly haired. Legs somewhat robust, black, and somewhat strongly pilose; the hind tibiæ slightly thickened towards the tip and the two first joints of the hind tarsi slightly thickened. Femora with dorsal and ventral rows of somewhat long hairs; tibiæ with similar rows which are shortest on the ventral side; all tibiæ on the dorsal side with somewhat strong bristles which are more numerous than in the other species; the short, dense pubescence on front and hind tibiæ present as usual. Tarsi with short hairs, a little longer on the dorsal side of the hind tarsi. All hairs and bristles black. Wings strongly brownish tinged, most towards the anterior margin, the more saturated part bounded by the cubital vein. Veins black or brown; the discal vein thin but distinct, the fork incomplete, the upper branch being interrupted at the base. The apical part of the mediastinal cell brown; the wings iridescent. Halteres more or less dark brown.

Female. Abdomen blackish grey, somewhat æneous, shining; the hairs as long as in the male. Wings and halteres as in the male. Length 3—3.7 mm.

This species is recognised without difficulty by its somewhat robust shape and legs and especially by its stronger pilosity, as also by the dark grey abdomen in the male.

B. pilosa is not common in Denmark; Tisvilde (the author); in Jutland at Silkeborg (A. Petersen), at Sæby and Frederikshavn (H. J. Hansen), and at Jerup north of Frederikshavn (Th. Mortensen). According to the localities the species seems to prefer sandy places, and nearly all the localities are at or near the shore. My dates are $^{10}/_6$ — $^{14}/_7$.

Geographical distribution: — The species is hitherto only known from Denmark.

Remarks: The above enumerated species of *Bicellaria* are certainly sure and distinct species; they are nearly related, the distinguishing characters are small, but good and constant. It will perhaps not be easy to determine the species from the analytical table given above, but I think that it will always be possible, by use of the table and descriptions, to get to a correct result. *B. melaena* is characterised

by the quite simple hind legs and the slightly hairy legs; *spuria* by the short and somewhat robust, more hairy legs, slightly thickened hind tibiæ, but simple hind tarsi; *intermedia* by the medium-long legs, the longer-haired femora and the slightly thickened two joints on the hind tarsi; besides the female has light halteres; *nigra* has still longer and more slender legs, the hind femora have still longer hairs, and the first two joints on the hind tarsi are considerably thickened; also it differs in the whole colour, the paler hairs and clearer wings, and the paler halteres in the male; *pilosa* finally is recognised by its strong pilosity and the colour of abdomen in the male. — In a historical sense it is not uninteresting to note, that the species of *Hybos* by the use of varying and not valid characters have been divided into more species than really exist, while on the contrary the species of *Bicellaria*, distinguished by characters which are to be sure small, but good, have remained unrecognised. For the rest there are several indications in the literature, showing that the authors have felt, that the species were not satisfactorily treated; thus Scholz (Zeitschr. f. Entom. Breslau, V, 1851, 60) says, after having enumerated *spuria* and *nigra*: „Die *Cyrtoma*-Arten bedürfen jedenfalls noch einer genaueren Auseinandersetzung“, and Zetterstedt says under *nigra*: „specimina sub hoc nomine a D. Stæger e Dania communicata, pedibus nigris & metatarsis parum incrassatis, potius, ut mihi videtur, ad *Cyrt. spuriam* referenda“. As remarked above these specimens belonged to *intermedia* and Zetterstedt's expression shows, that at the same time as he recognised them as not belonging to *nigra*, he was also not certain in referring them to *spuria*. Strobl (Mitth. Ver. Steierm. 1892, 43) gives some notes about *spuria* and *nigra*, but when he says, that *nigra* has „einen weisslich behaarten Hinterleib“ this is not quite correct, the hairs are more or less pale but not white; about *nigra* he says that the two first joints of the hind tarsi are considerably thicker than the following, but then he continues: „doch ist auch hier bei reifen Exemplaren die Verdickung wenig auffallend“; I think such specimens may have been *intermedia* which has always darker legs than *nigra*, and therefore the author takes these specimens to be quite mature. All specimens of *nigra* I have seen have had very distinctly thickened joints. In Schiner's descriptions there seems to be some confusion, as he ascribes *nigra* blackish and *spuria* brownish wings; moreover he says about *spuria*: „die Art ist nach meinen Erfahrungen, Meigens Angaben entsprechend, immer etwas grösser“, and he gives for *nigra* 1½", for *spuria* 1¾—2", whereas *nigra* in reality is the largest; Meigen gives also for *spuria* (*atra*) 1½" and for *nigra* 2".

2. **Empidinae.**

Eyes either touching in the male, separated in the female, or separated in both sexes; in the former case the facets in the male larger above than below. When the eyes are separated in both sexes they are sometimes more narrowly separated in the male than in the female. Antennæ five-jointed, with a two-jointed style. Proboscis of various length, from a little shorter than the head is high to about as long as the body. Maxillæ present; maxillary palpi one-jointed. Thorax not very high. Metapleura with bristles or (*Hilara*) bare. Cubital vein forked, or (*Rhamphomyia*) unforked; discal vein forked; discal cell present, sending three veins to the margin; four posterior cells; the basal cells of equal length; anal cell shorter than the second basal cell; lower branch of postical vein recurrent; anal vein reaching the margin or abbreviated. Axillary lobe generally well developed, sometimes small. Alula small or wanting. Stigma present, sometimes very weak.

Table of Genera.

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|---|-------------------------|
| 1. Cubital vein not forked..... | 4. <i>Rhamphomyia</i> . |
| — Cubital vein forked..... | 2. |
| 2. Mediastinal vein not reaching the margin; the upper branch of the cubital vein short, more or less steep; metapleura with bristles; front metatarsus in the male simple or very slightly swollen | 5. <i>Empis</i> . |
| — Mediastinal vein reaching the margin; the upper branch of the cubital vein somewhat long, more or less parallel with the lower branch or somewhat diverging; metapleura bare; front metatarsus in the male with rare exceptions more or less strongly swollen | 6. <i>Hilara</i> . |

4. **Rhamphomyia** Meig.

Species of small or medium size and most frequently of a slender shape. The colours are dark or grey, sometimes yellow. The head is somewhat small, more or less globular, and somewhat arched behind; it is here clothed with hairs which are generally somewhat stronger in the female than in the male. The eyes are large, occupying nearly the whole front part of the head; they are in most cases touching in the male, separated in the female, but sometimes they are separated in both sexes, but then the frons is narrower in the male than in the female, and sometimes it is very narrow. When the eyes are touching this is for a long distance, so that the frontal triangle is small, sometimes very small. The colour of the eyes is dark reddish or brownish sometimes bright red (e.g. *nigripennis*). When the eyes are touching the facets are in the male larger in the upper half part than below

and the dividing line is rather sharp; at the posterior margin of the eye the small facets are continued somewhat upwards. In the dichoptic males the facets are of the same size above and below. The common incisure in the middle of the inner eye-margin is present, often it is larger in the male than in the female. The vertex is small but prominent, and bears three ocelli and some shorter or longer hairs. The antennæ are inserted quite near to each other, about in the middle of the front side, rarely higher above (e. g. *flava*); they are five-jointed, the first joint is cylindrical, the second shorter, almost globular, the third more or less elongated, attenuated towards the apex and thus of more or less conical shape, and it is compressed; the two last joints form a shorter or longer, but always somewhat short style, the first joint of which is the shortest. The two basal joints have shorter or longer, more or less bristly hairs. Epistoma is broader or narrower, sometimes very narrow (e. g. *flava*); when the antennæ are inserted above the middle it is somewhat high; it is flat, or sometimes a little arched, or the lower edge is a little projecting. The jowls are very small, not descending below the eyes, but only present as a narrow rim. The oral cone is somewhat small; clypeus consists of two chitinous lists meeting above, and it is thus almost horse-shoe-shaped; it stretches from the epistoma to the base of labrum. Proboscis is shorter or longer, from somewhat shorter than the head is high to about twice as long; it is directed more or less vertically downwards. Labrum is about of the length of labium when the latter is in the normal position; it is strongly chitinised, semitubular, high at the base, pointed towards the apex and here divided into three pointed lobes which can be spread or closed. Hypopharynx is about of the length of labium, semitubular, dilated towards the end but the very apex forms a small, protruding point. The maxillæ have long lacinia formed as thread-like blades and pointed at the apex; they are somewhat shorter than hypopharynx; the maxillary palpi are somewhat long, cylindrical, one-jointed; they are directed upwards and haired. Labium is only weakly chitinised; the labella are as a rule more than half as long as the basal part of labium, not or only slightly broader, more or less oval, and haired below; they are cleft to their base but connected with the basal part of labium by an oblique line, so that they are longer below than above. Labium has a very long connecting membrane at the base, so that it may be drawn much longer out than its own length, but in rest this membrane is folded in, and likewise the oral cone, the clypeus then being withdrawn into the oral aperture. Thorax is rectangular somewhat, sometimes highly, arched above; prothorax

distinct, ring-like; it bears bristles or hairs above. Metathorax is very small, and there is no metasternum developed, the part between the first ventral segment and the hind coxæ being membranous. There are as a rule dorsocentral and acrostichal bristles or hairs, but they may be very variously developed, each kind present in one or more rows, and of various length, most frequently short; generally they are longest behind; the acrostichal bristles may be quite absent, and the thorax may be short and uniformly haired, without observable bristles. There are as a rule humeral, posthumeral, some notoplural, a supraalar and a postalar bristle; besides there may be smaller bristles or hairs at the sides of the thoracic disc. There are some (generally four) scutellar marginal bristles. Metapleura have stronger or weaker bristles or hairs. Abdomen is generally somewhat slender, cylindrical, consisting of eight segments; the first segment is short, its tergite slightly broader than the following. The male genitalia may show very different aspects, but seem however to be of the same principal construction. For want of suitable material I have only been able to examine their structure somewhat superficially. As said above there are eight abdominal segments, the eighth seems to form a complete ring which is not, as the other segments, divided at the sides into a ventral and a dorsal half-ring by a lateral connecting membrane; the ring is often incised in the hind margin in various ways, thus giving rise to projecting lamellar parts; the lower part is often more or less protruding as an arched ventral plate. The genitalia themselves seem to me to consist of two pairs of lamellæ, the upper and the lower, forming two pairs of forceps; the upper lamellæ are often very complicated and may, when dissected, show branches inwards which are not visible when the organ is seen in situ, or only the ends of them are seen, appearing as supernumerary lamellæ; the upper lamellæ are often more or less connected with each other and thus in reality consisting of only one piece. The penis issues from inwards just above the mentioned ventral plate (eighth segment) and curves upwards between the lateral lamellæ; it is thicker or thinner, often thread-like, and it may be simply curved or more or less sinuous; at the ventral base of penis there is (always?) a, generally small, sometimes cleft, ventral lamella, as a rule only seen by dissection. In the female the abdomen is pointed, the last segments being narrow, longer than broad; after the eighth segment follows a small ring terminating with two, somewhat long styles. The legs are more or less slender, sometimes rather long; in the males they sometimes show structural peculiarities such as thickenings or excisions of the hind femora and tibiæ, or they are provided with

dents or bundles of hairs or bristles, or finally the front or hind metatarsi are thickened. The legs are more or less hairy with a common clothing; besides there are longer hairs or bristles to a various degree, especially on the hind legs; in the female the legs are either simply haired, or they are all, or more frequently the posterior or hind pair, fringed with scaly hairs. Thin apical spurs or bristles are as a rule present, but they are always small and inconspicuous. There are two claws, two well developed pulvilli and a small, linear, membranous empodium, terminating with a pencil of hairs. Wings sometimes in the female more or less, sometimes much, dilated and of a curious shape, but not or only slightly so in the male; not rarely they are somewhat darker in the female than in the male, but sometimes on the contrary darkest in the male; the mediastinal vein not reaching the margin; cubital vein unforked and thus one cubital cell; discal vein forked, thus four posterior cells and the discal cell sending three veins to the margin, the third of which is the upper branch of the postical vein which closes the discal cell below; anal vein distinct or weak, reaching the margin or disappearing about in the middle; the second branch of the postical vein recurrent towards the base of the wing and about parallel with the margin; the anal cell shorter than the second basal cell. The discal cell may vary somewhat in shape and size, in some cases it is different in the male and the female, being larger in the latter sex, often very large and produced to the wing-margin. Stigma present, sometimes very weak. Axillary lobe generally well developed. Alula very slightly developed, fringed at the margin. Alar squamulæ roundish, fringed at the margin. — In some few (non Danish) species the wings are somewhat aberrant, without discal cell.

But few larvæ of species of *Rhamphomyia* are known. Bouché describes larva and pupa to *R. spinipes* (Naturgesch. der Ins. 1834, 48, Taf. IV, Fig. 26—30); Beling (Arch. für Naturgesch. 48, I, 1882, 214—17) describes larvæ and pupæ to *R. sulcata*, *nitidula* and *dentipes*. The larva of *R. platyptera* is mentioned by Kleine (Zeitschr. für Naturwissensch. 1909). The larva is cylindrical, somewhat spindle-shaped, whitish yellow; the body consists, the head included, of twelve segments (Beling says twelve and Brauer says: „Körper mit der Kieferkapsel 12-ringelig“; Bouché figures thirteen segments. I have not examined any larva, I think there are twelve segments, but I am not certain). The last segment is somewhat globular with shallow, longitudinal furrows; on the ventral side of the abdominal segments there are slight, transverse swellings (Kriechschwelen). The larva is amphipneustic with small prothoracic spiracles and larger

terminal spiracles lying on the rounded end of the last segment or slightly more above; below them there is a small tooth or wart. Besides the pupæ described by the authors mentioned I have examined the pupa of *R. nigripes*; it is dirty yellowish; the head has in front four quadrately placed tubercles, each with a long bristle; the antennal sheaths lie below the front of the head directed obliquely to each side; thorax has some long bristles above; on each of the abdominal dorsal segments there is a transverse row of small, triangular, brownish teeth, directed backwards, and between them are long bristles; the first segment has only bristles. The ventral segments have only bristles and somewhat sparingly. The dorsal bristles are directed backwards, those on the somewhat swollen sides of the segments are erect. At the apex there are some more or less tuft-like arranged bristles. There are prothoracic and seven pairs of small abdominal spiracles, all protruding process-like. According to Beling there may be a little difference between the male and female pupæ with regard to the head and the apex of abdomen, obviously due to the different shape of these parts in the two sexes of the imago.

The larvæ live in humous earth in woods especially on humid places; the larva to *R. dentipes* was found by Beling in a decaying stub of a beech, and Kleine records the larva of *R. platyptera* from decaying stubs of fir. The larvæ are certainly carnivorous. The pupæ are found on the same places as the larvæ. The larvæ hibernate and the transformation to pupa and development take place in the following spring or summer; thus the autumnal species must live as larvæ during the most part of the summer.

The species of *Rhamphomyia* occur for the most part in woods, especially on humid places, and on somewhat low plants; some also are seen outside woods, in fens and on meadows. The majority of the species are either spring species or autumn species, occurring respectively in the early spring or in the late summer and autumn; only some few species are seen during the whole summer. Several species are in spring seen hovering in the air higher or lower, especially at water, and sometimes they fly quite low above the water like the species of *Hilara*. They are carnivorous, feeding on other insects; I have taken *R. nigripes* with *Hilara maura* as prey; Poulton records from England, in the work cited above, *R. dentipes* with *Baetis pumilus* Burm. as prey. The species of *Rhamphomyia* or some of them seem to execute the act of copulation in the way, that the male catches a prey which it then presents to the female when copulation takes place, such as mentioned below under *Empis*. Hamm

(Entom. Month. Mag. XLV, 1909, 161) has taken *R. sulcata* in copula and with prey, and I have taken *R. nigripes* in the same way.

The genus comprises about 155 species from the palæarctic region; 22 have hitherto been found in Denmark. It is essentially a boreal genus, thus two species occur in Greenland, where otherwise of Empids only *Clinocera stagnalis* occurs, and four species occur on Nova Zembla. Zetterstedt has 79 species from Scandinavia, and even if this number is too great, the number of real species is certainly not small. On the other hand it is recently shown, that the genus is also well represented in South America in the mountainous regions; Bezzi records (Nova Acta. Abhandl. d. Kais. Leop. Carol. Deutsch. Akad. der Naturf. XCI, No. 3, 1909, 320) that 31 species are known from there.

Remarks: In the following descriptions I have not given the length of the proboscis, as this character is of no value, since the labium is, as said above, able to be extended to a great length when its basal connecting membrane is fully drawn out; I have on the contrary given the length of labrum, though also this length may be somewhat varying, according as the oral cone is folded in or more drawn out. I shall also note, that nearly all species with dark legs may have these somewhat varying between black and brown, which is, I think, for a great part due to the degree of maturity; but also old museum specimens are very often extraordinarily light, probably due to bleaching.

In the consecutive order in which I have placed the species, and in the analytical table I have to some degree used the groups proposed by Frey (Acta Soc. pro Faun. et Flor. Fenn. XXXI, No. 9, 1909, 17), but otherwise I think, that such definite groups cannot be established, as the arrangement of the thoracic bristles is much varied and would lead to many more groups. Thus in the group with the eyes in the males separated *nigripes* has pluriserial dorso-central bristles, *dissimilis* and *spissirostris* biserial; the two latter species have hairs behind the humeri, but they are delicate, so that the dorsocentral bristles are distinct from them. In the next group *spinipes* and *sulcata* have pluriserial dorsocentral bristles fused with the hairs behind the humeri, but in *vesiculosa* the dorsocentrals are somewhat distinct from these hairs, and *tarsata* has biserial dorsocentrals, rather distinct from the hairs at the sides, only somewhat fused with them quite in front; *conformis* has biserial dorsocentrals with both rows equally long, and uniserial acrostichals, it cannot be placed in Frey's group 4; *simplex* has biserial, equally long dorsocentrals and biserial acrostichals, it cannot well be placed in Frey's

group 3; *obscura* has uniserial dorsocentrals, but biserial acrostichals; *tibiella* and *plumipes* have distinct, biserial dorsocentrals, but *pennata* and *dentipes* have distinctly uniserial dorsocentrals, these species could scarcely remain in the same natural group; *culicina* and *hybrida* have distinctly observable acrostichals, *nigripennis* and *umbripennis* have, I think, none; *variabilis* has likewise no acrostichals but long dorso-centrals; *gibba* finally has ordinary, very short pubescence almost without rows.

Table of Species.

- | | |
|--|---------------------------|
| 1. Eyes in the male separated; wings in the female with the discal cell very large, or if not, with two spots below it; colour of the body not yellow nor shining black | 2. |
| — Eyes touching in the male; if slightly separated the colour of the body is yellow or shining black; wings in the female with a normal discal cell | 4. |
| 2. Thorax with four distinct stripes | 2. <i>nigripes</i> . |
| — Thorax only with two distinct stripes | 3. |
| 3. Male without yellow hairs at the end of the hind tibiæ; female with the discal cell reaching to the margin | 3. <i>spissirostris</i> . |
| — Male with yellow hairs at the end of the hind tibiæ; female with a normal discal cell | 4. <i>dissimilis</i> . |
| 4. Wings in the male a little broadened, in the female very broad with a brown seam; hind tibiæ and the two first tarsal joints in the male with very long hairs and bristles | 1. <i>platyptera</i> . |
| — Wings not broad or only somewhat broad in the female; hind tibiæ in the male not with so long hairs... | 5. |
| 5. Dorsocentral bristles pluriserial | 6. |
| — Dorsocentral bristles bi- or uniserial | 8. |
| 6. Halteres brownish; male with thin, whitish hind tibiæ and tarsi, and with a very large, whitish, somewhat bladder-like appendage at the genitalia; female with broad, brown wings and somewhat ciliated hind legs | 7. <i>vesiculosa</i> . |
| — Halteres pale; hind legs of the male normal; wings in the female not broad, hind legs not ciliated | 7. |
| 7. Wings strongly brownish tinged; male with a spine-like tuft of bristles at the base of the hind femora; female without spine-like bristles below the hind femora | 5. <i>spinipes</i> . |
| — Wing less tinged; male without any spine-like tuft at the base of the hind femora; female with short, spine-like bristles below the hind femora | 6. <i>sulcata</i> . |
| 8. Dorsocentral bristles biserial | 9. |
| — Dorsocentral bristles uniserial, or (in <i>gibba</i>) not observable .. | 14. |
| 9. Acrostichal bristles uniserial; legs in the female not pennate | 8. <i>conformis</i> . |
| — Acrostichal bristles biserial; legs in the female pennate, except in <i>simplex</i> | 10. |

10. Colour shining black 9. *tarsata*.
 — Colour grey or dark brown 11.
11. Colour blackish brown 10. *obscura*.
 — Colour grey 12.
12. Male genitalia relatively small, without a long projecting
 penis; legs in the female not pennate 11. *simplex*.
 — Male genitalia large or with a long, thin, projecting
 penis; legs in the female pennate 13.
13. Male genitalia large, penis not long projecting; posterior
 legs of the female pennate; length 3.5—5 mm. 13. *plumipes*.
 — Male genitalia smaller, penis projecting, long and thin;
 in the female only the hind tibiae pennate on the
 dorsal side; length 2.5 mm. 12. *tibiella*.
14. Acrostichal bristles present 15.
 — Acrostichal bristles absent, or (in *gibba*) exceedingly
 short 19.
15. Acrostichal bristles distinctly biserial; thorax grey in
 both sexes; hind legs in the male of peculiar shape;
 male genitalia large 16.
 — Acrostichal bristles more or less irregularly or in-
 distinctly biserial, or uniserial; thorax black or dark
 brown in the male, grey in the female, or the whole
 body yellow; male genitalia small 17.
16. Thorax grey, abdomen yellow; male genitalia large,
 hind femora with tufts of hairs at the apex; legs in
 the female pennate 14. *pennata*.
 — Thorax and abdomen grey; male genitalia with long
 lamellae and a long projecting penis; hind legs of a
 curious shape; legs in the female not pennate 15. *dentipes*.
17. Colour yellow in both sexes, thorax not striped; anten-
 nae inserted above the middle; eyes in the male
 narrowly separated 16. *flava*.
 — Colour dark in both sexes, or yellow in the female
 but then thorax somewhat distinctly striped; antennae
 inserted in the middle 18.
18. Thorax black in the male, grey in the female; hind
 femora with no bristle towards the middle on the
 ventral side; wings in the male brownish; length
 4.5—5 mm. 17. *culicina*.
 — Thorax black in the male, body quite yellow in the
 female; hind femora with a ventral bristle towards
 the middle; wings in the male darker; length 3.5—4 mm. 18. *hybrida*.
19. Halteres dark or black 20.
 — Halteres pale 21. *variabilis*.
20. Small, robust, black shining species; eyes in the male
 very narrowly separated; discal cell long; hind legs
 in the female somewhat pennate 22. *gibba*.
 — Slender species; eyes touching in the male; discal
 cell not long, situated somewhat near the base; legs
 in the female not pennate 21.

21. Front coxæ quite yellow, posterior coxæ darker; hind metatarsi in the male not thickened 19. *nigripennis*.
 — All coxæ blackish; hind metatarsi in the male slightly thickened 20. *umbripennis*.

1. *Rh. platyptera* Panz.

1794. Panz. Fn. Germ. XXIV, 23 (*Empis*). — 1851. Lefebv. Ann. Soc. Ent. Fr. 2, IX, 125, pl. IV, fig. 1—4 (*Empis*). — 1862. Schin. F. A. I, 97. — 1903. Kat. paläarkt. Dipt. II, 228. — *Empis marginata*: 1805, Fabr. Syst. Antl. 138, 3. — 1859. Zett. Dipt. Scand. XIII, 5017, 29—30. — *Rhamptomys marginata*: 1843. Jacobsen, Naturh. Tidsskr. IV, 1842—43, 211.

Male. Eyes contiguous. Epistoma grey; occiput grey with black hairs; labrum about as long as the head is high. Antennæ with the third joint a little elongated, black or brownish black; the basal joints slightly lighter and hairy. Thorax dull grey with a narrow, median and two broader, lateral, brown but indistinct stripes; on the anterior part there is on each side of the median stripe a narrow stripe, these two stripes diverging anteriorly. The dorsocentral bristles are of moderate length, somewhat irregularly biserial, the acrostichal bristles uniserial, very short, only visible behind; there are humeral, post-humeral, notopleural, supraalar and postalar bristles; all the bristles black. Scutellum grey with six, somewhat strong marginal bristles. Pleura grey with black metapleural bristles. Abdomen grey, not shining; venter of the same colour. Abdomen is densely clothed with erect, blackish or brown hairs, at the hind margin of the segments there are strong hairs; venter has long, scarce hairs. The exterior genitalia are small, the lower lamellæ triangular, somewhat pointed, shining, the upper lamellæ apparently doubled, so that four small, styliiform pieces are seen; all lamellæ with long hairs. Penis is brown, so far as I could see simply curved. Legs brown (the description is made after old museum specimens which are perhaps somewhat bleached), slightly shining; coxæ somewhat greyish pruinose. Front femora short-haired; middle femora with anterior, ventral and posterior rows of hairs, and with short hairs above; hind femora similarly haired but the hairs longer, and with long, bristle-like hairs in an anterior and postero-ventral row which are longest towards the apex; the anterior tibiæ with rows of short hairs and with some bristles on the dorsal side; the hind tibiæ with very long hairs, especially on the dorsal side, and also with a ventral row, between the hairs on the dorsal side there are some long, thin bristles; the two first joints of the hind tarsi are haired like the tibiæ, otherwise the tarsi are short-haired; the hind tarsi finely spinulose below; all the hairs are brownish. Wings slightly broadened but of normal shape,

hyaline, very slightly yellowish. Veins light brown to yellowish. Stigma faint, yellow. Halteres white with a slight yellow tinge.

Female. Quite agreeing with the male in shape and colour of the body, but the legs short-haired. Wings broad, and especially very broadened towards the apex, this forming an almost straight line in which the cubital, discal, postical and anal vein terminate; it is thus seen, that it is the part of the posterior margin from the apex of the anal vein to the apex of the cubital vein which is drawn out to form the broad, straight end of the wing; along the posterior and apical margin there is a broad, brown seam.

Length. About 4—4,5 mm.

Remarks: The specimen described l. c. by Lefebvre as a male is both by description and figures with certainty a female.

Rh. platyptera is very rare in Denmark, only five specimens, all females, have been taken; Charlottenlund (Jacobsen), Dyrehaven (Schlick), at Sorø (Schlick) and one specimen without locality probably also from Dyrehaven (Drewsen). Jacobsen caught his specimens in the grass, while Schlick took one of his two specimens sitting on a hedge-stake in the fence of Dyrehaven. The dates known are $16/5$ — $24/5$.

Geographical distribution:— Northern and middle Europe down into France and Switzerland; its northern limit lies in the southern Sweden.

2. *Rh. nigripes* Fabr.

1794. Fabr. Ent. syst. IV, 405, 13 (*Empis*) et 1805. Syst. Antl. 141, 17 (*Empis*). — 1822. Meig. Syst. Besch. III, 48, 13, Taf. XXIII, Fig. 2. — 1842. Zett. Dipt. Scand. I, 389, 1 et 1849. VIII, 3030, 1. — 1862. Schin. F. A. I, 98. — 1903. Kat. paläarkt. Dipt. II, 227.

Male. Eyes separated, frons narrow, dark grey, with a faint impressed middle-line, somewhat widened below; the frons has long, erect, blackish brown hairs. Epistoma grey; occiput grey with black hairs, on the lower half with long, pale yellow hairs. Labrum about as long as the head is high or slightly longer, black, ferruginous at the tip; palpi black with black hairs. Antennæ about as long as the head, black, the two basal joints greyish with black hairs; the first joint twice as long as the second. Thorax grey with four brownish black stripes, the two lateral broad, somewhat abbreviated in front, the two median narrow, abbreviated behind. The dorsocentral and acrostichal bristles short, black, sometimes brownish in front; the former somewhat pluriserial, the latter biserial; further a humeral bristle, a posthumeral, three notopleural bristles, some supraalar and a

postalar all black; about and behind the humeri there are yellow hairs. Scutellum grey with (about six) black marginal bristles. Pleura grey, metapleura with yellow hairs. Abdomen dark grey, slightly shining; narrow, pale grey hind margins to the segments are generally seen; venter lighter grey. Abdomen is clothed with erect, yellow hairs; venter similarly haired. Exterior genitalia somewhat large, the eighth ventral segment drawn out into two triangular lamellæ, long yellow haired; on the dorsal side a pair of similar, but more hidden lamellæ; the lower lateral lamellæ somewhat shovel-shaped, with an obliquely cut, somewhat dented hind margin; they are black, somewhat shining, with yellow hairs below; the upper lateral lamellæ are of a complicated shape, each sending a somewhat blade-like, at the

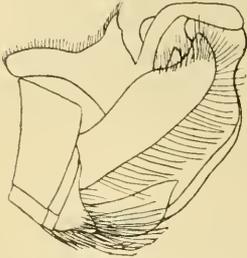


Fig. 6. *Rh. nigripes*,
male genitalia.

upper margin dark haired process forwards in over abdomen; at the base of this process there is a small, triangular outshoot above, and backwards each process has an almost rectangularly bent, somewhat styliform process. Penis is a thin, black thread curved several times, slightly thickened in the basal part, and here surrounded by a sheath. Legs somewhat robust, black; coxæ greyish pruinose; the hind femora somewhat long, with two thickenings on the posterior side just before and behind the middle, and slightly incurved between them; front and hind metatarsi very slightly thickened. The front femora are short-haired; the middle femora have a ventral row of short, strong bristles, and a row of longer bristles more posteriorly; the hind femora have a ventral row of longer bristles; the anterior tibiæ are short-haired, specially densely on the ventral side and with some longer bristles on the dorsal side; the hind tibiæ are similarly haired, but both the ventral hairs and the dorsal bristles are longer, and the latter are densely, somewhat tuft-like placed at the end of the tibiæ; the anterior tarsi are short-haired, the hind tarsi have bristle-like hairs on the dorsal side and are slightly spinulose on the ventral side. The stronger hairs and bristles are black or brownish, the finer partly pale, but besides the legs have a common, short, pale brownish pubescence. On the nodose posterior side of the hind femora there is a very short and dense, pale brown pubescence, and a similar, pale pubescence is found on the ventral side of the posterior femora. Wings slightly fumigated; veins blackish brown, the anal vein very pale, not reaching the margin. Stigma narrow, blackish. Halteres white.

Female. Frons about twice as broad as in the male, with a distinct, impressed middle line. Abdomen light grey, quite short-haired; hind femora simple, and the legs short-haired and without bristles; the dense, short pubescence on the ventral side of the



Fig. 7. Wing of *Rh. nigripes* ♀.

posterior femora wanting. The wings have the discal cell magnified and drawn out near to the posterior margin, the lower of the closing cross-veins parallel with the hind margin. The rest quite as in the male.

Length 5,5—6,5 mm.

The pupa is dirty yellowish; it has a length of 6 mm.

This species is easily recognised by the colouring of the thorax, the pilosity of the hind legs in the male and the shape of the discal cell in the female.

Rh. nigripes is not at all a common species in Denmark; Ermelund, Frederiksdal, Ruderhegn, Birkerød, Tyvekrog. It occurs often near water. It is a spring species, my dates are $^{28}/_5$ — $^{21}/_6$; on this latter date I took it at Frederiksdal, it was flying over and near a streamlet (Lyngby Aa) rather high in the air; several pairs were taken in copula, and it was taken with *Hilara maura*, which was swarming in great numbers over the water, as prey. The pupa was taken in Ermelund in a mole cast on $^{15}/_5$, it developed on $^{20}/_5$.

Geographical distribution: — Northern and middle Europe down into France; towards the north to northern Scandinavia; and in Finland.

3. *Rh. spissirostris* Fall.

1815. Fall. Dipt. Suec. Emp. 31, 38 (*Empis*). — 1822. Meig. Syst. Besch. III, 57, 31. — 1842. Zett. Dipt. Scand. I, 390, 2, et 1849. VIII, 3031, 2. — 1862. Schin. F. A. I, 97. — 1903. Kat. paläarkt. Dipt. II, 230. — *Empis nodipes*: 1815. Fall. Dipt. Suec. Emp. 25, 22.

Male. Eyes separated; frons very narrow, blackish, towards the antennæ greyish, with erect hairs. Epistoma grey. Occiput grey with yellow hairs, towards the vertex intermingled with some black ones.

Labrum a little longer than the head is high; palpi black, with black hairs. Antennæ about as long as the head, black, the two basal joints greyish. Thorax grey, very slightly shining, with two dark or blackish grey stripes; the dorsocentral and acrostichal bristles very short, biserial, brownish; further a humeral, a posthumeral, three notopleural, some supraalar and a postalar bristle; the humeral, posthumeral and notopleural bristles yellow, the others black; on and behind the humeri there are scarce, yellow hairs. Scutellum greyish with two marginal bristles. Pleura grey, metapleura with pale yellow hairs. Abdomen dark grey with narrow, light grey incisures, slightly shining; venter lighter grey and more dull. Abdomen clothed with long, erect, yellow hairs, those at the hind margins of the segments longest and strongest, fan-like spreading; venter more sparingly haired. The exterior genitalia much as in *nigripes*; the lamellar processes from the eighth segment larger, the backwards directed processes from the upper lamellæ not angularly bent but gently curved and the triangular outshoot above more tubercle-shaped; the lower lamellæ black, shining, with long, yellow hairs below. Penis thread-like and curved as in *nigripes*. Legs black; coxæ greyish pruinose; the front metatarsi somewhat thickened, the hind metatarsi practically not thickened. Anterior femora with somewhat long hairs below, on the middle femora in antero- and postero-ventral rows; hind femora with a dorsal row of middle-long hairs, and a ventral row of relatively few hairs which are long in the apical half; the anterior tibiæ with short hairs and a few longer bristles, the hind tibiæ short-haired ventrally, but with long hairs dorsally most of which are stronger and bristly; the hind metatarsi are similarly haired on the dorsal side, and slightly spinulose on the ventral side; also the middle metatarsi have long, bristly hairs on the dorsal side and are spinulose beneath; otherwise the tarsi are short-haired. The hairs on the femora, except on the dorsal side of the hind femora, are yellow, the other hairs and bristles black or dark brownish. For the rest the legs have a thin, short, pale pubescence. Wings hyaline; veins blackish; anal vein very pale, not reaching the margin. Stigma very faint, almost absent. Halteres clear white.

Female. Frons more than twice as broad as in the male, with a fine, impressed middle line. Dorsocentral and acrostichal bristles still shorter. Abdomen light grey, exceedingly short and sparingly haired. Legs nearly bare, only below the hind femora towards the apex some bristle-like hairs, which are blackish; front metatarsi simple. Wings with the discal cell magnified, extended backwards, so that the hinder, lower angle touches the margin, the lower of the

closing cross-veins perpendicular to, not parallel with the margin; at the hind-margin, on each side of the lower corner of the discal cell (in the third and fifth posterior cell) there is a more or less faint, greyish patch, sometimes very slightly visible.

Length 4,3—5 mm.

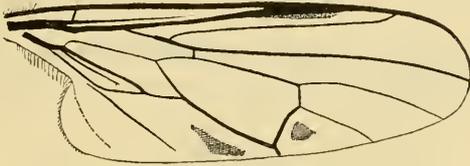


Fig. 8. Wing of *Rh. spissirostris* ♀.

This species cannot be confused with *nigripes*; besides the size, the design of thorax and the clear wings, it is distinguished in the male by the thickened front metatarsi and the curiously haired middle metatarsi, as well as by many other differences in the pilosity of the legs, and in the female by the shape of the discal cell.

Rh. spissirostris seems not to be common here; it occurs near water; Amager Fælled, Hillerød, Boserup near Roskilde and on Falster at Resle. It is a spring species, my dates are $^{22}/_5$ — $^{10}/_6$; on the latter date I took it on Amager Fælled flying low over a water pool together with the following species. Zetterstedt notes (VIII, 3031) as communicated by Stæger „Occurrit . . . tantum in litore maris“, but this is not correct as the localities Hillerød and Boserup show.

Geographical distribution:— Northern and middle Europe; its southern limit lies in Austria; towards the north to middle Sweden, and in Finland.

4. *Rh. dissimilis* Zett.

1849. Zett. Dipt. Scand. VIII, 3031, 2—3. — 1903. Kat. paläarkt. Dipt. II, 224.

This species is very similar to *spissirostris*, and I shall therefore only describe it comparatively.

Male. Somewhat larger than *spissirostris*; frons somewhat broader. Thorax much darker grey and shining, the two stripes hence much less distinct, especially outwards as the sides of the disc are rather dark; the stripes are broader than in *spissirostris*. The dorsocentral and acrostichal bristles slightly longer; all thoracic bristles black; on and behind the humeri there are fine, yellow hairs as in *spissirostris*. Abdomen and exterior genitalia quite as in *spissirostris*, the fan-like hairs at the hind margin of the segments stronger. Legs as in *spissi-*

rostris and similarly haired, but both the common, short pubescence and the other hairs and bristles are longer and more conspicuous; the hairs on the dorsal side of the hind femora are yellow, and at the tip of the hind tibiæ among the black bristles there are yellow hairs, placed densely, almost tuft-like, which are totally absent in *spissirostris*. Wings as in *spissirostris*; halteres a little more yellowish.

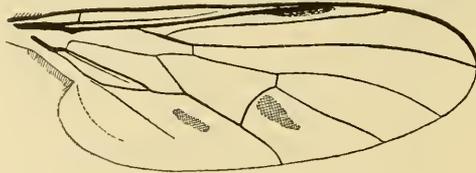


Fig. 9. Wing of *Rh. dissimilis* ♀.

Female. Differing from the male in the same way as the female of *spissirostris*, but the wings have the discal cell normal though longer than in the male; outwards to and below it (in the third and fifth posterior cell) there are two faint, greyish or yellowish, oblong spots. The halteres are whiter.

Length 5—6,5 mm.

Zetterstedt mentions a variety with not maculated wings, and another variety with patches on the wings; of this latter he had only seen one specimen from Denmark, and he adds „E Smolandia quoque missu“, but the whole passage seems to show, that he had also only one female of the variety with not maculated wings. I think the patches may have disappeared by exsiccation; all specimens I have seen had them distinctly observable.

Rh. dissimilis is more common in Denmark than *spissirostris*, that is to say, it is generally present in greater numbers, but it has only been taken on few localities; it occurs exclusively near water; Amager Fælled, Charlottenlund, at Hornbæk and on Langeland at Lohals. It is a spring species as the preceding, my dates are $^{16/5}$ — $^{30/6}$. I took it on Amager Fælled flying low over a water pool in great numbers together with *spissirostris*, but this latter species was only present in single specimens; sometimes it was seen to swoop down on small particles flowing on the surface of the water, as in search for prey, but I never succeeded in taking it with prey.

Geographical distribution: — The species is hitherto only known from the southern Sweden, Denmark and England. With us it is, as said, more common than *spissirostris*, but in Sweden the reverse seems to be the case.

5. *Rh. spinipes* Fall.

1815. Fall. Dipt. Suec. Empid., 26, 24 (*Empis*). — 1822. Meig. Syst. Besch. III, 49, 15. — 1842. Zett. Dipt. Scand. I, 395, 7, et 1849. VIII, 3034, 7. — 1862. Schin. F. A. I, 98. — 1903. Kat. paläarkt. Dipt. II, 229.

Male. Eyes contiguous but not for a long distance, the frontal triangle being high, but narrow. Epistoma dark grey. Occiput grey with black, downwards somewhat brownish hairs. Labrum slightly longer than the head is high; palpi black or brownish black, with blackish or brownish hairs. Antennæ somewhat longer than the head,

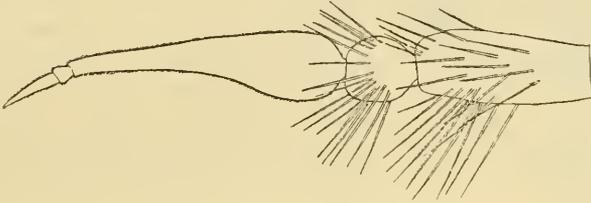


Fig. 10. Antenna of *Rh. spinipes*. $\times 65$.

black, the two basal joints slightly greyish, with long, black hairs; the third joint considerably elongated, especially in its terminal part. Thorax dark grey, slightly shining, with three blackish or brownish black stripes, the median narrow, the lateral very broad, occupying the whole lateral space; all three stripes somewhat abbreviated both in front and behind. The acrostichal and dorsocentral bristles long, black; the former somewhat irregularly biserial, the latter long and strong behind and here about uniserial, but pluriserial further forwards, and in the front part fusing with similar hairs clothing the disc at the sides behind and inwards to the humeri; there is no strong humeral bristle, but a posthumeral, generally four notoplural, some supraalar and a postalar bristle are discernible among the weaker hairs; they are all black. Scutellum grey with six to eight black marginal bristles. Pleura dark grey; metapleura with black or brownish black hairs. Abdomen blackish brown, very slightly shining; seen from in front it is more greyish, with a black, interrupted middle line; venter dark grey. Abdomen is clothed with long, erect, black hairs which are strongest at the hind margins of the segments and here fan-like spread; venter has long, black hairs. The exterior genitalia have the lower lateral lamellæ blackish, the lower margin is straight, the upper oblique, the lamellæ thus attenuating towards the apex and here curved towards each other; on the inside, near the apex there is a little tooth; the lamellæ have long, black hairs

below and at the apex; the upper lateral lamellæ are reddish brown, they are somewhat swollen in the middle and project forwards with a blunt process and backwards with a somewhat downwards declining process; both processes are short and both are curved towards each other, thus leaving an oval opening between the upper lamellæ through which the end of the penis goes; the lamellæ are short haired in the upper margin. Penis is a long, simply curved thread, somewhat thickened at the base, of ferruginous colour. The eighth ventral segment is arched and points backwards with a free margin, beset with long hairs (anushians), penis ascends from its lowermost part; above the segment forms two somewhat triangular lamellæ, one on each side, beset with long and strong, black bristles; in the opening of the segment, above the base of penis and below the mentioned process a globular body is seen. Legs black or sometimes dark reddish brown; coxæ greyish pruinose; anterior femora with medium-long

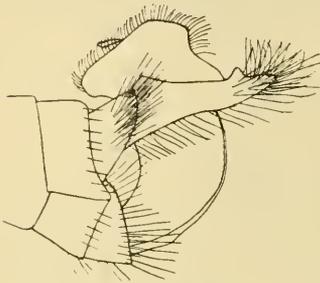


Fig. 11. *Rh. spinipes*,
male genitalia.

hairs above; front femora with two ventral rows of somewhat long hairs; middle femora with two similar rows of short, spine-like bristles; hind femora with somewhat long bristles on the anterior and posterior side, longest on the latter side and on the anterior side present only on the basal half, and with short, strong bristles at the base on the antero- and postero-ventral side; on the latter side a dense tuft of about six very strong bristles some way from the base; the posterior femora moreover with a very dense, short pubescence ventrally. Front tibiæ likewise with a very dense and short pubescence ventrally and with some bristles dorsally; middle tibiæ with short, strong hairs and some short bristles ventrally, and long bristles dorsally; hind tibiæ with short, dense hairs ventrally, and with longer hairs and two rows of bristles dorsally. Tarsi short-haired, with a very dense pubescence below, the hind tarsi with some bristles dorsally. All hairs and bristles black. Besides there is a common but scarce clothing of short, likewise black hairs. Wings slightly brownish fumigated. Veins blackish, anal vein reaching the margin. Stigma brown, large, reaching almost to the end of the subcostal cell. At the base the costa has a couple of long bristles. Halteres yellow or brownish yellow.

Female. Eyes broadly separated; frons grey. Abdomen coloured and haired quite as in the male. Legs short-haired, only with some

bristles dorsally on the hind femora, and on the tibiæ; there is no tuft of bristles on the hind femora, and the dense, short pubescence on the posterior femora is wanting.

Length 6,5—8 mm.

This species, which is our largest *Rhamphomyia*, is easily distinguished both by the size, and in the male by the curious tuft of bristles on the hind femora.

Rh. spinipes is not at all common in Denmark, I only know of ten specimens; Sorø (Jacobsen) and in Jutland at Rye near Silkeborg and on Seis Hede (A. Petersen). It is an autumn species, my only date is ²¹/₉ (Seis Hede), but it is recorded from September and October. It occurs generally in woods on humid localities; Zetterstedt records it from the twelfth of July, and the same author took it at a height of 4000 feet „in nive ambulans“.

Geographical distribution:— Northern and middle Europe down into France; towards the north to northernmost Scandinavia.

6. *Rh. sulcata* Meig.

1804. Meig. Klass. eur. zweifl. Ins. I, 229, 26 (*Empis*). — 1842. Zett. Dipt. Scand. I, 396, 8 et 1849. VIII, 3034, 8 et 1859. XIII, 5012, 8. — 1862. Schin. F. A. I, 98. — 1903. Kat. paläarkt. Dipt. II, 230.

Male. Eyes contiguous, the small frontal triangle blackish, light grey above the antennæ. Epistoma grey; occiput grey with black hairs. Labrum somewhat longer than the head is high; palpi black with black hairs. Antennæ somewhat longer than the head, black,

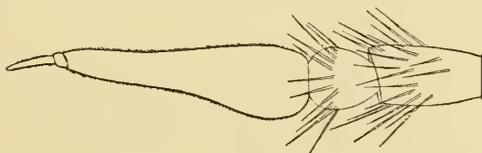


Fig. 12. Antenna of *Rh. sulcata*. $\times 65$.

the two basal joints slightly greyish, with black hairs; the third joint elongated, the terminal part not much attenuated. Thorax brownish grey, somewhat shining, with three blackish stripes, the median narrow; besides there is generally a dark shade at the side margin. The dorsocentral and acrostichal bristles somewhat short, black or brownish black; the acrostichal bristles pluriserial, the hindmost dorsocentral bristle long, forwards they are pluriserial and fusing with the hairs clothing the disc behind and inwards to the humeri; there are no humeral or posthumeral bristles, but three or four notopleural, some

supraalar and a postalar bristle can be discerned, all black. (Sometimes a somewhat strong humeral bristle is present). Scutellum grey with about eight black marginal bristles. Pleura dark grey; the meta-pleural bristles black. Abdomen blackish, shining, clothed with erect black or brownish hairs; those at the hind margin of the segments not specially strong. Venter similarly coloured, sparingly haired. Exterior genitalia short, knob-like, shining black; the lower lateral lamellæ short and broad, the upper likewise small and short; both pairs short-haired; the eighth ventral segment with long hairs at the margin. Penis hidden. Legs robust, black, sometimes brownish, shining, the hind metatarsi somewhat thickened and also the two following joints rather thick; coxæ greyish pruinose; front femora with short, fine hairs on the dorsal and ventral side; middle femora with two rows of short, spine-like bristles on the ventral side; hind femora with two similar rows of somewhat longer bristles, one standing on the postero-ventral side; besides, the posterior femora have a very dense, short, pale pubescence below; the front tibiæ with a very dense, short pubescence ventrally and some bristles dorsally; middle tibiæ with short, spinulous hairs and some bristles ventrally and with two rows of strong bristles dorsally; hind tibiæ with short hairs ventrally and two rows of bristles dorsally; tarsi short-haired, hind tarsi with some few bristles on the dorsal side; besides, the legs have a common, scarce clothing of short hairs. All hairs and bristles black. The posterior femora have a curious, fine, transverse striation, and the same is to a less degree found on the front femora. Wings brownish fumigated. Veins brown, anal vein reaching the margin. Stigma very faint, brownish. Costa with no long bristles but a tuft of short hairs at the base. Halteres yellow.

Female. Eyes broadly separated; frons dark grey. The hairs on the thoracic disc shorter than in the male. Abdomen dark brownish grey, very short and sparingly haired, only at the sides in front there are longer hairs. Legs less haired than in the male, middle femora with the rows of bristles on the ventral side very short, and hind femora only with one row of much shorter bristles than in the male, and besides with some postero-ventral bristles in the apical part; tibiæ less bristly, but the hind tibiæ besides the dorsal bristles with a dense row of short, strong hairs; the posterior femora without the dense, short pubescence, the hind femora instead with short, somewhat strong hairs. Hind tarsi not thickened.

Length. This species may vary somewhat in size, the length being 5,5 to about 8 mm.

Remarks: Schiner's description of the spinulosity of the legs is

erroneous, as he ascribes the hind femora in the female four rows of bristles; to the male he correctly ascribes two rows. The often mentioned canaliculation of the hind legs, expressed in the name of the species, is of no value, and is only due to exsiccation; it may be wanting, or present to a different degree in various specimens.

The species only bears resemblance to *spinipes*, from which it is distinguished in the male by the want of the tuft of bristles on the hind femora, and in the female by the spines beneath the femora, as also in both sexes by the in other ways different pilosity of the legs.

Rh. sulcata is more common than the preceding species, though it is generally only taken in single or few specimens at one time; Charlottenlund, Ermelund, Geel Skov, Birkerød, Tyvekrog, Vemmetofte, Nyraad near Vordingborg; in Jutland at Silkeborg and at Allerup near Esbjerg; it is a spring species, my dates are $6/5-8/6$. It occurs in woods and thickets, especially on humid localities; Zetterstedt records it to $30/7$ and has taken it on flowers of *Salix*.

Geographical distribution:— Europe down into Spain and Italy; towards the north to northern Scandinavia, and in Finland.

7. *Rh. vesiculosa* Fall.

1815. Fall. Dipt. Suec. Empid. 27, 27. — 1842. Zett. Dipt. Scand. I, 433, 55. — 1903. Kat. paläarkt. Dipt. II, 231. — *Rhamphomyia Falleni*: 1882. Meig. Syst. Besch. III, 50, 17.

Male. Eyes contiguous; epistoma grey. Occiput grey with blackish hairs. Labrum somewhat longer than the head is high, brown; palpi dark brown with brownish hairs. Antennæ not longer than the head,



Fig. 13. Antenna of *Rh. vesiculosa*. $\times 65$.

brownish black, slightly brownish at the base, the two basal joints only with short hairs, the third joint but slightly elongated and slightly attenuated towards the apex. Thorax dark grey, dull, with three blackish brown stripes, the lateral broad, the median very narrow and somewhat indistinct. Acrostichal and dorsocentral bristles of moderate length, blackish brown; the former biserial, the latter strong behind, shorter forwards and here pluriserial and fused with the hairs on the sides of the disc. There are notopleural, supraalar and postalar bristles, but they are only slightly discernible between the somewhat

strong hairs which are present numerously also in the præsutural depression. Scutellum with about eight black marginal bristles. Pleura dark grey, metapleura with black hairs. Abdomen robust, dark grey, mainly dull; it is densely clothed with dark brownish hairs, which are somewhat long and erect in front, short behind. Venter grey with somewhat short hairs. The genitalia are large and somewhat curiously shaped; the lower lateral lamellæ much arched, sending a little process backwards from their lower part, otherwise stretching upwards and somewhat triangular, but with the outer margin curved; seen directly from behind the two lamellæ form almost a round disc with a vertical opening between them, which is closed below by the two lower processes; the lamellæ are black, shining; the upper lateral lamellæ stretch upwards from the opening between the lower, and they are directed somewhat

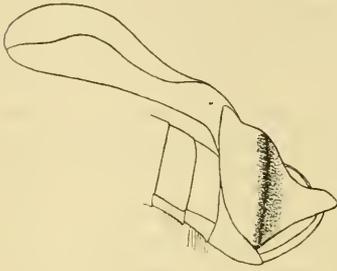


Fig. 14. *Rh. vesiculosa*,
male genitalia.

forwards in over the abdomen; each lamellæ is long, arched and somewhat spoon-like dilated at the end, the two lamellæ together are thus somewhat bladder-like. The upper lamellæ are ferruginous at the base but yellowish white towards the end. Both pairs of lamellæ are only slightly haired at the margin, for the rest bare. On the dorsal side, at the base of the upper lamellæ the eighth segment forms a pair of somewhat long-haired, squamular pieces. Penis is simply curved, ferruginous. Legs brownish; coxæ dark greyish pruinose; the very apex of the hind femora, hind tibiæ and tarsi yellowish white, only the last joint brown; generally also the middle tibiæ somewhat pale at the base; the hind femora somewhat broad, hind tibiæ rather short and thin, slightly curved, hind tarsi specially delicate, shorter than the tibiæ; both tibiæ and tarsi thinner than the anterior tibiæ and tarsi. The anterior femora mainly short-haired with a row of longer hairs in the apical half on the postero-ventral side; hind femora likewise short-haired, but with some bristles on the ventral and anterior side; posterior femora with a very dense and short pubescence below; anterior tibiæ short-haired, with some fine bristles dorsally; hind tibiæ very short and finely spinulose on the ventral side; tarsi short-haired. All hairs and bristles black or dark brownish. Wings hyaline, veins pale yellow; anal vein reaching the margin. Stigma narrow, very faint, yellowish. Halteres yellowish brown, the knob darkest.

Female. Frons broad, grey. Abdomen grey, haired about as in the male, the hairs somewhat shorter. Legs dark brown, knees narrowly pale yellow, the hind tibiæ and tarsi normal both in shape and colour; the legs are haired chiefly as in the male, but the hind femora have no bristles and are ciliated above and below, and likewise the hind tibiæ. Wings broad, almost half as broad as long, strongly brown fumigated.

Length 4,5—5,5 mm.

This species is at once recognised by the curiously shaped hind legs and the genitalia in the male, and by the dilated wings in the female, and by these characters it stands a little apart.

Rh. vesiculosa is very rare here; I know only two specimens, one taken in Ordrup Mose many years ago (Jacobsen) and one in Jutland at Allerup near Esbjerg on $\frac{2}{6}$ 1909 (Esben Petersen).

Geographical distribution:—Northern Europe, towards the north to northern Scandinavia, and in Finland; its southern limit lies in Denmark. It seems on the whole to be a somewhat rare species and is probably a spring species; Zetterstedt records it from $\frac{20}{5}$ — $\frac{22}{7}$, and he has taken it on *Salix*.

Remarks: I think it highly probable that this species is identical with *Rh. atripennis* Zett. as suggested by Frey (Act. Soc. pro Faun. et Flor. Fenn. 31, No. 9, 1909, 20); the differences are only such (colour of legs and wings) as may generally occur in species of *Rhamphomyia*.

8. *Rh. conformis* Kow.

1867. Kowarz, Verh. zool. bot. Gesell. Wien, XVII, 321, 3. — 1903. Kat. paläarkt. Dipt. II, 224. — *Rhamphomyia pseudotrilineata*: 1893. Strobl, Mitth. Ver. Steierm. 1892, 49.

Male. Eyes contiguous; the small frontal triangle blackish, grey just above the antennæ; epistoma blackish. Occiput dark grey with

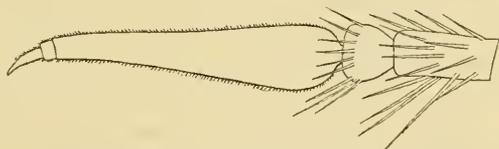


Fig. 15. Antenna of *Rh. conformis*. $\times 65$.

black hairs. Labrum slightly longer than the head is high, black; palpi not short, greyish black, with black hairs. Antennæ a little longer than the head, black, the two basal joints with black hairs, the third elongated, lancet-like, not much broader at the base than outwards.

Thorax dark grey, dull, with three blackish brown stripes, the median narrow and indistinct. Dorsocentral and acrostichal bristles long, black; the former strong behind, biserial, the latter uniserial. Further a humeral bristle, a posthumeral, about three notopleural, two supraalar and a postalar bristle, all black; besides there are some finer hairs on and behind the humeri. Scutellum with four black marginal bristles. Pleura grey, metapleura with black hairs. Abdomen dark grey, dull, with black hairs which are longest in front at the sides; the hind margin of the segments grey. Venter grey with very sparse, black hairs. Exterior genitalia moderately large, the lower lateral lamellæ broad, somewhat triangular with rounded apex; they are

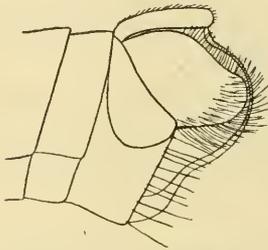


Fig. 16. *Rh. conformis*, male genitalia.

black, slightly greyish pruinose, and with dense, brownish black hairs at the margin; the upper lateral lamellæ styliform, slightly curved at the base; penis thread-like, ferruginous, somewhat thickened at the base; the eighth ventral segment arched, with long, black hairs at the margin. Legs black; coxæ greyish pruinose; the hind legs somewhat long, hind femora cylindrical, hind metatarsi not at all swollen, scarcely as thick as the end of the tibiæ; front femora with fine

hairs below towards the anterior and posterior sides, and with slightly longer hairs on the antero-dorsal side; middle femora with two rows of stronger hairs below and likewise with an antero-dorsal row; hind femora mainly short-haired, only with some longer hairs on the posterior side; the posterior femora with a very dense and short, whitish pubescence below, most distinct on the otherwise somewhat bare hind femora; front tibiæ with short hairs and some bristles dorsally and with a dense, short pubescence ventrally; middle tibiæ with rather strong bristles in several rows, especially on the dorsal and ventral sides; hind tibiæ with some bristles dorsally in two rows, and short hairs, among which a few longer, ventrally. Tarsi short-haired, the posterior somewhat spinulose beneath; hind metatarsi with a few bristles above. The hairs and bristles are mainly black or dark brownish. Wings very slightly yellowish tinged, most towards the anterior margin. Veins brown; anal vein not thin, reaching the margin. Stigma distinct, brownish. Halteres pale yellow.

Female. I do not know the female, but according to Kowarz it quite resembles the male; frons broad, whitish grey; legs as in the male; the wing-veins a little stronger.

Length about 6,5 mm.

This species is especially distinguished by the nearly bare hind femora, and the uniserial acrostichal bristles are also characteristic. — Kowarz says: „Hintertarsen mehr als doppelt so lang, als die Schiene“, this must be a lapsus, and he also continues: „Metatarsus von halber Schienenlänge.“

Rh. conformis is very rare in Denmark, only one specimen, a male has been taken at Silkeborg on ²²/₅ 1906 (A. Petersen). The species is evidently a spring species, Kowarz took it in April; the specimens were taken on a meadow, where they swarmed in the air with the legs pendulous, and sat on bushes.

Geographical distribution: — The species is hitherto only known from Hungary, Britain and Denmark, the northern limit thus seems to lie in our country.

9. *Rh. tarsata* Meig.

1822. Meig. Syst. Besch. III, 45, 6. — 1842. Zett. Dipt. Scand. I, 430, 51, et 1849. VIII, 3034, 51. — 1862. Schin. F. A. I, 101. — 1903. Kat. paläarkt. Dipt. II, 230.

Male. Eyes contiguous, frontal triangle greyish black; epistoma black. Occiput likewise black, slightly dusted, with black hairs. Labrum scarcely as long as the head is high; palpi brownish with brown hairs. Antennæ shorter than the head, black, the two basal joints short-haired, the third not much elongated, somewhat attenuated towards the apex. Thorax black, shining, without any design. Dorsocentral and acrostichal bristles somewhat long, black, biserial; the hinder dorsocentral bristles long; there are some hairs at the sides, but the dorsocentral bristles are distinct from them. Further a humeral bristle, a weak posthumeral, about three notopleural, weak supraalar and a postalar bristle, all black. Scutellum slightly greyish dusted, with four black marginal bristles. Pleura slightly dark greyish dusted, metapleura with black hairs. Abdomen black, shining, with short, black hairs, only slightly longer at the sides in front; venter black or blackish, sparingly haired. Exterior genitalia black, the lamellæ directed upwards and the eighth ventral segment arched somewhat downwards (anus hians); the lower lamellæ with long, black hairs at the lower (posteriorly pointing) margin; the upper lamellæ somewhat styliform and somewhat curved, lying above (in front of) the lower; the eighth ventral segment with long, black hairs on the margin. Penis a very thin, towards the apex exceedingly thin, simply curved

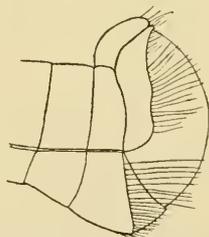


Fig. 17. *Rh. tarsata*, male genitalia.

thread. Legs black or blackish brown, somewhat shining; coxæ greyish pruinose; hind legs somewhat elongated, hind tibiæ somewhat dilated towards the apex, the hind metatarsi distinctly thickened, especially towards the base; also the front metatarsi slightly thickened. Front femora short-haired above and with an antero- and postero-ventral row of short hairs; middle femora with ventral and antero- and postero-ventral rows of somewhat longer hairs and with hairs on the anterior side, especially on the basal part; hind femora rather short-haired, only with longer hairs above and below towards the base; posterior femora with a scarcely observable, dense, whitish pubescence below, most distinct on the middle femora; front tibiæ with a dense pubescence below, and somewhat long hairs on the postero-dorsal side; middle tibiæ short-haired on the dorsal and ventral side, and with a few long bristles dorsally; hind tibiæ short-haired ventrally, and with a row of less dense hairs dorsally and here also with a row of long bristles; front tarsi short-haired and with somewhat longer, dense hairs on the postero-ventral side; posterior tarsi short-haired with slightly longer hairs above, and slightly spinulous beneath, hind metatarsi with a few dorsal bristles; all hairs and bristles black or brownish black. Besides the legs have the ordinary clothing of short hairs. Wings hyaline; veins brownish, the apical part of the subscostal vein and the cubital vein blackish; anal vein very weak outwards, but discernible to the margin. Stigma distinct, blackish. Halteres whitish.

Female. Frons broad, black. The hairs on the thoracic disc short. The anterior tibiæ slightly pennate on the dorsal side, posterior femora pennate on both sides, the scaly hairs longest and broadest on the ventral side, on the basal half of the dorsal side of the hind femora only slightly scaly; the posterior tibiæ pennate on the dorsal side, ciliated on the ventral side. Wing-veins somewhat stronger than in the male.

Length 3,8—4,5 mm.

This species is distinguished by the black, shining colour, the shape of the exterior genitalia in the male, and the way in which the legs are pennate in the female.

Rh. tarsata is somewhat common; Charlottenlund, Ordrup Mose, Ørholm, Tyvekrogen, Nordskoven at Jægerspris; on Langeland at Lohals; on Fænø, and in Jutland at Hald near Viborg. My dates are $7/6$ — $21/7$. Stæger took it on *Corylus*, sitting on the underside of the leaves; I took it in great numbers on $24/6$ at Hald; towards the evening the males were hovering in the air around tree-tops with the legs pendulous, and they were seen resting on the underside of

the leaves; the females were only present in small number, likewise sitting on the underside of the leaves, and here the males were also found during the day.

Geographical distribution:— Northern and middle Europe, from Germany to northern Scandinavia but there rare.

10. *Rh. obscura* Zett.

1838. Zett. Ins. Lapp. 564, 10. — 1842. Zett. Dipt. Scand. I, 429, 50.
— 1903. Kat. paläarkt. Dipt. II, 228.

Male. Eyes contiguous; epistoma dark. Occiput dark grey, with black hairs. Labrum about as long as the head is high. Antennæ almost of the length of the head, or slightly longer, black, the two basal joints very short-haired, the third elongate. Thorax brownish black, dull, with very faint traces of three darker stripes. The dorso-central and acrostichal bristles of moderate length, black; the former uniserial and longer behind, the latter biserial. Further a humeral bristle, a posthumeral, a pair of notopleural and supraalar and a postalar bristle, all black; besides there are a few weaker hairs. Scutellum has four black marginal bristles. Pleura dark greyish, metapleura with black hairs. Abdomen robust, greyish black, dull; it is densely clothed with somewhat short, black hairs, longer at the sides, especially in front. Venter blackish grey with somewhat short hairs. Exterior genitalia somewhat resembling those in *tarsata*, the lower lamellæ directed more or less upwards, not very broad, with long hairs at the lower (posterior) margin; the upper lamellæ lying in front of the lower, styliform. The eighth ventral segment arched, with long black hairs at the hind margin. Penis thread-like, black, curved upwards, a little sinuous and with a curious loop near the base. Legs black, slightly shining; coxæ greyish pruinose; anterior femora with short hairs above and rows of slightly longer, fine hairs below, hind femora with somewhat longer hairs above; posterior femora with the short, dense pubescence below, but scarcely observable. Anterior tibiæ short haired with a few bristles on the dorsal side; hind tibiæ short-haired on the ventral side, but somewhat densely and long-haired on the dorsal side, and between the hairs some bristles. Anterior tarsi short-haired, the middle ones slightly spinulose beneath, hind tarsi somewhat long-haired above and with a few bristles, slightly spinulose below and also here with the hairs of some length. All hairs and bristles black. Wings a little greyish tinged; veins brownish to blackish brown, anal vein distinct and reaching the margin. Stigma very faint, brownish. Halteres yellowish white.

Female. Frons broad, grey. Abdomen somewhat shorter haired than in the male; front femora with somewhat scaly hairs towards the apex, hind femora with a row of scaly hairs on the ventral side and a row of fine, bristly hairs on the postero-ventral side; hind tibiæ with longish hairs and some bristles on the dorsal side.

Length 3 mm.

This species may, I think, be best recognised from the curious loop at the base of the penis, and in the female by the way in which the legs are feathered. I have examined Zetterstedt's type-specimens, so that my identification is certain.

Rh. obscura is rare in Denmark, only one specimen, a male has been taken in Lyngby Mose ^{21/6} 1909 (the author).

Geographical distribution: — Northern Europe up to the northernmost Scandinavia; it is not known south of Denmark.

11. *Rh. simplex* Zett.

1849. Zett. Dipt. Scand. VIII, 3035, 10—11 et 1855, XII, 4613, 10—11. — 1903. Kat. paläarkt. Dipt. II, 229.

Male. Eyes contiguous, the small frontal triangle grey; epistoma grey. Occiput grey, with black hairs. Labrum a little longer than the head is high; palpi black, with black hairs. Antennæ as long as the head, black, the two basal joints slightly greyish, with short, black hairs, the third joint somewhat elongated and attenuated towards the apex. Thorax grey, dull, without stripes, only the hairs giving the impression of the presence of three faint stripes. Dorsocentral and acrostichal bristles of moderate length, black, biserial, the dorsocentral bristles longer and uniserial behind, quite in front they are pluriserial and somewhat fusing with the hairs at the sides of the disc. Further a humeral bristle, some posthumeral, three or four notopleural, a pair of supraalar and a postalar bristle, all black, but they are not much pronounced between the other, somewhat strong hairs on the [sides of thorax. Scutellum has six black marginal bristles. Pleura grey, metapleura with black hairs. Abdomen somewhat robust, grey, dull; it is densely clothed with somewhat strong, black hairs which are short above, longer at the sides. Venter grey, more sparingly clothed with somewhat short hairs. Exterior genitalia small, somewhat knob-like, blackish grey, slightly pruinose; the lower lamellæ short, broad, directed somewhat upwards, with black hairs at the margin; the upper lamellæ almost quite hidden; the eighth^vventral segment forming a somewhat large, arched plate below. Penis only sometimes seen above, between the lamellæ,

as a black, somewhat thick thread, curved forwards, often with the apex stretching in under the foregoing dorsal segment. Legs black or slightly brownish black, shining; coxæ greyish pruinose; front femora with antero- and postero-ventral rows of short, fine hairs; posterior femora with similar rows of somewhat longer hairs; front tibiæ short-haired below, slightly longer-haired and with some bristles above; middle tibiæ haired in the same way, but the hairs a little longer and also a few short bristles ventrally; hind tibiæ with moderately long hairs on the ventral side, and with long hairs and two rows of thin bristles on the dorsal side. Anterior tarsi short-haired and the metatarsi somewhat spinulose below, the spines longest on the middle tarsi; hind metatarsi with long hairs above and stronger spinulose below. All hairs and bristles black or brownish black; there is no dense pubescence discernible below the posterior femora. Wings hyaline, slightly yellowish tinged. Veins paler on darker brownish, anal vein distinct, reaching the margin. Stigma yellowish, only little conspicuous. Halteres white or yellowish white.

Female. Frons broad, grey. The hairs on thorax of the same length as in the male, those on abdomen only slightly shorter; the three stripes on thorax more conspicuous; the styles of the ovipositor somewhat long. Legs simply and shorter-haired, the bristles on the hind tibiæ shorter and no long hairs on the hind metatarsi. Wings slightly more tinged.

Length 3,8—4,5 mm.

This species is distinguished by its somewhat robust shape, the structure of the male genitalia and the immaculated or slightly striped thorax.

Rh. simplex is not common in Denmark, but may sometimes be present in somewhat great number on suitable localities; Charlottenlund at the shore, Vester Fælled, Amager Fælled; in Jutland on Tipperne in Ringkjøbing Fjord and at Nymindégab. It occurs in grass and low herbage on meadows and commons, and always near the shore. It is a spring species, my dates are only $\frac{1}{6}$ — $\frac{10}{6}$. I have examined Stæger's specimens which Zetterstedt mentions as sent to him under the name of *laevipes* var.

Geographical distribution:— The species is hitherto only known from the southernmost Scandinavia, Denmark and England.

12. *Rh. tibiella* Zett.

1842. Zett. Dipt. Scand. I, 432, nota, et 1849. VIII, 3044, 54—55. — 1903. Kat. paläarkt. Dipt. II, 230.

Male. Eyes contiguous, the small frontal triangle grey; epistoma greyish. Occiput grey with black hairs. Labrum about as long as the head is high; palpi dark, with black hairs. Antennæ scarcely as long as the head, black, the two basal joints may be brownish and are somewhat greyish pruinose, short-haired; the third joint not much attenuated towards the apex. Thorax dull grey, with three faint and indistinct stripes, the two lateral brownish, the median very indistinct or wanting. Dorsocentral and acrostichal bristles somewhat longish, black, biserial, the dorsocentral somewhat irregularly, the hinder of them long; further a humeral bristle, a posthumeral, about three notopleural, a pair of supraalar and a postalar bristle, all black; there is also a bristle in front inwards to the humeri (this is not a bristle special for this species, but it is here isolated). Scutellum with only two long marginal bristles. Pleura grey, metapleura with black hairs. Abdomen grey, dull, sometimes slightly brownish grey; it is somewhat densely clothed with rather long, erect, blackish or brownish hairs, those at the hind margins of the segments slightly stronger; venter coloured as the dorsum, sometimes a little paler, with short hairs. Exterior genitalia somewhat as in *tarsata*, the lower lamellæ somewhat blade-shaped and pointed, directed backwards or a little upwards; the upper lamellæ styliform and curved, but more or less hidden between the lower; sometimes a pair of small squamulæ are seen above at the base of the lamellæ, I think they are processes from the eighth dorsal segment; the lamellæ are black or brown, hairy at the margin. The eighth ventral segment is arched and drawn somewhat forwards in under the venter (anus hians); it has long hairs in the margin. Penis is a very thin, upwards curved, yellow thread, somewhat sinuous near the base. Legs dirty yellowish, or brownish, almost blackish yellow; coxæ grey pruinose. Front femora nearly bare; middle femora with two ventral rows of fine hairs and with short hairs on the anterior side; hind femora with dorsal and ventral rows of fine hairs; anterior tibiæ short-haired; the middle ones with some bristly hairs dorsally and ventrally; hind tibiæ with short hairs ventrally, longer and less dense hairs dorsally, and here also with rows of fine bristles; tarsi short-haired. The hairs and bristles are blackish or brownish. Wings hyaline; veins white, the subcostal and cubital veins yellow, anal vein evanescent at some distance from the margin. Stigma slightly yellowish or whitish, very faint. Halteres whitish.

Female. Frons broad, grey. The stripes on thorax slightly more distinct, the hairs almost as long as in the male, those on abdomen slightly shorter. Anterior legs short-haired; hind femora haired as in

the male, hind tibiæ compressed, pennate on the dorsal side, the hairs simple and short at the base, but outwards soon becoming long and scaly. Wings slightly yellowish tinged.

Length about 2,5 mm.

This species is recognisable by the colour, the shape of the male genitalia and the way in which the legs in the female are pennate. I have examined Stæger's specimens, mentioned by Zetterstedt l. c. The species may vary somewhat in the colour of abdomen, genitalia and legs, these parts being darker or lighter, the latter perhaps to some degree due to the degree of maturity; whether abdomen is darker or lighter it is however always grey or greyish. — As Zetterstedt says: „Stæg. in litt.“ the name is originally due to Stæger.

Rh. tibiella is not at all common in Denmark, I only know five specimens; Charlottenlund (Stæger), Bøllemosen (the author). It occurs in fens and on other humid localities in woods; it is a spring species, my dates are $1^{2/5}$ — $5/6$.

Geographical distribution: — The species is only known from the southern Sweden to Germany, and it occurs also in England (according to specimens sent to me from Mr. Verrall.).

13. *Rh. plumipes* Fall.

1815. Fall. Dipt. Suec. Empid. 25, 23 (*Empis*). — 1822. Meig. Syst. Besch. III, 47, 11. — 1842. Zett. Dipt. Scand. I, 426, 47. — 1862. Schin. F. A. I. 100. — 1903. Kat. paläarkt. Dipt. II, 229. — *Rh. geniculata*: 1842. Zett. Dipt. Scand. I, 427, 48 et 1849. VIII, 3042, 48.

Male. Eyes contiguous, the small frontal triangle grey; epistoma grey. Occiput likewise grey, with black, just below a little brownish hairs. Labrum as long as the head is high or slightly longer; palpi dark, with dark hairs. Antennæ of the length of the head, black or brownish black, the two basal joints sometimes paler to reddish, with short hairs; the third joint somewhat elongated, and attenuated towards the apex. Thorax dull grey with three indistinct stripes, the lateral slightly brownish, the median grey and very indistinct. The dorsocentral and acrostichal bristles of moderate length, black, biserial, the hinder dorsocentral bristles long. Further a humeral bristle, a post-humeral, three notopleural, a pair of supraalar and a postalar bristle, all black. Otherwise there are almost no other bristles or hairs on the sides of the disc. Scutellum grey, with four black marginal bristles, the exterior very small and often wanting. Pleura grey, metapleura with black hairs. Abdomen dull grey, sometimes a slightly yellowish or brownish colour shines through the grey pruinosity, but even then the abdomen is mainly greyish; the hind margins of the

segments are paler. Venter grey, but often pale yellowish or brownish to a higher degree than the dorsal side; abdomen is densely clothed with black or brownish hairs, somewhat long and erect at the sides; the hairs at the hind margins are not stronger than the others; venter somewhat sparingly haired. The exterior genitalia are large and curious, I interpret the structure in the following way: the sixth ventral segment is turned downwards so that its hind margin points down, the somewhat large seventh segment is turned in the same

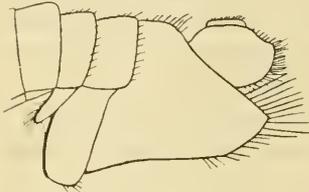


Fig. 18. *Rh. plumipes*,
male genitalia.

way, its downwards pointing hind margin is arched, and its ventral side, which points forwards, is black and shining; the somewhat folded connecting membrane between the seventh and eighth ventral segment is distinctly seen; the eighth ventral segment is very large, somewhat elongated, arched and with the sides and the hind margin curved upwards; it has somewhat long hairs at

the hind margin; the lower lamellæ are somewhat small, not stretching beyond the apex of the eighth ventral segment and somewhat hidden in it; the upper lamellæ seem to be small and styliform, but they are only indistinctly seen. Penis is hidden, only the upper, thread-shaped end may sometimes be seen between the lamellæ. Legs black or brownish, the knees more or less pale, which is most distinct when the legs are black; coxæ greyish pruinose. The anterior femora have some fine hairs below; the middle femora have an antero- and postero-ventral row of longer hairs, and besides an antero-dorsal row; the hind femora have a dorsal row of short hairs and on the basal half very long dorsal hairs, on the ventral side they have a very dense and short, pale pubescence which is not observable on the middle femora. Front tibiæ short-haired and only with a single subapical bristle; middle tibiæ with some bristles on the dorsal and ventral side; hind tibiæ with not long hairs on the dorsal and ventral side, and with some dorsal bristles. Tarsi short-haired. Besides the legs have the ordinary but sparse clothing of short hairs. The hairs and bristles black or brownish. Wings hyaline; veins more or less pale yellowish to brownish, anal vein reaching the margin, weak in the middle. Stigma a scarcely observable, yellowish shade. Halteres whitish or yellow.

Female. Frons broad, grey, with an impressed middle-line; the hairs on thorax and abdomen slightly shorter than in the male, the thoracic stripes slightly more distinct. The middle femora short pen-

nate on the dorsal and ventral side; middle tibiæ ciliated on both sides, the hairs on the dorsal side slightly scaly; the hind femora and tibiæ compressed, pennate on the dorsal and ventral side, the scaly hairs longest on the ventral side of the femora, short towards the apex on the dorsal side, and on the ventral third part of the tibiæ. Wings somewhat brownish tinged.

Length 3,5—5 mm.

This species may easily be recognised by the male genitalia, and the way in which the legs of the female are pennate; as seen from the description it may vary somewhat in colour, especially of the legs, these being darker or lighter, but again I think that this variation is to some degree dependent on the maturity, but also in the fully mature specimens some variation exists.

Rh. plumipes is not rare in Denmark, though it has not been taken many times, and I only know it from Lersøen and Amager Fæld; it seems to prefer somewhat humid places. Zetterstedt records, that it hovers in the air towards evening. My dates are only $\frac{6}{6}$ — $\frac{10}{6}$, but it is not exclusively a spring species as Zetterstedt records it from $\frac{15}{5}$ — $\frac{1}{8}$.

Geographical distribution:— Northern and middle Europe down into France; towards the north to northern Scandinavia, and in Finland.

Remarks: I feel sure, that *Rh. geniculata* Zett. (= *plumipes*, Fall. var. *pedibus obscuris*) is identical with *plumipes*, as also suggested by Schiner and Scholtz (*Zeitschr. für Entom. Breslau*, V, 1851, 55) (though these authors partly refer to *geniculata* Meig.); I have examined Stæger's specimens of *geniculata* which Zetterstedt had seen, and they are in all respects agreeing with *plumipes* and especially in the structure of the male genitalia, the hairiness of the legs in the male and the way in which the legs in the female are pennate, and they show every intermediate stage in the colour of the legs, from black to somewhat light brownish, but always with the knees more or less, sometimes very slightly, pale. In *Kat. paläarkt. Dipt. geniculata* Zett. is placed as synonym to *gracilipes* Loew, I think on Loew's authority; I do not know this species, but according to the description (*Programm* 1840, 22, 16) I think the identification is not correct; Loew, who had only the male, makes no mention of the curious genitalia, and his expression, that the front legs are specially long, so that the species is similar to a *Hemerodromia*, seems not to agree with *geniculata* Zett. *Rh. geniculata* Meig. seems to be another species. — Whether *plumipes* Meig. is really the present species is doubtful, as Meigen says, that the front femora are pennate below.

14. *Rh. pennata* Macq.

1827. Macq. Soc. Sc. Lille, 1827, 133, 6. — 1838. Meig. Syst. Besch. VII, 91, 46. — 1842. Zett. Dipt. Scand. I, 428, 49. — 1862. Schin. F. A. I, 100. — 1903. Kat. paläarkt. Dipt. II, 228.

Male. Eyes contiguous, the small frontal triangle grey; epistoma light grey. Occiput grey, with black hairs. Labrum as long as, or slightly longer than the head is high, ferruginous or brown. Antennæ about as long as the head, blackish, the two basal joints yellow, with short, brownish hairs, the third joint somewhat elongated and attenuated towards the apex. Thorax dull grey, with three narrow, brown stripes, the lateral slightly abbreviated in front, the median behind, the two interstices between the stripes slightly darker grey; the humeri with a yellow point. The dorsocentral and acrostichal bristles short, but somewhat strong, black; the former uniserial, the latter biserial; the hinder dorsocentral bristles long and also the foremost somewhat long. Further a humeral bristle, a posthumeral, a notopleural, a supraalar and a postalar bristle, all black; besides there are only a few short hairs. Scutellum with four black marginal bristles, the two median strong. Pleura light grey, metapleura with blackish hairs. Abdomen yellow or ferruginous, somewhat shining; it is densely haired with erect, brown hairs which are long at the sides; those at the hind margins of the segments slightly stronger than the others. Venter yellow sparingly and short haired. The exterior genitalia large and curious, and they influence the shape of the hind part of abdomen; from the sixth segment the end of abdomen is bent upwards, the fifth dorsal segment is excised in the hind margin, and the hind corners are drawn out and somewhat projecting; also the following dorsal segments are somewhat altered in shape, and they are small, lying more or less hidden on the forwards pointing

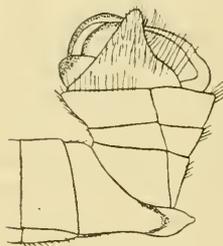


Fig. 19. *Rh. pennata*, male genitalia.

side of the upwards turned part, the eighth ventral segment is somewhat arched; the lower lateral lamellæ are somewhat triangular (at all events in situ), and the upper outer corner is drawn somewhat out; they are haired on the surface and at the hind margin; the upper lateral lamellæ are seen above between the upper edges of the lower, they are likewise broad and have a black upper margin, but I could not make out their exact shape, and they seem to be somewhat unsymmetrical. The yellow penis arises from the inner side of the eighth ventral segment with a thick base, it stretches upwards and the very thin end is curved forwards. The legs are yellow or ferruginous,

also the coxæ which are only very slightly pruinose. The front femora have short, fine hairs below; the middle femora have antero- and postero-ventral rows of short, slightly stronger hairs; the hind femora are somewhat long and a little thickened towards the apex, they have short hairs above and two ventral rows of short, somewhat strong, bristly hairs, the antero-ventral row is very dense at the apex; on the postero-ventral side near the apex there is a dense and compact tuft of strong hairs, placed on a slight swelling, and at the apex below there is an obliquely placed tuft of scaly hairs, this tuft is compressed having the hairs placed in one row; these two black hair-tufts are very conspicuous on the yellow legs; the front tibiæ are short-haired, only with a small subapical bristle; middle tibiæ with a little longer hairs ventrally, but likewise only with small bristles at the apex; the hind tibiæ strongly curved and somewhat excised at the base, with dense hairs on the ventral side which form a small tuft placed on a somewhat thickened part just after the excision; on the dorsal side there are short hairs and some fine bristles; the front tarsi have some curious, long and delicate, erect hairs on the ventral side; the posterior tarsi are short-haired, somewhat densely below; the posterior femora have a very dense, short, white pubescence below. The hairs and bristles are black or blackish brown. Besides the legs have the ordinary clothing of short hairs, somewhat conspicuous on account of the yellow colour of the legs. Wings slightly yellowish tinged; veins light brownish, anal vein distinct, reaching the margin. Stigma faint, yellowish. Halteres yellow or yellowish white.

Female. Frons broad, grey, with an impressed middle-line. Abdomen short haired. Front legs short haired, tarsi without long hairs; posterior legs compressed, middle femora short ciliated above, pennate below, middle tibiæ pennate on both sides with very long and rather broad scaly hairs; hind femora and tibiæ pennate on both sides, the scaly hairs on the dorsal side of the femora short and not very broad, the rest long and broad as on the middle tibiæ; the scaly hairs are blackish or dark brown, when seen towards the light they are brownish. Wings brownish fumigated.

Length 4,5 to about 6 mm.

This species is at once recognised by the colour, the shape of the legs and exterior genitalia in the male, and the very strongly pennate legs in the female.

Rh. pennata is not common in Denmark and has only been taken at few localities, but sometimes present in no small number; Lersøen, Dyrehaven; on Lolland at Maribo and in Jutland at Silkeborg;

my dates are $\frac{4}{6}$ to towards the end of June; it seems thus to some degree to be a spring species. It has been taken in plantations of *Salix*, as also recorded by Zetterstedt.

Geographical distribution:— Northern and middle Europe down into France; towards the north it goes no further than to southern Sweden.

15. *Rh. dentipes* Zett.

1842. Zett. Dipt. Scand. I, 397, 9, et 1849. VIII, 3055, 9. — 1903. Kat. paläarkt. Dipt. II, 224.

Male. Eyes contiguous, frontal triangle very small, grey; epistoma grey. Occiput grey with black hairs. Labrum as long as or a little longer than the head is high; palpi dark, brownish haired. Antennæ about as long as the head, black, the two basal joints slightly short-haired, the third joint elongated, slightly attenuated towards the apex. Thorax grey, almost bluish grey, practically without stripes, only the two interstices between the bristles a little darker. The dorsocentral bristles longish, a little longer behind, uniserial, the acrostichal bristles short, biserial, all black. Further a humeral bristle, a posthumeral, about three notopleural, two supraalar and a postalar bristle, all black; besides there are a pair of bristles in front, inwards to the humeri, and also some smaller bristles are present. Scutellum with four black marginal bristles. Pleura grey, metapleura with black or brownish hairs. Abdomen light grey, with black or brownish, somewhat erect,

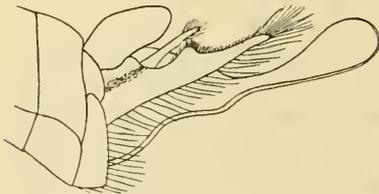


Fig. 20. *Rh. dentipes*, male genitalia.

longish hairs. Venter of the same colour, somewhat sparingly haired. Exterior genitalia of a curious shape, the upper lamellæ large, somewhat triangular or pointed oval and somewhat spoon-shaped, they are finely grey pruinose, in certain directions shining almost whitish; the lower lamellæ are broad at the base, tapering into a long and thin, ferruginous apex, in the middle of the upper margin there is a triangular tooth; they are long-haired, especially long at the apex; between the upper and lower lamellæ there is on each side a small style, perhaps belonging to the lower lamellæ. The eighth ventral segment is arched, and from here the curious penis projects; it is ferruginous, thread-like, sinuous at the base, stretching far backwards and then again curved forwards with the end part. Legs black or brownish black; coxæ greyish pruinose; the hind legs are of a curious shape, the hind femora thickened

towards the apex, with a somewhat triangular tooth a little before the apex on the ventral side and a small tooth at its base more apically; the hind tibiæ are curiously curved with the convexity outwards, and curiously dilated and excised at the base, so that there is a tooth outwards and a tubercle inwards on the ventral side; when femora and tibiæ are closed towards each other these formations work into each other. The anterior femora are short-haired; the middle femora with longer hairs below; hind femora with rows of hairs on the posterior and ventral sides, the latter long, forming a posterior and anterior row which latter is present only on the apical half; the tooth has short, strong hairs at the apex; front tibiæ without bristles; middle tibiæ with a few on the dorsal side, and with short, somewhat strong hairs ventrally; hind tibiæ with not long hairs on the dorsal side and with dense hairs on the somewhat edge-shaped antero-ventral side, being specially dense towards the tooth; tarsi short-haired, slightly spinulous below. The hairs are black or brownish. Besides there is the ordinary clothing of shorter hairs. Wings hyaline; veins yellowish or darker or paler brown, anal vein thin, evanescent in the middle, but again distinct towards the margin and reaching this. Stigma yellowish. Halteres pale yellow.

Female. Eyes separated, frons broad, grey. Abdomen shorter haired than in the male. Legs simple, haired about as in the male, hind tibiæ somewhat short-haired dorsally and with more bristly hairs on the postero-dorsal side. Wings slightly tinged; veins and stigma a little darker than in the male.

Length 3,8—4,5 mm.

This species is in the male at once recognised by the hind legs and exterior genitalia; the female can be distinguished by the light grey, unstriped thorax and also by the, in the middle evanescent anal vein.

Rh. dentipes is very rare in Denmark, only four specimens have been taken, and it has only recently been known as belonging to our fauna, the first specimen was taken in 1908; Ermelund (the author) and at Nyraad near Vordingborg (J. C. Nielsen); the dates are $^{12}/_5$ — $^7}/_6$, it is thus a spring species.

Geographical distribution:— Northern and middle Europe down into Styria; towards the north to northern Sweden, and in Finland.

16. *Rh. flava* Fall.

1815. Fall. Dipt. Suec. Empid. 30, 35 (*Empis*). — 1822. Meig. Syst. Besch. III, 59, 36. — 1842. Zett. Dipt. Scand. I, 438, 62. — 1862. Schin. F. A. I, 97. — 1903. Kat. paläarkt. Dipt. II, 225.

Male. Eyes separated, frons narrow, brownish; epistoma extremely narrow, brownish. Occiput grey, with black hairs; labrum somewhat longer than, towards twice as long as the head is high, yellow; palpi pale yellow with a dark hair at the apex. Antennæ somewhat longer than the head, inserted somewhat high, above the middle, brownish black; the two basal joints yellow, with short, dark hairs, the first joint long and slender, about twice as long as the second; the third joint elongated, strongly attenuated towards the apex, the style long, not much shorter than the third joint. Thorax yellow, only slightly shining. The dorsocentral bristles long, uniserial, somewhat longer behind, the acrostichal bristles short, somewhat indistinctly biserial, all black. Further a humeral bristle, a posthumeral, about two notopleural, one or two supraalar and a postalar bristle, all black; besides there is a bristle in front inwards to the humeri, and some smaller hairs. Scutellum with four black marginal bristles. Pleura yellow, metapleura with black hairs. Abdomen relatively long and slender, yellow, a little pruinose and slightly shining; sometimes it is a little darkened above, especially towards the apex; the incisures may be indistinctly brownish; it is somewhat sparingly haired with short, black or dark brownish hairs; those at the hind margins of the segments are slightly longer and stronger, especially in front. Venter yellow with short hairs, and also with a few longer at the hind margins of the segments. Exterior genitalia small and inconspicuous; the lower lamellæ somewhat triangular, the upper (as far as I could see) somewhat styliform. Penis a short, somewhat thick, upwards curved thread. Legs long and slender, yellow, tibiæ slightly brownish towards the apex, tarsi brownish; coxæ yellow. Anterior femora short-haired with slightly longer hairs on the antero-ventral side and with a few bristly hairs at the apex; hind femora similarly haired, in the apical fourth part with a few thin bristles on the ventral and anterior sides; anterior tibiæ short-haired; the middle ones with a few bristles on various sides; hind tibiæ with some bristles in two dorsal rows. Tarsi short-haired, middle and hind tarsi slightly spinulose beneath. The hairs and bristles black or at all events dark. The ordinary clothing of short hairs is somewhat dense, the hairs not adpressed and rather conspicuous, also on account of their dark colour. Wings hyaline, very slightly yellowish tinged; veins brownish, anal vein not reaching the margin. Stigma faint, yellowish. Halteres yellow or pale yellow.

Female. Frons slightly broader than in the male, epistoma much broader, greyish; otherwise it is quite similar to the male, also with regard to the hairiness of the legs.

Length 4—4,8 mm.

This curious species is at once distinguished in the male by the colour, the separated eyes and the narrow epistoma; the female is on the contrary very like the female of *hybrida*, under which species I shall note the specific differences. It is a very interesting species; the whole structure of the body and the shape of the exterior genitalia bring it near to the following species, while on the other hand the separated eyes in the male make it stand a little apart.

Rh. flava is very rare in Denmark, I only know of two specimens, one taken at an earlier time, probably in the vicinity of Copenhagen (Stæger), and one from Horsens in Jutland (H. J. Hansen), both females. It was taken in August.

Geographical distribution:— Northern and middle Europe down into France; towards the north to northern Sweden, but here rare, and in Finland. Zetterstedt mentions, that he took it on flowers of Umbelliferæ and Composites in shaded places. Verrall (Entom. Month. May. XIX, 1883, 224) records, that he met with the males hovering about six feet from the ground in plantations in considerable numbers.

Remarks: The separated eyes in the male of this species have not, strange to say, been noted previously, neither by Zetterstedt nor by Meigen, and also Frey (Acta Soc. pro Faun. et Flor. Fenn. 31, No. 9, 1909, 20) makes no mention of this fact, but places the species in his group 3. Zetterstedt says, that the antennæ in the female are quite black, but this is erroneous, as they have the two basal joints yellow as in the male; I think Zetterstedt has confused it with the female of *hybrida* which has the basal joints of the antennæ darker. The shape of the head in the male of *flava* is somewhat curious, not alone by the separated eyes, but also by the high inserted antennæ and by the fact, that the epistoma is very narrow, the eyes going near to each other below the antennæ.

17. *Rh. culicina* Fall.

1815. Fall. Dipt. Suec. Empid. 28, 29 (*Empis*). — 1822. Meig. Syst. Besch. III, 52, 19. — 1842. Zett. Dipt. Scand. I, 421, 41. — 1862. Schin. F. A. I, 99. — 1903. Kat. paläarkt. Dipt. II, 224.

Male. Eyes contiguous, the small frontal triangle brown; epistoma greyish. Occiput grey, with black hairs. Labrum about as long as, or somewhat longer than the head is high, ferruginous; palpi yellowish. Antennæ about as long as the head, black or brownish black, the two basal joints brown, with short hairs, the third joint elongated, not much attenuated towards the apex. Thorax black or brownish black, dull, somewhat velvet; two more brownish and less dull stripes are visible, the intermediate and side spaces thus forming three darker

stripes, but very indistinctly; when seen quite from in front thorax is greyish, especially the two stripes and a space in front of scutellum. The dorsocentral bristles somewhat long, longest behind, the acrostichal bristles short, all black and uniserial. Further a humeral bristle, a posthumeral, two or three notopleural, a supraalar and a postalar bristle, besides there is a small anterior supraalar bristle, but otherwise no hairs; the bristles are all black. Scutellum brownish grey, with four black marginal bristles. Pleura grey, somewhat yellowish, metapleura with black hairs. Abdomen relatively long and slender, velvet black, above sometimes somewhat brownish, down the sides it becomes reddish or yellowish, and the venter is more or less pale yellowish, palest at the base; it is clothed with erect, brownish hairs which are somewhat longish at the sides, longest in front; the hairs at the hind margins of the segments very slightly stronger than the others; venter somewhat short-haired. Exterior genitalia small and inconspicuous, the lower lamellæ seem to be somewhat blade-shaped, the upper styliform; they are short-haired. Penis is a short, thick, upwards curved thread, not protruding. Legs long and slender, yellow, also the coxæ; tarsi brown and the very apex of tibiæ also slightly darkened. Femora short-haired, the posterior femora very slightly longer haired below; just at the apex of the femora a couple of stronger, bristly hairs; tibiæ short-haired, front tibiæ very densely haired with fine and a little longish hairs on the ventral side; posterior tibiæ haired in the same way with less fine, shorter hairs; front tibiæ with a few thin bristles dorsally, middle tibiæ with some bristles on the various sides, hind tibiæ with two dorsal rows of a little stronger bristles. Tarsi short-haired, most densely beneath, on the front tarsi the hairs below very fine as on the tibiæ; the posterior tarsi slightly spinulous. All bristles black or brownish black, the hairs more brownish to paler brown. The ordinary clothing of the legs not sparse and somewhat conspicuous on account of its darker colour. Wings brownish tinged, somewhat iridescent; veins darker or paler brown, anal vein distinct, slightly thinner at the apex, reaching the margin. Stigma brownish, little conspicuous, but large, filling the whole apical part of the subcostal cell. Halteres brownish yellow.

Female. Eyes separated, but the frons narrow, slightly widened downwards, grey. Thorax grey, the same two stripes as in the male slightly visible. Abdomen more or less yellowish, darker above. Thorax and abdomen haired as in the male, and likewise the legs. Wings hyaline, somewhat yellowish tinged; stigma faint. Halteres yellow.

Length 4,5 to about 5,5 mm.

This species will be recognised among the Danish species without difficulty; the male shows resemblance to the male of *hybrida*, but the latter is a smaller species with still darker wings, and besides it differs by other characters, mentioned under this latter species; the female only might be confused with the female of *variabilis*, but this has no acrostichal bristles. The species is also like *sciarina* which is not hitherto found in Denmark, but this is a much smaller species, (and perhaps it is only a synonym to *hybrida*, see under this species).

Rh. culicina is very rare in Denmark, only one single specimen, a male, has been taken earlier; no locality is given for it.

Geographical distribution:— Northern and middle Europe, down into France; towards the north to northern Scandinavia but there becoming rare; and in Finland. According to Zetterstedt it occurs on leaves and on flowers of Umbelliferæ on shaded places; it is an autumn species, Zetterstedt gives the dates $\frac{1}{8}$ — $\frac{8}{9}$.

18. *Rh. hybrida* Zett.

1838. Zett. Ins. Lapp. 572, 46. — 1842. Zett. Dipt. Scand. I, 438, 63. — 1903. Kat. paläarkt. Dipt. II, 226.

Male. Eyes contiguous, the very small frontal triangle dark brownish; epistoma short, pale brown. Occiput dark grey, with black hairs. Labrum a little longer than the head is high, thin, ferruginous; palpi yellow. Antennæ shorter than the head, black, the two basal joints may be dark brownish, they are not distinctly hairy, the third joint elongated, somewhat attenuated towards the apex. Thorax velvet black or brownish black, with slight traces of a pair of less dull stripes in the middle. The dorsocentral bristles of moderate length, uniserial; the acrostichal bristles short and very inconspicuous, they are biserial or irregularly uniserial; all the bristles black. Further a humeral bristle, a posthumeral, generally two notopleural, a supraalar and a postalar bristle, all black. Scutellum greyish brown, with four black marginal bristles. Pleura greyish or yellowish brown, meta-pleura with brown hairs. Abdomen relatively slender, velvet black, sometimes slightly brownish black, and it may be brownish down the sides. Venter yellow. Abdomen somewhat sparingly clothed with black or brownish hairs which are short above, longer and erect at the sides; those at the hind margins of the segments a little stronger than the others; venter sparingly haired with short hairs. Exterior genitalia small and inconspicuous, the lower lamellæ somewhat blade-shaped, the upper lamellæ directed upwards and likewise somewhat broad; both pairs somewhat shining. Penis a short, upwards curved, thick thread, not protruding. Legs somewhat long and slender,

yellow, also the coxæ; tarsi more or less browned. The anterior femora short-haired; hind femora likewise, but with a single ventral bristle about in the middle and an antero-dorsal bristle nearer the apex; front tibiæ with a single bristle on the dorsal side, and with slightly longish and fine hairs ventrally; middle tibiæ with some very short bristles on the various sides; hind tibiæ with one or two bristles ventrally, and with two dorsal rows of slightly longer bristles. Tarsi short-haired, the front tarsi with hairs below like those on the tibiæ; the posterior tarsi very slightly spinulose beneath. The hairs and bristles blackish or brownish. The ordinary clothing on the legs not sparse, darker or paler brown. Wings strongly brown fumigated, somewhat iridescent; veins brown, the anal vein looks abbreviated, but generally a very slight trace is observable to the margin (not to be confused with the fold found here). Stigma brownish, little conspicuous. Halteres paler or darker brown.

Female. Very unlike the male, but only as to colour. Eyes separated, frons narrow, brownish. Thorax reddish yellow, with three paler, slightly greyish stripes, or thorax might be termed yellowish with two stripes and the sides reddish. Scutellum, pleura and abdomen yellow. Thorax and abdomen haired as in the male. Legs as in the male and haired in the same way. Wings hyaline, slightly yellowish tinged; veins paler brown, anal vein as in the male, but a little more distinctly traceable to the margin, and the apex just at the margin generally a little more distinct. Stigma very faint. Halteres yellow.

Length 3.5—4 mm.

This species stands somewhat curiously between the two preceding; the male resembles the male of *Rh. culicina*, but is however easily distinguished; it is smaller and has darker wings, and the anal vein is more distinct in *culicina*; the genitalia in *hybrida* are more conspicuous, shining, and the upper lamellæ larger, directed upwards and not styliform; finally *culicina* has the front tibiæ more densely haired below and has no bristle ventrally near the middle on the hind femora. The female on the other hand closely resembles the female of *flava*, but may be distinguished with certainty; it is smaller, the colouration of thorax is different, as *flava* has a uniformly yellow thorax without stripes; the antennæ are not as in *flava* inserted above the middle, they have the basal joints only brownish, not yellow; and also in this sex the bristle below the hind femora is characteristic; finally *flava* has the anal vein quite abbreviated. That the two sexes really belong to one species is beyond doubt, Zetterstedt has taken them in copula, and also here they have been taken, to

be sure not in copula, but however together. Zetterstedt notes the resemblance between the males of *hybrida* and *sciarina*, and the females of *hybrida* and *flava* and says: „An copulatio hybrida?“ This copulation should thus take place between the *sciarina*-male and the *flava*-female; as shown above this cannot be so, since the *hybrida*-female is distinct from the *flava*-female, but with regard to *sciarina* the case is doubtful; the *sciarina*-female seems not to be known, it is at all events not described, and as the species belongs to a group with sexual dimorphism in the colour, this female must probably be expected to differ somewhat from the male. I have only seen a single specimen of *sciarina*, but I am inclined to think, that it is only the male to *hybrida*; should this prove to be the case, *hybrida* should have the name *sciarina*.

Rh. hybrida is not common in Denmark, but sometimes taken in some number; Lersøen (Stæger), Damhusmosen (the author); it has thus hitherto only been taken in the neighbourhood of Copenhagen. It occurs on flowers of Umbelliferæ, generally near water, Stæger has thus taken it on Chaerophyllum sylvestre; it seems to be an autumn species, my dates are $17/7$ — $30/8$.

Geographical distribution: — The species is hitherto only known from Sweden, towards the north to Lapland; its southern limit should thus lie in Denmark.

19. *Rh. nigripennis* Fabr.

1794. Fabr. Ent. Syst. IV, 407, 20 (*Empis*). — 1805. Fabr. Syst. Antl. 144, 7 (*Tachydromia*). — 1815. Fall. Dipt. Suec. Empid. 30, 34 (*Empis*). — 1842. Zett. Dipt. Scand. I, 424, 45. — *Rhamphomyia obscuripennis*: 1830. Meig. Syst. Besch. VI, 340, 39. — 1893. Strobl, Mitth. Ver. Steierm. 1892, 59, (as var. b of *umbripennis*).

Male. Eyes contiguous, frontal triangle black; epistoma black. Occiput blackish, somewhat shining, with black hairs. Labrum as long as the head is high; palpi black, with black hairs at the apex. Antennæ as long as the head or slightly longer, black, the two basal joints with a few short, black hairs, the third joint elongated and attenuated towards the apex. Thorax strongly arched, deep velvet black, somewhat shining in front and at the sides. The dorsocentral bristles somewhat short, black, uniserial; no acrostichal bristles. Further a humeral, a posthumeral, a pair of notopleural and a postalar bristle, all black, but so far as I could see there is no supraalar bristle. Scutellum with four black marginal bristles. Pleura black or greyish black, slightly shining, metapleura with black hairs. Abdomen somewhat slender, deep velvet black on the dorsal side

and the upper part of the sides; on the lower part of the sides shining and sometimes somewhat translucently brownish. It is sparingly clothed with short, black hairs. Venter greyish or brownish, more or less pale, with short hairs. Exterior genitalia small, the lower lamellæ somewhat blade-like, the upper styliform, pointed, somewhat broader at the base; both pairs with short hairs apically. Penis thick at the base, curved upwards and hidden. Sometimes the genitalia are more retracted, and the mentioned structure not or indistinctly seen. Legs slender; front coxæ yellow, posterior coxæ darker, brownish or blackish; femora yellowish to brownish, generally darker towards the apex; tibiæ and tarsi dark brown to blackish. Femora short-haired, only the hind femora with some longer hairs above at the base; tibiæ likewise short-haired, front tibiæ with slightly longish, dense hairs below; anterior tibiæ without bristles; hind tibiæ short-

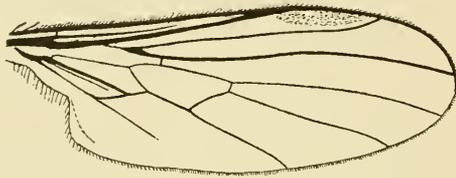


Fig. 21. Wing of *Rh. nigripennis*.

but distinctly haired on both sides and with some small bristles dorsally; tarsi short-haired; the posterior tarsi slightly spinulose beneath, the front tarsi with dense hairs below as on the tibiæ. Wings strongly blackish fumigated, iridescent; they are darkest towards the anterior margin, sometimes some shades may be seen, seaming the veins, especially the postical vein, at other times no shades are visible. Veins blackish or brownish, anal vein abbreviated, the discal cell lying before the middle of the wing. Stigma brownish black. Halteres dark brown or black.

Female. Eyes separated, frons somewhat narrow, black, shining. Thorax black, shining. Abdomen darker or paler brown, somewhat shining. Femora generally more yellow on the basal part; legs haired as in the male, only the dense hairs below the front tibiæ wanting. Wings hyaline, somewhat yellowish tinged.

Length 2.5—4 mm., the latter size only reached by females with fully extended abdomen.

This species can only be confused with the following, under which I shall give the distinguishing characters.

Rh. nigripennis is a common species in Denmark; Copenhagen in gardens, Amager, Ordrup Mose, Ermelund, Lyngby Mose, Ørholm

Præstevang and Tyvekrogen at Hillerød, Boserup near Roskilde; on Funen at Odense; on Langeland at Lohals and on Bornholm at Rønne, Hasle, Rø and Almindingen; on the other hand it has hitherto not been taken in Jutland, which is however probably only accidental. It is seen during most part of the summer, my dates are $\frac{3}{6}$ — $\frac{7}{8}$. It occurs in thickets, in fens and on humid places, and in low herbage in woods on shaded localities; it is here seen hovering in the air over the plants with the hind legs pendulous. When alive it has bright red eyes.

Geographical distribution:— Northern and middle Europe down into Styria; towards the north to Lapland, but here it seems rare; and in Finland.

Remarks: Meigen (Syst. Besch. III, 54) cites *nigripennis* Fall. under his *umbripennis*, but says, that the name cannot be kept, as the species is not *Tachydromia nigripennis* Fabr., and in VII, 334, 7 he enumerates Fabricius' species as *Ocydromia nigripennis*, but this is erroneous. Fabricius says: „Habitat in Daniæ floribus Mus. Dom. Lund.“ In the collection of Tønder-Lund there are two specimens present under the name of *nigripennis*, and both belong to the present species which must thus have the name *nigripennis* Fabr., and Fallén was quite right in his interpretation. Now the species is not *umbripennis* Meig., but certainly his *obscuripennis* and identical with var. b. *obscuripennis* Strobl. Meigen says, that the anal vein reaches the hind margin, but I think Strobl is right in supposing, that Meigen has been misled by the shade stretching from the anal vein. I think it also certain, that Zetterstedt's *nigripennis* is the present species, as also suggested by Strobl.

20. *Rh. umbripennis* Meig.

1822. Meig. Syst. Besch. III, 54, 25. — 1862. Schin. F. A. I, 101. — 1893. Strobl, Mittheil. Ver. Steierm. 1892, 59, (var. a. *umbripennis*). — 1903. Kat paläarkt. Dipt. II, 231, (excl. synonym. sub. *nigripennis*).

Male. Eyes contiguous, the small frontal triangle black; epistoma black. Occiput greyish black, slightly shining, with black hairs. Labrum as long as or a little longer than the head is high; palpi black, slightly blackish haired. Antennæ as long as the head, black, the two first joints with a few short hairs, the third joint elongated, attenuated towards the apex. Thorax strongly arched, deep velvet black, not or only slightly shining in front and not at all at the sides. The dorsocentral bristles somewhat long, black, uniserial; no acrostichal bristles. A humeral bristle, a posthumeral, a pair of notopleural, a supraalar and a postalar bristle present, all black. Scutellum has

four black marginal bristles. Pleura greyish black, metapleura with black hairs. Abdomen rather slender, deep velvet black, sometimes slightly shining down the sides. Venter black or greyish black, shining. Abdomen is somewhat sparingly clothed with short, black hairs; venter similarly haired. Exterior genitalia very small and inconspicuous, the lower lamellæ styliform, the upper broader. Penis is sometimes seen between the upper lamellæ as a very thin thread. Legs black or brownish; the coxæ all dark, slightly greyish pruinose; hind metatarsi slightly swollen. Femora short-haired, the hairs above a little more conspicuous; front tibiæ with fine, slightly longish hairs below; anterior tibiæ without bristles, hind tibiæ with small bristles dorsally; front tarsi with fine hairs below as on the tibiæ, posterior tarsi slightly spinulose beneath. Wings somewhat strongly brown fumigated, darkest towards the anterior margin, iridescent. Veins brownish or blackish, anal vein abbreviated; discal cell lying before the middle. Stigma brownish. Halteres black or blackish brown.

Female. Eyes separated, frons not specially narrow, dull blackish. Thorax black, very slightly shining, almost dull. Abdomen greyish black, a little more shining. Legs as in the male, only the hind metatarsi not thickened, and the fine hairs below the front legs absent. Wings nearly quite hyaline.

Length 2,5—2,8 mm.

This species is very like *nigripennis*, but it is with certainty distinguished by several characters; the male is distinguished by the thicker hind metatarsi and a different shape of the exterior genitalia, the wings are less blackish, more brown. The female has almost quite clear wings, abdomen is black, not brownish, and thorax almost not shining. In both sexes the legs are dark, and especially the front coxæ show no trace of pale colour. Besides there are other more minute characters, the dorsocentral bristles are longer, and also the hairs on the venter are longer; the legs are less long, and finally the species is smaller.

Rh. umbripennis is rare in Denmark and has only been taken in 1908 on two localities; Tyvekrogen (the author), and at Nøddebo (J. C. Nielsen); the dates are ²⁸/₅ and ³¹/₅; it seems thus in contrast to *nigripennis* to be a spring species. It was taken in low herbage in woods on humid ground or near water, among others it was sitting in great numbers in the flowers of *Taraxacum*.

Geographical distribution:— Europe down into Spain; it seems to have its northern limit in Denmark, as there is every reason to take Zetterstedt's *nigripennis* to be the preceding species.

Remarks: It is beyond doubt that this and the preceding species

are distinct, and Fallén and Zetterstedt have certainly never had it. Strobl l. c. has recognised both species, but takes them to be varieties; such characters however as the thickened hind metatarsi (not seen by Strobl) and the shape of the genitalia do not vary, and as mentioned there are many other characters, and also the characters from the colour I have found constant. *Rh. umbripennis* seems also to occur in spring, not as *nigripennis* during the whole summer, and it seems to be a more southern species.

21. *Rh. variabilis* Fall.

1815. Fall. Dipt. Suec. Empid. 29, 33 (*Empis*). — 1822. Meig. Syst. Besch. III, 51, 18. — 1842. Zett. Dipt. Scand. I, 407, 23. — 1862. Schin. F. A. I, 99. — 1903. Kat. paläarkt. Dipt. II, 231.

Male. Eyes contiguous, the very small frontal triangle dark; epistoma short, dark greyish. Occiput grey, with blackish, downwards more brownish hairs. Labrum somewhat longer than, towards one and a half times as long as the head is high, ferruginous or brownish; palpi yellow with a long hair at the apex. Antennæ as long as, or slightly longer than the head, brownish black, the two basal joints with short hairs, the third long, attenuated towards the apex. Thorax brown, dull, with three indistinct, slightly darker stripes, the median broadest and most distinct, the lateral often disappearing. The dorso-central bristles long, black, uniserial; no acrostichal bristles. One or two humeral bristles, a posthumeral, generally three notopleural, one or two supraalar and a postalar bristle are present, all long and black; besides there are some shorter, bristly hairs, especially a tuft on the humeri. Scutellum with four, rather strong, black marginal bristles. Pleura grey, metapleura with strong, black hairs; the spiracles brown. Abdomen brownish black, dull along the dorsum, somewhat shining on the sides; it may be more or less translucently brown or yellowish brown, especially at the sides; venter brownish, more or less translucent. Abdomen is clothed with erect, black hairs; the hairs at the hind margins of the segments much longer and stronger than the others and hence very conspicuous; venter with short hairs. Exterior genitalia small and inconspicuous, the lower lamellæ broad and short, the upper somewhat styliform; the end of the penis sometimes seen above as a thick thread. Legs somewhat long and rather strong, yellowish or ferruginous, the apex of the tibiæ and the tarsi dark brown or blackish; coxæ more or less greyish pruinose, the front coxæ sometimes only to a slight degree. Femora mainly short-haired, the anterior femora generally with some bristly hairs on the dorsal and posterior sides; all femora with a few stronger bristles at

the apex on the anterior and posterior sides; front tibiæ with some bristles dorsally, and with fine, longish hairs ventrally; middle tibiæ with bristles on the various sides; hind tibiæ with two dorsal and one anterior row of somewhat strong bristles. Tarsi short-haired, anterior tarsi with fine hairs below as on the tibiæ; all tarsi spinulous beneath, the hind metatarsi with a few bristly hairs above. All bristles black; the ordinary clothing on the legs blackish or brown, somewhat dense, and rather conspicuous. Wings more or less brownish tinged; veins brown, anal vein distinct, reaching the margin. Stigma brown, distinct. Halteres darker or paler yellow.

Female. Eyes separated, frons and epistoma grey. Thorax grey, without distinct stripes. Abdomen grey or more or less brownish; the hairs on thorax a little shorter, those on abdomen much shorter than in the male. Legs as in the male and mainly haired in the same way, but the bristles are shorter and less numerous and there are no bristles on the dorsal and posterior sides of the anterior femora, and no longish hairs below the front legs. Wings hyaline or very slightly tinged. Stigma faint, yellowish. Halteres whitish or pale yellow.

Length 3,5—4,2 mm.

This species is easily distinguished by the strong pilosity of thorax, and the strong bristles at the hind margins of the abdominal segments in the male; also the colour distinguishes it; from *culicina* it is at once distinguished by the absence of acrostichal bristles.

Rh. variabilis is common in Denmark: Geel Skov, Ruderhegn, Vedbæk; on Funen at Odense and Veflinge and in Jutland at Rye near Silkeborg, Hald near Viborg, Holstebro in great numbers, at Gjerlev near Randers Fjord and at Hobro. It is a somewhat late occurring species, my dates are from the last part of July to ¹⁵/₉. It occurs generally in low herbage, but otherwise on different localities, both somewhat humid and dry, and also on sandy places, and both in woods and outside.

Geographical distribution: — Northern and middle Europe down into France: towards the north to middle Sweden, being rare farther north; and in Finland.

Remarks: I have determined this species as *variabilis* Fall., but for the rest I think it beyond doubt, that this and *tenuirostris* Fall. are identical. I have seen specimens of both species from Zetterstedt's collection, and I find no difference, not even in the length of the proboscis. Already Fallén seems to have had some doubt about the species, as he says that he can scarcely distinguish them; the only character given by Fallén, Zetterstedt and Meigen is the length

of the „haustellum“, and this character is, as well known, without value, being dependent on the length to which the labium is extended; other characters mentioned are only such as are due to the degree of maturity.

22. *Rh. gibba* Fall.

1815. Fall. Dipt. Suec. Empid. 32, 41 (*Empis*). — 1822. Meig. Syst. Besch. III, 58, 32. — 1842. Zett. Dipt. Scand. I, 437, 61 et 1849. VIII, 3045, 61. — 1862. Schin. F. A. I, 101. — 1903. Kat. paläarkt. Dipt. II, 225.

Male. Eyes not quite contiguous, leaving a very narrow frontal stripe between them which is black, shining; epistoma somewhat narrow, black. Occiput greyish black, only very slightly hairy. Labrum about as long as the head is high, black, proboscis somewhat thick; palpi blackish. Antennæ about of the length of the head, black, the two basal joints short-hairy, the third joint somewhat elongated, the style short. Thorax very much arched, black, strongly shining; the disc is clothed with very short, black hairs; biserial acrostichal hairs may be discerned, but the dorsocentral bristles are not distinguished from the other hairs towards the sides; only behind there are some long dorsocentral bristles; of the usual bristles there seems only to be one, a notopleural, present. Scutellum black, shining, with four long, black marginal bristles. Pleura greyish black pruinose, metapleura with black hairs. Abdomen short and robust, black, shining, with short, black hairs; venter similarly coloured and haired. Exterior genitalia somewhat thick, there is a large, arched plate below (eighth ventral segment?), and a pair of upwards directed lamellæ above; between the latter the penis extends as a thin, ferruginous thread, curved upwards. Legs black or brownish black, shining; coxæ somewhat blackish grey pruinose; hind femora thick, the hind tibiæ of a curious shape, curved, somewhat nodose, and hairy; hind metatarsi slightly thickened. Front femora short-haired; the middle femora have a row of hairs below, and the hind femora are similarly haired; the front tibiæ have no bristles, the middle tibiæ have a pair of bristles on the dorsal side, the hind tibiæ are short- and densely haired on the dorsal side, the hairs stopping a little before the base, and here forming a small tuft; tarsi short-haired. All the hairs brownish. Wings whitish hyaline; veins white or yellowish, radial vein short, discal cell elongated, the medial cross-vein quite near to its base, anal vein not reaching the margin. Stigma narrow and very faint, scarcely observable. Halteres black.

Female. Eyes separated, frons narrow, shining black. Legs simple, without bristles; hind femora short ciliated below, hind tibiæ

short and thick, longish ciliated on the antero-dorsal side with somewhat scaly hairs; hind metatarsi somewhat thickened, densely hairy on the dorsal side. Wings slightly yellowish tinged, sometimes slightly

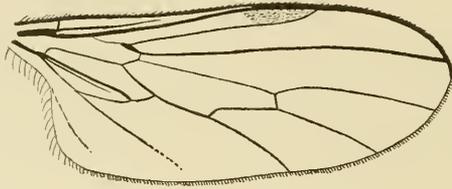


Fig. 22. Wing of *Rh. gibba*.

brownish in the middle at the anterior margin. Veins darker than in the male. Stigma a little more distinct.

Length 2,5 mm.

This small, thick-set, black shining species is at once recognised by its whole exterior from any other species of *Rhamphomyia*.

Rh. gibba is rare in Denmark; Ordrup Mose (Stæger), Geel Skov (the author); in Jutland in Vejle Nørreskov (the author) and at Laven near Silkeborg (H. J. Hansen); the dates are $^{31/7}$ — $^{5/9}$, the species thus being an autumn species. It occurs in fens and in low herbage in woods, and it has been taken on flowers of Umbelliferae.

Geographical distribution: — Northern and middle Europe down into Styria; towards the north to middle Sweden.

Rh. cana Zett.

In 1849, in Dipt. Scand. VIII, 3043, 50—51 Zetterstedt establishes a species, *Rh. cana*, which is again mentioned in XI, 4272, 50—51; about it is said: „Hab. in Dania. D. Stæger, qui specimen pro describendo mutuo communicavit 1848.“ It should thus belong to our fauna. Only the male is known, and there seems to have been only one specimen. We do not have the species in our collection, and I then wrote to Dr. Bengtsson, the director of the museum in Lund, where Zetterstedt's collection is. He kindly communicated me, that the species was not to be found. It is thus lost, and I think it doubtful whether it will ever be recognised. I shall not reprint here Zetterstedt's description to which I refer. The species is said to be similar to *obscura*, but of a lighter colour, and to *coracina*, but smaller. Thorax light grey, without stripes. Abdomen grey, slightly hairy, with „ano hiante, filato“. The wings are whitish hyaline, the anal vein does not reach

the margin. Halteres white. Legs not slender, brownish black, simple, the hind tibiæ with black bristles on the dorsal side. — Length $1\frac{1}{4}$ ".

5. **Empis** Linné.

Species of somewhat large to small size, and of a more or less slender shape. The colour black or blackish, but generally more or less grey or brown pruinose; sometimes the colour is yellow, and then generally with dark stripes on thorax and abdomen. The head is small, globular, narrower than thorax; sometimes it is somewhat elongated and pear-shaped; occiput is arched, or, when the head is elongated, drawn out and conical; it is more or less densely clothed with hairs or bristles, and there are likewise more or less numerous ocellar hairs or bristles. The eyes are larger or smaller; they are either touching in the male and separated in the female, or separated in both sexes, in some cases very narrowly separated. When the eyes are touching in the male, the facets in the upper part are larger than in the lower part, but the dividing line is generally not distinct or only so in rare cases; the small facets stretch upwards at the hind margin of the eye. The species with the eyes separated in both sexes have all facets small and of equal size. The colour of the eyes is brownish. The incision in the inner eye-margin is small and shallow, sometimes almost wanting. There are three ocelli, placed on a prominent tubercle. The antennæ are inserted near to each other, in or a little above the middle; they are five-jointed; the first joint is shorter or longer, the second short, the third is more or less elongated, conically tapering, and compressed; the two last joints form a style the first joint of which is the shortest. The two first antennal joints have shorter or longer hairs or bristles. Epistoma is broader or narrower and has generally below, at the margin of the oral aperture, a somewhat elevated callus, towards the sides continuing into the narrow jowls. The following description of the mouth parts is chiefly taken from *E. tessellata*. There is a small oral cone; on the front-side of it lies the chitinised clypeus which is somewhat horse-shoe-shaped, stretching with one leg down on each side. Proboscis is about twice as long as the head is high, (from a little longer than the head is high to almost as long as the body in the various species); it is directed vertically downwards. Labrum is strong, as long as proboscis, very high at the base, semitubular, and three-pointed at the apex, the two lateral lobes are well chitinised, the median less. The maxillæ have a thread-shaped lacinia, a little shorter than proboscis; the palpi are cylindrical, one-jointed, directed some-

what upwards. Hypopharynx is of the length of the proboscis, straight, pointed and a little dilated at the apex; it is somewhat semitubular. Labium is long and narrow, the labella are about one third of the length of the basal part of labium and not broader, they are cleft to their base and hairy below and at the apex; the basal part of labium is well chitinised. There is a long connecting membrane at the base of labium, and when this is stretched out the labium reaches far beyond the labrum; in rest this membrane is folded in and (generally, in some species not) likewise the oral cone, the clypeus is then withdrawn into the oral aperture. Thorax is almost rectangular, somewhat arched above; prothorax is distinct, ring-like, or sometimes (*Xanthempis*) specially developed; it has variously arranged bristles above. There is a narrow metanotum, but no metasternum, the whole space between the hind coxæ and first ventral segment being membranous. There are dorsocentral and most frequently also acrostichal bristles, but they may be variously developed, more or less numerous, longer or shorter and present in one or more rows; the acrostichal bristles may be absent; the bristles are generally longer and stronger behind. Besides there may be smaller hairs on the sides of the disc. There are generally humeral, posthumeral, some notopleural, a supraalar and a postalar bristle, but some of them may be absent. Scutellum has two to several marginal bristles; metapleura have stronger or weaker bristles which are more or less numerous. Abdomen is somewhat long and more or less slender, generally more slender in the male than in the female. It consists of eight segments, but the last is sometimes hidden. The first segment is short, on the dorsal side broader than the following, the second is the longest. Sometimes the first ventral segment seems not to be chitinised, thus there is in *tessellata* a distinct but very short first ventral segment, but in *livida* I could find none, so that it is either not chitinised or not separated from the second segment. The male genitalia may be of very various aspects and larger or smaller, but whatever the shape may be they seem always to consist of two pairs of lateral lamellæ, the upper and the lower; the upper lamellæ are however generally or always more or less connected with each other at the base or above. Penis is likewise of somewhat various shape, thread-like or thicker, simply curved or more sinuous and curved upwards between the lamellæ. At the ventral base of the penis there is (generally or always) a smaller or larger ventral lamella. The eighth abdominal segment seems to form a complete ring not divided into a dorsal and a ventral half-ring. In the female the abdomen tapers towards the apex; behind the eighth segment there is a small

ring, terminating in a pair of shorter or longer, styliform lamellæ; often there is also a small, styliform or knob-like process issuing from the ventral side of the eighth segment. In some cases the three last abdominal segments are suddenly narrowed. The legs are more or less long and slender; sometimes the femora may be thickened, and not rarely the males have the front or hind metatarsi, or both pairs more or less thickened. The legs have the ordinary short pubescence, and besides longer hairs and bristles, variously arranged in the various species and thus giving specific characters. Sometimes (especially in the subgenus *Pterempis*) the females have all the legs, or only the posterior, with the femora and tibiæ and sometimes also the metatarsi more or less feathered with scaly hairs, the arrangement of which likewise affords specific characters. The tibiæ have apical or subapical spurs in varying numbers, they are often very small and inconspicuous. There are two claws, two well developed pulvilli, and a small, median empodium with hairs. The wings may in single cases be broad, especially in the female; sometimes they are relatively long. They are hyaline or more or less darkened, sometimes milky in the male. The mediastinal vein is abbreviated, not reaching the margin; the cubital vein is forked and there are thus two cubital cells; from the discal cell three veins issue, the lowermost is the upper branch of the postical vein which closes the discal cell below, there are thus four posterior cells; the upper branch of the discal vein is sometimes abbreviated; the anal vein either reaches the margin or is abbreviated; the second branch of the postical vein is recurrent towards the base and almost parallel with the wing-margin, and the anal cell is much shorter than the second basal cell. Stigma present, often very weak. Alula is small, sometimes almost not developed, fringed at the margin; axillary lobe small or large, the angle generally deep and acute, but sometimes rectangular or obtuse, and the angle between alula and squamula alaris follows the axillary angle in shape; alar squamula generally fringed at the margin, rarely bare.

Not much is known about the developmental stages of the species of *Empis*. Macquart mentions (Suit. à Buffon I, 326, 1834) the pupa of *E. opaca*. Beling describes larvæ and pupæ of *E. trigramma* (Arch. für Naturgesch. Jahrg. XLI, 39—40, 1875) and of *E. tessellata*, *decora*, *grisea* (*nodosa*) and *aestiva* (ibid. XLVIII, 205—11, 1882). Kieffer (Ill. Zeitschr. für Entom. V, 1900, 131) describes larva and pupa of *E. meridionalis*. I have myself examined the larva of *E. tessellata*, but only one, bad specimen. The larvæ are cylindrical, whitish or yellowish; the body consists in all of twelve segments (Beling, Brauer), and it is pointed towards the head. The last segment is somewhat elongately

globular, rounded behind, it has some (generally nine) deeper or shallower, longitudinal furrows. On the ventral side of all or most abdominal segments there are slight, transverse swellings (Kriechschwielien). The larvæ are amphipneustic with very small prothoracic spiracles, and with larger or smaller posterior spiracles lying on the rounded hinder side of the last segment, in the middle or a little above; there is generally a small wart or tooth below the posterior spiracles. Besides the pupæ mentioned above I have myself examined the pupa of *E. tessellata*, *trigramma* and *stercorea*. The pupa is yellowish or light brownish; at the front side of the head there are two transverse, compressed, sharp processes at the base of the antennal sheaths, and two similar, smaller, above, these latter sometimes very small; each of these processes bears a strong hair; the antennal sheaths lie below, directed to each side; on the lower side, between the apices of the antennal sheaths are two bristles, and on a tubercle on each side below the prothoracic spiracles are two other bristles; above on thorax there are two bristles in front, and behind them eight bristles placed in a semicircular line with the convexity backwards; thus there are in all twenty bristles on head and thorax. Each abdominal segment has on the dorsal side a dense girdle of thin, straight, brownish spines, and between them some long hairs; at the base of the spines there are some quite short ones; the first segment has only hairs. On the ventral and lateral sides each segment has a girdle of long hairs. There are small prothoracic and seven pairs of likewise small abdominal spiracles.

The larvæ live in the ground, especially in humous earth in woods, also sometimes in decaying tree-stubs; Kieffer found the larva of *E. meridionalis* below the leaf-sheaths of *Scirpus silvaticus*; they are no doubt carnivorous. The pupæ are found in the same places, and the armature of spines on the abdomen is evidently used in working the way up to the surface at the time for escape, as already suggested by Macquart l. c. The larvæ hibernate and the development follows in the following spring or summer.

The species of *Empis* occur especially in woods, frequently on somewhat humid and shaded places, and they are generally seen on low plants. Some occur outside woods, on meadows in grass and low herbage. Some species are essentially spring species, others occur in the summer, while a few first fly in the autumn. Some of the species (of the subgenus *Pterempis*, perhaps all species of this subgenus, but also some species of *Empis* s. str.) hover in the air in swarms, and for some of these the copulation is known to take place in the air (e. g. *E. (Pterempis) genualis*, Bezzi, Deutsch. ent. Zeitschr.

1909, Beiheft, 88, and some species of *Empis* s. str. see below). The species are carnivorous, feeding on other Insects; I have taken *E. tessellata* with *Scatophaga stercoraria* L. and *E. stercorea* with a small Tipulid as prey. Poulton l. c. records from England the following samples of prey: *E. bilineata*: *Bibio lacteipennis* Zett., *Empis stercorea* L.; *E. grisea*: *Pegomyia bicolor* W.; *E. femorata*: *Hydrotæa* sp., *Thereva bipunctata* M. and *plebeja* L. *Myiospila meditabunda* F.; *Spilogaster duplicata* M.; *E. tessellata*: *Onesia sepulchralis* L., *Leptis scolopacea* L., a Tipulid, *Bibio nigriventris* Hal. and *marci* L., *Volucella inflata* F., *Aporomyia dubia* Fall., *Dryomyza anilis* Fall., *Tipula lunata* L. and *paludosa* M., *Hylemyia* sp., *Dilophus febrilis* L., *Mydæa* sp.; *E. livida*: *Tortrix viridana* L., *Crambus hortuellus* Hb., *Crambus* sp., *Lype phæopa* Steph., *Borborus nigrifemoratus* Macq. and *equinus* Fall., *Dicranomyia dumetorum* M., *Stomoxys calcitrans* L., *Anthomyia* sp., *Caricea tigrina* F., *Sepsis cynipsea* L., *Nemopoda cylindrica* F.; *E. opaca*: *Bibio lacteipennis* Zett. Hamm records (Entom. Month. Mag. XLV, 1909, 160) Bibios and other Diptera for *E. femorata*, and Howlett records (l. c. XLIII, 1907, 229) *Bibio varipes* M. and various Tipulids, Ephemeroidea and Perlids as prey for *E. borealis*.

The copulation of many species of Empids is connected with some interesting phenomena which are particularly mentioned by Howlett (Entom. Month. Mag. XLIII, 1907, 229) and Hamm (ibid. XLIV, 1908, 181 and XLV, 1909, 132 and 157). The species in question are *E. borealis*, *livida*, *opaca*, *tessellata* and *femorata*. In these species the males catch, at the time for copulation, a prey which they kill but do not devour; on the contrary they carry it in flight to a female to which it is presented, and then the copulation takes place. With regard to the species mentioned this act is begun in the air; then the pair settles down on a plant, the male generally taking hold with the front legs and holding the female with the posterior legs; during the act the female sucks eagerly at the prey; when copulation is finished the female seems always to drop the prey. The species of the subgenus *Xanthempis* seem to copulate without the males bringing prey to the females, and these species do not copulate in the air (Hamm l. c. XLV, 159).

A somewhat different case is recorded by Aldrich and Turley (Amer. Naturalist, XXXIII, 1899, 809). The species observed was *E. poplitea* Loew, or a closely allied species. Of this species the males were seen flying with a relatively large „balloon“ which was white and is described as composed of minute bubbles. In the balloon a small, dead fly was found e. g. Chironomids and Osciinids. The authors suggest, that the balloon is produced from the anal organs. The

balloon attracts the females, and then copulation takes place; when this is finished the balloon is dropped. The authors declare, that during the copulation the female sits on the male and the latter holds the balloon and rolls it during the copulation. In accordance with the facts recorded above it seems more probable, that the male hands the balloon to the female, and that this latter is below and holds the balloon during the copulation.

The genus comprises about 220 species from the palæarctic region; 29 have hitherto been found in Denmark.

The genus *Empis* comprises species many of which may differ to no slight degree and show many deviating characters; it might therefore be thought easy to divide up the genus; yet this is not so on account of intermediate forms, as has already been pointed out by Loew (Wien. entom. Monatschr. VIII, 1864, 353—54) and has since often been repeated. Loew, therefore, contented himself with dividing the genus in his well known groups (Verwandtschaftskreise). In 1909 (Deutsch. ent. Zeitschr. 1909, Beiheft, 85) Bezzi has created a number of subgenera somewhat different from Loew's groups, and I make use here of these subgenera, as I take them to indicate natural groups. Yet I think it will be difficult to get a sharp distinction between two of them, viz. *Empis* and *Pterempis*.

Table of Subgenera.

- | | |
|--|----------------------------|
| 1. Dorsocentral bristles uniserial, acrostichal bristles absent..... | 2. |
| — Dorsocentral bristles bi- or pluriserial (only in <i>E. livida</i> uniserial, but this species is known by the abbreviated branches of the discal vein)..... | 3. |
| 2. More or less yellow species; the head long, pear-shaped; hind femora not thickened..... | I. <i>Xanthempis</i> . |
| — Not yellow species; head round; hind femora thickened | II. <i>Anacrostichus</i> . |
| 3. Eyes in the male broadly separated; hind femora thickened..... | III. <i>Pachymeria</i> . |
| — Eyes in the male contiguous; hind femora not thickened... 4. | |
| 4. Wings with the axillary angle obtuse; eyes contiguous in the male narrowly separated in the female, epistoma very narrow in both sexes; only one notopleural bristle; hind legs considerably elongated; body black, shining | IV. <i>Lissempis</i> . |
| — Wings with the axillary angle acute; eyes contiguous in the male, broadly separated in the female; epistoma more or less broad; more than one notopleural bristle... 5. | |
| 5. Upper branch of the discal vein abbreviated..... | V. <i>Coptophlebia</i> . |
| — Upper branch of the discal vein not abbreviated (in <i>E. livida</i> both branches abbreviated just before the margin)..... | 6. |

6. Discal cell not pointed outwards; in the male front or hind metatarsi, or both more or less, sometimes only slightly thickened, legs in the female pennate (except in *cinerea*); generally small species. VI. *Pterempis*.
- Discal cell more or less pointed or narrowed outwards; in the male front and hind metatarsi not thickened, legs in the female not pennate; generally larger species. VII. *Empis*.

I. Subg. *Xanthempis* Bezzi.

This subgenus is, at all events with regard to its Danish species, rather well characterised. The species are all yellow, generally with dark markings to a higher or lower degree. They are of medium size and only slightly hairy. The eyes widely separated in both sexes and with all facets small. The head is long and pear-shaped as the occiput is drawn conically out. The antennæ long, as long as or generally longer than the head; the first joint considerably longer than the second, very short haired, the third much elongated. The chitinous lists forming the clypeus broad, almost occupying the whole front side of the oral cone; in one of the species, *bilineata*, the whole front side of the cone is chitinated, and the cone seems therefore to be less retractile and is generally stretched out. Prothorax more or less well developed, forming a neck-shaped part; above it is divided into two more or less distinct lobes, with short, spine-like bristles; (this structure is most developed in *bilineata*, nearly wanting in *lutea*). The thoracic bristles short and thorax otherwise bare. Dorsocentral bristles uniserial; no acrostichal bristles. One humeral bristle, one, or (*bilineata*) no posthumeral, one, or (*trigramma*) two notopleural, no, or (*trigramma* and *lutea*) one supraalar, and one postalar bristle. Metapleura with few bristles. Scutellum with two or four bristles. Abdomen slightly haired, without bristles at the hind margins of the

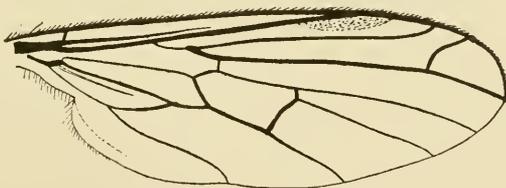


Fig. 23. Wing of *E. stercorea*.

segments. Male genitalia large, of complicated shape; the styli of the female ovipositor somewhat long. Legs rather long, not strong, in both sexes slightly hairy. Wings somewhat long, with strong veins; cubital vein curving downwards, terminating at the apex; discal cell

not pointed outwards; anal vein reaching the margin. Axillary lobe small, the axillary angle rectangular or obtuse, and likewise the angle between squamula and alula. Squamula fringed at the margin, or (*bilineata*) bare.

The species are all more or less essentially spring species, or at all events occur somewhat early. They occur especially in woods and thickets on shaded places. The species never hover in the air and the copulation does not take place in the air; so far as is known the male does not carry prey to the female at the time for copulation.

Table of Species.

- | | |
|--|------------------------|
| 1. Squamulæ bare at the margin; thoracic bristles very short; the disc grey with two brown stripes | 1. <i>bilineata</i> . |
| — Squamulæ fringed at the margin; thoracic bristles longer; the disc not with two stripes | 2. |
| 2. No supraalar bristle; thorax yellow with one stripe, or grey with three stripes | 3. |
| — A supraalar bristle present; thorax yellow, with three stripes or unstriped | 5. |
| 3. Thorax grey with three stripes; pleura with grey spots; scutellum with two bristles | 2. <i>punctata</i> . |
| — Thorax yellow with one stripe; pleura yellow; scutellum with four bristles | 4. |
| 4. Prothoracic spiracles yellow; thoracic disc dull with a rather broad stripe | 3. <i>univittata</i> . |
| — Prothoracic spiracles black; thoracic disc shining with a narrow stripe | 4. <i>stercorea</i> . |
| 5. Thorax with three stripes | 5. <i>trigramma</i> . |
| — Thorax unstriped | 6. <i>lutea</i> . |

1. **E. bilineata** Loew.

1867. Loew, Berl. Ent. Zeitschr. XI, 14 et 20, 5. — 1903. Kat. paläarkt. Dipt. II, 233. — *Empis punctata*: 1805. Fabr. Syst. Antl. 142, 22. — 1830. Meig. Syst. Besch. III, 338, 51. — 1862. Schin. F. A. I, 107. — *Empis testacea*: 1842. Zett. Dipt. Scand. I, 378, 11 et 1849. VIII, 3024, 11. — *Empis digramma*: 1838. Meig. Syst. Besch. VII, 87, 68. — 1909. Bezzi, Deutsch. Ent. Zeitschr. Beiheft, 91.

Male. Eyes broadly separated, frons yellow with a longitudinal, somewhat shining impression in the middle, and with some short, black hairs; epistoma and jowls yellow, slightly greyish. Occiput yellow, above with a large, dark grey spot reaching to the ocellar triangle; a narrow, triangular, shining space stretches from the ocellar triangle backwards; above occiput has short, black bristles. Labrum is ferruginous, palpi yellow. Antennæ about as long as the head, black, the two basal joints short-haired, the third somewhat elongated. Thorax dull greyish yellow, sometimes grey, with two distant, some-

what narrow, blackish brown stripes; the greyish colour occupies either the whole disc or this is more or less yellow at the sides, the greyish colour here only seaming the stripes outside narrowly or



Fig. 24. Antenna of *E. bilineata*. $\times 55$.

more or less broadly, and sometimes this seam is sharply abbreviated in front, the yellow colour here suddenly stretching in to the stripe. The dorsocentral bristles exceedingly short, uniserial, black; there is a very small humeral bristle, one short but strong notopleural bristle and a postalar bristle, all black. Scutellum grey, with two small, black, marginal bristles at the apex. Pleura yellow, metapleura with a few short, black bristles; prothoracic spiracles yellow. Abdomen yellow with a blackish grey dorsal stripe which is somewhat dilated at the incisures; venter yellow. Abdomen is

very sparingly clothed with short, pale yellow hairs, only at the margin of the first segment there are longer and darker hairs. The exterior genitalia are large, the lower lamellæ directed upwards, the posterior edge, which is turned upwards, is straight and posteriorly drawn out into a process; the upper lamellæ are seen between the upper, anteriorly pointing, margins of the lower, they leave an almost cylindrical opening between them. Penis is thick at the base and with some dilatations; it is strongly sinuous, there is especially a loop almost in the middle, but generally hidden between the lamellæ; it is curved upwards and forwards, the apex is not specially thin. The ventral lamella has some small spines at the apex. The genitalia are yellow, only the upper margin of the upper lamellæ is black; the margins and the posterior process have longish, reddish yellow hairs. Legs yellow or ferruginous, tibiæ slightly darkened towards the apex, tarsi black, paler towards the base; trochanters with the lower interior margin black. The legs have short, blackish or brownish hairs, slightly longer and very dense ventrally; some few small bristles are found on the dorsal side of the tibiæ and at the apex of the femora. Wings somewhat yellowish tinged; veins black or dark brown. Stigma very faint, yellowish, slightly observable. Squamulæ not haired at the margin. Halteres yellow.

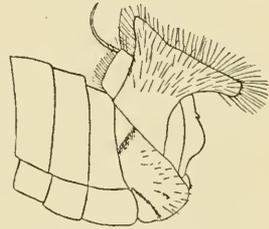


Fig. 25. *E. bilineata*, male genitalia.

very sparingly clothed with short, pale yellow hairs, only at the margin of the first segment there are longer and darker hairs. The exterior genitalia are large, the lower lamellæ directed upwards, the posterior edge, which is turned upwards, is straight and posteriorly drawn out into a process; the upper lamellæ are seen between the upper, anteriorly pointing, margins of the lower, they leave an almost cylindrical opening between them. Penis is thick at the base and with some dilatations; it is strongly sinuous, there is especially a loop almost in the middle, but generally hidden between the lamellæ; it is curved upwards and forwards, the apex is not specially thin. The ventral lamella has some small spines at the apex. The genitalia are yellow, only the upper margin of the upper lamellæ is black; the margins and the posterior process have longish, reddish yellow hairs. Legs yellow or ferruginous, tibiæ slightly darkened towards the apex, tarsi black, paler towards the base; trochanters with the lower interior margin black. The legs have short, blackish or brownish hairs, slightly longer and very dense ventrally; some few small bristles are found on the dorsal side of the tibiæ and at the apex of the femora. Wings somewhat yellowish tinged; veins black or dark brown. Stigma very faint, yellowish, slightly observable. Squamulæ not haired at the margin. Halteres yellow.

Female. Quite agreeing with the male; the ovipositor black or

brownish black, the eighth ventral segment with a very small, styli-form process.

Length 6—8 mm.

E. bilineata is common in Denmark; Ordrup Mose, Birkerød, Hillerød, Tyvekrogen; on Langeland at Lohals and in Jutland at Ristrup near Aarhus. My dates are $^{12}/_5$ — $^{12}/_7$; it is thus chiefly a spring species. It occurs in fens and in the outskirts of woods, often on Umbelliferæ, and in early spring on the flowers of Salix, and it may be present in great numbers. I once put a specimen living in a bottle together with a *Rhingia campestris*, and a few moments after the *Empis* had killed the *Rhingia* by pushing its beak in to the body of the *Rhingia* between head and thorax. *Rhingia* seems for the rest to be an ordinary prey for this species; Müller observed (Kosmos, V, 1881, 416; Entom. Nachricht. VIII, 1882, 116 and Mik, Wien. ent. Zeitg. I, 1882, 203) six females (*E. punctata*), each taking a *Rhingia* as prey; the *Empis* first pierced the *Rhingia* in the pleura, probably paralysing it, then placing itself on the back of the prey it plunged the proboscis through the soft parts between head and thorax. Müller also observed females sucking the juices of flowers, like the males. The author suggests, that the females of this and other species may suck both blood and vegetable juices, which is certainly correct, but when he thinks they may have differently constructed mouth parts, this is certainly not so.

Geographical distribution:— Northern and middle Europe down into Austria; towards the north to southern Sweden.

Remarks: I have here kept the name *bilineata* Loew, used in the Kat. paläarkt. Dipt; according to Bezzi l. c. the species is identical with *digramma* Meig.; if this is beyond doubt the latter name has priority.

2. *E. punctata* Meig.

1804. Meig. Klass. eur. zweifl. Ins. I, 227, 22. — 1867. Loew, Berl. ent. Zeitschr. XI, 15 et 20, 6. — 1903. Kat. paläarkt. Dipt. II, 243. — *Empis ignota*: 1830. Meig. Syst. Beschr. VI, 338. — 1842. Zett. Dipt. Scand. I, 380, 13 et 1849, VIII, 3025, 13. — 1862. Schin. F. A. I, 104.

Male. Eyes broadly separated, frons grey with an impressed middle-line; epistoma greyish yellow, jowls yellowish. Occiput grey above, with longish, black bristles, yellow below. Labrum ferruginous; palpi yellow. Antennæ long, longer than the head, black, the two basal joints with short, black hairs, the third much elongated. Thorax dull grey, with three somewhat broad, dark brown stripes, the lateral abbreviated in front the middle behind. The dorsocentral bristles

short in front, longer behind, uniserial, black. Further a humeral bristle, a posthumeral, a notopleural and a postalar bristle, all somewhat long, black; in the præsutural depression there are some very small hairs. Scutellum grey, with two strong, black marginal bristles and sometimes with two weaker. Pleura yellow, sternopleura and hypopleura with a grey spot at their lower side; metapleura with black hairs. Prothoracic spiracles more or less brown. Abdomen yellow, somewhat shining, with a grey or blackish dorsal line, dilated at the incisures, and with a line on each side just at the venter; this latter yellow. Abdomen is haired with short, yellow hairs. The exterior genitalia are large, the lower lamellæ directed upwards and generally somewhat forwards; they are excised in the hinder (forwards turned) margin at the apex, and here densely beset with longish black hairs; the upper lamellæ protrude forwards between the lower, they have the hinder upper angle drawn out into a pointed lobe, this and the upper margin is blackish; a triangular process from the upper lamellæ is seen projecting in the middle between the lower (backwards turned) margins of the lower lamellæ. Penis is somewhat thick, thickest near the base, and curved upwards and forwards; the ventral lamella is large, arched, blackish at the upper margin. Legs yellow, tibiæ slightly darkened towards the apex, tarsi black or blackish, generally paler at the base, especially the hind tarsi; trochanters with a black point at the apex, femora blackish just at the very apex. The legs are short-haired, specially densely below; there are some few, small bristles on the dorsal side of the tibiæ and on the anterior and posterior side of the femora at the apex. The hairs are black or brownish. Wings slightly yellowish tinged; veins blackish or brown. Stigma yellowish but very faint. Squamulæ with long hairs at the margin. Halteres yellow.

Female. Agreeing with the male; the ovipositor blackish, the eighth ventral segment with a small, styliform process.

Length 5,5—7 mm.

E. punctata is not common in Denmark, and it has first in later time been known as belonging to our fauna; Tyvekrogen, Tisvilde, Nordskoven at Jægerspris; on Funen at Strib and in Jutland at Ringkjøbing, Silkeborg, Moesgaard and Sminge near Silkeborg and at Frederikshavn. My dates are $\frac{1}{6}$ — $\frac{13}{7}$, it is thus a somewhat early

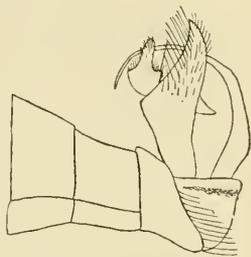


Fig. 26. *E. punctata*,
male genitalia.

species. It occurs on somewhat shaded places in woods, sitting on low plants e. g. often on *Urtica*.

Geographical distribution:— Northern and middle Europe down into France; towards the north to middle Sweden, and in Finland.

3. *E. univittata* Loew.

1867. Loew, Berl. ent. Zeitschr. XI, 12 et 20, 3. — 1903. Kat. paläarkt. Dipt. II, 246. — *Empis stercorea* var. b.: 1842. Zett. Dipt. Scand. I, 378.

Male. Eyes broadly separated, frons reddish yellow with an impressed middle line; epistoma and jowls reddish yellow. Occiput yellow, grey above and here with some long, black bristles. Labrum ferruginous, brownish towards the apex; palpi yellow, with some longish, dark hairs. Antennæ long, considerably longer than the head, black; the first joint elongated, somewhat greyish, this and the second with short, black hairs; the third joint much elongated, almost twice as long as the two first together. Thorax yellow, somewhat dull, with a broad, black or greyish black median stripe. The dorsocentral bristles short, long behind, uniserial, black. Further a humeral bristle, a posthumeral, a notopleural and a postalar bristle, all rather long, black; sometimes a second, weaker notopleural bristle is present. Scutellum grey with a broad yellow margin and four black marginal bristles, the outermost weak; postscutellum yellow, grey in the middle. Pleura yellow, metapleura with black hairs; the prothoracic spiracles yellow. Abdomen yellow, somewhat shining, with a greyish black median stripe, dilated at the incisures, and a similar stripe at each side, just at the yellow venter. Abdomen is somewhat sparingly

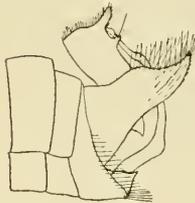


Fig. 27.
E. univittata,
male genitalia.

haired with short, yellow hairs. Exterior genitalia large, the lower lamellæ directed upwards, somewhat excised in the hinder, upwards turned, margin, so that the lower (hinder) angle is drawn out in a point; the upper lamellæ protrude forwards between the upper (forwards turned) margins of the lower, their hinder angle is drawn out into a process and below this there is a small tooth with a longer hair; sometimes a triangular process from the upper lamellæ is seen, protruding between the lower (more or less backwards turned) margins of the lower lamellæ. The upwards pointing edge of the upper lamellæ is black and black haired, and the same edge of the lower lamellæ has long, blackish hairs. Penis is somewhat thick, curved upwards and forwards, with angles at the base and near the tip; it has a small dilatation near the apex. The ventral lamella is large, but

may be more or less hidden. Legs yellow, tibiæ slightly blackish towards the apex, tarsi blackish; trochanters and apex of the femora with small, black points. Legs short-haired, almost without bristles, only the front tibiæ with a pair of small bristles on the dorsal side, somewhat behind the middle; middle and hind tibiæ with no or a single small bristle; femora with the ordinary small bristles at the apex. The hairs and bristles black or the former brownish. Wings slightly yellowish; veins blackish or brown. Stigma yellowish. Squamulæ with long hairs at the margin. Halteres yellow.

Female. Agreeing with the male; ovipositor blackish, the eighth ventral segment with a small style, often only seen with difficulty.

Length 5,5—7,5 mm., the latter size only reached by females with fully extended abdomen.

E. univittata is not common in Denmark and has first been taken here in recent time; Ørholm, Tisvilde, on Langeland at Lohals (the author), and on Bornholm at Hasle (H. J. Hansen). The first specimen was taken on Bornholm in 1883 by H. J. Hansen, and then I have taken it on the other localities in 1909 and 1910. My dates are $22/6$ — $13/17$, it seems thus not to occur specially early. It occurs on shaded places in woods on low plants e. g. not rarely on *Urtica*.

Geographical distribution:— Northern and middle Europe, down into Germany; towards the north to southern Sweden.

4. *E. stercorea* L.

1761. Linn. Fn. Suec. 1899. — 1805. Fabr. Syst. Antl. 141, 21. — 1822. Meig. Syst. Besch. III, 36, 38. — 1842. Zett. Dipt. Scand. I, 377, 10, p. p. — 1862. Schin. F. A. I, 107. — 1867. Loew, Berl. ent. Zeitschr. 12 et 19, 1. — 1903. Kat. paläarkt. Dipt. II, 244.

Male. Eyes broadly separated, frons reddish yellow, with an impressed median line; epistoma and jowls reddish yellow. Occiput

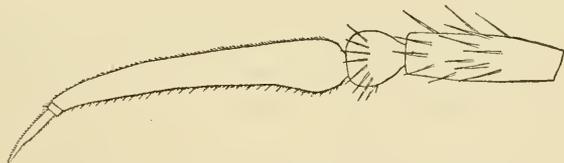


Fig. 28. Antenna of *E. stercorea*. $\times 55$.

of the same colour, with a greyish black spot behind the ocelli, and with black bristles. Labrum ferruginous; palpi yellow, with longish, blackish hairs at the apex. Antennæ longer than the head, black, the first joint elongated, this and the second with short hairs, the

third joint long, about one and a half times as long as the two first together; sometimes the first joint is somewhat brownish. Thorax yellow, somewhat shining, with a narrow, black median stripe. The dorsocentral bristles of moderate length, longer behind, uniserial, black. Further a humeral bristle, a posthumeral, a notopleural and a postalar bristle, all long, black; besides there are some small hairs on the humeri and some inconspicuous ones in the præsutural depression. Scutellum yellow with a blackish middle spot at the base, and with four black marginal bristles, the outermost weak; post-scutellum yellow with a black middle spot. Pleura yellow, metapleura with black hairs; the prothoracic spiracles black. Abdomen yellow, shining, with a blackish median dorsal stripe, dilated at the

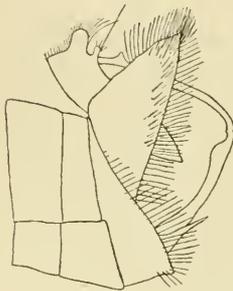


Fig. 29. *E. stercorea*,
male genitalia.

incisures, and with a similar stripe at each side, just at the yellow venter; it is clothed with short, yellow hairs, at the margin of the first segment there are longer hairs. Exterior genitalia large, the lower lamellæ directed upwards, the hinder (forwards pointing) margin obliquely cut and the lamellæ pointed; the upper lamellæ protruding forwards between the lower, the upper, hinder angle drawn out into a small process, this and the upper margin black; below the process there is a small tooth bearing a long hair; a small process from the upper lamellæ is generally seen between the lower (backwards pointing) edges of the lower lamellæ, it is black at the tip; all the margins of the lamellæ have more or less long, blackish hairs.¹ Penis is curved upwards and forwards; the basal half is thickened, the apex is not specially thin, and there is a small dilatation near it; the ventral lamella is narrowed towards the apex. The legs are yellow, tibiæ very slightly darkened towards the apex, tarsi black at the apex but generally paler in a large basal part; trochanters and apex of the femora with a black point. Legs short-haired, front tibiæ with a few dorsal bristles, posterior tibiæ with none or very small; the ordinary bristles at the femora present. The hairs black or dark brown. Wings somewhat yellowish tinged;

¹ Loew says l. c. under *univittata*, with regard to the upper lamellæ: „... sie hat auch jederseits einen kleinen schmalen, ebenso gefärbten und behaarten Anhang, von dem bei *Emp. stercorea* keine Spur vorhanden ist.“ As will be seen the upper lamellæ in the two species are chiefly of the same shape; I think Loew has had no specimen of *stercorea* with the genitalia in so favourable a position, that they showed the small processes of the upper lamellæ.

veins black or brown. Stigma slightly yellowish, more or less faint. Squamulæ with long hairs at the margin. Halteres yellow.

Female. Agreeing with the male; the ovipositor long, black; the eighth ventral segment with a long, thin style.

Length 6,5—8,5 mm.

The pupa is yellowish white, the length about 6 mm.; the upper of the tubercles on the front side of the head are very small, the lower large, knob-shaped but with a very distinct edge below.

This species is somewhat similar to *univittata* and also nearly related to that species, but it is distinguished at once by the shining thorax with the stripe much narrower and by the black prothoracic spiracles.

E. stercorea is a common species in Denmark; neighbourhood of Copenhagen, Lersøen, Dyrehaven, Bøllemosen, Ørholm, Geel Skov, Hillerød, Tyvekrogen, Tisvilde; on Funen at Strib; on Langeland at Lohals and in Jutland at Ristrup near Aarhus, at Sminge, Funder and Juul Sø near Silkeborg and at Frederikshavn, finally on Bornholm at Hasle. My dates are $\frac{1}{6}$ — $\frac{12}{7}$. It occurs on shaded places in woods and in fens and similar localities, often at the border of water, and it is found on low plants, often Umbelliferæ. I once took it with a small Tipulid as prey. The pupa was taken in Geel Skov in a decaying stub of a fir on $\frac{5}{5}$, it developed soon after.

Geographical distribution:— Northern and middle Europe down into France; towards the north to northern Scandinavia, and in Finland; it seems thus to go farther towards the north than *univittata*.

5. *E. trigramma* Meig.

1822. Meig. Syst. Besch. III, 38, 42. — 1842. Zett. Dipt. Scand. I, 379, 12 and 1849. VIII, 3025, 12 and 1855. XII, 4610, 12. — 1862. Schin. F. A. I, 108. — 1867. Loew, Berl. ent. Zeitschr. XI, 17 et 21, 8 — 1903. Kat. paläarkt. Dipt. II, 245.

Male. Eyes broadly separated, frons yellow, with a longitudinal, impressed middle point; epistoma and jowls yellow. Occiput yellow,



Fig. 30. Antenna of *E. trigramma*. $\times 55$.

but with a large, dark grey spot above which leaves only the posterior eye-margins yellow, and with some longish, black bristles. Labrum ferruginous; palpi yellow, with long, dark hairs at the apex. Antennæ

very long, much longer than the head, black; the first joint much elongated, this and the second joint slightly haired with short hairs; the third joint slightly longer than the two first together. Thorax yellow or reddish yellow, with three very broad, greyish black stripes, the two lateral somewhat abbreviated in front. The dorsocentral bristles somewhat short, a little longer behind, uniserial, black. Further a humeral bristle, a posthumeral, two notopleural, a supraalar and a postalar bristle, all black; of the notopleural bristles one is somewhat

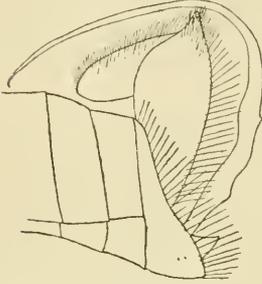


Fig. 31. *E. trigramma*, male genitalia.

weak, and a third, likewise weak, is sometimes present. Scutellum grey with four black marginal bristles, the outermost small. Pleura yellow, metapleura with black hairs; the prothoracic spiracles brown. Abdomen yellow, somewhat shining, with a black dorsal stripe, dilated at the incisures, and with a black stripe at each side, just at the yellow hairs. Abdomen is haired with short, yellow hairs. Exterior genitalia large, the lower lamellæ directed upwards, the upper, hinder angle drawn out into a small process which

is black; the upper lamellæ protrude forwards between the lower, they are somewhat large, about triangular; the lamellæ have short, blackish hairs at the upwards pointing margins, the lower lamellæ have longer, yellowish hairs at the lower (backwards pointing) margin. Penis is slightly thickened at the base, curved upwards and forwards, very long, and thin at the apex; the ventral lamella is more or less visible, the eighth segment with longish hairs at the margin. Legs yellow, tarsi blackish, paler at the base; trochanters and apex of femora with a black point. Legs short-haired, tibiæ with some few small bristles on the dorsal side, and femora with small bristles at the apex on the anterior and posterior side; the hairs blackish or for the most part brownish. Wings slightly yellowish tinged; veins blackish or brown. Stigma yellowish or slightly brownish. Squamulæ with long hairs at the margin. Halteres yellow.

Female. Agreeing with the male; the ovipositor long, black; the eighth ventral segment drawn out into a long, narrow process.

Length 4,8—5,8 mm.

The pupa is yellowish, of a length of 5,5 mm.; the two upper of the tubercles on the front side of the head are very small, the lower somewhat knob-shaped with an edge below.

This species resembles to some degree *punctata*, but it is easily known by the not grey but yellow ground colour of the thorax, the

quite yellow pleura, the long antennæ with much elongated first joint, the presence of a supraalar bristle and the shape of the male genitalia.

E. trigramma is common in Denmark; Frederiksberg Have, Amager, Utterslev Mose, Charlottenlund, Ermelund, Geel Skov, Tyvekrogen, Boserup near Roskilde; on Langeland at Lohals and in Jutland at Ringkjøbing and Silkeborg. It is a spring species; my dates are $12/5$ — $1/7$. It occurs in the outskirts of woods, in fens and also on fields and is found on bushes and low plants; sometimes it may occur in great numbers. I have taken it in copula on $26/6$. The pupa was found in the ground in Geel Skov on $29/4$, it developed on $9/5$.

Geographical distribution: — Northern and middle Europe down into Austria and Styria; towards the north to southern Sweden.

6. *E. lutea* Meig.

1804. Meig. Klass. eur. zweifl. Ins. I, 228, 24. — 1822. Meig. Syst. Beschr. III, 37, 40. — 1862. Schin. F. A. I, 107. — 1867. Loew, Berl. ent. Zeitschr. XI, 17 et 21, 9. — 1903. Kat. paläarkt. Dipt. II, 239.

Male. Eyes broadly separated, frons yellow; epistoma and jowls pale yellow. Vertex and occiput yellow, only the ocellar tubercle brown; occiput with a few black hairs. Labrum ferruginous; palpi pale yellow with fine hairs at the apex. Antennæ a little longer than the head, blackish or brownish; the first joint elongated, this and the second with short hairs; the third joint not quite twice as long as the two first together. Thorax yellow, slightly shining. The dorsocentral bristles somewhat short, not longer behind, irregularly uniserial or somewhat biserial, black. Further, a humeral bristle, a posthumeral, a notopleural, a supraalar and a postalar bristle, all black; besides there are some smaller but however conspicuous hairs both on the sides and in the præsutural depression. Scutellum yellow, with two black marginal bristles. Pleura yellow, metapleura with only two or three black bristles; the prothoracic spiracles yellow. Abdomen and venter yellow, somewhat shining, clothed with short, yellow hairs, at the hind margin of the three first segments longer and somewhat darker hairs. Exterior genitalia large, the lower lamellæ directed somewhat upwards or straightly outwards, their lower hinder angle drawn out into a long styliform process, beset with yellow hairs below, and with black hairs above; the upper lamellæ protruding between the upper margins of the lower, they have a black upper margin, densely beset with short, blackish hairs. Penis thick at the base,

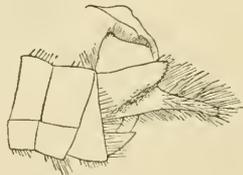


Fig. 32. *E. lutea*, male genitalia.

curved upwards and forwards, with a little dilatation at the apex; the ventral lamella triangular, more or less hidden. Legs yellow, tarsi brownish or blackish; trochanters and apex of femora with black points. The legs short-haired, tibiæ with some bristles on the dorsal side, femora with the ordinary bristles at the apex; the bristles black, the short hairs more or less pale brown. Wings a little yellowish tinged; veins brown or dark brown. Stigma slightly yellowish, very faint. Squamulæ with long hairs at the margin. Halteres yellow.

Female. I do not know the female but according to the descriptions it is similar to the male, but has some more bristles on the hinder part of the thoracic disc, thus differing herein from the other species.

Length 5—5,5 mm.

E. lutea is very rare in Denmark, only three specimens, all males, have been taken, at Horsens at the middle of July 1883 (H. I. Hansen).

Geographical distribution: — Europe down into Italy; it seems to have its northern limit in Denmark as the above given locality is the northernmost known; it occurs also in England.

II. Subg. *Anacrostichus* Bezzi.

Black, shining, or somewhat greyish pruinose species of medium size and slightly hairy. Eyes separated in both sexes, the frons sometimes narrower in the male than in the female; all facets small. Antennæ somewhat long, first joint longer than the second, the third elongated. Dorsocentral bristles uniserial (more or less irregularly), no acrostichal bristles. A humeral bristle, a posthumeral, a couple of notopleural, a supralaar and a postalar bristle present. There are somewhat long propleural and numerous metapleural bristles. Scutellum with four to six marginal bristles. Abdomen without bristles. The three last abdominal segments in the female suddenly narrowed,

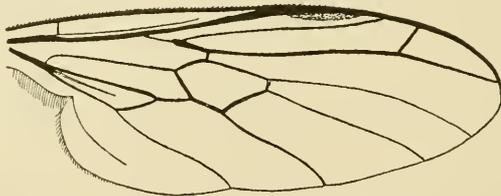


Fig. 33. Wing of *E. nitida*.

the styli of the ovipositor long. Legs somewhat robust, hind femora more or less thickened. Wings with the cubital vein curved slightly

downwards, terminating a little before the apex; discal cell somewhat pointed outwards; anal vein reaching the margin. Alula slightly developed; axillary lobe large, axillary angle acute or rectangular.

One Danish species..... 7. *nitida*.

7. *E. nitida* Meig.

1804. Meig. Klass. eur. zweifl. Ins. I, 223, 9. — 1822. Meig. Syst. Besch. III, 39, 43. — 1849. Zett. Dipt. Scand. VIII, 3027, 1. (*Pachymeria*). — 1868. Loew, Berl. ent. Zeitschr. XII, 232 et 240, 1. — 1903. Kat. paläarkt. Dipt. II, 241.

Male. Eyes separated, frons somewhat broad, blackish; epistoma of the same colour, shining just at the margin. Occiput dark grey with black hairs which are long at the upper margin and curved forwards. Labrum ferruginous, black at the base; palpi blackish with longish hairs. Antennæ longer than the head, first joint elongated, the two first joints with short hairs, the third long, with a very short style. Thorax grey or brownish grey with two brownish stripes. The dorsocentral bristles are longish, somewhat irregularly uniserial, black; they are longer behind; no acrostichal bristles. Further a humeral bristle, a posthumeral, about three notopleural, a supraalar and a postalar bristle, all black; besides there are somewhat long hairs on the humeri and in the præsutural depression. Scutellum with two black marginal bristles in the middle and two outer short and weak. Pleura grey, metapleura with long, black bristles, propleura with distinct, longish hairs. Abdomen black, shining, clothed with short, black hairs which are longer only at the sides in front; venter similarly coloured and haired. Exterior genitalia small and knob-like; the eighth ventral segment large and bending up on the sides, with long hairs at the hind margin; the lower lamellæ short, broad and somewhat triangular, curved towards each other at the apex; above, at the apex of the lower lamellæ there is a pair of somewhat hook-shaped, upwards directed, reddish lamellæ and in front of them a pair of short, styliform, haired processes (I think the former are the upper lamellæ, the latter belonging to the eighth dorsal segment). Penis is short, reddish, curved upwards between the lamellæ so that only the base is seen. Legs somewhat robust, hind femora thickened, hind tibiæ slightly curved and curiously dilated and bent at the base; coxæ greyish pruinose, femora black or brownish black, yellow at the apex, tibiæ and tarsi yellow, the latter brownish towards the apex. Front femora short-haired; middle femora with short hairs and longer bristles below; hind femora densely haired below with somewhat longish hairs; posterior tibiæ with a short,

dense ciliation below which is erect and vertical on the hind tibiæ, and these latter with longer, bristly hairs above on the apical half; tarsi densely haired below, and with small bristles at the apex of the joints. The legs have further ordinary clothing of shorter hairs. The hairs and bristles are black or brownish. Wings hyaline, very slightly yellowish tinged; veins brown, costa conspicuously ciliated. Stigma yellow. Halteres yellow.

Female. Frons not broader than in the male; the bristles on thorax shorter. The three last abdominal segments suddenly narrowed, the styles of the ovipositor somewhat long. Legs as in the male and haired in about the same way. Wings brownish tinged, especially on the basal half.

Length 5—6 mm.

E. nitida seems to be rather rare in Denmark, only five specimens, all females, have been caught, and all recently, in 1906, 1909 and 1910, the species not being known earlier as belonging to our fauna. Ermelund, Lyngby Mose (the author), Hillerød (Th. Mortensen) and in Jutland at Silkeborg (A. Petersen); the dates are ¹²/₅—³⁰/₅, the species is thus a spring species.

Geographical distribution: — Europe down into Italy; towards the north to middle Sweden, and in Finland. — Meigen notes that it occurs on *Taraxacum* (Löwenzahn). Loew says l. c., that it is not known from Sweden, I do not understand how he has come to this conclusion, as Zetterstedt in 1849 records it from Sweden and the determination is beyond doubt; besides I have seen a Swedish specimen.

III. Subg. *Pachymeria* Stephens.

Dark, sometimes a little lighter species of medium size. Eyes separated in both sexes, frons a little narrower in the male; all facets small. Antennæ somewhat short, first joint about as long as the second or a little longer. Palpi sometimes (in non-Danish species) elongated. Dorsocentral and acrostichal bristles biserial (in non-Danish species they may be pluriserial). There are many humeral bristles, some posthumeral, notopleural and supraalar and one postalar bristle. (Some of the bristles may be indistinct, and in non-Danish species the numbers may be different). Propleural hairs distinct, metapleural bristles numerous. Scutellum with four bristles (four to eight in non-Danish species). Abdomen without bristles. Male genitalia large. The three last abdominal segments in the female suddenly narrowed; the styli of the ovipositor not long. Hind femora more or less thickened, sometimes (in non-Danish species) distinctly pennate in the female.

(In the single Danish species they are slightly pennate). Wings with the discal cell pointed, the cubital vein terminating a little before the apex; anal vein reaching the margin. Alula small; axillary lobe large, the axillary angle acute.

One Danish species..... *S. grisea*.

S. E. grisea Fall.

1815. Fall. Dipt. Suec. Empid. 22, 12. — 1842. Zett. Dipt. Scand. I, 373, 6 et 1859. XIII, 5007, 6. — 1862. Schin. F. A. I, 108. — 1903. Kat. paläarkt. Dipt. II, 237.

Male. Eyes separated, frons grey, with an impressed middle line and some black hairs; epistoma grey below the antennæ, more downwards black, shining. Occiput grey, with dense and long, black hairs, below with brownish yellow hairs. Labrum ferruginous or brownish; palpi yellow. Antennæ somewhat short, black, the basal joints sometimes brownish or reddish, with short hairs; the third joint slightly excised below. Thorax grey, slightly shining, with three very faint, brownish stripes. The dorsocentral bristles short in front and here biserial, long and uniserial behind; acrostichal bristles short, biserial; all black. Further there are many humeral bristles, some posthumeral, notopleural and supraalar and one postalar bristle, all black; the bristles are somewhat indistinct between the other hairs present, thus the præsutural depression has many, rather strong hairs, but generally two strong bristles. Scutellum with four strong, black marginal bristles. Pleura grey, metapleura with black or somewhat brownish bristles; propleura with brownish or yellowish hairs; prothoracic spiracles yellow. Abdomen somewhat flat, a little varying in colour, greyish black or sometimes more brownish, shining; venter similarly coloured. Abdomen somewhat densely clothed with yellow hairs which are longest in front, and here there are some dark hairs intermingled at the sides. Exterior genitalia large and curious, blackish or lighter; the lower lamellæ narrow but long, densely haired with long, brownish hairs on the lower side; the upper lamellæ with two teeth on each side, a basal, somewhat styliform, backwards curved, and an apical, somewhat triangular; the lamellæ are hairy at the margin. The last ventral segment is arched, and from here the long, sinuous, yellow or brown penis issues; it is

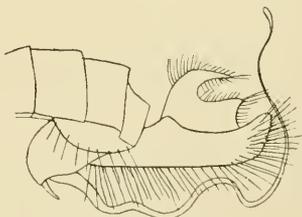


Fig. 34. *E. grisea*,
male genitalia.

thread-like and very thin towards the apex. The ventral lamella is small, triangular. Legs yellow, coxæ more or less brownish, especially towards the base, and here somewhat greyish pruinose, sometimes quite brown; tarsi darkened towards the apex; the legs may vary somewhat in colour, generally the hind femora are brown on the basal half, and often the middle femora are likewise brown on the dorsal and ventral side in the basal part, and also the front femora may here be a little darkened. The front femora have fine hairs below and long hairs on the posterior side; the posterior femora have dense, short hairs below, intermingled with longer bristles, which latter are specially strong on the hind femora and placed in two rows, further the posterior femora have also some bristles or bristly hairs on the antero-dorsal side; the tibiæ have a dense pubescence of short hairs ventrally, being longest on the posterior tibiæ; besides, the legs have the ordinary clothing of shorter or longer hairs. The hairs are mainly black, below the tibiæ pale brownish. Wings hyaline, slightly yellowish tinged. Veins dark brown, anal vein thin, reaching the margin but very weak a little before the apex; the apical part of the costal (mediastinal) cell more or less brownish. Stigma very small and narrow, whitish and scarcely observable. Halteres paler or darker yellow.

Female. Frons a little broader than in the male. The last three abdominal segments suddenly narrowed, brownish, forming a kind of ovipositor, terminating in two styliform lamellæ; the posterior femora have somewhat scaly hairs above and below; the hairs above are only very slightly broadened, those below in the apical half part distinctly scaly; the hind femora have rows of bristles below; the posterior tibiæ are densely haired below with somewhat strong hairs, and they have rows of bristles, especially on the dorsal side. The wing-stigma more obvious than in the male but however very faint.

Length 4—6 mm.

This species varies somewhat in colour, especially of the legs; I have only considered the varieties known from our country, and these have always a blackish, sometimes a little brownish abdomen. The varieties mentioned by Strobl (Mitth. Ver. Steierm. 1892, 85) with the abdomen quite brown, or brown with black bands at the base do not occur here.

E. grisea is somewhat common in Denmark; Ordrup Mose, Charlottenlund, Ørholm, at Skelskør; on Fænø and in Jutland in Vejle Nørreskov, at Horsens, Silkeborg, Laven near Silkeborg and at Frederikshavn; my dates are $^{16}/_6$ — $^{14}/_8$. It occurs in woods, fens and

similar localities and is often seen on flowers of Umbelliferæ, sometimes in rather great numbers.

Geographical distribution: — Europe down into Italy; towards the north to southern Sweden.

Remarks: *E. maculipes* Zett. is a nearly related species, but certainly distinct; I have seen the female of the type, and it differs, as mentioned by Zetterstedt, by having no scaly hairs on the femora, and also in that the last abdominal segments are less, or almost not at all narrowed.

IV. Subg. *Lissempis* Bezzi.

Somewhat small, black, shining species, which are slightly haired. Eyes contiguous (only apparently) in the male, narrowly separated in the female or (*cuneipennis* Bezzi, non-Danish) narrowly separated in both sexes; all facets small. Antennæ somewhat long, first joint a little longer than second, the third joint elongated. Dorsocentral and acrostichal bristles biserial; only a notopleural and a postalar bristle present. Metapleura with numerous long hairs. Scutellum with two

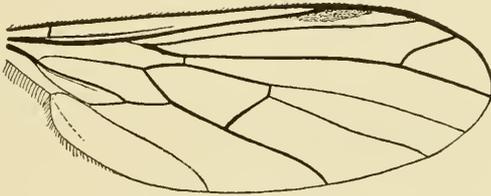


Fig. 35. Wing of *E. nigritarsis*.

marginal bristles. Abdomen without bristles. Male genitalia small; ovipositor with long styles. Hind legs elongated with thickened metatarsi. Wings somewhat or (*cuneipennis*, non-Danish) very narrow; axillary lobe somewhat small or (*cuneipennis*) wanting, and axillary angle obtuse. Alula not developed. Discal cell somewhat truncate; cubital vein terminating at the apex; anal vein reaching the margin.

One Danish species 9. *nigritarsis*.

9. *E. nigritarsis* Meig.

1804. Meig. Klass. eur. zweifl. Ins. I, 221, 5. — 1867. Loew, Berl. ent. Zeitschr. XI, 59. — 1903. Kat. paläarkt. Dipt. II, 240.

Male. Eyes contiguous; epistoma very narrow, black, shining. Occiput black, somewhat shining, with blackish hairs. Labrum brownish; palpi brown. Antennæ somewhat long, black; the basal joints with a few, short hairs. Thorax black, shining. Dorsocentral and acrostichal

bristles short and thin, biserial, whitish; the hinder dorsocentral bristles longer and uniserial. Further a notopleural and a postalar bristle, but the former is only slightly pronounced between the hairs which clothe the sides of thorax. Scutellum has two yellow marginal bristles. Pleura greyish pruinose, metapleura with long, bristly, whitish hairs; propleura with some inconspicuous hairs. Abdomen black, shining, somewhat densely clothed with yellow hairs, which are long and erect at the base, short towards the apex. Venter similarly coloured and sparingly haired. Exterior genitalia small, the lower lamellæ broad, somewhat shovel-like, with longish hairs at the hind margin; the upper lamellæ are almost quite hidden. Penis is somewhat thick, ferruginous, curved upwards between the lamellæ and thin at the apex. Legs slender, the hind legs elongated, the tibiæ thickened at the apex, club-shaped, hind metatarsi thickened. The legs are yellow, coxæ greyish pruinose, the anterior tibiæ brown towards the apex and the tarsi brown, the apex of the hind tibiæ and the tarsi black or blackish brown; also the apex of the hind femora narrowly brown. The front tibiæ and tarsi with longish hairs on the dorsal side; the middle femora with long hairs on the dorsal and ventral side at the base, the hairs being short towards the apex, the tibiæ with very long, fan-like, erect and bristly hairs on the dorsal and ventral side, and similar hairs on the first tarsal joints; hind femora with long hairs below and some bristles on the antero-dorsal side, tibiæ with some bristly hairs, especially on the dorsal and ventral side. All hairs are whitish or yellowish white. Besides, there is the ordinary clothing of short hairs. Wings somewhat yellowish tinged; veins brown, anal vein reaching the margin but very thin towards the apex. Stigma brownish. Halteres pale yellow.

Female. Similar to the male, but the eyes narrowly separated, the frons black, shining. Abdomen shorter haired. The hind legs a little less thickened and all the legs simply haired, the hind tibiæ with short bristles dorsally.

Length 4—5 mm.

E. nigratarsis seems to be very rare in Denmark, and it has first been detected in 1909 when two specimens, both females, were taken on the little island Egholm at Skelskør on 13/6 (Th. Mortensen).

Geographical distribution:— Middle Europe down into Italy; it has its northern limit in Denmark; it also occurs in England.

V. Subg. *Coptophlebia* Bezzi.

Small, black or greyish species. Eyes contiguous in the male, with the upper facets larger than the lower, separated in the female. Antennæ

somewhat short, the basal joints short, of about equal length, the third joint not long. Dorsocentral and acrostichal bristles biserial, the latter

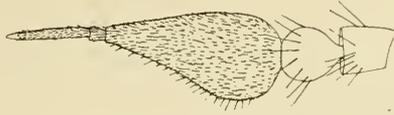


Fig. 36. Antenna of *E. vitripennis*. $\times 100$.

sometimes absent (e. g. *hyalipennis*). One stronger and some weaker humeral bristles, a posthumeral, one to some notopleural, a supraalar and a postalar bristle. Metapleural bristles numerous. Scutellum with two to four bristles. Abdomen without bristles. Male genitalia small or larger. Legs with bristles; hind legs somewhat elongated; front and hind metatarsi in the male more or less thickened. Posterior, or only hind legs in the female compressed and pennate. Wings with the axillary lobe well developed and the axillary angle acute; the upper branch of the discal vein abbreviated, and generally also the anal vein; discal cell not pointed; cubital vein terminating at the apex.

Table of Species.

- | | |
|---|--------------------------|
| 1. No acrostichal bristles; thoracic and scutellar bristles yellow, the latter four in number; anal vein reaching the margin..... | 10. <i>hyalipennis</i> . |
| — Acrostichal bristles present; thoracic and scutellar bristles black; the latter two in number; anal vein abbreviated.... | 2. |
| 2. Halteres and metapleural bristles pale yellow..... | 11. <i>albinervis</i> . |
| — Halteres and metapleural bristles black..... | 12. <i>vitripennis</i> . |

10. *E. hyalipennis* Fall.

1815. Fall. Dipt. Suec. Empid. 21, 10. — 1822. Meig. Syst. Besch. III, 24, 14. — 1842. Zett. Dipt. Scand. I, 385, 19. — 1862. Schin. F. A. I, 106. p. p. — 1893. Strobl. Mitth. Ver. Steierm. 1892. 73. — 1903. Kat. paläarkt. Dipt. II, 238.

Male. Eyes contiguous; epistoma dark grey. Occiput grey, with more or less pale hairs. Labrum ferruginous or brown, very long and thin, more than twice as long as the head is high. Antennæ relatively long, about of the length of the head, black, the third joint elongated; the style somewhat long. Thorax grey, unstriped, viewed from in front more blackish and shining; the humeral point brown or reddish. The dorsocentral bristles somewhat long, biserial, longer and uniserial behind, yellow; no acrostichal bristles. Further one stronger and some a little weaker humeral bristles, a posthumeral, about three notopleural, a supraalar and a postalar bristle, all yellow,

but there are also some other hairs at the sides. Scutellum with four yellow marginal bristles, the outer weak. Pleura grey, metapleura with long, yellow, bristly hairs; propleura with some inconspicuous hairs. Abdomen and venter grey, clothed with longish, erect, whitish or pale yellowish hairs which are longest in front. Exterior genitalia somewhat large; the eighth ventral segment large, arched, the eighth dorsal segment likewise large, and, as it seems, somewhat unsymmetrical; the lamellæ of complicated shape, a pair of styliform and a pair of broader, hairy processes are seen, but otherwise the structure is not to be observed without dissection. The penis is seen below as a thin thread, issuing from the arched ventral plate; this latter has long hairs at the margin. Legs black or brownish, coxæ greyish pruinose; hind legs elongated; front metatarsi slightly thickened, hind metatarsi likewise but to a still slighter degree; hind tibiæ somewhat thickened towards the apex. Front femora with longish hairs above towards the apex, posterior femora with long, bristly hairs below, they are dispersed and between them are shorter hairs; the hind femora have also long hairs on the anterior and posterior side; the front tibiæ have long hairs on the dorsal side, a short, dense pubescence below and somewhat longer pubescence on the posterior side; middle tibiæ have shorter hairs and long bristles on various sides, hind tibiæ likewise and especially long bristles dorsally; the tarsi are slightly spinulous beneath; the hind metatarsi have some bristles on the dorsal side, the middle metatarsi have a long bristle near the base and a similar at the apex. The hairs and bristles are more or less dark brown, those below the femora whitish. The ordinary short pubescence of the legs inconspicuous. Wings hyaline; costa and anterior veins brown, the other veins more or less pale yellow; the upper branch of the discal vein abbreviated, the anal vein reaching the margin; the upper branch of the cubital vein about rectangular to the lower. Stigma yellowish. Halteres yellow.

Female. Frons broad, grey. Abdomen short-haired. Hind legs compressed, hind femora pennate with somewhat short, scaly hairs above in the whole length, and below in the apical half; otherwise the legs short-haired.

Length 3,5—3,8 mm.

E. hyalipennis is but little known as Danish, it has only been taken in Ordrup Mose on the flowers of *Carduus* on two occasions, on ⁸/_s 1841 and ¹⁰/_s 1845 (Stæger), but it was present in somewhat great numbers; no doubt it will be found again.

Geographical distribution:— Europe down into Italy; towards the north to middle Sweden.

11. *E. albinervis* Meig.

1822. Meig. Syst. Besch. II, 26, 16. — 1862. Schin. F. A. I, 106. — 1893. Strobl, Mitth. Ver. Steierm. 1892, 74. — 1903. Kat. paläarkt. Dipt. II, 233. — *Empis albipennis*: 1842. Zett. Dipt. Scand. I, 386, 20. — *Empis hyalipennis* p. p.: 1862. Schin. F. A. I, 106.

Male. Eyes contiguous; epistoma greyish black. Occiput grey with whitish hairs. Labrum dark brown, long and thin, but not twice as long as the head is high. Antennæ black, third joint short, the style somewhat long. Thorax grey with a slightly darker median stripe and traces of a pair of lateral stripes. The dorsocentral and acrostichal bristles short, biserial, black; the former longer and uniserial behind. Further a humeral bristle, a posthumeral, a couple of notopleural, a supraalar and a postalar bristle, all black; besides there are some smaller hairs on the sides. Scutellum with two black marginal bristles. Pleura grey, metapleura with long, pale yellow, bristly hairs; propleura with white hairs. Abdomen and venter grey, clothed with longish, erect, yellowish hairs. Exterior genitalia rather small, the lower lamellæ somewhat broad, with some long hairs at the lower posterior angle; the upper lamellæ just seen at the apex above the lower, but for the rest hidden. Penis thick at the base, curved upwards between the lamellæ. The seventh dorsal segment with a little tubercle in the median line. Legs black or blackish brown; coxæ greyish pruinose; hind legs elongated, front and hind metatarsi slightly thickened, and also the following two joints a little thicker than those on the middle tarsi. Middle femora with rows of long, bristly hairs on the ventral and postero-ventral side; hind femora with short hairs and some thin bristles above, and a few bristles ventrally; front tibiæ short-haired on the dorsal side and with a short, but comparatively strong pubescence below and on the posterior side; middle tibiæ with bristles and bristly hairs on various sides, especially some (about four) long bristles on the dorsal side; hind tibiæ with short, somewhat dense hairs ventrally and some bristles dorsally; tarsi somewhat spinulous beneath, and with bristles at the apex of the joints; front and hind metatarsi with somewhat long hairs dorsally. The hairs and bristles are blackish or brownish. Wings hyaline; veins white, also the costa or this slightly yellowish towards the apex; the upper branch of the discal vein and the anal vein abbreviated. Stigma almost not observable. Halteres pale yellow.

Female. Frons medium-broad, grey. Abdomen short-haired. Posterior legs compressed, middle femora slightly, hind femora distinctly pennate above and below; likewise the middle tibiæ slightly, the hind tibiæ distinctly pennate dorsally, the latter also with some scaly hairs

ventrally at the base. Anterior margin of the wing and the stigma a little more yellowish than in the male.

Length about 3 mm.

This species is easily known from *hyalipennis* by the abbreviated anal vein and the bristles on thorax being black; also the male genitalia are of quite a different shape, and the legs in the female pennate in another way and for the rest there are several other characters.

E. albinervis is very rare in Denmark, only one specimen, a male, has been taken, on Funen at Middelfart on ¹⁸/₇ 1907 (the author).

Geographical distribution:— Northern and middle Europe down into Styria; towards the north to middle Sweden.

12. *E. vitripennis* Meig.

1822. Meig. Syst. Besch. III, 25, 15. — 1862. Schin. F. A. I, 106. — 1867. Loew, Berl. ent. Zeitschr. XI, 57, 3 et 163, et 1869. XIII, 88. — 1903. Kat. paläarkt. Dipt. II, 246.

Male. Eyes contiguous; epistoma greyish black. Occiput dark grey with black hairs. Labrum long and thin, twice as long as the head is high, blackish, brown at the apex; palpi black. Antennæ black, third joint somewhat short, the style elongated. Thorax black, slightly greyish, somewhat shining. The dorsocentral and acrostichal bristles of moderate length, black, biserial, the former longer and uniserial behind. Further a humeral bristle, a posthumeral, about two notopleural, a supraalar and a postalar bristle, all black; the notopleural bristles rather distinct, the others not very conspicuous among the hairs on the sides of thorax, as the humeri and the præ-sutural depression are somewhat densely clothed with rather long hairs. Scutellum with two black marginal bristles. Pleura grey, metapleura with black bristles; propleura with short hairs. Abdomen black, shining, slightly greyish, clothed with somewhat short, erect, yellowish hairs which are longest at the sides. Venter similarly coloured and sparingly haired. Exterior genitalia not large, the lower lamellæ directed straightly backwards or more or less upwards, somewhat blade-shaped, each with two small, styliform processes at the apex (the inner perhaps belonging to the otherwise hidden upper lamellæ); the eighth ventral segment somewhat arched. Penis thickened at the base, curved upwards between the lamellæ. Legs black or dark brownish; coxæ greyish pruinose; hind legs elongated; front metatarsi exceedingly slightly thickened, hind metatarsi distinctly and the apex of the hind tibiæ somewhat thickened. Front femora with a row of fine hairs below; middle femora with an antero- and postero-ventral

row of stronger hairs, those in the postero-ventral row long towards the base, besides there are shorter hairs on the anterior side; hind femora with long, fine hairs on the ventral and anterior side and with short hairs above; front tibiæ with fine hairs and some bristles dorsally, a dense, short pubescence ventrally, and a little longer pubescence on the posterior side; middle tibiæ with three long bristles dorsally, and dense, somewhat strong hairs ventrally; hind tibiæ with similar hairs ventrally and some long bristles dorsally and here also with shorter hairs; tarsi slightly spinulose beneath, especially the hind tarsi, and with bristles at the apex of the joints, one at the apex of the middle metatarsi especially long; hind metatarsi with longish hairs

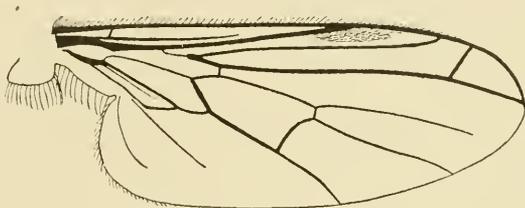


Fig. 37. Wing of *E. vitripennis*.

and some bristles above. The hairs and bristles are black or dark brownish. Wings hyaline; veins blackish to brown; the upper branch of the discal vein abbreviated, the anal vein very faint, abbreviated. Stigma distinct, brownish. Halteres blackish.

Female. Eyes separated, frons grey. The bristles on thorax short; abdomen quite short-haired. The posterior legs compressed, strongly pennate on both sides, the scaly hairs longest on the hind legs; on the ventral side of the middle tibiæ there are scaly hairs only at the base and on the hind tibiæ on the basal half part. The wings tinged with brown, most strongly towards the base.

Length 2,8 to about 3,5 mm.

Remarks: Loew says, that the front metatarsi are quite simple, and they may also be termed so, but in comparison with the middle metatarsi they are quite slightly thickened.

E. vitripennis seems not to be rare in Denmark, but it has not been taken many times and only on few localities; Ruderhegn, Geel Skov (the author); in Jutland in Greisdalen at Vejle (the author), at Rye near Silkeborg, Frijsenborg near Aarhus and Hald near Viborg (H. J. Hansen). My dates are $2/8-15/9$. In 1907 and 1909 I took it in great numbers in Geel Skov on $8/9-15/9$; they were flying quite low on places with *Calluna* between spruce firs. According to the dates the species is an autumn species.

Geographical distribution:— Northern and middle Europe down into France, and in England; it seems to have its northern limit in Denmark.

VI. Subg. *Pterempis* Bezzi.

Small or medium sized, dark or greyish species. Eyes contiguous in the male, with the upper facets larger than the lower; in the female separated. Antennæ short, the two basal joints about of equal length, the third not long. Dorsocentral and acrostichal bristles biserial, the former rarely pluriserial. A humeral bristle, a posthumeral, two to four notopleural, one, rarely several supraalar and one postalar bristle. Generally some hairs on the sides of the disc. Metapleural hairs numerous. Scutellum with two to four marginal bristles. Abdomen without bristles. Male genitalia small or of medium size, sometimes somewhat larger. Legs with bristles; front or hind metatarsi or both pairs in the male more or less thickened; middle tibiæ with a short, fine, erect pubescence on the anterior side. In the female the legs nearly always more or less compressed and pennate. Wings with the axillary lobe well developed, axillary angle acute or rectangular; the discal cell more or less truncate outwards. Veins complete, rarely the anal vein abbreviated.

* This subgenus, in which the females nearly always have pennate legs, includes the hovering species.

Table of Species.

1. Halteres whitish or yellow	2.
— Halteres black	7.
2. Abdomen clothed with blackish or brownish hairs	3.
— Abdomen clothed with whitish or yellowish hairs	5.
3. Abdomen black, or more or less testaceous at the base; legs in the female pennate; size 4,2—5,6 mm.	5.
— Abdomen grey; legs in the female not pennate; size 3,5 mm.	23. <i>cinerea</i> .
4. Abdomen black; præsutural depression somewhat haired; wings blackish; female with the anterior metatarsi pennate above, and the hind tibiæ pennate below in the whole length	13. <i>pennipes</i> .
— Abdomen more or less testaceous at the base; præsutural depression bare; wings not blackish, at most slightly brownish; female with the anterior metatarsi not pennate, hind tibiæ pennate below only in the basal half	14. <i>rufiventris</i> .
5. Scutellum with four marginal bristles	6.
— Scutellum with two marginal bristles	17. <i>lamellicornis</i> .
6. Wings in the male somewhat tinged; middle femora with the bristles below not tuft-like at the base; front metatarsi in the female pennate above	15. <i>decora</i> .

- Wings in the male hyaline, slightly milky; middle femora with the bristles below tuft-like crowded at the base; front metatarsi in the female not pennate. 16. *vernalis*.
- 7. Abdomen clothed with whitish or yellowish hairs 8.
- Abdomen clothed with more or less blackish hairs 10.
- 8. Metapleural bristles whitish or yellow 9.
- Metapleural bristles black 19. *prodromus*.
- 9. Abdomen white-haired; metapleural bristles whitish; size 3,2—3,8 mm 18. *chioptera*.
- Abdomen yellow-haired; metapleural bristles yellow; size 5—5,7 mm 20. *serotina*.
- 10. Anal vein reaching the margin 21. *caudatula*.
- Anal vein abbreviated, not reaching the margin. 22. *aestiva*.

13. *E. pennipes* L.

1761. Linn. Fn. Succ. 1896. — 1805. Fabr. Syst. Antl. 138, 6. — 1822. Meig. Syst. Besch. III, 21, 8. — 1842. Zett. Dipt. Scand. I, 380, 14 et 1859. XIII, 5008, 14. — 1862. Schin. F. A. I, 107. — 1903. Kat. paläarkt. Dipt. II, 242. — *Empis ciliata* (non Fabr.): 1804. Meig. Klass. eur. zweifl. Ins. I, 220, 3. — 1815. Fall. Dipt. Succ. Empid. 20, 8.

Male. Eyes contiguous; epistoma blackish. Occiput greyish black, with black, below more brownish hairs. Labrum very long, only somewhat shorter than the whole body, black; palpi black or brownish. Antennæ black, about as long as the head, the two basal joints with a few short hairs. Thorax black, shining, somewhat greyish brown pruinose, especially when seen from in front. The dorsocentral bristles somewhat long, biserial, the hinder of them longer, strong and uniserial, acrostichal bristles a little shorter, biserial; all black. Further a humeral bristle, a posthumeral, about two notopleural, a supraalar and a postalar bristle, all black, but they are not very conspicuous among the other hairs present at the sides of the thoracic disc. Scutellum with two strong, black marginal bristles, and at each side a small one. Pleura dark greyish pruinose, metapleura with black bristles. Abdomen black, somewhat shining, venter sometimes a little paler, and dull greyish. Abdomen is clothed with erect, blackish or brown hairs which are longest at the sides and especially in front; venter with shorter hairs. Exterior genitalia somewhat large, the lower lamellæ are directed more or less straightly backwards, they are rather long and somewhat triangular with a shallow excision in the upper margin, and they are therefore pointed; the upper lamellæ

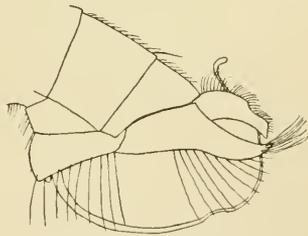


Fig. 38. *E. pennipes*, male genitalia.

protrude at the base of the lower, they are hook-shaped, curved slightly downwards and about as long as the lower; the eighth ventral segment is arched and drawn forwards (anus hians) and from here the long, thread-like penis issues, it is curved forwards and slightly sinuous; the hinder margin of the eighth ventral segment and the lower margin of the lower lamellæ have long hairs, and the lamellæ have a fan-like tuft of hairs at the apex; the upper lamellæ are short-haired above; all the hairs are black. Legs black or brownish; coxæ greyish pruinose; hind metatarsi slightly thickened. Front femora short-haired; middle femora with an antero- and postero-ventral row of bristly hairs which are long in the basal half, but suddenly become short in the apical half, further there is a row of hairs above on the anterior side, also becoming short towards the apex; hind femora with shortish, fine hairs below, stronger and dense hairs above; front tibiæ with a fine, dense pubescence below and a row of bristly hairs above; middle tibiæ with bristles and short hairs below, and with a short, dense pubescence on the anterior side, above with three to four somewhat strong bristles in the basal half and one at the apex; hind tibiæ with shortish hairs below and long, bristly hairs above; posterior tarsi somewhat spinulous beneath, especially the hind pair; the dense pubescence on the front and middle tibiæ is continued out on the tarsi on the ventral and anterior side respectively; the hind metatarsi have long hairs above. The hairs and bristles are black or brownish, the dense pubescence on the anterior legs more or less pale. Wings blackish tinged; veins black or dark brown. Stigma blackish or brownish. Halteres dark yellow, not rarely darker and brownish.

Female. Frons somewhat broad, dark grey; thorax more grey than in the male and with three scarcely observable black stripes; the thoracic bristles shorter, and abdomen short-haired. Legs compressed, posterior femora pennate on both sides, the scaly hairs rather long, especially on the hind femora; front tibiæ and metatarsi pennate on the dorsal side, middle tibiæ and metatarsi likewise pennate above, but ciliated below, only at the base the hairs are scaly; hind tibiæ pennate on both sides with long, scaly hairs, those on the ventral side being short towards base and apex. Wings a little more tinged than in the male. Halteres paler, generally yellow.

Length 4,2—5 mm.

E. pennipes is not rare in Denmark; Ermelund, Boserup, Vemme-tofte, at Nyraad near Vordingborg; on Falster; on Langeland at Lohals and in Jutland at Silkeborg. My dates are $\frac{3}{6}$ — $\frac{1}{7}$. It occurs in woods on somewhat shaded places, and is often seen on Geranium

Robertianum, as already mentioned by Meigen; Zetterstedt records it from *Geranium sylvaticum*.

Geographical distribution: — Europe down into Italy; towards the north to middle Sweden, and in Finland.

14. *E. rufiventris* Meig.

1838. Meig. Syst. Besch. VII, 86, 65. — 1862. Schin. F. A. I, 108. — 1903. Kat. paläarkt. Dipt. II, 243. — *Empis ventralis*: 1842. Zett. Dipt. Scand. I, 381, 15.

Male. Eyes contiguous; epistoma brownish black. Occiput grey, with black or brownish hairs. Labrum long and thin, more than twice as long as the head is high, blackish brown; palpi black, with some hairs at the apex. Antennæ as long as the head, black, the two first joints with short hairs. Thorax grey, slightly shining, with faint traces of three darker stripes. The dorsocentral bristles somewhat long, biserial, longer and uniserial behind; acrostichal bristles shorter, biserial; all black. Further a humeral bristle, a posthumeral, three notopleural, a supraalar and a postalar bristle, all black; besides there are some few other hairs. Scutellum with four black marginal bristles, the middle ones strong. Pleura grey, metapleura with long, black bristles. Abdomen black or greyish black, somewhat shining, more or less testaceous at the base and on the sides, here often almost in the whole length; venter generally quite testaceous. Abdomen is clothed with short, brownish hairs which are longer at the sides in front; the hairs at the hind margin of the first, short segment are blackish; venter sparingly haired with some few long hairs at the hind margins of the segments. Exterior genitalia of medium size, somewhat resembling those in *pennipes*; the lower lamellæ directed more or less upwards, somewhat broad, obliquely cut at the end and therefore somewhat pointed; the upper lamellæ hook-shaped and curved somewhat downwards. Penis thread-like, curved simply upwards, with a somewhat large ventral lamella at the base. The eighth ventral segment arched, with long, blackish brown hairs at the hind margin, and similar hairs at the lower margin of the lower lamellæ, the upper lamellæ short-haired. Legs brownish black or brown; coxæ greyish pruinose; hind metatarsi slightly thickened. Middle femora with short hairs above, long, bristly hairs below in the basal half; hind femora with long, but somewhat fine hairs below and with some bristly hairs on the anterior and posterior side in the basal half; besides there is a very dense and short pubescence on the ventral side of the posterior femora; front tibiæ with somewhat short hairs above and a dense, erect pubescence below;

middle tibiæ with two rows of bristles below and a row of about four long bristles above, besides with a short, dense pubescence on the anterior side; hind tibiæ with dense, somewhat longish hairs below and two rows of shorter and longer bristles above; tarsi somewhat spinulous beneath; the dense pubescence on the ventral side of the front tibiæ and on the anterior side of the middle tibiæ is continued out on the tarsi; hind metatarsi with long hairs above. The hairs and bristles are black or brownish, the short, dense pubescence pale. Wings somewhat brownish or yellowish tinged; veins darker or lighter brown. Stigma brown. Halteres yellow.

Female. Frons broad, blackish grey. Abdomen shorter haired than in the male and generally of darker colour, only pale on the venter towards the base. Legs compressed, posterior femora pennate on both sides, anterior tibiæ pennate above, hind tibiæ likewise and also below in about the basal half; the scaly hairs on the ventral side of the femora are short at the base but increase in length towards the apex, on the dorsal side of the middle femora they are on the contrary long at the base but decrease in length outwards. Wings more strongly brownish than in the male.

Length 5—5,6 mm.

This species shows some resemblance to *pennipes*, but besides by the colour it may in the male be distinguished by a difference in the genitalia and the way in which the legs are haired; also the præsutural depression is bare in *rufiventris* but hairy in *pennipes*; in the female the species is distinguished by the anterior metatarsi not being pennate above, and the hind tibiæ only pennate in the basal half below; finally the present species is larger than *pennipes*.

E. rufiventris is not rare in Denmark, but may on the other hand scarcely be termed common; Ordrup Mose, Ermelund, Dyrehaven, Boserup near Roskilde; on Falster at Resle and on Langeland at Lohals. It occurs in somewhat open places in woods in low herbage and on bushes; like the preceding species it occurs on the flowers of *Geranium Robertianum*; I once took it in some number in Ermelund on $\frac{30}{6}$ and exclusively on the flowers of the *Geranium* while not one was seen on other plants. My dates are $\frac{18}{5}$ — $\frac{3}{7}$, it is thus a somewhat early species.

Geographical distribution: — Northern and middle Europe down into Styria; its northern limit lies in the southern Sweden.

15. *E. decora* Meig.

1822. Meig. Syst. Besch. III, 22, 9, Tab. XXII, Fig. 18. — 1862. Schin. F. A. I, 107. — 1903. Kat. paläarkt. Dipt. II, 236.

Male. Eyes contiguous; epistoma greyish black. Occiput grey, with black hairs above, yellowish below. Labrum not twice as long as the head is high, dark brown; palpi black with some blackish hairs. Antennæ black, a little shorter than the head, the two basal joints somewhat greyish, with short hairs. Thorax grey, with three slightly conspicuous, darker and shining stripes. The dorsocentral bristles somewhat long, pluriserial in front, uniserial and longer behind, acrostichal bristles biserial; all brownish, the stronger ones behind more blackish. Further a humeral bristle, a posthumeral, three notopleural, a supraalar and a postalar bristle, all black, but besides the humeri and the sides of the disc are clothed with somewhat long hairs which are almost fused with the dorsocentral bristles. Scutellum with four black marginal bristles, the middle ones strong. Pleura grey, metapleura with long, yellowish or whitish, bristly hairs. Abdomen black, shining, clothed with somewhat longish, yellowish hairs which are longest at the sides in front; venter similarly coloured, more sparingly haired. Exterior genitalia not large, the lower lamellæ directed upwards, somewhat triangular, haired at the margin especially at the apex; I could not see the upper lamellæ, they seem to be small. Penis is reddish, thick and short, bent upwards but slightly curved. Legs blackish brown, coxæ greyish pruinose; hind metatarsi very slightly thickened. Front femora short-haired; middle femora with two rows of long, bristly hairs below on about the apical half, and with shorter hairs on the anterior side; hind femora with somewhat short hairs below and long bristles on the anterior side; front tibiæ with not long hairs on the dorsal side; middle tibiæ with bristles on the dorsal and ventral side; hind tibiæ with short hairs below and two rows of bristles on the dorsal side; there is a pubescence below the front tibiæ and on the anterior side of the middle tibiæ, but it is very inconspicuous; tarsi somewhat spinulose beneath, and with short bristles at the apex of the joints; the middle metatarsi with a long bristle at the apex, the hind metatarsi with some bristles. The hairs and bristles are black or brown, the bristles generally darkest. Wings somewhat slightly brownish tinged; veins brown. Stigma slightly brownish. Halteres yellow.

Female. Eyes separated, frons grey. Thorax with the bristles somewhat shorter than in the male. Front tibiæ pennate above in the apical half or two thirds, and the front metatarsi likewise pennate above; the front femora not pennate above but only ciliated; posterior legs compressed, the femora pennate on both sides, the tibiæ pennate above in the whole length, below in about the basal half part; middle tibiæ with short hairs and bristles below on the not pennate part,

hind tibiæ and metatarsi with long bristles on the dorsal side posteriorly to the row of scaly hairs. Wings a little more tinged than in the male.

Length 3,7—4,7 mm.

E. decora is very rare in Denmark, only three specimens have been caught; on Funen at Odense and in Jutland at Frijsenborg and Sæby (H. I. Hansen); the dates are in July.

Geographical distribution:— Europe down into Spain and Italy; its northern limit lies in Denmark, as it is not known from Scandinavia; it also occurs in Britain.

Remarks: This species seems to vary somewhat with regard to the pennation of the legs in the female; the above description is made from the three Danish specimens, of which two are females; these have no scaly hairs on the coxæ, the front coxæ have fine, pale hairs, the posterior coxæ have a somewhat dense row of somewhat stronger, bristly and black hairs, at most some of the hairs on the middle coxæ are slightly broadened. Strobl says (Mitth. Ver. Steierm. 1892, 76) that the anterior coxæ are pennate; in Wien. Ent. Zeit. XVIII, 1899, 19 he says (about the var. *genualis*) that all coxæ are pennate, but that in some specimens the front coxæ may be bare, and in one specimen the scales were narrow and on the hind coxæ there were only bristles. Also Becker mentions (Berl. Ent. Zeitschr. XXXI, 1887, 125) a female without scaly hairs on the coxæ. Also with regard to the scaly hairs on the front femora the statements are different, sometimes they are stated to be present, sometimes absent. — I shall also note here, that Strobl (l. c. 77) mentions, that *E. rufiventris* has the posterior coxæ pennate, while the above described *rufiventris* has only hairs on the coxæ, thus also this species would seem to vary in this respect. That my *rufiventris* is correctly determined I must consider as certain, as I have examined specimens determined by Zetterstedt (as *ventralis* Zett. (Stæg. in litt.) = *rufiventris* Meig.).

16. *E. vernalis* Meig.

1822. Meig. Syst. Besch. III, 27, 19. — 1842. Zett. Dipt. Scand. I, 384, 18, et 1849. VIII, 3025, 18. — 1862. Schin. F. A. I, 107. — 1903. Kat. paläarkt. Dipt. II, 246. — *Empis pennaria* p. p.: 1815. Fall. Dipt. Suec. Empid. 20, 9.

Male. Eyes contiguous; epistoma blackish. Occiput grey with black, below with yellowish hairs. Labrum a little longer than the head is high; palpi black with some hairs. Antennæ about as long as the head, black, the two first joints with short hairs. Thorax grey, dull,

with three slightly conspicuous, somewhat darker and a little shining, narrow stripes. The dorsocentral and acrostichal bristles somewhat long, black, biserial, the hinder dorsocentral bristles longer and uniserial. Further a humeral bristle, a posthumeral, three notopleural, a couple of supraalar and a postalar bristle, all black and somewhat strong; but besides there are some rather strong hairs especially just behind the transverse furrow, and some inwards to the humeri. Scutellum with four black marginal bristles. Pleura grey, metapleura with black bristles. Abdomen grey, somewhat densely clothed with not long, whitish or yellowish hairs; venter similarly coloured and haired. Exterior genitalia not large, the seventh dorsal segment has some excisions in the hind margin, the eighth is flat, somewhat impressed above and here black and shining; it has a process at each side, which is either tubercle-shaped, or hook-shaped and curved backwards, according to the direction in which it is seen and to the degree to which the genitalia are contracted; the lower lamellæ are directed more or less upwards, they are somewhat broad, the hinder lower angle a little pointed; the upper lamellæ are small, generally quite hidden. Penis is thick, somewhat compressed, curved upwards and a little dilated at the apex; there is a small, triangular ventral lamella. All the hairs on the genitalia are black. Legs black; coxæ greyish pruinose; the hind metatarsi slightly thickened, and also the front metatarsi thicker than the middle ones. Front femora short-haired; middle femora densely haired above, with some longer hairs at the base, below with bristles on the basal half and short hairs on the apical half, the bristles at the base are dense, almost forming a tuft; hind femora short-haired above, with bristles on the anterior side and long, fine hairs on the posterior side, decreasing in length towards the apex; on the ventral side there are longer and shorter bristles; front tibiæ with bristly hairs on the dorsal side and a short, dense pubescence ventrally and on the posterior side; middle tibiæ with bristles above and below, those above long and present in a number of four to five, besides with a short, dense pubescence on the anterior side; hind tibiæ with short hairs below and bristles above; tarsi short-haired; only the hind metatarsi somewhat spinulous beneath, but with no long hairs above; the tarsal joints with bristles at the apex which are somewhat long on the anterior tarsi; the dense pubescence on the front and middle tibiæ is continued out on the tarsi. The hairs and bristles are black or brownish black, the dense pubescence on the anterior legs pale. Wings hyaline, somewhat milky; the anterior veins brown or black, the others pale brown or yellowish, thin. Stigma faint, yellowish. Halteres whitish or pale yellow.

Female. Frons broad, grey, with a longitudinal impression. The bristles on thorax shorter than in the male; abdomen is quite short-haired, and the hairs are dark to blackish, except at the base. Posterior legs somewhat compressed; middle femora pennate above, and on the apical half below, hind femora pennate above, and about in the apical two thirds below; hind tibiæ somewhat ciliated on both sides, the hairs above slightly broadened and those below at the base somewhat scaly; the scaly hairs on the whole somewhat narrow. Wings somewhat brownish tinged; veins darker than in the male.

Length 3—4,2 mm.

E. vernalis is a common species in Denmark; Lersøen, Utterslev Mose, Amager, Charlottenlund, Ordrup Mose, Nyraad at Vordingborg; on Funen at Veflinge; on Langeland at Lohals and in Jutland at Sæby and Frederikshavn; finally on Bornholm at Allinge. It is a somewhat early occurring species, my dates are $^{21/5}$ to the first half of July. It occurs in bushes e. g. in plantations of *Salix*, and frequently on fields in the grass.

Geographical distribution: — Europe down into Italy; towards the north to northern Scandinavia, and in Finland.

17. *E. lamellicornis* Beck.

1887. Beck. Berl. ent. Zeitschr. XXXI, 124, 74. — 1893. Strobl, Mitth. Ver. Steierm. 1892, 77. — 1903. Kat. paläarkt. Dipt. II, 238.

Male. Eyes contiguous; epistoma dark grey. Occiput grey with blackish brown, downwards yellowish hairs. Labrum not twice as long as the head is high; palpi blackish with some hairs at the apex. Antennæ about as long as the head, black. Thorax grey, practically unstriped. The dorsocentral and acrostichal bristles somewhat long, black, biserial, the former longer and uniserial behind. Further a humeral bristle, a posthumeral, about three notopleural, a supraalar and a postalar bristle, all black, but they are not very conspicuous among the somewhat long hairs on the sides of the disc and in the præsutural depression. Scutellum with two black marginal bristles. Pleura grey, metapleura with somewhat weak, pale brownish or yellowish hairs. Abdomen grey, clothed with somewhat longish, whitish or yellowish hairs; venter similarly coloured and haired. Exterior genitalia not large, the lower lamellæ directed more or less upwards, short and somewhat broad, between their upper margins project the upper lamellæ which are claw-shaped, curved downwards and longer than the lower lamellæ; the eighth dorsal segment is not impressed, and it is not black and shining as in *vernalis*, but grey; at each side of it there is a more or less distinct tubercle or hook,

as in *vernalis*¹. Penis is long, thin, curved upwards and more or less sinuous, and there is a triangular ventral lamella. At the hind margin of the eighth segment there are long hairs, the lamellæ are shorter haired; all the hairs are pale yellowish. Legs blackish or brown; coxæ greyish pruinose; front metatarsi not, hind metatarsi distinctly dilated. Front femora short-haired; middle femora somewhat densely haired above, the hairs longest towards the base, and with two rows of bristles below, which are shortest towards the apex; the bristles at the base are not placed tuft-like as in *vernalis*; hind femora short-haired above, with longer, fine hairs on the posterior side and stronger hairs on the anterior side, and with shorter and longer bristles below; front tibiæ with bristly hairs above, and with a short, dense pubescence on the ventral and posterior side; middle tibiæ with bristly hairs below and with three or four long bristles above, besides with a short, dense pubescence on the anterior side; hind tibiæ somewhat densely and longish haired below, and with similar hairs and some bristles above; hind metatarsi slightly spinulose beneath and with longer hairs and some bristles above; the tarsal joints have short bristles at the apex, longest on the anterior tarsi; the dense pubescence on the anterior tibiæ is continued out on the tarsi. All the hairs and bristles are black or brownish black, the dense pubescence pale brown. Wings somewhat hyaline, slightly greyish; veins brown to pale brownish. Stigma yellowish, often very faint. Halteres yellow.

Female. Frons broad, grey, with a longitudinal impression. The bristles on thorax shorter than in the male. Abdomen short-haired, the hairs however longer and paler than in *vernalis*. Posterior legs compressed; posterior femora pennate on both sides, but the row of scaly hairs below not reaching to the base; front tibiæ ciliated above, middle tibiæ pennate above, ciliated below, hind tibiæ likewise but also pennate below at the base. Wings strongly brownish, especially on the anterior part.

Length 3,5 mm.

This species much resembles *vernalis*, but is however distinguished without difficulty; besides the two scutellar bristles there are several other distinguishing characters; in the male the genitalia are of a different structure and with pale hairs, and also the hairs on the legs show several differences, especially the basal bristles below the

¹ Both here and in *vernalis* this hook or tubercle may be more or less distinctly observable, which is certainly dependent on the more opened or closed state of the genitalia.

middle femora are not tuft-like. In the female the wings are much stronger tinged, and also the pennation of the legs is different, especially the posterior tibiæ are pennate on the dorsal side, which is not the case in *vernalis*. Strobl (l. c.) says nothing about this difference in the pennation, but it is present in my specimens and also in specimens sent to me from Mr. Becker.

E. lamellicornis is very rare in Denmark, only three specimens, a male and two females, are known, taken by Stæger many years ago, probably in Ordrup or the neighbourhood.

Geographical distribution:— Middle Europe down into Styria, Switzerland and Spain; it seems to have its northern limit in Denmark as it is not known from Scandinavia, but it has perhaps not always been recognised.

A third species, much resembling the two preceding, is *E. penaria* Fall.; it is not found in Denmark hitherto, but will probably be found here, as it is known from Scandinavia, England and Germany. The male genitalia are constructed as in *vernalis*, but the eighth segment is not flat, black and shining above, but grey as the whole abdomen, and there seems to be no tubercles or hooks at the sides; the hairs on the genitalia are pale. The bristles below at the base of the middle femora are less densely placed. The female has the wings generally more tinged than *vernalis* but less than *lamellicornis*, and the specimens I have examined have the hind, but not the middle tibiæ pennate on the dorsal side. In both sexes the thorax is less distinctly striped than in *vernalis*.

18. *E. chioptera* Fall.

1815. Fall. Dipt. Suec. Empid. 21, 11. — 1842. Zett. Dipt. Scand. I, 376, 9. — 1862. Schin. F. A. I, 106. — 1867. Loew, Berl. Ent. Zeitschr. XI, 43 et 54, 14. — 1903. Kat. paläarkt. Dipt. II, 234.

Male. Eyes contiguous; epistoma dark grey. Occiput grey, with yellowish hairs, only quite above with black hairs. Labrum only a little longer than the head is high; palpi black, slightly haired with

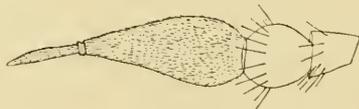


Fig. 39. Antenna of *E. chioptera*. $\times 100$.

brownish hairs. Antennæ shorter than the head, black, the two first joints with a few short hairs. Thorax grey, with a faint indication of three darker stripes. The dorsocentral and acrostichal bristles

short, black, biserial, the former somewhat longer and uniserial behind. Further a humeral bristle, a posthumeral, three notopleural, a couple of supraalar and a postalar bristle, all black and somewhat short; besides there are hairs on the humeri and some more bristles inwards to the humeri and at the transverse furrow. Scutellum with two black marginal bristles. Pleura grey, the hairs on metapleura yellowish. Abdomen grey, with somewhat longish, whitish or yellowish white hairs, which are longest at the sides, short in the middle; venter similarly coloured and haired. Exterior genitalia small, the lower lamellæ roundish, directed more or less upwards; the upper lamellæ small, lamelliform, slightly curved. Penis slightly curved; at the hind margin of the eighth ventral segment there are long, yellow hairs, the lamellæ short-haired with whitish hairs. Legs black; coxæ greyish pruinose; the front metatarsi somewhat strongly, the hind metatarsi somewhat swollen. Front femora with fine hairs on the ventral side; middle femora with two ventral rows of bristly hairs; hind femora with similar hairs ventrally on the apical part, short hairs on the posterior side and some bristles on the anterior side towards the apex; front tibiæ with fine, longish hairs on the posterior side and with a fine, erect pubescence below; middle tibiæ with a dense row of fine hairs on the dorsal side, with rows of bristles below and about five long bristles dorsally, besides with a dense, erect pubescence on the anterior side; hind tibiæ with somewhat dense, strong hairs on both sides and with bristles above; tarsi short-haired or slightly spinulose beneath, the front and hind metatarsi with somewhat long hairs dorsally, which are longest and somewhat bristly on the latter; at the apex of the tarsal joints are short bristles; the

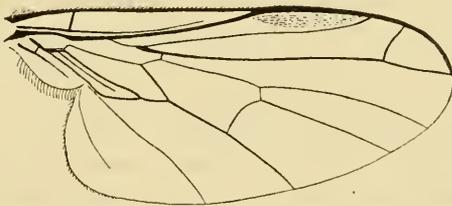


Fig. 40. Wing of *E. chioptera*.

dense pubescence on the anterior tibiæ is continued out on the tarsi. The hairs and bristles black or brownish, sometimes still paler, the dense pubescence on the anterior legs pale. Wings whitish, somewhat milky; costa brownish in the basal half, black and strong from the middle to the tip, the other veins whitish, only the subcostal and

cubital veins a little darker; the cubital fork about rectangular. Stigma faint, yellowish. Halteres black.

Female. Frons broad, grey. The bristles on thorax very short, and abdomen likewise short-haired. Front tibiæ ciliated above; posterior legs somewhat compressed, the middle femora ciliated on both sides, the hairs very slightly scaly, the hind femora haired in the same way, but the hairs a little more broadened, towards the apex with some bristly hairs on the antero-ventral side; the posterior tibiæ short ciliated, especially on the dorsal side. Wings slightly brownish; veins brown.

Length 3,2—3,8 mm.

E. chioptera is a common species in Denmark, but it has, however, hitherto only been taken on Sealand; Charlottenlund, Ordrup Mose, Ermelund, Dyrehaven, Ørholm, Geel Skov, Tyvekrogen and on the little island Egholm at Skelskør. It is a spring species, my dates are $^{14}/_5$ — $^{26}/_6$. It occurs in grass, low herbage and on bushes, I have especially taken it on flowering *Prunus spinosa*, and it is often present in no small numbers.

Geographical distribution:— Northern and middle Europe down into France; towards the north to middle Scandinavia, and in Finland.

19. *E. prodromus* Loew.

1867. Loew, Berl. ent. Zeitschr. XI, 42 et 54, 13. — 1903. Kat. paläarkt. Dipt. II, 243.

Male. Eyes contiguous; epistoma greyish black. Occiput of the same colour, with black, downwards paler hairs. Labrum scarcely longer than the head is high; palpi black. Antennæ black, shorter than the head. Thorax black, shining, unstriped. The dorsocentral and acrostichal bristles short, black, biserial, the former a little longer and uniserial behind. Further a humeral bristle, a posthumeral, about three notopleural, a supraalar and a postalar bristle, all black, somewhat short and not much conspicuous between the other, more or less strong hairs present at the sides of the disc. Scutellum with two black marginal bristles. Pleura black, very slightly greyish pruinose; the hairs on metapleura black. Abdomen black, somewhat shining, clothed with short, whitish or greyish white hairs; venter similarly coloured and haired. Exterior genitalia small, the lower lamellæ broad and short, somewhat triangular; the upper lamellæ are seen above the lower, so far as I could see they seem to be divided into two branches, the lower of which is lamelliform, the upper directed upwards, small and somewhat styliform. Penis directed upwards between the lamellæ, slightly curved, with a black, shining

ventral lamella at the base. Legs black; coxæ slightly pruinose, front and hind metatarsi somewhat slightly thickened. Middle femora with a row of bristly hairs on the ventral side; hind femora short-haired above and with some bristles on the ventral side in the apical half; front tibiæ with fine hairs on the postero-dorsal side; middle tibiæ with bristly hairs below, and about three long bristles on the dorsal side; hind tibiæ with somewhat dense hairs below and above, and on the latter side with some bristles; tarsi slightly spinulose beneath, hind metatarsi with some longer hairs above; at the apex of the tarsal joints there are short bristles. The hairs and bristles are black. The short, dense pubescence on the anterior tibiæ is also present in this species, but it is scarcely observable with a lens. Wings somewhat milk-white; the basal half of the costa light brownish, the apical half blackish; the other veins whitish, the cubital vein a little darker. Stigma very faint, scarcely perceptible. Halteres black.

Female. Frons somewhat broad, grey. Thorax somewhat shorter haired than in the male; abdomen very short-haired and towards the apex the hairs blackish. Posterior legs somewhat compressed, the posterior femora pennate above, but the hairs only slightly broad, middle tibiæ ciliated above, hind tibiæ ciliated on both sides, longest above and the hairs here very slightly and indistinctly broadened. Wings a little brownish on the basal part, hyaline towards the apex; veins brownish. Stigma slightly brownish.

Length 2,5 to about 3 mm.

This species resembles somewhat *chioptera*, but it is distinguished by many characters and is easily known by its black colour, small size, black metapleural hairs and much shorter haired abdomen.

E. prodromus seems not to be common in Denmark, but has however been taken on several localities and sometimes in great numbers; it has first been detected here in somewhat recent time, the first specimens were taken in 1881; Ørholm, Nordskoven at Jægerspris, Tisvilde and on Langeland at Lohals (the author); in Jutland at Hald near Viborg (the author), at Sæby and Frederikshavn (H. I. Hansen); my dates are from ²¹/₆—¹¹/₇. According to Loew l. c. it occurs earlier than *chioptera* but continues longer than this. I have taken it on meadows in woods and in low herbage; f. inst. I took it at Tisvilde in great numbers in the wood on *Ranunculus acer*, swarming over and sitting on the flowers, but it was also present on other low plants on somewhat shaded places.

Geographical distribution:— Europe down into Styria; Loew (l. c. 56) suggests that *E. volucris* in Zetterstedt may be *prodromus* but I have had specimens from Zetterstedt's collection, and they

proved to be *aestiva*; it is thus hitherto not known north of Denmark, since *volucris* in Siebke's Enum. Ins. Norv. 33, is probably also *aestiva*.

20. *E. serotina* Loew.

1867. Loew, Berl. ent. Zeitschr. XI, 48 et 55, 18. — 1903. Kat. paläarkt. Dipt. II, 244. — *Empis obscura*: 1849. Zett. Dipt. Scand. VIII, 3026, 23. — 1903. Kat. paläarkt. Dipt. II, 241. — *Empis obscuripennis*: 1893. Strobl, Mitth. Ver. Steierm. 1892, 66.

Male. Eyes contiguous; the small frontal triangle and the epistoma dark greyish. Eyes with the facets in the larger upper part much larger than below, the difference between the two parts of the eye very distinct. Occiput grey with black, in the lower half with yellow hairs. Labrum not twice as long as the head is high; palpi somewhat long, blackish with brownish hairs. Antennæ not as long as the head, black, the two first joints about of equal length, with short hairs, the third elongated and much attenuated towards the apex. Thorax greyish brown, the interstitia presenting themselves as two stripes, and also the sides of the disc are darker, so that four stripes may be seen; but when the thorax is viewed quite from behind, or from in front with the light from behind, there are three distinct, dark stripes (with the bristles), abbreviated behind. The dorsocentral and acrostichal bristles somewhat short, black, the former pluriserial, stronger and uniserial behind; the latter biserial. Further a humeral bristle, a posthumeral, three or four notopleural, a supraalar and a postalar bristle, all black; besides there are some weaker, black hairs at the sides of the disc and at the transverse furrow, and the humeri, the posthumeral part and the anterior part of the præsutural depression are clothed with yellowish hairs. Scutellum has four black marginal bristles. Pleura brownish grey, metapleura with yellow bristles, propleura with yellowish hairs. Abdomen black, dull, the first segment greyish brown pruinose; it is clothed above with short, black, at the sides with long, yellow hairs, but there are no bristles at the hind margin of the segments. Venter grey with pale hairs. Exterior genitalia small, the lower lamellæ somewhat blade-shaped, directed upwards, the upper lamellæ nearly quite hidden, only their upper margin seen; there is a somewhat long, cleft or furrowed ventral lamella with partly whitish yellow hairs; the genitalia for the rest black-haired. Legs black; coxæ greyish pruinose; front metatarsi a little and hind metatarsi very slightly thickened. The posterior femora each with two dense rows of somewhat thin bristles on the ventral side; the middle femora also with some bristles dorsally, and the hind femora with some on the anterior and posterior side and

on the dorsal side towards the apex; the front tibiæ with some bristles on the dorsal side and for the rest with a short, dense, reddish or brownish pubescence, longest on the posterior side; middle tibiæ with some bristles above, and short, somewhat strong hairs below, besides with a very short pubescence on the anterior side; the hind tibiæ have likewise some bristles above and also shorter hairs, and a ciliation below, which is specially dense towards the apex; the hind metatarsi are spinulose beneath and have some bristles above, and all tarsi have short bristles at the apex of the joints; the pubescence and ciliation on the tibiæ is continued out on the tarsi. The hairs and bristles are black or brownish black, only below the front femora yellowish; the hairs on the coxæ yellow. Wings a little brownish tinged. Veins brown, the lower branch of the cubital fork bending downwards, terminating about at the apex of the wing. Stigma brown. Halteres blackish, the peduncle brownish.

Female. Frons broad, grey. Thorax more grey than in the male and the two interstitia more conspicuous. Abdomen greyish pruinose, the hairs somewhat shorter than in the male; the lamellæ of the ovipositor somewhat long. The front femora slightly pennate above towards the base; the posterior femora pennate above and below, the middle femora below only on the apical half; the front tibiæ pennate above, but the hairs only slightly broadened, middle tibiæ ciliated and with a few thin bristles above, hind tibiæ pennate below, the hairs only slightly broadened and passing into cilia towards the apex; above they are ciliated and with a row of bristles.

Length 5—5,7 mm.

E. serotina is rare in Denmark, only seven specimens are known; Tyvekrog (the author); in Jutland at Holstebro (Jacobsen, Zetterstedt's type-specimens), at Gjerlev near Randers Fjord (H. J. Hansen) and at Rebild near Skjørping (J. P. Kryger). It seems to be a late occurring species, my dates are from the last part of July to $\frac{1}{9}$; Loew records September for the species.

Geographical distribution: — Middle Europe down into Styria; its northern limit lies in Denmark.

Remarks: I am quite sure, that this species, of which I have examined Zetterstedt's type-specimens, is identical with *serotina* Loew, as the description by Loew agrees in every character; his description of the colour of thorax, the yellow hairs at the sides, the colour and hairs of abdomen, the structure of the genitalia and the structure and hairiness of the legs, agrees in every respect. — As the *E. obscura* Macq. will scarcely ever be recognised again, I use the name *serotina* Loew for the present species, which is thus identical with *obscura* Zett.

21. *E. caudatula* Loew.

1867. Loew, Berl. ent. Zeitschr. XI, 33 et 53, 6. — 1903. Kat. paläarkt. Dipt. II, 234. — *Empis morosa* (non Meig.): 1862. Schin. F. A. I, 109.

Male. Eyes contiguous, epistoma blackish. Occiput dark grey, with black hairs. Labrum a little longer than the head is high; palpi black. Antennæ shorter than the head, black. Thorax black, somewhat shining, a little greyish pruinose and with a slight indication of three darker stripes. The dorsocentral and acrostichal bristles short, biserial, black, the former longer and uniserial behind. Further a humeral bristle, a posthumeral, about three notopleural, a supraalar and a postalar bristle, all black, but besides there are short or longer hairs on the humeri, the sides of the disc and in the præsutural depression; especially there are some stronger ones inwards to the humeri and at the transverse furrow. Scutellum with four black marginal bristles. Pleura somewhat greyish pruinose, metapleural hairs black. Abdomen black, slightly shining, clothed with somewhat longish, black hairs, generally brownish at the sides in front; venter similarly coloured and haired. Exterior genitalia small, constructed quite as in *prodromus*, the upper lamellæ seem likewise to be two-branched. Penis is generally quite hidden. Legs black; coxæ slightly pruinose; front and hind metatarsi somewhat thickened. Front femora short-haired; middle femora with two rows of bristly hairs ventrally; hind femora short-haired above and below, on the latter side with a couple of bristly hairs towards the apex and further with fine hairs on the posterior side, which are long towards the base, and with some bristles towards the apex on the anterior side; front tibie with fine hairs above; middle tibie with two rows of bristly hairs below, and with about five long bristles above; hind tibie short-haired on both sides and with some bristles above; tarsi slightly spinulous beneath, the front and hind metatarsi with longer hairs above, which are longest and bristly on the hind metatarsi; at the apex of the tarsal joints short bristles are found. The dense, erect pubescence on the ventral side of the front tibie and on the anterior side of the middle tibie is present and somewhat distinct, and it is continued out on the tarsi. The hairs and bristles are black or blackish, the short, dense pubescence pale. Wings somewhat milk-white; the basal half of the costa, the subcostal vein and the basal part of the cubital vein brown, the apical half of the costa and the outer part of the cubital vein black or blackish; the other veins white. Stigma very slightly yellowish. Halteres black.

Female. Eyes separated, frons grey. The hairs on thorax shorter than in the male; abdomen very short-haired. Posterior legs some-

what compressed; posterior femora pennate on both sides, the hairs only slightly broad, especially on the middle femora; the tibiæ short ciliated on both sides, most densely on the dorsal side of the middle tibiæ and the hairs here very slightly broadened, the hind tibiæ with a few short, bristly hairs on the dorsal side. Wings greyish hyaline, slightly brownish towards the base; veins brownish.

Length 2,8—3,2 mm.

This species resembles *prodromus* but is easily distinguished by its black-haired abdomen; also in the hairiness of the legs there are many characters, f. inst. the posterior femora in the female are pennate on both sides, in *prodromus* only above. From *chioptera* it is likewise distinguished by the black-haired abdomen and also by the smaller size. Finally it is distinguished from both by the four scutellar bristles.

E. caudatula does not seem to be rare in Denmark, but it has hitherto only been taken on Sealand and Langeland, and first in somewhat recent time, the first specimens were taken in 1884; Copenhagen in a garden, Amager, Damhusmosen, Ermelund, Ørholm, Frederikssund (the author), at Vemmetofte and Skelskør (H. J. Hansen) and on Langeland at Lohals (the author). My dates are $2^{1/5}$ — $5/7$. It occurs in low herbage and especially in grass. It is somewhat interesting, that I have taken most of my specimens on Amager and also some in Ermelund, for both localities were much visited by Stæger, and yet the species was not known to him and it is not found in his collection. It would seem as if it has first later appeared in our country.

Geographical distribution: — Northern and middle Europe down into France; it seems to have its northern limit in Denmark; it occurs also in England.

22. *E. aestiva* Loew.

1867. Loew, Berl. ent. Zeitschr. XI, 39 et 54, 11. — 1903. Kat. paläarkt. Dipt. II, 232. — *Empis volucris* (non Meig.): 1842. Zett. Dipt. Scand. I, 387, 24. — ? *Empis volucris*: 1862. Schin. F. A. I, 109.

Male. Eyes contiguous; epistoma blackish. Occiput black, with black hairs. Labrum a little longer than the head is high; palpi black, with a few hairs at the apex. Antennæ shorter than the head, black. Thorax black, shining. The dorsocentral and acrostichal bristles short, biserial, black, the former somewhat longer and uniserial behind. Further a humeral bristle, a posthumeral, about three notopleural, a supraalar and a postalar bristle, all black; they are not very distinct between other hairs present, especially inwards to the humeri. Scutellum

with two black marginal bristles. Pleura blackish, very slightly greyish, the bristles on metapleura black. Abdomen black, somewhat shining, clothed with short, black hairs, which are brownish at the sides; the hairs are somewhat longer on the sides of the first segments. Exterior genitalia not large, the lower lamellæ directed backwards or generally more or less upwards, the upper hinder angle a little hook-formed and pointed and with some forwards curved hairs; the upper lamellæ are hidden between the lower, so that it appears as if only one pair of lamellæ is present. Penis is curved simply upwards and thin towards the apex; the eighth ventral segment is somewhat arched and protruding. Legs black or brownish black; coxæ very slightly pruinose; hind metatarsi somewhat thickened. Front femora with some fine hairs below; middle femora with two somewhat dense rows of bristly hairs, one ventral, the other postero-ventral; the hairs are somewhat short, only the three or four basal ones long; hind femora short-haired above and on the posterior side, and with rows of bristly hairs on the ventral and anterior side; front tibiæ with short hairs above and a dense, erect pubescence below; middle tibiæ short-haired below, the hairs strongest in the basal half, and on the dorsal side with some long bristles, generally two or three on the basal half and one at the apex, but this latter may be short or even wanting; besides there is a dense, erect pubescence on the anterior side; hind tibiæ with longish hairs below and above, and with some bristles on the latter side; the hind tarsi slightly spinulose beneath, the metatarsus with short hairs and above with some bristles; the tarsal joints with very short bristles at the apex; the short, erect pubescence on the anterior tibiæ is continued out on the tarsi. All hairs and bristles

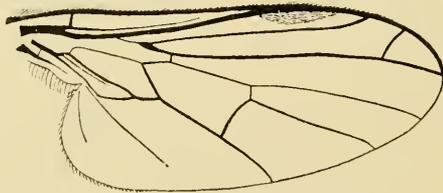


Fig. 41. Wing of *E. aestiva*.

black or blackish, the dense, erect pubescence on the anterior legs pale. Wings hyaline; subcostal, radial and cubital veins dark brown, the other veins pale brownish, the anal vein abbreviated somewhat before the margin. Stigma faint, yellowish. Halteres black.

Female. Eyes separated, frons blackish. Thorax and abdomen shorter haired than in the male. Posterior legs somewhat compressed,

posterior femora pennate on both sides with rather long scaly hairs; on the ventral side of the middle femora the scaly hairs are present only on the apical half, the basal half has only ordinary hairs, and on the hind femora the ventral base has likewise only ordinary hairs; the middle tibiæ are only pennate above and the scaly hairs are short and adpressed; hind tibiæ pennate on both sides, but on the ventral side only on the basal half, on the dorsal side there are some bristles posteriorly to the row of scaly hairs. Wings distinctly brownish, especially towards the base.

Length 3—3,5 mm.

E. aestiva is common in Denmark; Copenhagen in a garden, Ordrup Mose, Dyrehaven, Ørholm, Søllerød, Hillerød. Frerslev Hegn, Frederikssund; on Funen at Middelfart; on Langeland at Lohals and in Jutland in Højenbæk Dal at Vejle, in Vejle Nørreskov, at Laven near Silkeborg, Hald near Viborg, Gjerlev near Randers Fjord and at Aalborg; my dates are $^{20}/_6$ — $^4/_8$. It occurs generally on open places in woods, often sitting on the flowers of Composites, and I have taken it in great number swarming on *Carduus*.

Geographical distribution:— Northern and middle Europe down into Thuringia; towards the north to middle Scandinavia.

Remarks: Zetterstedt mentions under his *volucris* a male from Denmark, teste Stæger; Loew has already (l. c. 56) declared, that this must be *aestiva* according to a specimen sent to him from Stæger. The species in the collection in our museum labelled *volucris*, and of which all specimens are from Stæger, proved also to be *aestiva*; moreover I have seen a specimen determined as *volucris* from Zetterstedt's collection, labelled Stæger, and it was *aestiva* like the other specimens in the collection determined as *volucris*, as mentioned above under *prodromus*.

23. *E. cinerea* Zett.

1855. Zett. Dipt. Scand. XII, 4609, 7—8. — Kat. paläarkt. Dipt. II, 235.

Female. Frons broad, dark grey, epistoma of the same colour. Occiput grey, with black, below with pale hairs. Labrum twice as long as the head is high; palpi black, with longish hairs at the apex. Antennæ as long as the head, black, the first joint slightly longer than the second, the third broad at the base, attenuated towards the apex; the two first joints with short hairs. Thorax grey, the two interstitia generally presenting themselves as slightly darker stripes. The dorsocentral and acrostichal bristles not short, biserial, black, the former somewhat longer and stronger and uniserial behind. Further a humeral bristle, a posthumeral, about three notopleural, a supraalar

and a postalar bristle, all black; besides there are some hairs on the sides of the disc. Scutellum with four black marginal bristles. Pleura grey, metapleura with black, propleura with some pale hairs. Abdomen slate-grey, clothed with short, black, at the base with somewhat pale hairs; venter similarly coloured and haired. The lamellæ of the ovipositor somewhat long and thin. Legs black; coxæ greyish pruinose, and the legs also on the whole somewhat pruinose. They are short-haired, the front and middle tibiæ with a row of fine hairs above, most distinct on the front tibiæ; hind tibiæ with some fine bristles above, and hind femora with a row of fine hairs below. Wings hyaline, very slightly greyish; veins brown, costa and the cubital vein blackish; the lower branch of the cubital fork bending slightly downwards, terminating at the apex of the wing. Stigma faint. Halteres whitish.

Length 3,5 mm,

The species was founded by Zetterstedt on females, and I also have only females, the male thus not being known. I have not seen the type, but I think the determination beyond doubt as Zetterstedt's description quite agrees.

E. cinerea is at present only very little known, I caught all my specimens, nine in number, with the net on a common on Amager in the grass, on $6/6$ — $20/6$ 1909. The locality is similar to that mentioned by Zetterstedt; „In Oelandia . . . in floribus Potentillæ . . . juxta litus maris . . .“.

Geographical distribution:— Middle Sweden to Denmark.

Remarks: I think this species may belong to *Pterempis*, though its legs are not pennate.

VII. Subg. *Empis* s. str.

Somewhat large or medium-sized species, generally of brownish or greyish colour, sometimes somewhat lighter. Eyes contiguous in the male, with the upper facets larger than the lower; separated in the female. Antennæ as a rule somewhat long, the first joint generally about twice as long as the second, sometimes only slightly longer; the third joint generally elongated. The dorsocentral bristles pluriserial (only in *livida* uniserial), the acrostichal bristles pluriserial or biserial; the sides of the disc with hairs, sometimes somewhat fused with the dorsocentral hairs. There is a humeral bristle, only rarely absent (*borealis*), further one or three posthumeral bristles (absent in *borealis* and *opaca*), three to several notopleural, one supraalar and one postalar bristle. Metapleural bristles numerous; propleura with distinct hairs. Scutellum with four to several marginal bristles. Ab-

domen generally with bristles at the hind margin of the segments. Exterior genitalia small or large. Legs with bristles; metatarsi not thickened; no short, erect pubescence on the anterior side of the middle tibiæ. Legs in the female very rarely somewhat pennate (in no Danish species). Wings sometimes broad, especially in the female; veins complete (only in *livida* the branches of the discal vein slightly abbreviated); cubital vein terminating at some distance from or very near the apex of the wing. Discal cell more or less pointed outwards. Axillary lobe well developed, axillary angle acute and deep; alula present, but small.

Table of Species.

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| 1. Thorax with three stripes..... | 2. |
| — Thorax with four stripes..... | 5. |
| 2. The branches of the discal vein abbreviated just before the margin..... | 26. <i>livida</i> . |
| — No abbreviated veins..... | 3. |
| 3. Acrostichal bristles biserial; metapleural bristles yellow | 27. <i>nigricans</i> . |
| — Acrostichal bristles pluriserial; metapleural bristles black... | 4. |
| 4. Scutellum with more than four marginal bristles..... | 24. <i>tessellata</i> . |
| — Scutellum with four marginal bristles..... | 25. <i>brevicornis</i> . |
| 5. Wings strongly brownish tinged, somewhat broad in the male, very broad in the female..... | 28. <i>borealis</i> . |
| — Wings slightly tinged and not broad..... | 29. <i>opaca</i> . |

24. ***E. tessellata*** Fabr.

1794. Fabr. Ent. Syst. IV, 405, 10, et 1805. Syst. Antl. 140, 13. — 1822. Meig. Syst. Besch. III, 17, 1. — 1842. Zett. Dipt. Scand. I, 368, 1. — 1862. Schin. F. A. I, 103. — 1903. Kat. paläarkt. Dipt. II, 245. — *Empis livida* (non L.): 1781. Fabr. Spec. Ins. II, 471, 5, et 1805. Syst. Antl. 139, 10.

Male. Eyes contiguous; frontal triangle and epistoma grey. Occiput grey with black bristles. Labrum about twice as long as the

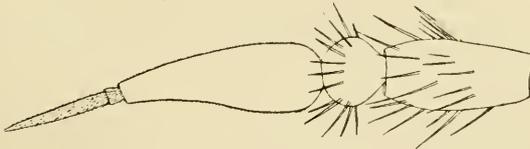


Fig. 42. Antenna of *E. tessellata*. $\times 50$.

head is high; palpi black, with long, black hairs. Antennæ black, as long as the head, the first joint about twice as long as the second; the two first joints greyish, with somewhat long, black hairs. Thorax grey or more or less brownish, with three brownish black stripes, the median somewhat narrow and abbreviated behind; further there is a

small, cuneiform spot on each side, more or less connected in front with the lateral stripe; the space in front of the scutellum is darker brown. The dorsocentral and acrostichal hairs are somewhat long, but fine, and pluriserial; they are long and strong behind, and the three rows are here more or less fused together; the sides of the disc are clothed with slightly shorter hairs, which are fused with the dorsocentral hairs. The hairs are all black. Further a humeral bristle, about three posthumeral, a number of notopleural and supraalar and one postalar bristle, all strong, black; on the humeri there are many rather strong, bristly hairs. Scutellum has a number of stronger and weaker, black marginal bristles. Pleura greyish or greyish brown, metapleura with numerous, stronger and weaker, black bristles; propleura with black hairs. Pro- and mesothoracic spiracles light brown. Abdomen brownish, the colours somewhat reflecting, changing according to the view; seen from behind abdomen has a dark middle stripe or dark triangles; it is clothed with black hairs, which are longest at the sides and strong at the hind margins of the segments. Venter greyish, without strong hairs. Exterior genitalia not large, the lower lamellæ broad, somewhat triangular, rounded or slightly pointed at the apex, and directed somewhat upwards; the upper lamellæ are seen above the lower, they are very small and likewise triangular. Penis is hidden. The lower lamellæ are somewhat shining, densely haired with longish hairs, among which some few stronger. Legs with the coxæ greyish pruinose, otherwise somewhat varying in colour and thus giving rise to two, somewhat distinct varieties; either the femora are black, tibiæ and tarsi rufous, the latter blackish towards the apex (*genuina*), or the legs quite rufous or yellowish, only the front femora more or less blackish at the base and the tarsi blackish at the apex (*rufipes* Stæg. in litt. Zett. l. c., *livida* Fabr.). The hind tibiæ have a small, low, somewhat densely haired knob on the posterior side, at a little distance from the base. The legs are somewhat strongly haired and spined; front femora with longish hairs below, and strong bristles on the anterior and posterior side; middle femora with bristles on the anterior, ventral and postero-ventral side; besides the anterior femora have a very short, dense, pale pubescence ventrally; hind femora with strong bristles all round, except above, and with longer, thin hairs towards the base, especially on the dorsal and posterior side; front tibiæ with two rows of strong bristles on the dorsal side, and with a short, brownish pubescence ventrally; middle tibiæ with (four) rows of strong bristles on the various sides; hind tibiæ with two rows of strong bristles on the dorsal side and a short ciliation ventrally; tarsi with strong bristles at the apex of the

joints, the posterior metatarsi also with some beneath; the pubescence on the front tibiæ and the ciliation on the hind tibiæ continued out on the tarsi. All the hairs and bristles black. Wings strongly brownish, somewhat yellowish towards the base. Veins brown, the lower branch of the cubital fork bent very slightly downwards and just at the apex curved a little upwards, it terminates long before the apex of the wing. Stigma a little darker brown than the wing, but very faint and little conspicuous. Halteres yellow.

Female. Chiefly agreeing with the male; frons broad, grey. The lamellæ of the ovipositor short, and below them there is a small, roundish appendage. Hind tibiæ simple, but the legs with still more bristles than in the male, thus the front tibiæ with small bristles ventrally and the hind tibiæ with a ventral row of strong bristles, and also the front metatarsi have bristles.

Length 9—11 mm.

The pupa is brownish yellow, about 11 mm. long; the two upper of the tubercles on the front side of the head are distinct, transverse and compressed, the two lower have a large, sharp edge below.

E. tessellata is very common and has been taken in almost every part of Denmark. It is chiefly a somewhat early occurring species, but some few may be seen rather late; my dates are $18/5$ — $19/8$. It occurs especially in low herbage, very often on flowers of various Umbelliferæ, in fens, fields and similar localities, both in and near woods and in not woody districts. I once have taken it with a *Scatophaga stercoraria* as prey. The larva was taken in mole-casts in Ordrup Mose on $20/4$, it pupated $1/5$ and developed $17/5$, and in Frerslev Hegn on $7/5$ which latter pupated $9/5$ and developed $6/6$.

Geographical distribution: — Whole Europe down into Spain and Italy; towards the north to middle Scandinavia, and in Finland.

25. *E. brevicornis* Loew.

1869. Loew, Beschr. eur. Dipt. I, 263, 155. — 1903. Kat. paläarkt. Dipt. II, 234.

Male. Eyes contiguous; epistoma greyish. Occiput grey with black bristles and hairs. Labrum somewhat longer than the head is high; palpi brown with black hairs. Antennæ a little shorter than the head, black, first joint a little longer than the second, both with short, black hairs, third joint relatively short. Thorax brownish, with three darker stripes, abbreviated behind; the two lateral broadest. The dorsocentral and acrostichal bristles of moderate length, black, pluriserial, the former longer and uniserial behind; the sides of the

thoracic disc have similar hairs, which are fused with the dorsocentral hairs. Further a humeral bristle, a posthumeral, about four notopleural, a supraalar and a postalar bristle, all black; besides there are stronger and weaker hairs on the humeri and in the anterior part of the præsutural depression. Scutellum with four black marginal bristles. Pleura greyish, metapleural bristles black; propleura with black hairs. The spiracles yellowish brown. Abdomen black, dull, with narrow greyish hind margins to the segments; it is clothed with black hairs and has strong bristles at the hind margins of the segments. The fourth dorsal segment has a curious shape, it is somewhat excised in the hind margin on each side at the lower angle, and below the excision the angle is drawn out into a process, which bears a tuft of strong bristles; in the excision a somewhat broad membrane is seen. The venter is greyish, with black hairs. Exterior genitalia not large, somewhat resembling those in *tessellata*; the lower lamellæ triangular, directed upwards, the upper apex drawn out into a distinct point, which is curved slightly backwards; the upper lamellæ small, triangular and pointed; the lower lamellæ have short hairs at the hind margin. The somewhat sinuous apex of the black penis protrudes forwards between the upper lamellæ (in my specimen), it has a small dilatation near the middle; the genitalia are more strongly compressed than in *tessellata*, and have a more pointed upper apex. Legs rufous; coxæ blackish, greyish pruinose, trochanters black, the femora more or less darkened in the middle, and the tarsi blackish towards the apex. The legs haired somewhat as in *tessellata*; the anterior femora with stronger and weaker hairs on various sides; the hind femora with bristles on the ventral side; front tibiæ with bristles on the dorsal side and a dense, short, pale pubescence on the ventral side; middle tibiæ with (four) rows of bristles on the various sides; hind tibiæ with somewhat long bristles on the dorsal side and short ciliated on the ventral side; the posterior tarsi spinulous below, the

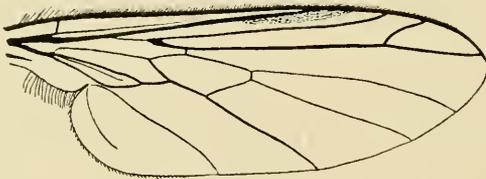


Fig. 43. Wing of *E. brevicornis*.

hind metatarsi also with bristles above, and all tarsi with bristles at the apex of the joints; the pubescence below the front tibiæ is continued out on the tarsi. All hairs and bristles black. Wings strongly

brown tinged, towards the base and anterior margin deep yellow. Veins dark brown, the lower branch of the cubital vein bending very slightly downwards, and with a scarcely observable trace of a recurvation at the apex, terminating a little before the apex of the wing. Stigma somewhat dark brown. Halteres yellow.

Female. Frons somewhat broad, grey. Thorax and abdomen much shorter haired than in the male, and abdomen of grey colour; the lamellæ of the ovipositor short and below them a small lamella. Legs short-haired, the anterior tibiæ with short, the hind tibiæ with longer bristles. Wings hyaline, but the costal cell, the first basal cell, the anal cell and the alula yellow (all the same parts which are yellow in the wing of the male).

Length 5,5—6 mm.

This interesting species resembles somewhat *tessellata*, but can in no way be confused with it, as both the size and other characters easily distinguish it. Loew's description agrees in every character, so that the determination is beyond doubt, but Loew has not seen the curious shape of the fourth abdominal segment in the male. Also the female described by Loew agrees fully with my females, so that it may be considered as certain, that it was really the female to this species Loew had before him. Loew declares correctly, that the species is nearly related to *tessellata*; when he is of opinion that it stands nearer to the *ciliata* group than does *tessellata* I am not sure, that this is correct; the hairs on the thoracic disc are present quite as in *tessellata*; there is however the difference, that the hairs outside the dorsocentral rows are of the same or about the same length as the dorsocentral hairs, while in *tessellata* they are shorter. — The species is not much known, and I do not find it mentioned since Loew, except in Verrall's List of Brit. Dipt. 2nd Ed. 1901.

E. brevicornis is rare in Denmark, only five specimens, a male and four females, have been caught, and it was taken for the first time in 1908; Ermelund, Tyvekrog and in Nordskoven at Jægerspris (the author); the dates are $18/5$ — $21/6$, it is thus a spring species.

Geographical distribution: — Loew described the species from Bavaria, and Verrall records it from England.

26. *E. livida* L.

1761. Linn. Fn. Suec. 1897. — 1822. Meig. Syst. Besch. III, 35, 36. — 1842. Zett. Dipt. Scand. I, 372, 4. — 1862. Schin. F. A. I, 104. — 1903. Kat. paläarkt. Dipt. II, 239. — *Empis lineata*: 1805. Fabr. Syst. Antl. 141, 19.

Male. Eyes contiguous; frontal triangle and epistoma grey. Occiput brownish grey with black bristles, the hairs below yellowish

white. Labrum about twice as long as the head is high, palpi yellow with short hairs. Antennæ as long as the head, black, the first joint twice as long as the second, the two first joints with short hairs. Thorax yellowish brown, with three narrow, velvet black stripes, abbreviated behind, the two lateral also in front; the humeri with a rufous point. The dorsocentral bristles uniserial, longer and strong behind, the acrostichal bristles shorter, biserial; all black. Further a humeral bristle, a posthumeral, three notopleural, a supraalar and a postalar bristle, all black; besides there are some bristly hairs on the humeri and around the posthumeral bristle, and some small hairs in the anterior part of the præsutural depression. Scutellum has a broad, yellow margin and four black bristles. Pleura greyish brown, metapleura with black bristles and some thin, yellow hairs; propleura with yellowish hairs; the spiracles brownish yellow. Abdomen brownish yellow, slightly shining, sometimes showing some ill-defined dark spots; it is clothed with short, black hairs, at the hind margins of the segments there are longer, black bristles. Venter similarly coloured and haired; towards the anterior margin of the first ventral segment there is in the middle an impression with longish hairs, but it is difficult to see in dried specimens. Exterior genitalia rather small, and in so far of a curious construction, as the upper lamellæ are much larger than the lower; each of the upper lamellæ is almost semiglobular, the two lamellæ together forming a globular knob; they have two small incisions in the hind margin between which a median tooth is formed; the lower lamellæ are small, much shorter than the upper, triangular and pointed. Penis is strongly curved, but generally hidden between the lamellæ, sometimes a little protruding above. The lower lamellæ and the eighth ventral segment have somewhat long, black hairs. Legs yellow, the very apex of the tibiæ and the tarsi except the base blackish; coxæ very slightly greyish pruinose. Femora chiefly short-haired, the hind femora with longer hairs towards the base, and short, bristly hairs below; the middle tibiæ with a dorsal and two ventral rows of strong bristles; hind tibiæ with two dorsal rows of bristles; besides the front and hind tibiæ finely ciliated below; the tarsi with somewhat numerous bristles, especially below. Wings somewhat brownish tinged. Veins dark brown, the lower branch of the cubital fork bending downwards and slightly recurved towards the apex, terminating about at the apex of the wing; the branches of the discal vein not reaching the margin but stopping just before it. Stigma faint. Halteres yellow.

Female. Frons somewhat broad, brownish, with an impressed middle line. The hairs on the thoracic disc and the bristles on ab-

domen shorter than in the male; abdomen brownish grey, with the light from behind darker; the lamellæ of the ovipositor somewhat long and slender. Front femora ciliated on the anterior side, the hairs in the basal half somewhat scaly; middle femora with fine hairs below, which are long in the apical half; hind femora ciliated below with somewhat scaly hairs; the posterior tibiæ with short but strong bristles on various sides; the middle tibiæ have ventrally near the base a very slight dilatation densely beset with short bristles. Wings quite hyaline.

Length 7 to about 10 mm.

E. livida is like *tessellata* very common in Denmark and has been taken in all parts of our country. It is seen during a great part of the summer, my dates reach from the last half of June to $\frac{1}{9}$. It occurs both in the outskirts of woods and outside, but it seems especially to prefer grassy fields, commons and meadows.

Geographical distribution:— Europe down into France; towards the north to middle Sweden, and in Finland.

27. *E. nigricans* Meig.

1804. Meig. Klass. eur. zweifl. Ins. I, 224, 14, et 1822. Syst. Besch. III, 34, 35. — 1903. Kat. paläarkt. Dipt. II, 240. — *Empis rustica*: 1815. Fall. Dipt. Suec. Empid. 18, 3. — 1842. Zett. Dipt. Scand. I, 371, 3. — 1862. Schin. F. A. I, 104.

Male. Eyes contiguous; frontal triangle and epistoma greyish brown. Occiput grey with black bristles, on the lower half with whitish yellow hairs. Labrum about twice as long as the head is high; palpi yellow, with yellow, at the apex with dark hairs. Antennæ as long as the head, black, the two first joints generally brownish or yellowish, with short, black hairs; the first joint about twice as long as the second. Thorax brownish, with three somewhat broad, blackish stripes, the median abbreviated behind. The dorso-central bristles irregularly biserial or pluriserial, long and uniserial behind, the acrostichal bristles biserial, all black. Further a humeral bristle, a posthumeral, a number (four to five) of notopleural, a supraalar and a postalar bristle, all black; besides there are some strong hairs on the humeri and at the sides of the disc, especially some in front of the supraalar bristle and these latter may be rather strong; in the anterior part of the præsutural depression there are some yellow hairs. Scutellum with four black marginal bristles. Pleura grey, metapleura with yellow, and sometimes some brown bristles; propleura with yellow hairs; the spiracles yellowish. Abdomen black or greyish black, shining. It is clothed in the middle

line with short, black hairs, at the sides with long, yellow hairs; there are no distinct bristles at the hind margin of the segments.

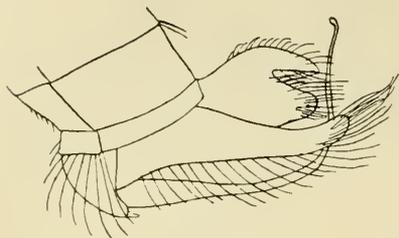


Fig. 44. *E. nigricans*, male genitalia.

Venter grey, dull, with yellow hairs.

Exterior genitalia large, the lower lamellæ long, elongated triangular and somewhat pointed; the upper lamellæ with a deep incision and thus divided into a lower, somewhat rounded lobe, and an upper, more dentiform lobe which is curved a little downwards. Penis ferruginous, thick at the base, going straight

about to the end of the lamellæ, but here curving upwards, and with a very fine apex. The lower margin of the lower lamellæ has long, yellow, towards the apex blackish hairs. The eighth ventral segment is arched, and there is a somewhat large ventral lamella. The two last abdominal segments are bent somewhat down, the genitalia thus being at a lower level than the abdomen. Legs yellow; coxæ very slightly pruinose; the apex of the femora black, the front femora above and the middle femora on the anterior side more or less darkened or blackened, the tibiæ towards the apex and the tarsi black. Middle femora with two rows of bristly hairs below; hind femora likewise with bristly hairs below, and on all sides towards the base; front tibiæ with some bristly hairs above, short ciliated on the posterior side, and with a short, fine pubescence below; middle tibiæ with two dorsal rows of bristles and a ciliation below, which is longest on the antero-ventral side; hind tibiæ with dorsal rows of bristles and a short ciliation ventrally; tarsi densely haired, with small bristles at the apex of the joints; the middle metatarsi and apex of the tibiæ with long hairs on the posterior side; the hind metatarsi with some bristles. The pubescence on the front tibiæ is continued out on the tarsi. All hairs and bristles black. Wings somewhat brownish tinged. Veins dark brown, the lower branch of the cubital fork bending downwards, terminating just before the apex of the wing. Stigma somewhat brownish. Halteres yellow.

Female. Frons broad, grey; abdomen more grey than in the male; ovipositor with somewhat long lamellæ. Legs short-haired, middle femora and posterior tibiæ with short bristles; all tarsi spinulose beneath; middle femora not darkened on the anterior side. Wings less tinged, more yellowish than in the male, especially towards the apex.

Length 8–10 mm.

E. nigricans is not common in Denmark and has only been taken a few times; Ordrup Mose, Ermelund, and on Funen; my dates are $\frac{3}{7}$ — $\frac{7}{8}$. Zetterstedt records it as frequenting the flowers of *Carduus*.

Geographical distribution: — Northern and middle Europe down into France; towards the north to middle Sweden.

28. *E. borealis* L.

1761. Linn. Fn. Suec. 1899. — 1822. Meig. Syst. Besch. III, 36, 37. — 1842. Zett. Dipt. Scand. I, 370, 2. — 1862. Schin. F. A. I, 105. — 1903. Kat. paläarkt. Dipt. II, 334.

Male. Eyes contiguous; frontal triangle and epistoma brownish grey. Occiput grey, with long, black, downwards brownish hairs. Labrum not, or scarcely twice as long as the head is high; palpi blackish, with long, black hairs. Antennæ long, longer than the head, black, first joint twice as long as the second, the third elongated, very slightly attenuated towards the apex; the style short; the two first joints with longish, black hairs. Thorax dark greyish brown, with four blackish brown stripes, the two median abbreviated behind, the two lateral generally less distinct and abbreviated at both ends. The dorsocentral hairs pluriserial, the acrostichal biserial, all long and fine, black; the dorsocentral hairs strong and a little longer behind; the sides of the disc with similar hairs, fused with the dorsocentral hairs. There are three or four notopleural bristles, a supraalar and a stronger and a weaker postalar bristle, all black, but there are no humeral or posthumeral bristles discernible between the long hairs. Scutellum has six black marginal bristles. Pleura grey, metapleura with black bristles; propleura with black hairs. Abdomen greyish brown, slightly shining, clothed above with short, at the sides with long, erect, black hairs, which are slightly stronger at the hind margins of the segments. Venter similarly coloured, with long, black hairs. Exterior genitalia large, and the apex of abdomen curiously shaped; the sixth dorsal segment arched and bending rectangularly down, the seventh segment a very narrow ring, the eighth somewhat broader; the lower lamellæ of a somewhat rectangular shape, the upper lamellæ

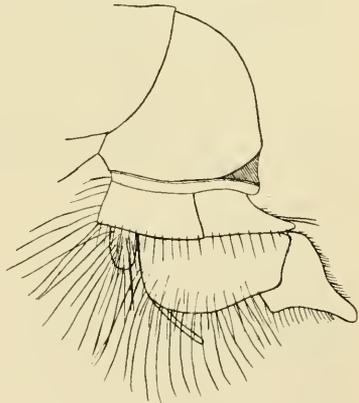


Fig. 45. *E. borealis*, male genitalia.

triangular, pointed, somewhat shining; they are directed straightly backwards; there is a somewhat large, triangular ventral lamella and at the apex of this a pair of long, thin styles. Quite hidden in the interior there is a curious, three-branched, reddish penis. The ventral and the lower lamellæ are long-haired, the upper lamellæ short-haired. On account of the bending of the sixth segment the genitalia lie at a lower level than abdomen. Legs black; coxæ greyish pruinose; the posterior femora except the apex and the hind tibiæ in the middle to a greater or less extent reddish, also the front femora generally more or less reddish at the base. Front femora with somewhat long, fine hairs below; middle femora with shorter, but stronger, bristly hairs below, and hind femora with short hairs and bristles; front and middle tibiæ densely haired with longish hairs and somewhat longer, bristly hairs above, and the former with a short, dense, pale pubescence, the latter with a short ciliation below; hind tibiæ with bristles above and short ciliated below; the posterior tarsi slightly spinulose below, and all tarsi with bristles at the apex of the joints; the hairs and bristles on the dorsal side of the tibiæ are continued in about the same way out on the metatarsi, and likewise the pubescence below the front tibiæ. All hairs and bristles black. Wings somewhat broad, strongly brownish tinged. Veins brown, the lower branch of the cubital fork bending distinctly downwards, slightly recurved at the apex and terminating just before the apex of the wing. Stigma dark brown. Halteres yellow.

Female. Frons broad, grey, with a median impression. Thorax and abdomen not shorter haired than in the male; the lamellæ of the ovipositor somewhat long. Legs somewhat more reddish than in the male; the posterior tibiæ reddish except the tip, the front tibiæ more or less reddish at the base. The legs haired about as in the male, but the anterior tibiæ not densely haired above, but only with bristles. Wings very broad with a broadly rounded apex, strongly brown tinged.

Length 6,5—7,5 mm.

E. borealis is not to be termed common in Denmark, and it has not been taken many times; Bagsværd, Tyvekrog, Grib Skov and in Jutland at Silkeborg, at the latter place in no small number. It is with us exclusively a spring species, my dates are only $5/5$ — $20/5$; I have taken it in copula on $12/5$. It occurs in woods. Fabricius and Zetterstedt record, that it hovers in the air towards evening; according to Zetterstedt it frequents the flowers of *Salix* and goes up in the mountains to where the region of *Salix* ends; he records it from $15/5$ — $1/8$.

Geographical distribution:— Northern and middle Europe down into France; towards the north to northernmost Scandinavia, and in Finland; it seems to be most common in the north.

29. *E. opaca* Meig.

1804. Meig. Klass. eur. zweifl. Ins. I, 226, 17. — 1858. Zett. Dipt. Scand. XII, 4608, nota. — 1862. Schin. F. A. I, 105. — 1903. Kat. paläarkt. Dipt. II, 241.

Male. Eyes not quite touching, and only for a short space, frontal triangle and epistoma greyish brown, the lower margin of the latter black, shining. Occiput grey, with black bristles, downwards with yellowish hairs. Labrum about twice as long as the head is high; palpi brown, with brownish, at the apex with black hairs. Antennæ long, longer than the head, black; first joint twice as long as the second, the third elongated; the two first with longish, black hairs. Thorax light brown, with four dark brown stripes, the two median abbreviated behind, the lateral abbreviated in front. The dorsocentral bristles of medium length, pluriserial, longer, somewhat strong and uniserial behind; the acrostichal bristles shorter, biserial; all black. Further a humeral bristle, three or four notopleural, a supraalar and a postalar bristle, all strong, black; besides there are short bristles on the humeri, small hairs in the anterior part of the præsutural depression and generally a second, weak postalar bristle, but there is no posthumeral bristle. Scutellum with six black marginal bristles. Pleura brownish, meta- and propleura with black bristles and below with some yellowish hairs. The spiracles yellowish. Abdomen black, somewhat shining, and with a slight bluish tint; the first segment, the front part of the second and the sixth and seventh segments grey pruinose, the sixth with a black, not pruinose triangle at the front margin; also the side margins of the segments somewhat pruinose. Venter greyish. Abdomen is clothed with short, black hairs; there are strong bristles on the sides at the hind margins of the segments; the second segment has longish, yellow hairs on the sides. Exterior genitalia not large, somewhat knob-like, but the eighth ventral segment large, forming an arched plate; the lower lamellæ are broad, directed upwards, with a straightly cut upper margin; they are curved towards each other with the hind margins; the upper lamellæ protrude between and above the lower, they have likewise an almost straight upper margin and a somewhat pointed apex, pointing backwards. Penis is thick, red, curved upwards and forwards, and with a median furrow. The genitalia are black, somewhat shining, with short hairs. Legs ferruginous; coxæ densely

brownish pruinose, trochanters, apex of femora and tibiæ, and the tarsi except the very base black or blackish. Femora with rows of short, strong bristles below; tibiæ with rows of similar bristles dorsally; tarsi somewhat spinulose beneath, and with bristles at the apex of the joints; front and hind tarsi with a short, dense, erect pubescence beneath, the middle tarsi with ordinary ciliation. All bristles black, and the legs for the rest black-haired. Wings somewhat brownish tinged. Vein brown; the lower branch of the cubital fork bent somewhat downwards, the apex curved very slightly upwards, terminating somewhat before the apex of the wing. Stigma very faint. Halteres pale yellow.

Female. Frons broad, brownish. Abdomen not pruinose on the sixth and seventh segment, but the grey side spots dilated inwards at the front margin of the segments, there is thus, besides the grey base of the abdomen, a narrow band at the front margin of the third segment, and more or less distinct lateral bands on the following segments. The lamellæ of the ovipositor short. Legs haired about as in the male; the hairs of the short ciliation on the postero-ventral side of the posterior femora may be slightly broadened, but the legs cannot at all be termed pennate.

Length 7—8 mm.

E. opaca is very rare in Denmark, only four specimens, a male and three females, have been caught, in 1906 and 1907, and all in Jutland; Ringkøbing (Th. Mortensen), Silkeborg (A. Petersen); the dates are $^{12}/_5$ and $^{1}/_6$.

Geographical distribution:— Europe down into Italy; its northern limit lies in Denmark, and it occurs also in England.

Remarks: Between the species of *Empis* s. str. this species points somewhat towards the subgenus *Polyblepharis* Bezzi.

6. **Hilara** Meig.

Species of small, at most of medium size, generally of dark, blackish, brownish or greyish colour, sometimes lighter grey or brown, and also sometimes yellow. The head is about as broad as or a little narrower than the thorax; it is about globular, but however shorter than high; it is somewhat arched behind and here more or less densely clothed with hairs, which may be somewhat bristly. The eyes are rather large; they are nearly always separated in both sexes with the frons of the same or almost the same breadth, but sometimes the frons in the male is to a higher or lower degree narrower than in the female; only very rarely (*flavipes* and *gracilipes*) the eyes are touching in the male. In the latter case the facets are in the

male larger above than below, but when the eyes are separated all facets are of equal size. The colour of the eyes is dark reddish or brownish. The usual incisure in the middle of the inner eye-margin is distinct and rather deep. The vertex bears three ocelli, and vertex and frons are short-haired, and the vertex has generally four bristles.



Fig. 46. Antenna of *H. maura*. $\times 70$.

The antennæ are inserted near to each other, about in the middle of the front side of the head; they are of the length of, or somewhat longer than the head; they consist of five joints, the two basal joints are short, the third elongated, conically tapering, and compressed, it tapers in such a way, that the upper margin is straight, but the lower oblique or slightly concave; the two last joints form a style, the basal joint of which is quite short, the second long and terminating in a small, bristle-shaped part. The basal joints of the antennæ have short bristles, the other joints are short-haired, the bristle-like end is bare¹. Epistoma is generally as broad as the frons, its lower margin slightly thickened. The jowls are very narrow and not descending below the eye-margin. The oral cone is small, but distinct, and allows the proboscis to be drawn considerably in. Clypeus consists of two chitinous lists, which are broad above where they meet the epistoma, and continue down on each side as narrow lists. Proboscis is short, from about as long as the head is high to somewhat shorter; it is directed downwards. Labrum is thick and strong, high at the base and three-pointed at the apex; it is semitubular and generally slightly curved with the convex side forwards. Hypopharynx is about as long as labrum, somewhat semitubular or canaliculated, dilated at the apex and pointed; it is curved like the labrum. The maxillæ have a short, blade-like lacinia, not much more than half as long as labrum; the maxillary palpi are somewhat large, one jointed, curved upwards and truncate at the apex; they have long hairs on the convex lower side and among these some, generally one or two, specially long hairs. Labium is in the natural position about of the length

¹ Mik (Wien. Ent. Zeitg. XIII, 1894, 280, footnote; Pl. II, Fig. 12) describes the antenna of *H. sartor* as six-jointed, counting the bristle-shaped terminal part as a joint; I have not been able to detect any division between this part and the second joint of the style, even by high magnifying power.

of labrum, but it has a long connecting membrane; the labella are relatively long, almost twice as long as the small basal part of labium, somewhat broad, and cleft to the base; they are somewhat hairy. Thorax is rectangular, somewhat arched above. Prothorax is small, but distinct, it has two curious, strong and straight bristles above, one on each side, and sometimes some hairs on the sides. Metathorax is very small, and I could find no chitinised metasternum. On the thoracic disc there are dorsocentral and acrostichal bristles; they are very short to medium long; generally the dorsocentral bristles are uniserial, the acrostichal bristles biserial or more or less regularly quadriserial; sometimes they are all pluriserial. Generally a humeral bristle, a posthumeral, one to three notopleural, a supraalar and a postalar bristle present, rarely some of them may be absent, but the notopleural bristles are always present. Scutellum has generally four, sometimes more marginal bristles. Metapleura are bare. Abdomen is more or less slender, especially in the males; it is cylindrical, or in the male it may be a little compressed, and in this sex it is not much narrowed towards the apex. It consists of eight segments; the first segment is short and a little broader than the following, the second is the longest. The male genitalia are very uniformly constructed and somewhat curious; the two last abdominal segments are much lower than the preceding, and as their dorsal side is hidden under the genitalia, it looks as if there were eight ventral, but only six dorsal segments; the eighth ventral segment is as a rule somewhat large. The genitalia are more or less, often strongly compressed with a sharp edge downwards or backwards; they consist of a pair of lamellæ, which at the end bear some small spines; they are directed forwards, and the spines are generally hidden under the sixth dorsal segment. Quite hidden between these lamellæ is found a pair of sinuous or angular, somewhat styliform pieces, at most the ends of them may be seen anteriorly between the lamellæ; I think the lamellæ are the lower and the inner pieces represent the upper lamellæ. Below the lamellæ lies a large, compressed piece with a more or less sharp edge, which is I think the ventral lamella; it terminates above with a slender process, which is curved forwards between the lamellæ. Penis is exceedingly thin, thread-like, curved upwards and forwards and quite hidden in or below the ventral lamella and between the lateral lamellæ. In the female the abdomen is more robust and suddenly pointed; the seventh and eighth segment are very narrow and often drawn back into the foregoing; after the eighth segment follows a very narrow ring, terminating with two thin styles. The legs are generally not specially long; in the male the

front metatarsus is in nearly all species more or less thickened, only in some few it is simple. The females have often the hind tibiae more or less compressed and curved. In some few (non-Danish) species the hind femora are in both sexes or only in the male thickened and suddenly narrowed at the apex. The legs are more or less hairy and have bristles to a higher or lower degree, different in the various species, and as a rule the legs are most bristly in the males; also apical or subapical spurs or bristles are generally present. There are two claws, two well developed pulvilli and a distinct,

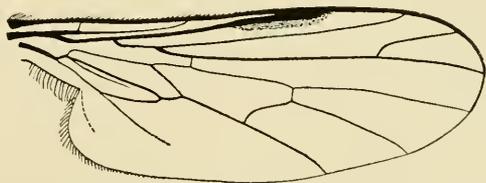


Fig. 47. Wing of *H. pubipes*.

linear, membranous empodium. Wings with the mediastinal vein bent at the apex and reaching the margin, the cubital vein forked, the upper branch somewhat long and not steep; there are thus two cubital cells; the discal vein branched, four posterior cells and the discal cell sending three veins to the margin, the lowermost is the upper branch of the postical vein, which closes the discal cell below; the lower branch of the postical vein recurrent, about parallel with the wing-margin, and the anal cell shorter than the second basal cell; the anal vein generally weak, sometimes reaching the margin, but generally abbreviated. Stigma present. Axillary lobe well developed. Alula not or almost not developed, fringed at the margin. The alar squamula roundish, and likewise fringed at the margin.

Of the developmental stages I have only examined a pupal skin of *H. niveipennis* Zett., but Beling (Arch. für Naturgesch. 48, 1, 1882, 218—221) describes larvæ and pupæ of *H. interstincta* Fall., *pilosa* Zett., *maura* Fabr., *quadrivittata* Meig., *flavipes* Meig. and *matrona* Hal., and (Verh. zool. bot. Gesell. Wien, XXXVIII, 1888, 2) *H. quadrivittata* Meig. again, and Brauer (Denkschr. d. Akad. d. Wissenschaft. Wien, math. nat. Cl. XLVII, 1883, 65, Taf. IV, Fig. 77—79) describes the larva of *H. lurida* Fall. The body of the larva consists of twelve segments, the head included; it is cylindrical, white or yellowish; the head is small; the last segment is somewhat globular with a membranous, somewhat large, triangular tooth or wart; above it lie the terminal spiracles; the anterior spiracles lie at the front end of the

prothoracic segment, the larva is thus amphipneustic. On the ventral side of most abdominal segments there are small, transverse swellings (Kriechschwielien). The pupa is pale yellowish to brownish; it has two processes or teeth in front, at the bases of the diverging antennal sheaths, and four long hairs; thorax has some similar hairs above and below. The pupa of *H. niveipennis* has besides the two teeth mentioned further two triangular teeth below the head, inwards to the apices of the antennal sheaths; each of these teeth has a hair standing close to it; the same two teeth or processes are found also in the pupa of *H. pilosa* and *matrona* according to Beling, but are not mentioned for the other species. The abdominal segments have each above a transverse row of strong, short bristles or teeth of unequal length and with some long hairs intermingled; on the sides and below there are long hairs.

The larvæ live in humous earth on humid places in woods, and may be taken in mole-casts, further among decaying leaves and in decaying wood (Brauer took the larva of *lurida* in a decaying poplar); they are certainly carnivorous. The pupæ are found in the same places as the larvæ. The larvæ hibernate, and the transformation to pupa and final development take place in the following spring or summer.

The species of *Hilara* are easily known by the almost always thickened front metarsi in the male and by the long upper branch of the cubital vein. They occur both in and near woods and on fields and commons, especially near water. They are often seen in great numbers flying low above the surface of ponds, pools and ditches; some species are flying higher, below the trees in woods; it is generally only the males which fly in this way, but pairs in copula may, however, also be seen. They are also seen in the evening flying more singly somewhat high in the air, and then generally in copula. They are carnivorous, feeding on other Insects, especially small Diptera. I have taken *H. pubipes* with a *Tachydromia* and with a small *Chironomus* as prey, *H. maura* with Chironomids, small Tipulids, small beetles, a *Myrmica*, a Podurid and several other forms, and *H. interstincta* with Chironomids as prey. Poulton mentions in the work cited above only one undetermined *Hilara* with *Chironomus riparius* M. as prey. Girschner (Entom. Nachricht. XV, 1889, 221) mentions small beetles and Aphids as prey for *H. maura* and *interstincta*, and also the latter with the former as prey. Mik (Wien. ent. Zeitg. XI, 1892, 80) records small Phryganids and a *Psocus* as prey for *H. æronetha*, and the same author mentions (ibid. XIII, 1894, 283) *Simulium reptans* L., *Ptilonota centralis* F., a Cecidomyid and a small

Empid as prey for *H. pruinosa* M. Howlett (Entom. Month. Mag. XLIII, 1907, 231) mentions *Simulium latipes* M. and small Chironomids as prey for *H. maura*. The species have never been taken with prey except when flying in the air, and when a pair in copula is taken, they seem always to have a prey with them, and the facts with regard to this phenomenon are somewhat curious. For several species it has been observed, that when they are taken with a prey, this latter is enveloped in a little web; this was first recorded by Girschner (Entom. Nachricht. XV, 1889, 221) for *H. maura* and *interstincta*, and later by Mik (l. c.) for *H. æronetha* and *pruinosa*. Howlett (l. c.) mentions it with regard to *H. maura*. I have myself made the same observation with regard to *H. pubipes*. I observed this species at Tisvilde in July 1909; in the evening the species was seen sitting on the white wall of the hotel, and each had a small *Chironomus* in the mouth; (as remarked above the species of *Hilara* have elsewhere only been taken with prey when flying); when the fly was caught or frightened, so that it flew away, the prey was left on the wall, and by examining it I found it enveloped in a small web, apparently consisting of only a few threads; the specimens of the *Hilara* were all males. The species was also taken flying in the evening high in the air in copula and with prey. Thus five species: *H. maura*, *interstincta*, *pubipes*, *æronetha* and *pruinosa* are now known to make these webs. From the various observations it is clear, that it is only the males which make the web, that this is produced from the mouth, and that it is used to envelop the prey in; it is probable that more or all *Hilara* species produce such a web. The prey seems always to be caught in the air, and this seems again to be in connection with the copulation, the male probably attracting the females with the food, the facts thus being similar to what is recorded above under *Empis*.

Besides the mentioned five species still another species, *H. sartor* Beck., makes a web, but this is much larger, and the males are seen flying with it. *H. sartor* and its web has given rise to a whole literature (by Osten Sacken, Becker, Mik, Girschner, Verhoeff, Handlirsch), in which very different opinions as to the origin of the web, its use and the way in which it is carried are advanced (see Mik, Wien. ent. Zeitg. XIII, 1894, 273). It seems to me somewhat probable, that the web may be of the same nature and origin, and chiefly of the same use as the webs in the other species, perhaps at the same time acting as a means of enticement for the females, but I can otherwise say nothing about it, and in comparison with the curious

balloon, mentioned above under *Empis*, it is also possible, that we have here to do with a particular structure.

The genus comprises about 110 species from the palæarctic region; 26 have hitherto been found in Denmark; of these three are here described as new, the total number of palæarctic species thus increasing to about 113.

Table of Species.

1. Legs quite black or blackish brown, sometimes greyish pruinose (with or without lighter knees).....	2.	
— Legs not quite black or blackish brown, either yellow, or at all events the front legs more or less yellow....	21.	
2. Halteres dark or black.....	3.	
— Halteres yellow.....	15.	
3. Dorsocentral and acrostichal bristles very short, pluriserial; scutellar bristles 6—10; abdomen and legs yellow-haired.....	10.	<i>maura.</i>
— Dorsocentral bristles uniserial, at most a little irregularly biserial; abdomen and legs dark-haired.....	4.	
4. Acrostichal bristles quadriserial or tri- to quadriserial....	5.	
— Acrostichal bristles biserial.....	9.	
5. Scutellar bristles 6—8.....	11.	<i>interstincta.</i>
— Scutellar bristles 4.....	6.	
6. Thorax and abdomen black, shining.....	7.	
— Thorax and abdomen dull black, or thorax blackish brown, abdomen slightly shining.....	8.	
7. Dorsocentral and acrostichal bristles not very short, the former long behind, the latter not distinctly quadriserial in front; discal cell not specially long; hind tibiæ in the female simple.....	1.	<i>cornicula.</i>
— Dorsocentral and acrostichal bristles very short, the former not long behind, the latter quite quadriserial; discal cell rather long; hind tibiæ in the female thickened in the apical half.....	4.	<i>discoidalis.</i>
8. Thorax black, thoracic bristles rather long; abdomen dull; wings generally blackish; hind tibiæ in the female very broad and curved.....	8.	<i>nigrina.</i>
— Thorax blackish brown; abdomen a little shining; wings not blackish; hind tibiæ in the female less broad and less curved.....	5.	<i>quadrifaria.</i>
9. Discal cell unusually long and attenuated outwards; front metatarsi in the male simple.....	26.	<i>minuta.</i>
— Discal cell of common shape; front metatarsi in the male thickened.....	10.	
10. Thorax dark brown with four more or less distinct stripes.....	17.	<i>bistriata.</i>
— Thorax not with four stripes.....	11.	
11. Thorax much shining, abdomen quite dull; front metatarsi in the male somewhat quadratic.....	6.	<i>chorica.</i>

- Thorax less shining, abdomen not quite dull; front metatarsi in the male not quadratic 12.
12. Dorsocentral bristles not long behind, those and the acrostichal bristles on the whole very short 3. *clypeata*.
- Dorsocentral bristles long behind, thoracic bristles longer . . . 13.
13. Thorax and abdomen rather shining; wings strongly blackish brown; hind tibiae in the female simple . . . 2. *coracula*.
- Thorax and abdomen slightly shining; wings not strongly tinged; hind tibiae in the female more or less broad and curved 14.
14. All legs somewhat short; exterior genitalia in the male not large; front metatarsi only with a single bristle; hind tibiae in the female slightly broad and curved 9. *bivittata*.
- All legs more slender; exterior genitalia in the male large; front metatarsi with some bristles above; hind tibiae in the female distinctly broad and curved . . . 7. *pseudochorica*.
15. Thorax light grey; wings milk-white 19. *niveipennis*.
- Thorax grey or brown with four distinct stripes, or dark brown with indistinct stripes or with one broad stripe; wings not milk-white 16.
16. Thorax dark brown with four indistinct stripes, or dark grey with one broad stripe; front tibiae in the male with more or less long bristles; hind tibiae in the female simple 17.
- Thorax light grey or brown with four distinct stripes; front tibiae in the male not with long bristles; hind tibiae in the female more or less compressed and curved 18.
17. Thorax dark grey with one broad stripe; acrostichal bristles quadriserial; front metatarsi in the male not much thickened, shorter than tibiae 12. *aëronetha*.
- Thorax dark brown with four indistinct stripes; acrostichal bristles biserial; front metatarsi very thick, as long as tibiae 18. *pilipes*.
18. Thorax grey; acrostichal bristles quadriserial or trito quadriserial 19.
- Thorax brownish; acrostichal bristles biserial; occiput greyish brown 14. *quadrivittata*.
19. Occiput quite grey; middle femora and tibiae in the male with long hairs on the anterior side 13. *pupipes*.
- Occiput more or less black, not quite grey; middle legs in the male without long hairs 20.
20. Occiput black above, grey below; the lateral stripes on thorax very near to the median pair 15. *Beckeri*.
- Occiput black with a grey triangle above; the lateral stripes on thorax less near to the median pair . . . 16. *carinthiaca*.
21. Legs, except the tarsi, quite yellow 22.
- Posterior legs more or less brownish or blackish; halteres dark 25.

22. Acrostichal bristles more than biserial; front metatarsi in the male thickened..... 23.
 — Acrostichal bristles biserial; front metatarsi in the male simple..... 24.
 23. Thorax grey; halteres yellow..... 21. *gallica*.
 — Thorax blackish grey; halteres with yellow peduncle and dark knob 22. *lurida*.
 24. Thorax grey with two stripes; halteres yellow; eyes in the male narrowly separated..... 24. *cingulata*.
 — Thorax black, shining; halteres dark (or yellow in the female); eyes in the male contiguous..... 25. *flavipes*.
 25. Thorax grey, with one stripe or unstriped; acrostichal bristles quadriserial..... 20. *litorea*.
 — Thorax blackish brown; acrostichal bristles biserial. 23. *lasiopyga*.

In the table I have placed *H. æronetha* in the group with yellow halteres; according to Mik and Strobl this species may vary with dark halteres.

1. *H. cornicula* Loew.

1873. Loew, Berl. ent. Zeitschr. XVII, 42, 31. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 105, 1. — 1903. Kat. paläarkt. Dipt. II, 250.

Male. Vertex and frons velvet black, the latter shining in the middle; epistoma more greyish; palpi brownish with brown hairs. Occiput dull black, with blackish, downwards with pale hairs. Antennæ black. Thorax black, shining. The dorsocentral and acrostichal bristles of some length, black or blackish, the former uniserial, and long behind, the latter quadriserial but just in front bi- to triserial. Further a humeral bristle, a posthumeral, about three notopleural, a supraalar and a postalar bristle, all black. Scutellum with four black marginal bristles, the inner strongest. Pleura grey pruinose. Abdomen black, shining, with black hairs; at the hind margin of the segments longer, bristly hairs. Venter similarly coloured and haired. Exterior genitalia somewhat large, compressed, with a little longer hairs above. Legs black or blackish; coxæ grey pruinose. The femora, especially the hind femora, with fine hairs above and below; middle femora with some longer, more bristly hairs on the anterior side; front tibiæ with fine hairs and some slightly longer hairs on the dorsal side; hind tibiæ with two rows of bristly hairs on the dorsal and anterior side. Front metatarsi somewhat thicker than the end of tibiæ, slightly shorter, about three fourths or more of the length of tibiæ, and nearly as long as the four following joints, generally with one or two bristly



Fig. 48. *H. cornicula*, front leg.
 × 30.

hairs on the dorsal side. The hairs and bristles black or brownish. Wings slightly light brownish tinged. Veins lighter or darker brown; the upper branch of the cubital vein nearly rectangular at its origin, and not much diverging. Stigma brown. Halteres blackish.

Female. Quite similar to the male; the bristles on thorax not shorter. Front metatarsi simple, about half as long as tibiæ, and as long as the three following joints; the whole tarsus a little longer than tibia; hind tibiæ simple.

Length 3—3,5 mm.

Immature and old museum specimens have often lighter legs, and also abdomen may be somewhat brownish, especially at the base.

H. cornicula seems to be rare in Denmark as it has been taken only one time, ^{29/5} 1844 in Lersøen (Stæger); it was present in some numbers.

Geographical distribution:— Europe down into Italy; it occurs in England but is not known north of Denmark. (See however geographical distribution under *H. clypeata*).

2. *H. coracula* n. sp.

Male. Vertex and frons velvet black, the latter with a little brownish triangle above the antennæ; epistoma blackish; palpi dark with black hairs. Occiput black or greyish black, with black hairs. Antennæ black. Thorax black, shining. The dorsocentral and acrostichal bristles of some length, black; the former uniserial, long behind, the latter biserial. Further a humeral bristle, a posthumeral, three notopleural, a supraalar and a postalar bristle, all black. Scutellum has four black marginal bristles. Pleura greyish pruinose. Abdomen black, somewhat shining, with black or brownish black hairs and somewhat longer, bristly hairs at the hind margin of the segments. Venter similarly coloured, short-haired. The exterior genitalia rather large, strongly compressed, the ventral piece (ventral lamella) longer than in *cornicula*. Legs black or brownish black; coxæ slightly greyish pruinose. Femora with fine hairs above and below, they are somewhat long below the hind femora; the middle femora with a few bristly hairs on the anterior side; front tibiæ with fine hairs and some slightly longer bristles on the dorsal side, longest at the apex; hind tibiæ with two rows of somewhat long bristles on the dorsal and anterior side. Front metatarsi of a shape as in *cornicula*, a little thicker than the end of tibiæ, slightly shorter than the tibiæ, and about as long as the other four joints; they are short-haired, with some longer hairs above towards the apex. The hairs and bristles brown. Wings strongly blackish brown tinged. Veins

brown; the upper branch of the cubital vein somewhat diverging. Stigma brown. Halteres brownish black.

Female. Similar to the male; the bristles on thorax of the same length. Front metatarsi simple, not half as long as tibiæ and shorter than the four following joints, the whole tarsus about as long as the tibia; hind tibiæ simple.

Length 2,8 to fully 3 mm.

This species is similar to *cornicula*, but distinguished by the biserial acrostichal bristles and the strongly tinged wings.

H. coracula is very rare in Denmark, only two specimens, a male and a female have been taken, on Falster at Resle on ²⁸/₅ 1882 (H. J. Hansen).

Geographical distribution:— The species is only known from Denmark.

3. *H. clypeata* Meig.

1822. Meig. Syst. Besch. III, 4, 4. — 1842. Zett. Dipt. Scand. I, 356, 27. — 1862. Schin. F. A. I, 114. — 1892. Strobl, Verh. zool. bot. Gesell. XLII, 106, 2. — 1903. Kat. paläarkt. Dipt. II, 250.

Male. Vertex and frons velvet black; epistoma dark; palpi black, with blackish hairs. Occiput velvet black, with blackish hairs. Antennæ black. Thorax black, shining, with a very slight brownish pruinosity, which forms two scarcely discernible stripes on the interstitia between the hairs. The dorsocentral bristles irregularly biserial, the acrostichal bristles biserial, all very short, black; the dorsocentral bristles not longer behind. There are some small hairs on the sides of the disc, but of stronger bristles only two notopleural are discernible.

Pleura dark grey. Scutellum with four bristles, the inner the strongest. Abdomen black, shining, very slightly greyish; it has very short hairs and no bristles at the hind margin of the segments. Venter coloured and haired in the same way. Exterior genitalia compressed, with short hairs above. Legs black, coxæ greyish pruinose. The legs are short-haired with black or brownish black hairs; the middle femora with some bristly hairs on the anterior side; the hind femora with fine hairs above and below; all tibiæ short-haired, the hind tibiæ most distinctly.

Front metatarsi thickened, somewhat ovate, about twice as broad as the end of the tibiæ, a little shorter than tibiæ and about as long as the four following joints; the second and third

joint on the front tarsi very slightly, on the posterior tarsi distinctly longer than broad. Wings hyaline, or at most slightly greyish. Veins

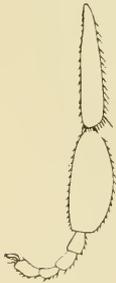


Fig. 49. *H. clypeata*, front leg. $\times 30$.

black or blackish brown; the upper branch of the cubital vein originating with an acute angle, and diverging. Stigma brownish. Halteres black or blackish.

Female. Quite similar to the male; the dorsocentral and acrostichal bristles of the same length as in this; front metatarsi simple, half as long as tibiæ, and as long as the three following joints; hind tibiæ simple.

Length 3—3,5 mm.

This species is easily known from the two preceding by the short dorsocentral and acrostichal bristles, and by the former not being long behind. It must be very like *pinetorum* Zett., but this species seems to be smaller and to have the middle tarsal joints shorter than broad. — My specimens of the present species belong to the var. *brevifurca* Strobl (l. c.). — I am somewhat inclined to think, that *clypeata* Zett. may be *cornicula*, as the author speaks of the distinct pilosity of thorax, and as he mentions the species from Denmark, sent by Stæger; in the collection in our museum *cornicula* was found determined by Stæger as *clypeata*, while *clypeata* was not present in the collection.

H. clypeata is rare in Denmark, only four specimens have been taken; Amager (the author) and at Frederikshavn and on Læsø (H. J. Hansen); the dates are from ²⁰/₆ to the first half of July.

Geographical distribution: — The species seems to be widely distributed, from southern Sweden down to South Africa. If *clypeata* Zett. is identical with *cornicula* the present species is not known north of Denmark.

4. *H. discoidalis* n. sp.

Male. Vertex and frons velvet black; above the antennæ a small triangle, which is black, but not velvet; epistoma black; palpi black and black-haired. Occiput velvet black, with black hairs. Antennæ black. Thorax black, shining. The dorsocentral and acrostichal bristles exceedingly short, black; the former uniserial, backwards irregularly biserial, not longer behind, the latter quadriserial. There are two notopleural bristles, a supraalar and a postalar bristle, all black, but I could detect no humeral or posthumeral bristles. Scutellum with four black marginal bristles. Pleura somewhat greyish pruinose. Abdomen black, shining, clothed with very short hairs, which are a little longer on the two first segments, they are here pale yellow, but darker to brownish on the rest of abdomen; there are no longer hairs at the hind margin of the segments. Venter similarly coloured and haired. Exterior genitalia moderately large, somewhat dull, the



Fig. 50. *H. discoidalis*,
front leg.
× 30.

lamellæ shining. Legs black or blackish; coxæ greyish pruinose; the knees somewhat broadly yellow. Femora short-haired, the hairs slightly longer above on the front and hind femora; middle femora with some few bristles basally on the anterior side; front tibiæ short-haired, only with a pair of small bristles at the apex; hind tibiæ only with a row of small bristles on the dorsal side and with fine hairs on the ventral side. Front metatarsi somewhat thicker than the end of the tibiæ, about two thirds of the tibiæ in length, and as long as the four following joints together; they are short-haired. All the hairs more or less dark brown. The fourth joint on the anterior tarsi is as broad as long, the other joints longer. Wings hyaline. Veins black; the upper branch of the cubital vein diverging; the discal cell exceptionally long, its upper margin longer than the upper of the veins issuing from it. Stigma long, blackish. Halteres black.

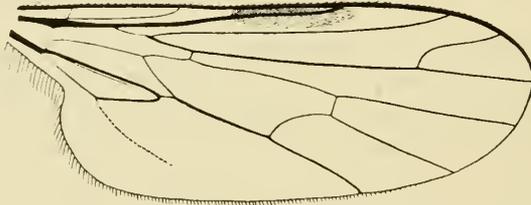


Fig. 51. Wing of *H. discoidalis*.

Female. Similar to the male; front metatarsi simple, not quite half as long as tibiæ, and shorter than the four following joints; hind tibiæ evenly but considerably thickened in somewhat more than the apical half; they are not compressed but very slightly curved.

Length 2,8 to fully 3,5 mm.

This species is distinguished from *cornicula* by the very short, quite quadriserial acrostichal bristles, and from *coracula* by the same character and the hyaline wings; it resembles *clypeata* by the short thoracic bristles, but the latter species has biserial acrostichal bristles; the most distinguishing character is the length of the discal cell, this being longer than in any other species known to me, except *minuta*.

H. discoidalis seems very rare in Denmark; it was first taken in this year (1910), and only three specimens, a male and two females, on a humid meadow at Hald near Viborg in Jutland, on $25/6$ and $27/6$ (the author).

Geographical distribution:— The species is only known from Denmark.

5. *H. quadrifaria* Strobl.

1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 116, 9. — 1903. Kat paläarkt. Dipt. II, 255.

Male. Vertex and frons velvet black; epistoma black; palpi blackish, with long, black hairs. Occiput velvet black, with black, downwards brownish hairs. Antennæ black. Thorax slightly shining, dirty blackish brown, generally with two narrow, very faint, lighter stripes. The dorsocentral and acrostichal bristles somewhat long, black; the former uniserial, longer behind, the latter distinctly quadriserial, those in the inner rows slightly longer than the outer. Further a humeral bristle, a posthumeral, about three notopleural, a supraalar and a postalar bristle, all black. Pleura grey pruinose. Scutellum with four black marginal bristles. Abdomen black, somewhat greyish pruinose and slightly shining, almost dull; it has short, black hairs, and longer, bristly hairs at the hind margin of the segments. Venter quite grey, dull, short-haired. Exterior genitalia somewhat large, compressed, the lamellæ incised at the end and thus divided into a broader, outer, and a narrower, inner process. Legs black; coxæ greyish pruinose. The front femora have long hairs on the postero-dorsal side, the middle femora about five long bristles on the anterior side, and the hind femora long hairs above and still longer and more bristly hairs below; the front tibiæ have some bristly hairs above, the middle tibiæ on the various sides, and the hind tibiæ are ciliated above and below, and have bristles on the dorsal and anterior side. Front metatarsi thick, cylindrical, not twice as thick as the end of tibiæ and about three fourths of it in length and almost as long as the four following joints; they are somewhat short-haired, the hairs below rather strong. The hairs and bristles black or brownish black. Wings hyaline or slightly greyish. Veins black; the upper branch of the cubital vein nearly rectangular at its origin, the curve somewhat angular, and the branch slightly diverging. Stigma distinct, blackish brown. Halteres black.

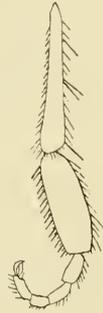


Fig. 52. *H. quadrifaria*, front leg. $\times 30$.

Female. Quite similar to the male; the thoracic bristles somewhat shorter. The hind tibiæ thickened towards the end and curved somewhat inwards. Front metatarsi simple, about half as long as tibiæ and as long as the three following joints.

Length 2,8—3,5 mm.

H. quadrifaria is common in Denmark; it is however not known from earlier time, and was not present in Stæger's collection; it was for the first time taken in 1881. Utterslev Mose, Amager, Præste-

vangen at Hillerød and at Boserup; in Jutland at Holstebro, Thisted and Frederikshavn, and on Bornholm at Rønne. My dates are $13/6$ — $10/8$. I took most of my specimens on the common on Amager, where they were flying over small water-pools.

Geographical distribution: — Europe down into Spain; the species is not known north of Denmark, and is not recorded from England.

6. *H. chorica* Fall.

1815. Fall. Dipt. Suec. Empid. 24, 18 (*Empis*). — 1822. Meig. Syst. Besch. III, 4, 3. — 1842. Zett. Dipt. Scand. I, 357, 28. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 108, 3. — 1903. Kat. paläarkt. Dipt. II, 249.

Male. Vertex and frons velvet black, the latter with a shining point above the antennæ; epistoma greyish black; palpi blackish, with long, black hairs. Occiput velvet black, with black hairs. Antennæ black. Thorax black, shining. The dorsocentral bristles uniserial, the acrostichal bristles biserial, all black; the former a little longer than the latter, and the hindmost of them long. Further a humeral bristle, a posthumeral, about three notopleural, a supraalar and a postalar bristle, all black. Pleura somewhat light grey. Scutellum with four black marginal bristles, the inner longest. Abdomen velvet black with black hairs, those at the hind margin of the segments somewhat longer. Venter grey, short-haired. Exterior genitalia compressed, with longish hairs at the sides; the lamellæ shining. Legs black; coxæ greyish pruinose; front legs short and robust. Front femora with fine hairs above and below; middle femora with some



Fig. 53.
H. chorica,
front leg.
× 30.

bristles on the anterior side; hind femora with long, fine hairs above and below; front tibiæ ciliated above and below, and with some bristles above, of which the two apical are long; middle tibiæ with some bristles; hind tibiæ ciliated and with some bristles above and below. Front tibiæ somewhat thickened towards the apex, metatarsi broad and compressed, rectangular or nearly quadratic, somewhat more than half as long as the tibiæ; they are densely, somewhat longish pubescent on the posterior side and have one or two bristles above towards the apex; the three following joints are very short, much broader than long; also on the posterior tarsi the middle joints are short, the third and fourth broader than long on the middle tarsi

and as long as broad on the hind tarsi. The hairs and bristles black or brownish black. Wings a little brownish tinged. Veins chiefly black or dark brown; the upper branch of the cubital vein originating

with an acute angle, and somewhat diverging; the anal vein continued to, or almost to the margin. Stigma black. Halteres black.

Female. Quite similar to the male. The bristles on the dorsal side of the front tibiæ shorter; metatarsi simple, but short, about one fourth part of the tibiæ in length, and scarcely as long as the three following joints, which are shorter than broad; hind tibiæ somewhat compressed and slightly curved in the middle.

Length 2,2—3 mm.

This species is easily recognised by the characteristic shape of the front metatarsi in the male, and the female agrees so fully with the male, that it also is easily recognised, and besides its hind tibiæ are characteristic. Strobl says (l. c.) about the front metatarsus in the male "fast so lang, als die Schiene", I find it considerably shorter.

H. chorica is common in Denmark; at Vedbæk; on Fænø; in Jutland at Laven and Sminge near Silkeborg, Holstebro, Hald near Viborg, Gjerlev near Randers Fjord, Tinbæk Mølle at Lindenberg Aa near Skørping, Sæby, Frederikshavn and Jerup near Frederikshavn; finally on Bornholm at Hasle, Allinge and Rø. It has been taken from ²⁴/₆ to the middle of August.

Geographical distribution:— Northern and middle Europe down into France; towards the north to Lapland, and in Finland.

7. *H. pseudochorica* Strobl.

1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 109, 4. — 1903. Kat. paläarkt. Dipt. II, 225.

Male. Vertex and frons velvet black; epistoma black; palpi dark or blackish, with dark hairs, between which only one long. Occiput velvet black, with black hairs. Antennæ black. Thorax black, somewhat fatty shining. The dorsocentral and acrostichal bristles somewhat long, black; the former uniserial, longer behind, the latter biserial. Further a humeral bristle, a posthumeral, two or three notopleural, a supraalar and a postalar bristle, all black. Pleura dark, slightly greyish. Scutellum with four black marginal bristles, the inner longest. Abdomen black, slightly shining, with black hairs and fine marginal bristles on the segments. Venter greyish black, short-haired. Exterior genitalia large, much compressed, distinctly haired with somewhat longish hairs. Legs black or brownish black; coxæ slightly pruinose. Front femora with fine hairs on the posterior side; middle femora with bristly hairs on the anterior side; hind femora with short hairs above, long hairs below; front tibiæ with fine hairs and some longer bristles on the dorsal side; hind tibiæ



Fig. 54.
H. pseudo-
chorica,
front leg.
× 30.

with fine hairs and with very fine bristles on the dorsal and anterior side. Front tibiæ only slightly thickened towards the apex, metatarsi somewhat thickened and a little compressed, straight or slightly concave below, somewhat arched above, with longish hairs and some longer, bristly hairs above; they are about two thirds of the tibiæ, and fully as long as the four following joints; the second to fourth joints are broader than long, the other tarsal joints longer than broad, the fourth joint on the middle tarsi as long as broad. The hairs and bristles are brownish to blackish. Wings yellowish or slightly brownish tinged, most towards the anterior margin. Veins brown; the upper branch of the cubital vein somewhat diverging, not curved at the apex. Stigma brownish. Halteres black.

Female. Similar to the male. Legs with shorter bristles; front metatarsi simple, scarcely half as long as tibiæ and as long as the three following joints; hind tibiæ distinctly compressed and somewhat curved in the middle.

Length 2,5 mm.

This species is easily distinguished from *chorica* by the shape of the front metatarsi and exterior genitalia in the male, and in both sexes by the less shining thorax.

H. pseudochorica seems very rare in Denmark, only four specimens have been taken at Frederikshavn in July 1881 (H. J. Hansen).

Geographical distribution: — Strobl records the species from Austria and Carinthia, its northern limit lies thus in Denmark.

8. *H. nigrina* Fall.

1815. Fall. Dipt. Suec. Empid. 24, 19 (*Empis*). — 1822. Meig. Syst. Besch. III, 4, 5, Taf. XXII, Fig. 5. — 1842. Zett. Dipt. Scand. I, 354, 24. — 1862. Schin. F. A. I, 115. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 111, 5 b. — 1903. Kat. paläarkt. Dipt. II, 253.

Male. Vertex and frons dull black; epistoma grey; palpi greyish black, with long, blackish hairs. Occiput grey or dull black, according to the direction in which it is seen; it has blackish hairs. Antennæ black, the style somewhat long. Thorax black, slightly shining. The dorsocentral and acrostichal bristles somewhat long, black; the former uniserial, longer behind, the latter quadriserial. Further a humeral bristle, a posthumeral, three notopleural, a supraalar and a postalar bristle, the two latter specially long, all black. Pleura grey. Scutellum with four black marginal bristles, the inner longest. Abdomen black, rather dull, clothed with black hairs, and with somewhat long bristles

at the hind margin of the segments. Venter grey, short-haired. Exterior genitalia somewhat large, compressed; the lamellæ somewhat long-pointed. Legs black; coxæ greyish pruinose. Front femora with fine hairs above and below, and on the posterior side; middle femora with bristles on the anterior side; hind femora with fine hairs, and with bristly hairs on the antero-ventral side, which latter are long towards the apex; front tibiæ with fine hairs and some longer, bristly hairs above, longest at the apex; middle tibiæ with bristles on the various sides; hind tibiæ ciliated and with bristles on the dorsal and anterior side. Front metatarsi thickened, somewhat thicker than tibiæ; they are short-haired, longest above, and a little longer towards the apex, below they have some distantly placed, longer, very fine hairs; they are about three fourths of the tibiæ in length and nearly as long as the four following joints, which are longer than broad; the whole tarsus is longer than tibiæ. The hairs and bristles black or blackish. Wings somewhat blackish tinged. Veins blackish; the upper branch of the cubital vein not much diverging; anal vein continued to the margin. Stigma blackish brown. Halteres black.



Fig. 55. *H. nigrina*, front leg. $\times 30$.

Female. Similar to the male; the thoracic bristles about of the same length or slightly shorter. Front metatarsi simple, scarcely half as long as the tibiæ and as long as the three following joints; hind tibiæ with the basal third part thin, then strongly dilated, compressed and curved, and again a little narrowed towards the apex.

Length 3.5 towards 4 mm.

This species resembles *quadrifaria*, but it has a blacker and a little more shining thorax, longer thoracic bristles and darker wings with a complete anal vein; the female is easily known by the shape of the hind tibiæ.

H. nigrina seems not to be common in Denmark; Ordrup Mose (Stæger), and in Jutland at Hald near Viborg (the author); the dates are $^{24}/_6$ — $^{17}/_8$. I took my specimens towards the evening flying low over a rapidly flowing brook. — Immature specimens may have the legs light brown, and the wings rather slightly tinged.

Geographical distribution: — Europe down into Italy; towards the north to southern Sweden, and in Finland.

9. *H. bivittata* Strobl.

1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 113, 7. — 1903. Kat. paläarkt. Dipt. II, 249.

Male. Vertex and frons velvet black; epistoma blackish grey; palpi greyish black, with black hairs. Occiput velvet black, the hairs blackish. Antennæ black. Thorax black, slightly, somewhat fatty shining; between the dorsocentral and acrostichal bristles there is on each side a more shining, and generally somewhat greyish, narrow stripe. The dorsocentral and acrostichal bristles rather short, black; the former uniserial, slightly longer behind, the latter biserial. Further a humeral bristle, a posthumeral, about three notopleural, a supraalar and a postalar bristle, all black and not long. Pleura dark grey. Scutellum with four black marginal bristles, the inner longest. Abdomen greyish black, a little shining, short-haired, with a little longer, bristly hairs at the hind margin of the segments; the hairs black. Venter grey, short-haired. Exterior genitalia somewhat compressed, a little haired on the sides; the lamellæ short. Legs black; coxæ greyish pruinose; knees yellowish. Front legs short, and the legs upon the whole somewhat short. Front femora with fine hairs above and below; middle femora with somewhat short, bristly hairs on the antero-ventral side; hind femora with fine hairs above and below; front tibiæ with fine, short hairs above and a few bristly hairs, generally one above the



Fig. 56. *H. bivittata*,
front leg.
× 30.

middle and two at the apex; middle tibiæ only with inconspicuous, short, bristly hairs; hind tibiæ likewise with very short, inconspicuous, bristly hairs on the dorsal and anterior side. Front tibiæ distinctly thickened towards the apex, front metatarsi about twice as thick and about three fourths of the length of the tibiæ, and as long as the four following joints; they are ovate, straight below, slightly arched above; the hairs above are a little longer than below, and at the apex is a longer hair; the four following joints broader than long; third and fourth joint on the middle tarsi likewise broader than long, on the hind tarsi a little longer than broad. The hairs and bristles are black.

Wings somewhat brownish tinged. Veins dark brown; the upper branch of the cubital vein somewhat diverging, anal vein visible to, or almost to the margin. Stigma large, brown. Halteres blackish.

Female. Similar to the male; the thoracic bristles of the same length. Front metatarsi simple, about half as long as tibiæ; third and fourth joint broader than long, and also so on the middle tarsi, on the hind tarsi slightly longer; hind tibiæ slightly dilated and a little curved.

Length 3 or about 3 mm.

The short front legs are characteristic for this species.

H. bivittata seems to be very rare in Denmark, only three speci-

mens, all females, have been taken; Ermelund, on Funen at Strib (the author), and on Bornholm at Hasle (H. J. Hansen). The dates are $27/6$ — $8/7$.

Geographical distribution: — Europe down into Italy; it is not known north of Denmark, but it occurs in England (according to specimens sent to me from Mr. Verrall).

10. *H. maura* Fabr.

1781. Fabr. Spec. Ins. II, 471, 4 (*Empis*). — 1805. Fabr. Syst. Antl. 139, 9 (*Empis*). — 1842. Zett. Dipt. Scand. I, 341, 7. — 1862. Schin. F. A. I, 115. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 126, 17. — 1903. Kat. paläarkt. Dipt. II, 253. — *Hilara globulipes*: 1822. Meig. Syst. Besch. III, 3, 2.

Male. Vertex velvet black; frons grey in the middle, narrowly velvet black at the sides; epistoma grey; palpi blackish, with long, yellowish hairs. Occiput velvet black, with black, below with yellowish hairs. Antennæ black. Thorax black or somewhat brownish black, very slightly shining, with two more shining, longitudinal stripes; viewed obliquely from the side or from in front it is grey or brown, with three black, longitudinal stripes. The brown or grey colour is due to a very short pubescence, which generally is grey on the sides, brown on the interstitia between the bristles. The dorsocentral and acrostichal bristles very short, pluriserial, not longer behind, of brown to blackish colour. There are no humeral or posthumeral bristles, two notopleural, a supraalar and a postalar bristle, all black, but short and not much conspicuous; besides there are fine, yellow hairs on the sides of the disc. Pleura grey or brownish grey pruinose. Scutellum with a short, greyish brown pubescence, and with a number (six to ten) rather weak, black marginal bristles. Abdomen greyish black, somewhat shining; it is densely clothed with yellow hairs, which are especially distinct and slightly longer at the hind margin of the segments, but not at all form bristles. Venter similarly coloured and haired. Exterior genitalia not much compressed, clothed with yellow hairs, which are somewhat long above. Legs black, somewhat shining, with a yellow pubescence; coxæ greyish pruinose; knees yellowish. Femora short-haired; hind femora with somewhat longer hairs above and below; the hind femora are somewhat thickened and somewhat suddenly narrowed at the apex, and here very slightly serrated

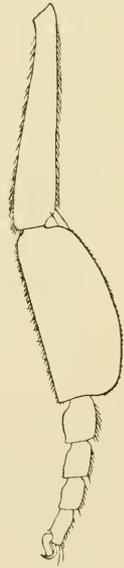


Fig. 57.
H. maura, front
leg. $\times 30$.

below; the tibiæ are likewise short-haired without bristles, only the hind tibiæ have bristly hairs on the dorsal side. Front metatarsi much thickened, much thicker than tibiæ, straight below, arched above, about four fifths of the tibiæ in length, and as long as the four other joints together; third and fourth joint on all tarsi slightly longer than broad. Wings hyaline or slightly greyish tinged. Veins black or dark brown; the upper branch of the cubital vein originating with an acute angle, slightly curved and much diverging; anal and axillary vein white and very weak. Stigma brown. Halteres black.

Female. Quite agreeing with the male. Front metatarsi simple, about half as long as tibiæ, and as long as the three following joints; hind tibiæ thickened in about the apical half, but not compressed.

Length 3,5—5 mm.

This species is at once recognised by the pluriserial dorsocentral and acrostichal bristles, and it is also otherwise characteristic.

H. maura is very common in Denmark; Lersøen, Amager, Charlottenlund, Bøllemosen, Lyngby Mose, Frederiksdal, Fure Sø, Geel Skov, Tyvekrog, Nøddebo, at Nyraad near Vordingborg and at Skelskør; on Falster at Resle; in Jutland at Nymindegab, Funder near Silkeborg, Frederikshavn and Skagen. It is a somewhat early species, my dates are $^{15}/_5$ — $^{21}/_6$. It is generally seen flying in numbers above water, both on commons, in fens and in woods, and it may then also be seen in copula in the air, and generally with prey; I have taken it in copula on $^3/_6$, $^{17}/_6$ and $^{21}/_6$; on the latter date I took it swarming over a streamlet (Lyngby Aa) together with *Rhamphomyia nigripes*, which latter was taken with the *Hilara* as prey. As mentioned under the genus it is known to envelop the prey in a web. Zetterstedt records it to the $^{15}/_9$.

Geographical distribution: — Northern and middle Europe down into France; towards the north to northern Scandinavia.

11. *H. interstincta* Fall.

1815. Fall. Dipt. Suec. Empid. 24, 17 (*Empis*). — 1842. Zett. Dipt. Scand. I, 343, 10. — 1862. Schin. F. A. I, 115. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 131, 22. — 1903. Kat. paläarkt. Dipt. II, 252. — *Hilara modesta*: 1822. Meig. Syst. Besch. III, 10, 17.

Male. Vertex and frons velvet black, the latter with a greyish brown triangle above the antennæ; epistoma grey; palpi greyish black, with numerous long, black hairs. Occiput dull black or greyish, with black hairs. Antennæ somewhat long, black, the style long. Thorax blackish brown, very slightly shining, with three black stripes, abbreviated behind, the outer stripes appearing broader or narrower

according to the direction of the view. The dorsocentral and acrostichal bristles of some length, black, the former irregularly biserial, long behind, the latter quadriserial. Further a humeral bristle, a posthumeral, two strong notopleural, a supraalar and a postalar bristle, all black and rather long; but besides there are other hairs on the sides of the disc, especially some strong, bristly hairs in the anterior part of the præsutural depression. Pleura dark grey pruinose. Scutellum with six, sometimes eight black marginal bristles. Abdomen greyish black, somewhat shining, with the light from behind it has lighter hind margins to the segments and a faint, dark dorsal stripe; it is densely clothed with somewhat long, black hairs and has long marginal bristles on the segments. Venter greyish, short-haired. Exterior genitalia small, compressed, with short hairs. Legs black, black-haired; coxæ greyish pruinose; the knees slightly yellowish. Front femora with hairs on the posterior side; middle femora with long, bristly hairs on the anterior side and two rows of strong bristles on the apical half below; hind femora with fine hairs and with bristles below; front tibiæ ciliated above and below, and with bristles above; middle tibiæ with bristles on the various sides, and hind tibiæ with somewhat long bristles on the dorsal and anterior side. Front metatarsi slightly thickened, almost not thicker than the end of tibiæ, cylindrical, about three fourths of the tibiæ in length and a little shorter than the other four joints together; they are long-haired above and with some longer, bristly hairs; all tarsal joints longer than broad. Wings almost hyaline. Veins black or dark brown; the upper branch of the cubital vein somewhat diverging, not curved at the apex. Stigma brown. Halteres brownish black.

Female. Similar to the male; the thoracic bristles of the same length as in this. Front metatarsi simple, half as long as tibiæ, and about as long as the two following joints; hind tibiæ slightly compressed in the apical part, and very slightly curved. Wings brown tinged.

Length 4,5 to fully 6 mm.

H. interstincta is rather common in Denmark; Ordrup Mose, Bølle-mosen, Lyngby Mose, Birkerød, Tisvilde, Nyraad at Vordingborg; in Jutland at Hald near Viborg; my dates are in June and to $\frac{2}{7}$. I have always taken it in or near woods, often flying over ditches, even over

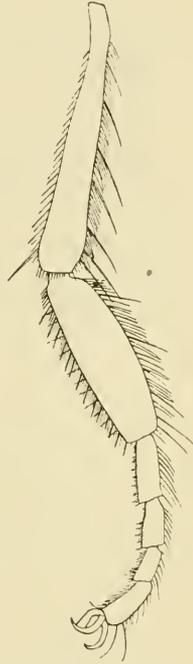


Fig. 58. *H. interstincta*, front leg. $\times 30$.

tracks filled with water; I have taken it over water in copula on $\frac{2}{7}$ and then it had small Chironomids as prey. As mentioned in the description of the genus it is known to envelop the prey in a web.

Geographical distribution:— Europe down into Italy; towards the north to northern Scandinavia, and in Finland.

12. *H. aëronetha* Mik.

1892. Mik, Wien. ent. Zeitg. XI, 81. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 158, nota. — *Hilara angustifrons*: 1892. Strobl, l. c. 132, 23.

Male. Vertex and frons velvet black, above the antennæ a small, brownish triangle; frons narrow, above the antennæ scarcely as broad as the base of the third antennal joint. Epistoma brownish black; palpi greyish, with long, black hairs. Occiput velvet black above, downwards dark grey, with strong, black hairs. Antennæ black. Thorax dark grey, very slightly shining, with a broad median, brownish black stripe, somewhat abbreviated behind, and with the sides of the disc

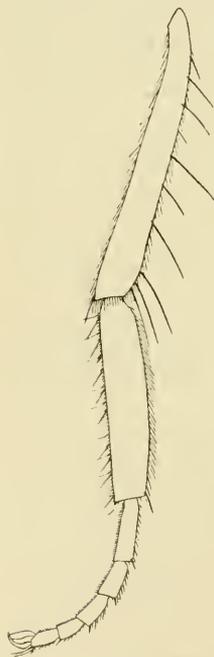


Fig. 59. *H. aëronetha*,
front leg. $\times 30$.

of the same colour. The dorsocentral and acrostichal bristles of moderate length, black, the former uniserial, long behind, the latter quadriserial. Further a humeral bristle, two posthumeral, three notopleural, a supraalar and a postalar bristle, all black and rather strong; besides there are somewhat long hairs anteriorly in the præ-sutural depression and in front of the supraalar bristle. Scutellum with four strong, black marginal bristles. Pleura grey or brownish grey pruinose; humeri with a small, reddish point. Abdomen dull grey, with a not very distinct, dark middle line; with the light from behind abdomen is slightly shining and with the front part of the segments blackish; the sides and hind parts ash-grey. It is clothed with somewhat long, black hairs, longest at the sides; the hairs at the hind margin of the segments somewhat longer; towards the sides at the base the hairs may be a little brownish. Venter dark grey, with short, black hairs. Exterior genitalia somewhat large, with short, black hairs; the lamellæ black, shining. Legs black, slightly dark greyish pruinose, hind femora shining black on the posterior side; coxæ greyish pruinose; knees reddish. Front femora with fine hairs above and on the posterior side; middle femora short-haired

and with bristles on the anterior side; hind femora with longish hairs above and shorter hairs below; front tibiae with a row of bristles on the dorsal side; middle tibiae with a few short bristles on the antero- and postero-ventral side and with two bristles basally on the antero-dorsal side; hind tibiae short ciliated and with a dorsal and anterior row of bristles. Front metatarsi not much thickened, cylindrical, a little more than three fourths of the tibiae in length, and as long as the other four joints together; they are short-haired; all tarsal joints longer than broad. The hairs and bristles are black, only a short pubescence on the antero-ventral side of the front tibiae yellow. Wings yellowish hyaline. Veins black; the upper branch of the cubital vein issuing almost rectangularly, slightly diverging; anal vein visible near to the margin. Stigma long, blackish. Halteres dark yellow, the base of the knob darker.

Female. I do not know the female, but according to the descriptions cited it is similar to the male; frons somewhat broader; the dorso-central bristles irregularly biserial; the acrostichal bristles shorter, and likewise the hairs on abdomen, and the marginal bristles not long. The legs shorter haired, the hind tibiae simple.

Length 6—6,5 mm; the female is recorded to be smaller, 5,5—6 mm.

This species, which is our largest *Hilara* and one of the largest species in the genus, is easily known by the size, the colouration of thorax and by several other characters, especially the narrow frons. — In the analytical table I have placed it in the group with yellow halteres, according to Mik and Strobl it may sometimes have dark halteres.

H. aëronetha is very rare in Denmark, only two specimens, both males, have been taken; at Hald near Viborg in Jutland on $24/6$ and $25/6$ 1910 (the author); the specimens swarmed high in the air near Hald Sø at tree-tops. Mik took it flying over a brook in the mountains, and it was observed to envelop its prey in a web; the prey was Phryganids and a large *Psocus*.

Geographical distribution: — The species is hitherto only known from Styria, Hungaria and Denmark.

Remarks: My species quite agrees with the description by Strobl l. c., but two points in Mik's description are not in accordance; he says about the acrostichal bristles, that they are present „bis zur 6 (nicht deutlich geordnete) Reihen“; in my specimens they are regularly quadriserial as also described by Strobl; further Mik says: „Die vordere Gabelast ist spitzwinklig aufgesetzt und schwingt sich am Ende nach vorwärts, so dass seine Mündung noch einmal so nahe gegen die Mündung der 2. Längsader gerückt ist, als gegen jene des hinteren

Gabelastes." In my specimens the anterior cubital branch is almost straight and terminates about in the middle between the radial and cubital vein; Strobl too says nothing about such a course of the upper cubital branch, as described by Mik. — It is perhaps possible, that the specimens with more or less yellow, and those with really black halteres are different, and that the two characters mentioned in Mik's description belong only to the species with black halteres.

13. *H. pubipes* Loew.

1873. Loew, Berl. ent. Zeitschr. XVII, 43, 35. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 139, 29. — 1903. Kat. paläarkt. Dipt. II, 255.

Male. Vertex, frons and epistoma grey; palpi grey, with yellow hairs. Occiput grey, with black hairs above, which are present only along the eye-margin; downwards with yellowish hairs. Antennæ black. Thorax light or almost bluish grey, with four brownish black stripes, the two median abbreviated behind, the lateral abbreviated at both ends, forming cuneiform spots. The dorsocentral and acrostichal bristles short, black; the former uniserial, longer behind, the latter very short, quadriserial behind, irregular in front, and for the rest on the whole somewhat irregular. Further a humeral bristle, a post-humeral, three notopleural, a supraalar and a postalar bristle, all black, rather small. Pleura light grey. Scutellum with four black marginal bristles. Abdomen light grey, clothed with longish, whitish yellow hairs, and with fine marginal bristles at the sides of the segments. Venter grey, short-haired. Exterior genitalia small, somewhat compressed, yellow-haired; the lamellæ short, somewhat blackish. Legs black, but distinctly greyish pruinose, knees narrowly yellowish; coxæ light grey; the posterior side of the hind femora shining black on the basal half. Front femora with fine hairs on the posterior side and some stronger hairs on the anterior side; middle femora with long hairs on the antero-dorsal side; hind femora short-haired, only with some longer hairs below towards the apex; front tibiæ short-haired, with some not long bristles above; middle tibiæ densely haired, especially on the anterior and posterior side; on the anterior side the hairs longish; the hairs are continued out on the tarsi, only here a little shorter; hind tibiæ short-haired, with some bristles on the dorsal side. Front metatarsi thickened, somewhat thicker than tibiæ, they are about four fifths of the tibiæ in length, and a little longer than the other four joints together; they

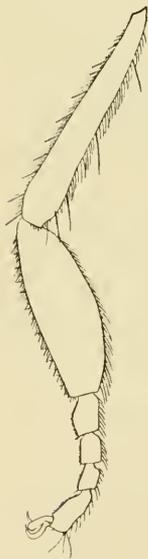


Fig. 60. *H. pubipes*, front leg.
× 30.

are short-haired. The hairs on the legs are yellowish to brownish, on the posterior tarsi more blackish, the bristles are black. Wings hyaline. Veins black or blackish brown; the upper branch of the cubital vein much diverging. Stigma brown. Halteres yellow to dark yellow.

Female. Quite similar to the male. Front metatarsi simple, not half as long as tibiæ; hind tibiæ somewhat dilated and strongly curved outwards in the middle; middle femora with hairs on the anterior side about as in the male, but not so dense, tibiæ and tarsi without long hairs.

Length 4—5 mm.

This species is easily known by the long hairs on the middle legs in the male, and the female is quite similar and its hind tibiæ are characteristic.

H. pubipes is not common in Denmark, it has on some occasions been taken in great number, but it seems to be rather local; Dyrehaven (H. J. Hansen), Ørholm, Tisvilde, on Langeland at Lohals and in Jutland at Hald near Viborg (the author); it was for the first time taken in 1884. My dates are only $25/6$ — $10/7$. I took it often in the evening in copula flying high in the air, and when a pair was taken with the net, there was also always a prey with them, which was in one case a *Tachydromia*; on another occasion I took the male in great number with a small *Chironomus* as prey, and this was imbedded in a web; (see under the description of the genus).

Geographical distribution: — Northern and middle Europe down into Styria; it is not known north of Denmark; it occurs also in England (according to specimens sent to me from Mr. Verrall).

14. *H. quadrivittata* Meig.

1822. Meig. Syst. Besch. III, 7, 11, p. p. — 1862. Schin. F. A. I, 115, p. p. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 142, 31. — 1903. Kat. paläarkt. Dipt. II, 255.

Male. Frons and epistoma greyish brown, vertex a little darker; palpi greyish, with dark hairs. Occiput greyish brown, with black hairs, chiefly present along the eye-margin; downwards the hairs are paler. Antennæ black. Thorax greyish brown, with four brownish black stripes, the median abbreviated behind, the lateral in front; the median stripes are distant, while the lateral are rather near to the median. The dorsocentral and acrostichal bristles short, black; the former uniserial, long behind, the latter biserial, but somewhat irregular, so that in places there may be three or four bristles transversally. Further a humeral bristle, a posthumeral, three notopleural, a supraalar and a postalar bristle, all black. Pleura grey. Scutellum

with four black marginal bristles. Abdomen greyish brown, clothed with yellow hairs, and with not long, dark marginal bristles on the segments. Venter similarly coloured, short-haired. Exterior genitalia of medium size, somewhat compressed, the lamellæ slightly shining, with longish, brownish hairs above. Legs black, greyish pruinose, knees narrowly yellowish; coxæ grey; hind femora shining black on the posterior side in the basal part. Front femora with fine hairs on the posterior side; middle femora with longish hairs on the anterior side and below; hind femora with long hairs above and towards the apex below; front tibiæ with some bristles above; middle tibiæ with a row of hairs on the antero-dorsal side, a row of longer, bristly hairs on the posterior side and some ventral bristles towards the apex; hind tibiæ with a dorsal and an anterior row of bristles. Front tibiæ thickened towards the apex, metatarsi thick, somewhat shorter than tibiæ and about as long as the four other joints together; they are a little longer haired above than below; the three middle joints about as long as broad; on the middle tarsi the three middle joints a little longer, the fourth about as long as broad, and on the hind tarsi the joints longer. The hairs are chiefly yellowish, the bristles black. Wings slightly yellowish tinged. Veins dark brown to black; the upper branch of the cubital vein arising about rectangularly, somewhat diverging, not curved at the apex. Stigma brownish yellow. Halteres yellow.

Female. Similar to the male; thorax more grey on the middle between the inner stripes. Front metatarsi simple, half as long as tibiæ; and as long as the three following joints; all tarsal joints longer than broad, the fourth joint on the middle tarsi shortest; hind tibiæ slightly compressed and a little curved in the middle.

Length 4—4,5 mm.

This species resembles *pubipes*, but it is of a more brownish colour, the male has not densely haired middle tibiæ, and the female has less curved hind tibiæ; besides the acrostichal bristles are mainly biserial.

H. quadrivittata is very rare in Denmark, only two specimens, a male and a female, are known, one taken at Skodsborg many years ago (Stæger), and one in a garden at Copenhagen (the author); it was taken in June.

Geographical distribution: — Northern and middle Europe down into France; I think it is not known with certainty north of Denmark, since *quadrivittata* in Zetterstedt is in all probability *H. carinthiaca* (see under this species). It occurs also in North America in Alaska, (if the American species described as *H. quadrivittata* Meig. is really this species).

15. *H. Beckeri* Strobl.

1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 143, 32. — 1903. Kat. paläarkt. Dipt. II, 248.

Male. Frons and vertex velvet black, above the antennæ a triangular, grey spot; epistoma grey; palpi black, with black hairs. Occiput velvet black above, with black hairs, chiefly present along the eye-margin; below the occiput is grey. Antennæ black. Thorax somewhat dark grey, with four brownish black stripes, the median stripes abbreviated behind, the lateral in front; the median stripes are distant, the lateral very near to the median, almost or really confluent with them. The dorsocentral and acrostichal bristles short, black; the former uniserial, longer behind, the latter quadriserial but somewhat irregularly. Further a humeral bristle, a posthumeral, two (sometimes three) notopleural, a supraalar and a postalar bristle, all black. Scutellum with four black marginal bristles. Pleura grey. Abdomen dark grey, darkest to almost black along the dorsum; it is clothed with yellowish hairs and has fine, yellow or brownish bristles at the hind margin of the segments; in the apical part and along the middle above the hairs and bristles are darker or black. Venter grey, with short, pale hairs. Exterior genitalia somewhat small, compressed, short-haired with dark hairs, the lamellæ not shining. Legs black, somewhat greyish pruinose; the knees narrowly reddish; coxæ grey; hind femora black, shining on the posterior side. Front femora with fine hairs on the posterior side; middle femora with bristly hairs on the anterior side; hind femora short-haired; front tibiæ with fine hairs on the dorsal side, and with some slightly longer, very fine, bristly hairs, the pair at the apex longest; middle tibiæ with a row of longish hairs on the anterior side and with short bristles on the antero- and postero-ventral side; hind tibiæ with bristles on the anterior and dorsal side. Front metatarsi thickened, about three fourths of the tibiæ in length, and scarcely as long as the four following joints; they are short-haired; the three middle joints longer than broad on all tarsi. The hairs are brown to blackish, the bristles and bristly hairs black. Wings hyaline or slightly greyish. Veins black; the upper branch of the cubital vein somewhat diverging, not curved. Stigma black. Halteres yellow.



Fig. 61. *H. Beckeri*, front leg. $\times 30$.

Female. Similar to the male. Front metatarsi simple, not half as long as tibiæ, and as long as the three following joints; the other

tarsal joints longer than broad; hind tibiæ slightly compressed, somewhat curved in the middle.

Length 3,5—4,5 mm.

This species is very similar to *quadrivittata*, but it is distinguished by the quadriserial acrostichal bristles, the black upper part of the occiput, and also the hairs and bristles on the legs show differences, as seen from the description.

H. Beckeri is rare in Denmark, and it has first quite recently been known as belonging to our fauna, as the first specimens were taken in 1909, and it was again taken in 1910; Dyrehaven at Røde Bro (the author), Fure Sø (Wesenberg-Lund) and in Jutland at the spring at Ravnkilde (J. P. Kryger); my dates are $^{28}/_7$ — $^{23}/_8$. At Fure Sø it was taken on Phragmites.

Geographical distribution: — Northern and middle Europe down into Carinthia; it is not known north of Denmark.

Remarks: *H. quadrivittata* in Zetterstedt is certainly not the present species but *carinthiaca* (see under this species).

16. *H. carinthiaca* Strobl.

1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 144, 33. — 1903. Kat. paläarkt. Dipt. II, 249. — *Hilara quadrivittata* (non Meig.): 1842. Zett. Dipt. Scand. I, 339, 5.

Male. Vertex, frons and epistoma grey; frons somewhat narrow; palpi grey with black hairs. Occiput black, but from the vertex a bluish grey triangle stretches down the occiput, with the point downwards; the hairs are black and chiefly present at the eye-margin; downwards the hairs are more brownish. Thorax grey, somewhat slate-coloured, with four dark brown and somewhat shining stripes, the median abbreviated behind, the lateral in front; the former are distant, the latter near to them. The dorsocentral and acrostichal bristles short, black; the former uniserial, longer behind, the latter quadriserial. Further a small humeral bristle, a posthumeral, two notopleural, a supraalar and a postalar bristle, all black. Pleura grey. Scutellum with four black marginal bristles. Abdomen dark, almost blackish grey; with the light from behind it shows broad, lighter anterior margins to the segments; it is blackish haired and with black marginal bristles on the segments; in front the hairs are yellowish. Venter dark grey, short-haired. Exterior genitalia of medium size, somewhat compressed, the lamellæ large, somewhat shining, each terminating with a simple, truncate process; the lamellæ

have longish, black hairs above. Legs somewhat slender, black, almost not pruinose; the knees yellowish; coxæ grey pruinose. Front femora with fine hairs on the posterior side, and a few long hairs on the anterior side; middle femora with bristles on the antero-dorsal side and fine hairs below; hind femora with longish hairs above and towards the apex below; front tibiæ short-haired, and with a few bristles on the dorsal side; middle tibiæ with short bristles below; hind tibiæ short-haired, and with bristles on the dorsal and anterior side. Front tibiæ slightly thickened towards the apex, metatarsi somewhat thicker, short-haired, somewhat shorter than the tibiæ and as long as the four following joints; all tarsal joints longer than broad, only the fourth joint on the middle tarsi as broad as long. All hairs and bristles black or blackish. Wings hyaline. Veins black or dark brown; the upper branch of the cubital vein somewhat diverging. Stigma dark brown. Halteres yellow.

Female. Similar to the male. Front metatarsi simple, half as long as tibiæ, and a little shorter than the four following joints; all tarsal joints longer than broad, except the fourth joint on the middle tarsi; hind tibiæ somewhat compressed and distinctly curved in the middle.

Length 3—4.2 mm.

This species somewhat resembles the three preceding, but it is recognised at once by the dark occiput with a bluish grey triangle; it is also a little smaller.

Remarks: I think it beyond doubt that Zetterstedt's *quadrivittata* is the present species; his description agrees rather well, and he says: "Specimina plura utriusque sexus ut frequens Daniæ incola etiam a D. Stæger missa"; now all specimens in Stæger's collection labelled *quadrivittata* were *carinthiaca*.

H. carinthiaca is a common species in Denmark; neighbourhood of Copenhagen, Ordrup Mose, Dyrehaven at Røde Bro, at Skelskør; on Fænø, and in Jutland in Vejle Nørreskov, Greisdalen and at Horsens, and finally on Bornholm at Allinge and Rø; my dates are $\frac{1}{7}$ — $\frac{2}{8}$. It occurs generally in or near woods, and I have taken it flying in great numbers over a ditch just outside a wood.

Geographical distribution:— Northern and middle Europe down into Switzerland; towards the north to middle Scandinavia, and in Finland; it occurs also in England (according to specimens sent to me from Mr. Verrall.).



Fig. 62.
H. carinthiaca,
front leg. $\times 30$.

17. *H. bistriata* Zett.

1842. Zett. Dipt. Scand. I, 340, 6, et 1849. VIII, 3015, 6, et 1859. XIII, 5000, 6. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 145, 34. — 1902. Kat. paläarkt. Dipt. II, 248.

Male. Vertex and frons velvet black, the latter narrowly greyish just above the antennæ; epistoma dark grey; palpi dark, with long, black hairs. Occiput dull black, with black hairs, which are present chiefly at the eye-margin. Antennæ black, third joint relatively broad at the base, and short. Thorax dark brown, sometimes rather dark, with four black stripes, the median abbreviated behind, the lateral in front, these latter broad. The dorsocentral and acrostichal bristles of some length, black; the former uniserial, long behind, the latter biserial. Further a humeral bristle, a posthumeral, about two notopleural, a supraalar and a postalar bristle, all black, but they are not much conspicuous, and besides there are other hairs at the sides of the disc and in the præsutural depression. Pleura dark grey. Scutellum with four black marginal bristles. Abdomen blackish brown, black haired, with fine marginal bristles on the segments. Venter dark grey, short-haired. Exterior genitalia of medium size, somewhat compressed, with dark hairs, which are a little longer above. Legs quite black or brownish black, dull, the hind femora shining on the

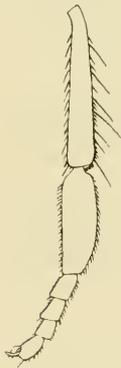


Fig. 63.
H. bistriata,
front leg. $\times 30$.

posterior side; coxæ greyish pruinose. The front femora have somewhat long hairs on the posterior side; the middle femora have finer hairs on the anterior and antero- and postero-ventral side; hind femora have fine hairs above and below; the front tibiæ have short hairs and some bristles above; middle tibiæ short-haired; hind tibiæ with fine bristles on the dorsal side, and shorter bristles on the antero-ventral side. Front tibiæ slightly thickened towards the apex, metatarsi not much thickened, a little thicker than the end of tibiæ, cylindrical, short-haired; they are about three fourths of the tibiæ in length, and nearly as long as the four following joints; these latter are short, slightly or not longer than broad; the fourth joint on the middle tarsi as long as broad, the other posterior tarsal joints longer. The hairs and bristles black. Wings hyaline. Veins black or blackish; the upper branch of the cubital vein originating at a somewhat acute angle and somewhat diverging, slightly curved at the apex. Stigma blackish brown. Halteres brown to dark brown.

Female. Quite similar to the male. Front metatarsi simple, about half as long as tibiæ and as long as the three following joints;

the third and fourth joint on the anterior tarsi as long as broad; hind tibiæ somewhat compressed and a little curved.

Length 3–3,5 mm.

The determination of the species is certain, as Zetterstedt's type-specimen, sent to him from Stæger, is in our collection. Strobl's determination is no doubt also correct; the author says, that the species may have sometimes six scutellar bristles; all my specimens have four. As Zetterstedt says; „Stæg. in litt.“ the name is originally due to Stæger.

The species is related to the four preceding, but it is much darker, the inner thoracic stripes a little approximate, and the halteres not yellow but dark. All five species are related and show the common character, that the occiput is less haired, the hairs chiefly present at the eye-margin.

H. bistrata seems to be somewhat rare in Denmark; Lersøen (Stæger, Zetterstedt's type-specimen), Ermelund, Lyngby Mose and Donse Dam (the author); on the latter locality I took it in some number, flying over the pond, but only males, and I have only taken one female. It is perhaps an early species, my dates are $13/5$ — $3/6$.

Geographical distribution:— Northern and middle Europe down into Spain (var. *cantabrica* Strobl); towards the north to southern Sweden.

18. *H. pilipes* Zett.

1838. Zett. Ins. Lapp. 555, 5. — 1842. Zett. Dipt. Scand. I, 346, 13. — 1903. Kat. paläarkt. Dipt. II, 254.

Male. Vertex and frons velvet black, the latter with a small, brownish triangle above the antennæ; epistoma dark grey; palpi greyish black, with long, black hairs; proboscis somewhat long, labrum as long as the head is high. Occiput dark to blackish brown, with black hairs; downwards the hairs are brownish. Antennæ black, somewhat long. Thorax dark brown, with four, somewhat indistinct, darker stripes, the median approximated, abbreviated behind, the lateral very indistinct. The dorsocentral and acrostichal bristles somewhat long, black; the former uniserial, long behind, the latter biserial. Further a humeral bristle, a posthumeral, two notopleural, a supraalar and a postalar bristle, all black, but besides there are other, somewhat strong hairs on the sides of the disc and in the præsutural depression. Pleura dark grey or brownish grey. Scutellum with four to six black marginal bristles. Abdomen grey or brownish grey, with black hairs and short marginal bristles on the segments. Venter grey, short-haired. Exterior genitalia robust, almost not compressed, black-haired, the hairs not or slightly longer above; the

lamellæ a little shining. Legs quite black or brownish black; coxæ grey pruinose. Front femora with somewhat strong hairs on the posterior side, and with fine hairs below, which are long towards the base; middle femora with bristles on the anterior side, and with finer hairs on the antero- and postero-ventral side; hind femora with long hairs above and below, longest but less dense on the latter side; front tibiæ with a double row of long and strong bristles above, very long towards the apex, and with fine hairs below; middle tibiæ with bristles on the various sides; hind tibiæ with hairs below, and with long bristles on the dorsal, antero-dorsal and antero-ventral side. The front femora somewhat thickened, and the front tibiæ thickened towards the apex and considerably shorter than the femora, metatarsi much thickened, fully twice as thick as the end of the tibiæ, somewhat ovate; they have long, bristly hairs below towards the anterior side, otherwise they are short-haired, the hairs above a little longer, especially towards the apex, and there is generally a longer hair at the apex, and sometimes a bristle towards the base; the metatarsi are as long as tibiæ, in large and strong specimens even longer, and they are longer than the four following joints, which are short, about as broad as long. The hairs and bristles are black, the short hairs on the front metatarsi may be brownish. Wings almost hyaline. Veins black or blackish brown; the upper branch of the cubital vein diverging, not curved at the apex. Stigma blackish brown. Halteres yellow.

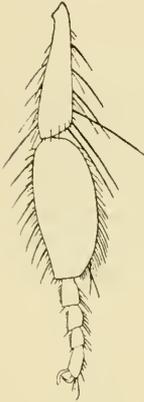


Fig. 64.
H. pilipes,
front leg.
× 30.

Female. Similar to the male, but the legs shorter haired, and the bristles on the dorsal side of the front tibiæ not specially long; front metatarsi simple, half as long as tibiæ and as long as the three following joints; third and fourth joint on the anterior tarsi about as broad as long. Hind tibiæ simple.

Length 3—4 mm.

This species is easily known in the male by the strong bristles on the front tibiæ and the thick and large front metatarsi, and in both sexes by the yellow halteres.

H. pilipes is somewhat common in Denmark; Amager, Charlottenlund, Boserup et Roskilde; on Fænø; in Jutland at Nymindégab, Tipperne at Ringkjøbing Fjord, Struer, Sæby and Frederikshavn, and finally on Læsø; my dates are $\frac{1}{6}$ to August. The species seems to occur exclusively at or near the shore, or at all events on sandy places, all my localities are at the shore, or when not just at the

shore they are, however, sandy. Stæger collected it on *Carex arenaria*; Zetterstedt records it from flowers of *Salix*.

Geographical distribution:— Northern Europe up to northern Scandinavia; it is not known south of Denmark (see below), but it occurs in England (according to specimens sent to me from Mr. Verrall).

Remarks: This species cannot be *pilipes* Strobl (Verh. zool. bot. Gesell. Wien, XLII, 147, 36), and the author himself also expresses some doubt about it. Strobl's species is smaller, 2—2,6 mm., with long and strong marginal bristles on the abdominal segments; the exterior genitalia are different, and the front metatarsi shorter than tibiæ, which latter are not short, and the metatarsi are somewhat long-haired above, but not with long hairs below. Strobl's species must thus keep the name *tanychira* Kow., as already suggested by the author. Of *pilipes* I have examined specimens which Zetterstedt had seen.

19. *H. niveipennis* Zett.

1842. Zett. Dipt. Scand. I, 352, 22, et 1849. VIII, 3017, 22. — 1862. Schin. F. A. I, 116. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 149, 37. — 1903. Kat. paläarkt. Dipt. II, 254.

Male. Frons and epistoma grey; palpi yellowish or brownish, with dark hairs. Vertex dark grey or grey. Occiput grey, or, when seen from above, dark, with black, downwards paler hairs. Antennæ black. Thorax light grey or almost bluish grey, sometimes with two distant, slightly darker grey stripes, abbreviated behind. The dorso-central and acrostichal bristles uniserial and biserial respectively, black, the former long behind. Further a humeral bristle, a post-humeral, two notopleural, a supraalar and a postalar bristle, all black. Pleura grey. Scutellum with four black marginal bristles, the inner considerably longer than the outer. Abdomen light grey, almost silvery, with white hairs, and a little longer, fine, white bristles at the hind margin of the segments. Venter similarly coloured, sometimes a little yellowish, short-haired. Exterior genitalia brownish or darker, short and directed upwards, not obliquely forwards. Legs brown or blackish brown, knees lighter; often the legs more light brown, probably in immature specimens; coxæ grey. Middle femora with bristly hairs on the anterior side; hind femora with fine hairs above; front tibiæ extremely short-haired; hind tibiæ with short, bristly hairs above. Front tibiæ slightly thickened towards the apex, metatarsi somewhat thickened, a little shorter than the tibiæ, about as long as the four following joints, which are short, as broad as long. The hairs are chiefly brownish. Wings milk-white. Veins

white; the upper branch of the cubital vein originating with an acute angle, diverging, and curved a little at the apex. The stigma is white, very faint, scarcely observable; the apical part of the subcostal vein is thickened. Halteres whitish.

Female. Quite similar to the male. Front metatarsi simple, half as long as tibiæ; hind tibiæ thin and simple.

Length 2—2,4 mm.

The pupa is yellowish white; besides the two teeth at the bases of the antennal sheaths it has two triangular teeth below the head inwards to the apices of the sheaths, each with a hair close to it. The length is 2,5 mm.

This species is at once recognised by the colour of the body and the wings.

H. niveipennis seems to be rare in Denmark, only six specimens have been caught; Ordrup Mose (Jacobsen), Ermelund (J. P. Kryger), and Ørholm (the author); my dates are $^{23}/_5$ — $^{26}/_6$; it is certainly a somewhat early species. Strobl records it from low herbage at the margin of brooks, and from flowers of *Pyrus* from the end of April to the end of May. The pupa was taken in a mole-cast in Ermelund on $^{24}/_4$, it developed on $^{15}/_5$.

Geographical distribution:— Northern and middle Europe down into Austria; towards the north to middle Sweden.

20. *H. litorea* Fall.

1815. Fall. Dipt. Suec. Empid. 24, 20 (*Empis*). — 1842. Zett. Dipt. Scand. I, 351, 21, et 1849. VIII, 3017, 21. — 1862. Schin. F. A. I, 113 et 114. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 161, 46. — 1903. Kat. paläarkt. Dipt. II, 252. — *Hilara univittata*: 1822. Meig. Syst. Besch. III, 8, 14. ♂.

Male. Vertex and frons grey, the latter rather narrow; epistoma grey, very narrow; palpi yellowish or brownish, with dark hairs, especially one long hair is present. Occiput grey, with black hairs, below with paler hairs. Antennæ black. Thorax grey, almost always with a somewhat broad, brownish middle stripe. The dorsocentral and acrostichal bristles of some length, black; the former uniserial, longer behind, the latter quadriserial. Further a humeral bristle, a posthumeral, three notopleural, a supraalar and a postalar bristle, all black; generally there are besides some weaker bristles or bristly hairs. Pleura grey, the spiracles lighter or darker brownish. Scutellum with four black marginal bristles. Abdomen dark brown, a little lighter at the base, clothed with brownish to blackish hairs, but on the first segments the hairs are yellow; there are somewhat long

marginal bristles on the segments. Venter of the same colour or more greyish, short-haired. Exterior genitalia somewhat large, compressed, with some longish hairs on the sides; the lamellæ somewhat shining. Legs darker or lighter brownish, the anterior more or less yellowish, the light colour generally present as stripes and more or less extended; tarsi darkest, generally blackish; the knees yellowish; coxæ grey, the front coxæ yellow, and often also the posterior coxæ more or less yellowish. Front femora with fine hairs on the posterior side; middle femora with fine, bristly hairs on the anterior side; hind femora with fine hairs above and below; front tibiæ with short hairs above, and a pair of small bristles at the apex, posterior tibiæ short-haired, the hind tibiæ with a few bristles on the anterior and dorsal side, the latter somewhat long. Front tibiæ slightly thickened towards the apex, metatarsi somewhat thickened, shorter than the tibiæ, and as long as the four following joints; the tarsal joints longer than broad, only the fourth joint on the anterior tarsi about as broad as long. The hairs are yellowish to brownish, the bristles blackish. Wings relatively large, hyaline. Veins thin, darker or lighter brown; the upper branch of the cubital vein somewhat diverging. Stigma very faint. Halteres dark brown to black.

Female. Of much lighter colour than the male, but otherwise similar to it. Frons broader, this and occiput lighter. Thorax bright grey, without any stripe. Abdomen likewise bright, almost whitish grey and with white hairs. Front metatarsi simple, about half as long as tibiæ, and as long as the three following joints; hind tibiæ slightly compressed and a little curved in the middle.

Length 3—3,5 mm.

This species is easily known by the colour of the thorax in the male, and in the female by the colour and the dark halteres. As mentioned in the description the thorax in the male may sometimes want the dark stripe, I think, as also suggested by Strobl, that such males are not quite mature, and then the thorax is as a rule faint and indistinctly brownish on the middle part.

H. litorea is not common in Denmark, but it cannot, however, be termed rare; at Copenhagen in a garden, Ordrup, Charlottenlund, Ermelund, Dyrehaven, Ørholm, Ruderhegn, Hillerød; on Funen at Odense and Veflinge, and on Bornholm at Almindingen; my dates are $1^s/6$ — $20/9$, it thus occurs somewhat late. It seems especially to



Fig. 65.
H. litorea,
front leg.
× 30.

occur in or near woods and in the vicinity of water. Stæger took it numerously flying in the air and in copula in Charlottenlund on 20/s.

Geographical distribution:— Northern and middle Europe down into France; towards the north to middle Sweden.

21. *H. gallica* Meig.

1804. Meig. Klass. eur. zweifl. Ins. I, 222, 7 (*Empis*). — 1822. Meig. Syst. Besch. III, 9, 15. — 1842. Zett. Dipt. Scand. I, 336, 2. — 1862. Schin. F. A. I, 114. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLIII, 166, 50. — 1903. Kat. paläarkt. Dipt. II, 251.

Male. Vertex, frons and epistoma grey, frons somewhat narrow; palpi dark, somewhat greyish, with brown or blackish hairs. Occiput grey, with black, downwards with brownish hairs. Antennæ somewhat long, black, the basal joints reddish. Thorax grey, with two somewhat distant, slightly darker stripes, abbreviated behind; a small humeral point reddish. The dorsocentral and acrostichal bristles short, black; the former uniserial, but in places irregularly biserial, longer behind, the latter somewhat dense, biserial to quadriserial, but very irregular and sometimes almost quite biserial. Further a humeral bristle, a posthumeral, three notopleural, a supraalar and a postalar bristle, all black and somewhat strong; besides there are finer hairs on the sides and in the præsutural depression. Pleura grey, the spiracles brownish, and likewise a small, indistinct spot below the wing-root. Scutellum with four black marginal bristles. Abdomen



Fig. 66.
H. gallica,
front leg. $\times 30$.

grey, sometimes somewhat brownish or yellowish towards the base; it is clothed with brownish or blackish hairs, and has somewhat longer marginal bristles on the segments. Venter similarly coloured, short-haired. Exterior genitalia of medium size, somewhat compressed; the lamellæ somewhat shining, with longish hairs. Legs yellow, also the coxæ, the four last tarsal joints dark brown to blackish. Front femora with short, fine hairs on the posterior side; middle femora with a few bristly hairs on the anterior side, which are short towards the apex; hind femora short-haired; front tibiæ short-haired above and below, and with a few short bristles above; middle tibiæ with some fine (sometimes less distinct) bristles above; hind tibiæ with one dorsal row of bristles. Front tibiæ slightly thickened towards the apex, metatarsi very slightly thicker, elongated, cylindrical, straight below and with longish hairs above; they are somewhat shorter than

the tibiæ, and also shorter than the four following joints; all tarsal joints longer than broad, except the fourth joint on the middle tarsi. The hairs chiefly brownish, the bristles black. Wings hyaline or slightly yellowish tinged. Veins lighter or darker brown, paler towards the base; the upper branch of the cubital vein somewhat diverging, not curved at the apex; the anal vein can be traced to or almost to the wing-margin. Stigma brownish. Halteres yellow.

Female. Quite similar to the male; frons a little broader. Front metatarsi simple, about half as long as tibiæ, and as long as the three following joints; hind tibiæ simple, straight, not compressed.

Length 4—4,5 mm.

H. gallica is rare in Denmark, only seven specimens are known; Charlottenlund (Stæger), Boserup at Roskilde (H. J. Hansen) and at Tisvilde (the author); the dates are from May to $\frac{6}{7}$.

Geographical distribution:— Northern and middle Europe down into France; towards the north to middle Scandinavia, and in Finland.

22. *H. lurida* Fall.

1815. Fall. Dipt. Suec. Empid. 22, 13 (*Empis*). — 1822. Meig. Syst. Besch. III, 8, 12. — 1842. Zett. Dipt. Scand. I, 336, 1. — 1862. Schin. F. A. I, 114. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 171, 54. — 1903. Kat. paläarkt. Dipt. II, 252.

Male. Vertex and frons velvet black, the latter brownish just above the antennæ; epistoma dark greyish; palpi reddish, with dark hairs. Occiput dull black or, seen from the side, dark grey, with black, below more brownish hairs. Antennæ black or brownish black. Thorax blackish grey, slightly shining, generally with two, very faint, darker stripes; sometimes also a middle stripe is visible; humeri and postalar callus reddish. The dorsocentral bristles uniserial, long, longer behind, the acrostichal bristles somewhat shorter, quadriserial, but often irregular, so that there are more than four rows; all black. Further a humeral bristle, one or two posthumeral, three notopleural, a supraalar and a postalar bristle, all rather long, black; besides there are other hairs or smaller bristles on the sides and in the præ-sutural depression. Pleura dark grey, with reddish or brownish, indefinite spots. Scutellum with four black marginal bristles. Abdomen blackish or greyish brown, more or less yellowish at the base; it has black hairs and long marginal bristles on the segments. Venter similarly coloured, short-haired. Exterior genitalia of medium size, slightly compressed, somewhat high, the lamellæ each with a broad, outer and a slender, inner process, both long, and above with long, bristly hairs, which are directed backwards. Legs yellow, also the

coxae, tarsi brownish or blackish towards the apex. Front femora with short hairs, especially above and on the posterior side; middle femora with a row of bristles on the anterior side; hind femora short-

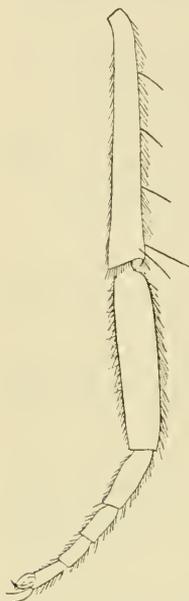


Fig. 67. *H. lurida*,
front leg. $\times 30$.

haired, a little longer above and below, and the hairs below long at the apex; front tibiae with some short bristles on the dorsal side; middle tibiae with some scattered bristles on the various sides; hind tibiae with longer bristles on the dorsal and anterior side. Front tibiae as long as femora, very slightly thickened towards the apex; metatarsi only slightly thickened, not thicker than the end of the tibiae, cylindrical, about three fourths of the tibiae in length, and about as long as the four following joints; all tarsal joints longer than broad. The hairs brownish, the bristles black. Wings slightly yellowish tinged. Veins brown to black; the cubital fork somewhat long, the upper branch slightly diverging, a little curved towards the apex. Stigma large, brown. Halteres dark brown with a yellow peduncle.

Female. Frons slightly broader than in the male. Front metatarsi simple, about half as long as tibiae, and as long as the three following joints; hind tibiae simple; the bristles rather strong. The colour may be about the same as in the male, but often it is much darker, abdomen being lighter only at the base of the venter, pleura quite grey, and the legs nearly quite brownish or blackish, especially the hind legs.

Length 4.5—5 mm.

H. lurida is very rare in Denmark, only two specimens, both males, have been taken, in the vicinity of Copenhagen, one in earlier time (Stæger), and one later (H. J. Hansen).

Geographical distribution:— Northern and middle Europe down into Austria; towards the north to middle Sweden, and in Finland.

23. *H. lasiopyga* n. sp.

Male. Vertex and frons velvet black; epistoma brownish black; palpi brownish yellow, with black hairs. Occiput dull black, with black hairs. Antennae black. Thorax blackish brown, dull or almost dull, the bristles may form three very faint, darker stripes. The dorsocentral and acrostichal bristles somewhat long, black; the former uniserial, longer behind, the latter biserial. Further a humeral bristle,

a posthumeral, three notopleural, a supraalar and a postalar bristle, all somewhat long, black; besides there are some other hairs on the sides of the disc. Pleura dark grey. Scutellum with four strong, black marginal bristles. Abdomen dull black, densely clothed with black hairs, and with long marginal bristles on the segments. Venter similarly coloured, short-haired. Exterior genitalia small, only slightly compressed, the lamellæ a little shining. On the sides at the hind margin of the eighth ventral segment there are long, erect, fan-like spread hairs. Legs black or blackish; coxæ grey pruinose; on the front legs the coxæ, femora and the base of the tibiæ yellowish, and likewise, but to a slighter degree on the middle legs; also the hind legs with the base of the femora light, and with yellow knees. Front femora with somewhat long hairs on the postero-dorsal side; middle femora with strong bristles on the anterior side; hind femora with longish hairs above and below, longest below; front tibiæ with short hairs and some bristles above; middle tibiæ short-haired; hind tibiæ with bristles on the dorsal and anterior side. Front tibiæ a little thickened towards the apex, metatarsi somewhat thicker, a little compressed, with a little longer hairs on the dorsal side and a pair of bristles at the apex; they are about two thirds of the tibiæ in length, and as long as the three following joints; the middle metatarsi have a little dilatation at the base on the posterior side, beset with a little longer hairs. All tarsal joints longer than broad. Wings some-



Fig. 68.
H. lasiopyga,
front leg.
× 30.

what dark tinged. Veins blackish; the upper branch of the cubital vein originating about rectangularly, only slightly diverging, and slightly curved at the apex; anal vein distinct, brownish, not reaching the margin. Stigma blackish brown. Halteres black.

Female unknown.

Length 2.7—3 mm.

This species is easily recognised, especially by the erect hairs at the end of abdomen and by the, to be sure small, but however very characteristic dilatation at the base of the middle metatarsi, a shape, which I have seen in no other *Hilara*. In immature specimens the legs may be lighter.

H. lasiopyga seems to be rare, only four specimens have been taken, two in 1883 and two in 1908; Vejle Nørreskov (the author)



Fig. 69.
H. lasiopyga,
middle
metatarsus.
× 35.

and in Greisdalen (H. J. Hansen, the author); both localities are at Vejle. The dates are in August.

Geographical distribution:— The species is only known from Denmark.

24. *H. cingulata* Dahlb.

1850. Dahlb. Vetensk. Acad. Handl. 1850, 160. — 1852. Zett. Dipt. Scand. XI, 4270, 20—21. — 1892. Strobl, Verh. zool. bot. Gesell. Wien, XLII, 159, 44. — 1903. Kat. paläarkt. Dipt. II, 249.

Male. Vertex grey; frons very narrow, dull black, somewhat lighter above the antennæ; epistoma grey; palpi pale yellow, with yellow or brown hairs. Occiput grey, with yellow hairs. Antennæ black, the basal joints reddish. Thorax grey, slightly shining, with two narrow, darker to blackish, shining stripes, abbreviated behind. The dorsocentral and acrostichal bristles not short, black; the former uniserial, longer behind, the latter biserial. Further a humeral bristle, a posthumeral, two notopleural, a small supraalar and a postalar bristle, all black. Pleura grey. Scutellum with four black marginal bristles. Abdomen blackish, sometimes more or less reddish; the hairs are dark, and there are fine, black marginal bristles on the segments. Venter reddish, short-haired. Exterior genitalia very small. Legs yellow, also the coxæ; tarsi dark brown towards the apex, posterior coxæ a little darkened at the base; the legs are somewhat long and slender, the tarsi, also the front tarsi, long, front metatarsi simple, not thickened. Front femora with fine hairs on the posterior side; middle femora with bristles on the anterior side; hind femora with a row of longish hairs above, and very fine hairs below; front tibiæ without bristles, middle tibiæ with some few; hind tibiæ with bristles on the dorsal and anterior side; all tarsal joints distinctly longer than broad. The hairs brownish, the bristles blackish. Wings slightly yellowish tinged. Veins yellowish to brown; the upper branch of the cubital vein somewhat diverging. Stigma faint, yellow. Halteres yellow.

Female. Similar to the male. but the frons broad, grey, humeri and propleura reddish; abdomen likewise reddish, with whitish yellow hind margins to the segments. Coxæ quite yellow; hind tibiæ simple.

Length 3 mm.

H. cingulata is rare in Denmark, only three specimens, all females, are known; at Odense (H. J. Hansen) and on Fænø on ²⁰/₇ 1907 (the author).

Geographical distribution:— Europe down into Spain (var. *morenae*

Strobl); towards the north to southern Sweden. It seems everywhere to be a rare species.

25. *H. flavipes* Meig.

1822. Meig. Syst. Besch. III, 11, 19. — 1862. Schin. F. A. I, 113.
1892. Strobl, Verh. Zool. bot. Gesell. Wien, XLII, 160, 45. — 1903. Kat. paläarkt. Dipt. II, 250.

Male. Eyes contiguous; vertex black; epistoma dark grey; palpi whitish yellow, with dark hairs. Occiput dark grey, with blackish, downwards with pale hairs. Antennæ black. Thorax black, shining. The dorsocentral and acrostichal bristles black, the former uniserial, only slightly longer behind, the latter biserial. Further a small humeral bristle, a posthumeral, two notopleural, a supraalar and a postalar bristle, all black. Pleura grey. Scutellum with four black marginal bristles. Abdomen dull blackish brown or black, sometimes lighter towards the base; it is dark-haired, the hairs at the hind margin of the segments only very slightly longer. Venter yellowish. Exterior genitalia small, compressed, the lamellæ a little shining. Legs long and slender, tarsi long, front metatarsi simple, not thickened; the legs are yellow, also the coxæ, the posterior coxæ a little darker; the apical part of the hind femora and the tibiæ towards the end slightly darker, tarsi brown, blackish towards the apex. Front femora with longish, fine hairs on the posterior side and below; middle femora with a few bristles on the anterior side in the basal part; hind femora with a row of long, somewhat strong hairs above, and finer hairs below; front tibiæ with short hairs, a little longer above, but without bristles; hind tibiæ with a row of fine bristles on the dorsal side. All tarsal joints longer than broad. The hairs all paler or darker brownish. The pulvilli are conspicuous and rather large. Wings slightly greyish or yellowish tinged. Veins brown to dark brown; the upper branch of the cubital vein somewhat diverging; anal vein distinct, but not reaching the margin; discal cell somewhat broad. Stigma blackish brown. Halteres with the peduncle yellow, the knob blackish brown to black.

Female. Similar to the male, but the frons broad, grey. Thorax a little pruinose behind; abdomen generally more or less brownish, with light incisures. The posterior coxæ yellow; hind tibiæ simple. Halteres (in my specimens) quite yellow.

Length 2,5—3 mm.

This species is at once recognised in the male by the contiguous eyes; the female is known from the female of *cingulata* by the black thorax and the not red basal joints of the antennæ.

H. flavipes is not at all common in Denmark, but it has, however, been taken on several localities; Geel Skov (the author); in Jutland in Greisdalen at Vejle (the author), at Hald near Viborg and at Sæby (H. J. Hansen); the dates are from the last days of July to ¹⁵/₉.

Geographical distribution:— Northern and middle Europe down into France; it is not known north of Denmark (unless *gracilipes* Bohem. is identical, which is probable); Verrall records it from England (under *Oreogeton*). It seems generally to be rare, but Verrall notes it as common in England, (*Entom. Month. Mag.* XXII, 1886, 202, 55).

Remarks: I think the suggestion by Strobl (l. c. 161), that *gracilipes* Bohem. is identical with *flavipes*, is correct; thus my specimens have the thorax in the female a little pruinose, and yellow halteres, which characters are given for *gracilipes*, but I have no doubt, that my species is *flavipes*.

26. *H. minuta* Zett.

1842. Zett. Dipt. Scand. I, 359, 31, et 1849. VIII, 3018, 31. — 1892. Strobl, Verh. zool. bot. Gesell. Wien. XLII, 120, 13. — 1903. Kat. paläarkt. Dipt. II, 248 (*Rhagas*).

Male. Vertex, frons and epistoma black; palpi dark. Occiput black, with a few black hairs. Antennæ black, the style somewhat thick. Thorax black, dull or at all events only very slightly shining. The dorsocentral and acrostichal bristles short, black; the former uniserial, not longer behind, the latter biserial. I find only a small humeral bristle, a notopleural and a postalar bristle, all black. Pleura greyish black, almost quite black. Scutellum with four to six black marginal bristles. Abdomen black, very slightly hairy. Legs black; front metatarsi simple, about half as long as the tibiæ. The legs are very short-haired, almost bare, the hairs dark; the hind tibiæ with

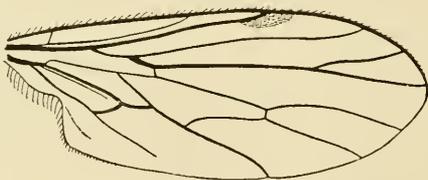


Fig. 70. Wing of *H. minuta*.

fine hairs below. Wings somewhat blackish fumigated, most towards the anterior margin. Veins black or blackish, also the anal vein;

the lower branch of the cubital vein directed a little downwards, slightly recurved at the apex, the upper branch originating with an acute angle and diverging, very slightly curved at the base; the discal cell long, and attenuated towards the apex, the branches of the discal vein issuing near to each other. Stigma blackish, but faint. Halteres black.

Female. Quite similar to the male; hind tibiæ simple.

Length 2 mm.

H. minuta has only been taken in one specimen, a female, on ^{30/6} 1909 at Lohals on Langeland (the author).

Geographical distribution;— Northern and middle Europe down into Austria; towards the north to southern Sweden.

Remarks: I have examined Zetterstedt's type-specimens, so that my determination is certain. Zetterstedt says, that the front tibiæ in the male are thickened, but in his type this is the case only to a very slight degree (if the specimen is really a male, the apex of abdomen is wanting). It also seems to me, that Strobl's species is the same. — In the Kat. paläarkt. Dipt. the species is enumerated under *Rhagas*, it seems on the authority of Loew (Nat. Hist. Rew. 1856, 86); I do not know Loew's paper, but I see no reason for separating the species from *Hilara*.

As mentioned under the description of the family, still one species is recorded from Denmark viz. *H. fuscipes* Fabr. According to Fabricius (Ent. Syst. IV, 406, 14 and Syst. Antl. 144, 5) this species is founded on Danish specimens, as he says: „Habitat in Dania Mus. Dom. Lund.“ As said above under the family the specimens in Lund's collection labelled *Tachydromia fuscipes* are not this species, and as I think there is no full certainty for the occurrence of the species in Denmark, I have at present omitted it.

3. Ocydromiinae.

Eyes either touching in the male, separated in the female, or touching in both sexes; in rare cases narrowly separated in both sexes; when touching the upper facets are in the male generally larger than the lower. Antennæ either five-jointed, with a two-jointed style or long arista, or three-jointed, with a long, not articulated arista. Proboscis short, sometimes somewhat long and then directed straightly or obliquely forwards. Maxillæ (always?) present, the maxillary palpi one-jointed. Thorax somewhat high and arched.

Metapleura bare or with short hairs. Cubital vein unforked; discal vein forked, or (*Ocydromia*, *Leptozeza*) unforked; a discal cell present, sending three or two veins to the margin; three or four posterior cells; the basal cells of equal length; the anal cell shorter than or as long as the second basal cell; the lower branch of the postical vein recurrent, or meeting the anal vein at a right angle; anal vein short, or longer and reaching the margin. Axillary lobe large (except in *Leptozeza sphenoptera*). Alula very small or wanting. Stigma present; sometimes (*Leptozeza*) absent.

Table of Genera.

- | | |
|--|-------------------------|
| 1. Antennæ with the third joint more or less elongated, terminating with a short style; discal vein forked | 2. |
| — Antennæ with the third joint short, terminating with a long arista; discal vein unforked | 5. |
| 2. Antennæ long, longer than the head, third joint much elongated; hind femora thickened, with spines below | 9. <i>Oedalea</i> . |
| — Antennæ shorter, at most as long as the head, third joint less elongated; hind femora not thickened, without spines below | 3. |
| 3. Antennæ short, the style very short; proboscis about as long as the head, or longer, directed straightly or obliquely forwards; anal cell considerably shorter than the second basal cell | 12. <i>Euthyneura</i> . |
| — Antennæ longer, the style somewhat long; proboscis very short, directed downwards | 4. |
| 4. Basal cells somewhat large, anal cell shorter than the second basal cell, anal vein long, reaching the margin | 7. <i>Trichina</i> . |
| — Basal cells small, anal cell about as long as the second basal cell, anal vein not prolonged beyond the anal cell | 8. <i>Microphorus</i> . |
| 5. Third antennal joint short, ovate, arista inserted in its upper margin | 10. <i>Ocydromia</i> . |
| — Third antennal joint longer, conical, arista terminal | 11. <i>Leptozeza</i> . |

7. *Trichina* Meig.

Species of small size and of dark colours. The head is globular, somewhat arched behind, as broad as thorax. Occiput somewhat haired. Eyes large, occupying the whole front side of the head; they are touching in the male, and in the female either also touching, but for a shorter distance, or they are in this sex narrowly separated, leaving a very narrow frontal stripe between them. In the male the facets are larger in about the upper half, the dividing line is sharp; when the eyes are touching in the female, the facets are large in a small upper part, when they are separated all facets are small. The incisure in the middle of the inner eye-margin is distinct. There are

three ocelli on the vertex, and some small hairs. The antennæ are inserted near to each other in the middle, or sometimes a little above the middle. They are five-jointed; the first joint is very short, the second about globular, the third more or less elongated, attenuated towards the apex and compressed; the two last joints form a shorter or longer style, the first joint of which is short, the second long and terminating in a bristly part, which is bare. Epistoma is very narrow; jowls are not developed, the eyes going quite to the mouth aperture. About the mouth parts I can only say very little, as I have only been able to examine dried specimens. The proboscis is very short, only stretching slightly out of the mouth aperture; labrum is strong, broad at the base, curved downwards towards the apex; the maxillary palpi are short, one-jointed, somewhat club-shaped. Thorax is rectangular, rather highly arched above; prothorax is very small, and likewise metathorax. There are somewhat short uniserial dorsocentral bristles and biserial acrostichal bristles; the former show a long bristle behind. A humeral bristle, a pair of posthumeral, one to three notopleural, a supraalar and a postalar bristle present. Scutellum has about four to eight marginal bristles. The metapleura are bare. Abdomen is somewhat slender, often a little compressed; it consists of eight segments; as usual the first is small, the second the longest. In the male the abdomen is only slightly attenuated towards the apex; the male genitalia are small, in *flavipes* they form a very small forceps, consisting, so far as I have seen, of a pair of straight lamellæ with small teeth at the apex, and between the lamellæ a thin, styliform process (penis?); in *clavipes* the forceps is a little larger, and it seems to be somewhat unsymmetrical. In the female the abdomen is pointed towards the apex, and it terminates with two small and short styles. The legs are slender, the hind legs the longest; the hind tibiæ may be more or less thickened towards the

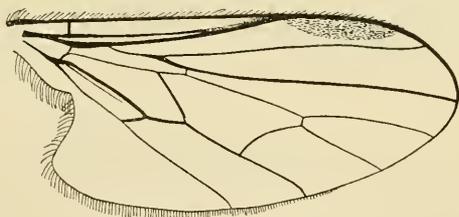


Fig. 71. Wing of *T. flavipes*.

apex. The legs have shorter or longer, fine hairs, sometimes the hind legs have stronger bristles. The tibiæ have no apical spurs. There are two claws, and two well developed pulvilli; the empodium

is long, but narrow, and terminating with a bristle-shaped part. The wings have the mediastinal vein not distinctly reaching the margin, but uniting with the subcostal vein; the cubital vein is unforked, and there is thus one cubital cell; the discal vein forked, and there are thus four posterior cells, and from the discal cell three veins go to the wing-margin, the third is the upper branch of the postical vein, which closes the discal cell below; the second branch of the postical vein recurrent, the anal cell shorter than the second basal cell; the anal vein long, straight, reaching the margin. Stigma present. The axillary lobe large. Alula very small, fringed at the margin. Alar squamula small, likewise fringed at the margin.

The developmental stages of *Trichina* are, so far as I am aware, not known.

The species of *Trichina* occur in woods on humid and somewhat shaded places; the males sometimes hover in the air. The species are no doubt carnivorous.

The genus is small, it comprises 5 palæarctic species; two have hitherto been found in Denmark.

Table of Species.

1. Scutellum with about eight bristles; legs yellow, hind tibiæ slightly thickened; stigma not filling the apex of the subcostal cell 1. *flavipes*.
- Scutellum with four bristles; legs with the hind femora and tibiæ more or less dark brown in the apical half; hind femora in the male with spine-like bristles below; hind tibiæ distinctly thickened; stigma occupying the apex of the subcostal cell. 2. *clavipes*.

1. *T. flavipes* Meig.

1830. Meig. Syst. Besch. VI, 336, 1, Tab. LXV, Fig. 10. — 1842. Zett. Dipt. Scand. I, 254 (*Microphora*). — 1860. Loew. Zeitschr. für Entom. Breslau, XIV, 41, 3. — 1862. Schin. F. A. 1, 79 (*Microphorus*). — 1903. Kat. paläarkt. Dipt. II, 257.

Male. Eyes touching for a long distance, the facets in the upper half larger than below, the dividing line sharp. The narrow epistoma

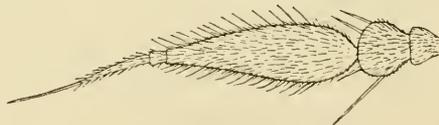


Fig. 72. Antenna of *T. flavipes*. $\times 100$.

black or greyish black; palpi blackish. Occiput black, shining, with black, below with brownish hairs. Antennæ black, the style together with the bristly apical part somewhat long, considerably more than

half as long as the third joint, and the bristly part of the style as long as the basal part. Thorax black, shining, slightly metallic. The dorsocentral and acrostichal bristles short, black, the hindmost dorsocentral bristle long. Further a small humeral bristle, one or two posthumeral, a notopleural, a supraalar and a postalar bristle, all black. Scutellum has about eight black marginal bristles. Pleura black, shining. Abdomen black above, dull or almost dull, sometimes a little lighter towards the base. Venter yellowish. Abdomen has on the dorsal side somewhat long, erect, brownish hairs; venter has shorter, pale hairs. Legs pale yellowish, tarsi slightly brownish towards the end; hind tibiæ slightly thickened towards the apex. Anterior femora short-haired; hind femora with rows of long hairs above and below; anterior tibiæ with fine hairs above and below, strongest above; hind tibiæ with similar hairs above and a dense pubescence below; the last joint on all tarsi with somewhat long hairs above. The hairs yellowish. Wings a little blackish fumigated. Veins dark brown. Stigma brown, not filling the apex of the subcostal cell. Halteres blackish brown.

Female. Similar to the male, but the eyes touching for a shorter distance; the antennæ placed above the middle. The large facets of the eye only occupying the upper third part, the dividing line somewhat sharp. The scutellar marginal bristles yellowish. Wings hyaline. Halteres yellowish or dirty whitish.

Length 2.5—3 mm.

T. flavipes is somewhat common in Denmark, but has, however, hitherto only been taken on Sealand; neighbourhood of Copenhagen, Ørholm, Geel Skov and Tyvekrog; my dates are $^{15}/_9$ — $^{13}/_{10}$, it is thus a late occurring species. It occurs in woods on somewhat shaded places on bushes, the males sometimes hover in the air in swarms; thus I took it hovering in great numbers on $^{20}/_9$ in Geel Skov, while the females sat on leaves in the vicinity.

Geographical distribution: — Northern and middle Europe down into France; towards the north to northern Sweden. Zetterstedt records it from July.

2. *T. clavipes* Meig.

1830. Meig. Syst. Besch. VI. 336, 2. — 1842. Zett. Dipt. Scand. I, 254, 2 (*Microphora*). — 1860. Loew. Zeitschr. für Entom. Breslau, XIV, 35, 1. — 1862. Schin. F. A. I, 79 (*Microphorus*). — 1903. Kat. paläarkt. Dipt. II, 257. — *Empis minuta* (non Fabr.) p. p.: 1815. Fall. Dipt. Suec. Empid. 32, 40.

Male. Eyes touching, the facets in the upper part larger than below. The very narrow epistoma greyish black; palpi brownish.

Occiput black, somewhat shining, with black, below with pale hairs. Antennæ black, the third joint rather elongated, the style together with the bristly part short, scarcely half as long as the third joint. Thorax dark æneous, brightly shining. The dorsocentral and acrostichal bristles somewhat short, black, the former a little longer behind, and the hindmost long and strong. Further a humeral bristle, a pair of posthumeral, about three notopleural, a supraalar and a postalar bristle, all somewhat long, black. Scutellum with four black marginal bristles. Pleura black, shining. Abdomen black, velvet along the dorsum, but somewhat metallic shining at the sides and on the venter; it may be a little translucently brownish towards the base. It is clothed with somewhat long, light brownish to yellowish hairs; also the venter has long hairs. Abdomen is less attenuated than in *flavipes*, the exterior genitalia are a little larger and show a small hook. The legs are lighter or darker yellowish, the posterior coxæ somewhat darkened; the hind femora and tibiæ dark brown in about the apical half; all tarsi dark except at the base; the anterior femora and the front tibiæ may be a little darkened in the middle. Hind femora a little thickened, and hind tibiæ distinctly thickened towards the apex. Anterior femora with short hairs above and below; hind femora with long hairs above and below, and on the latter side also with a row of strong, somewhat spine-like bristles; anterior tibiæ short-haired; hind tibiæ densely ciliated below and with longish hairs above; the last joint on all tarsi with long, bristly hairs above. The hairs are yellowish to brownish. Wings a little dark fumigated. Veins brown or blackish. Stigma brown, quite filling the apex of the subcostal cell. Halteres blackish brown.

Female. Similar to the male, but the eyes very narrowly separated, the facets (so far as I could see) all small; frons black. Thorax black, not æneous; the bristles at the sides of the disc, the hindmost dorsocentral bristle and the scutellar bristles yellow. Abdomen shining. The legs as in the male, but not rarely somewhat lighter, the spine-like bristles below the hind femora absent. Wings hyaline. Halteres yellow.

Length 2,5—3 mm.

This species is easily distinguished from *flavipes* by the colour of the legs, the distinctly thickened hind tibiæ, the spine-like bristles below the hind femora in the male, the short antennal style and the stigma, which occupies just the apex of the subcostal cell. At first sight it is similar to *flavipes*, but on closer examination it differs by a multitude of characters.

T. clavipes is not common in Denmark, only eleven specimens

are known; Ermelund (the author), Dyrehaven (Stæger), Bøllemosen, Tisvilde and in Jutland at Hald near Viborg (the author); my dates are $^{22}/_6$ — $^{23}/_7$; it seems thus to be an earlier occurring species than *flavipes*; it occurs on similar localities.

Geographical distribution: — Europe down into Italy and Spain; towards the north to northern Sweden, and in Finland.

Remarks: Fallén described this species as *Empis minuta*; Loew (l. c. 36) states, that this is incorrect, as Fabricius had already described an *E. minuta*. This latter species has never been recognised, though often drawn into synonymy. Loew says, that he should be inclined to think, that it is a *Phora* on account of Fabricius's statement „Habitat gregatim in Daniæ agaricis“. It is interesting to see, that the species is, as I have already mentioned in the description of the family, in reality a *Phora*; another specimen, standing at the side of the first in the collection of Lund, is a *Sciara*. *Empis minuta* Fabr. will thus have to be abolished.

8. **Microphorus** Macq.

(1827. *Microphor.*)

Small, somewhat robust, not slender species of black or greyish colours. Head a little narrower than thorax, somewhat globular and arched behind. Occiput beset with hairs. Eyes rather large, touching for a long distance in the male, well separated in the female; in the male the facets in the upper half larger than below. The incision in middle of the inner eye-margin distinct. Vertex with three ocelli and some small hairs. Antennæ inserted near to each other, about in the

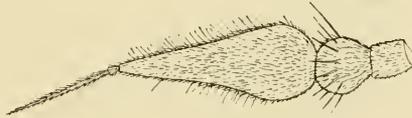


Fig. 73. Antenna of *M. anomalus*. $\times 80$.

middle; they are five-jointed, the first joint small, the second almost globular, the third is triangular, pointed towards the apex, rather broad at the base, and compressed; the two last joints form a two-jointed style, the first joint of which is very small, the second long. The second antennal joint has a few bristles, the third has somewhat long hairs, the style has short hairs quite to the apex. Epistoma is not so narrow as in *Trichina*; the jowls do not descend below the eyes. The proboscis is short, not stretching much beyond the mouth aperture, but however distinctly to be seen; it may be directed down-

wards or forwards. Labrum is as long as labium, strong, broad at the base, with three short points at the apex; it is semitubular and curved somewhat downwards towards the apex; hypopharynx is but slightly shorter, canaliculated, dilated towards the apex, but pointed outermost; it is also curved a little downwards; the maxillæ have a lancet-like or blade-shaped lacinia, and cylindrical, one-jointed palpi; labium has a relatively large basal part, but short labella, which are cleft to the base. Thorax is rectangular, very strongly arched above; prothorax very small and likewise metathorax. There are uniserial or irregularly biserial dorsocentral bristles, and bi- or quadriserial acrostichal bristles; further a humeral bristle, one or two posthumeral, two to three notopleural, one or two supraalar and a postalar bristle. Scutellum has six to eight marginal bristles. Metapleura are bare. Abdomen is cylindrical; in consists in the common way of eight segments; in the male the last segment is small, much lower than the preceding, and more or less hidden under the genitalia; the latter form a little knob-like forceps, which is directed upwards and seems to be somewhat unsymmetrical. In the female the abdomen is pointed and terminates with two thin styles. Legs somewhat slender, hind tibiæ and metatarsi sometimes thickened in the male. The legs have shorter and longer hairs and bristles, but no apical spurs are present. There are two claws, two well developed pulvilli, and a very small, linear, bristle-bearing empodium. The wings are not long; the mediastinal vein does not quite reach the margin; the cubital vein is

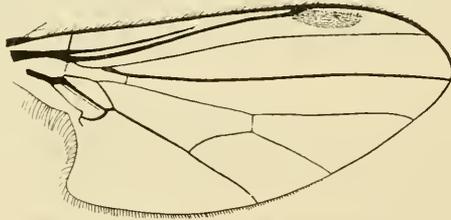


Fig. 74. Wing of *M. anomalus*.

unforked, thus only one cubital cell; the discal vein is forked, thus four posterior cells, and from the discal cell three veins go to the margin, the third is the upper branch of the postical vein, closing the discal cell below; the lower branch of the postical vein recurrent; there is no anal vein developed (or only the basal part, closing the anal cell below). The discal cell is rather long; the basal cells small, and the anal cell about as long as the second basal cell. Stigma present. The axillary lobe is large. Alula not developed, but the wing here with a long fringe. Alar squamula fringed at the margin.

The larva to *M. anomalus* (*pusillus*) is described by Beling (Arch. für Naturgesch. 48, 1, 1882, 212). It is cylindrical, somewhat attenuated towards the head; the last joint somewhat thick, with slightly, longitudinal furrows; on the rounded hinder end is a broad, pointed, membranous tooth or wart, which is curved upwards; above it lie the terminal spiracles (Beling does not mention the, certainly present, prothoracic spiracles, but this he does not do either in the descriptions of other Empid larvæ). The abdominal segments have small, ventral swellings (Kriechschwielien). The larva is 7 mm long, 0,9 mm thick. It was found below the leaves in a plantation of beeches on $13/5$ and developed on $29/5$.

The species of *Microphorus* occur in woods and on fields in low herbage and grass, generally on somewhat humid localities; the species are certainly carnivorous, but I am not aware, that any direct observation has been made; Macquart says however about the etymology: „Le nom de *Microphorus*, petit voleur, fait allusion aux brigandages qu'exercent ces petits insectes à l'égard des autres.“

The genus comprises 9 species from the palæarctic region, two have hitherto been found in Denmark.

Table of Species.

- | | |
|---|-----------------------|
| 1. Dorsocentral and acrostichal bristles long, the latter biserial; hind tibiæ and metatarsi in the male simple; thorax in the female grey | 1. <i>velutinus</i> . |
| -- Dorsocentral and acrostichal bristles short, the latter quadriserial; hind tibiæ and metatarsi in the male swollen; thorax in the female black | 2. <i>anomalus</i> . |

1. *M. velutinus* Macq.

1827. Macq. Soc. Sc. Lille, 1827, 140, 2. — 1838. Meig. Syst. Besch. VII, 78, 4. (*Trichina*). — 1855. Zett. Dipt. Scand. XII, 4599, 3—4. (*Microphora*) — 1860. Loew, Zeitschr. für Entom. Breslau, XIV, 45, 3. — 1862. Schin. F. A. 1, 79. — 1903. Kat. paläarkt. Dipt. II, 258. — *Microphora fuscipes*: 1852. Zett. Dipt. Scand. XI, 4268, 3. — *Rhamphomyia holosericea*: 1842. Zett. Dipt. Scand. I, 425, 46.

Male. Eyes touching; epistoma black; palpi dark. Occiput black, with black hairs. Antennæ black. Thorax somewhat velvet black, very slightly shining, with two narrow, greyish stripes, abbreviated behind; also two lateral stripes, one on each side, are visible. The dorsocentral and acrostichal bristles long, black, the former uniserial, longer and strong behind, the latter biserial. Further a humeral bristle, a pair of posthumeral, about three notopleural, a pair of supraalar and a postalar bristle, all somewhat long, black. Scutellum has six

to eight black marginal bristles, of which four are long. Pleura black or greyish black. Abdomen velvet black, with long, erect, black hairs. Venter black, with somewhat long hairs. Exterior genitalia with some bristly hairs. Legs black; coxæ slightly pruinose; the anterior knees very slightly yellowish. Femora with rows of strong hairs, the anterior femora on the posterior side, the hind femora on the anterior side; tibiæ with hairs above, which are somewhat strong on the hind tibiæ. All hairs black. Wings slightly tinged. Veins black or dark brown. Stigma brownish. Halteres black.

Female. Differing from the male by its grey colour. Eyes separated, frons and occiput grey. Thorax grey with two brownish stripes, which may sometimes be less distinct, and there may also be traces of a faint median stripe. Abdomen grey, and the hairs shorter than in the male. Legs also a little greyish, with the knees generally more distinctly yellowish; they are a little shorter haired than in the male. Wings more hyaline. Halteres pale brownish.

Length 2,2—2,5 mm.

M. velutinus is not common in Denmark, or it has at all events hitherto not been taken frequently; it was for the first time taken in 1882; Amager, Ordrup Mose, Lyngby Mose (the author), Nøddebo (J. C. Nielsen), and on Falster at Resle (H. J. Hansen). My dates are $^{18}/_5$ — $^{14}/_6$, it is thus an early species. It occurs both in or at woods and on fields, often in the vicinity of water. I took it in copula on $^{31}/_5$.

Geographical distribution: — Europa down into Italy and Spain; towards the north to southern Sweden.

2. *M. anomalus* Meig.

1824. Meig. Syst. Besch. IV, 9, 7 (*Platypeza*). — 1862. Loew, Zeitschr. für Entom. Breslau. XIV, 43, 2. — 1903. Kat. paläarkt. Dipt. II, 257. — *Microphorus crassipes*: 1827. Macq. Soc. Sc. Lille, 1827, 140, 1. — 1862. Schin. F. A. I, 79. — *Trichina crassipes*: 1838. Meig. Syst. Besch. VII, 78, 3. — *Microphorus pusillus*: 1827. Macq. l. c. 140, 3. — *Microphora pusilla*: 1842. Zett. Dipt. Scand. I, 256, 4, ♀ et 1849. VIII, 2999, 4. — *Microphora tarsella*: 1842. Zett. Dipt. Scand. I, 257, 5, ♂.

Male. Eyes touching; epistoma and palpi black. Occiput blackish, a little shining, with black hairs. Antennæ black. Thorax velvet black, almost quite dull, with two narrow, slightly greyish stripes, convergent posteriorly; also the sides of the disc a little greyish, especially when seen with the light from in front. The dorsocentral and acrostichal bristles short, black; the former a little irregularly biserial in front, long behind, the latter quadriserial. Further a humeral

bristle, a posthumeral, two to three notopleural, a supraalar and a postalar bristle, all black. Scutellum has six black marginal bristles, two of which are long. Pleura greyish black. Abdomen velvet black above, more greyish on the sides; it is somewhat sparingly clothed with longish, erect, black hairs. Venter greyish black, with long, strong hairs. Exterior genitalia with some bristly hairs. Legs black; coxæ somewhat brownish pruinose; hind tibiæ strongly dilated towards the apex, club-shaped, hind metatarsi very thick and swollen. Anterior femora with long hairs on the postero-ventral side, which are strongest in the apical half; hind femora with long hairs above and below, longest above; anterior tibiæ with short hairs, middle tibiæ also with a couple of bristles on the dorsal side; hind tibiæ with long hairs above, longest and strongest on the thickened apical part; hind metatarsi with longish hairs above. The hairs are black. Wings hyaline, somewhat iridescent and transmitting the light a little reddish. Veins dark brown to black. Stigma slightly brownish. Halteres black.

Female. Similar to the male. Eyes separated, frons greyish black. Thorax and abdomen slightly more shining than in the male, and shorter haired. Legs simple, and likewise shorter haired. Halteres paler or darker brownish.

Length 2,2—2,8 mm.

This species is in the male at once distinguished from *velutinus* by the shape of the hind legs; in the female it is recognised by the black, not grey thorax, and in both sexes by the much shorter dorsocentral and acrostichal bristles, and by the latter being quadriserial.

M. anomalus is, like the preceding, not common in Denmark; Charlottenlund (Stæger); on Langeland at Lohals (the author); on Lolland at Maribo (Schlick) and on Bornholm at Hasle (H. J. Hansen). My dates are only ³⁰/₆ to the last half of July; it occurs evidently less early than *velutinus*; otherwise it occurs in similar localities.

Geographical distribution: — Northern and middle Europe down into France; towards the north to middle Sweden.

9. *Oedalea* Meig.

Species of somewhat small size and a somewhat slender shape, the colour of the body black. The head globular, as broad as thorax, arched behind, and here with some hairs. Eyes large, occupying the whole front side of the head; they are touching in the male, well separated in the female; in the male the facets in the upper half part

are larger than below. The incision in the middle of the inner eye-margin present and distinct. The vertex with three ocelli and some hairs. The antennæ are inserted near to each other, in the middle; they are relatively long, always longer than the head. They consist of five joints; the two basal joints are short, the first cylindrical, the second somewhat globular, the third joint is long, compressed, very slightly or not attenuating towards the apex, and thus somewhat band-shaped; the two last joints form a style, the basal joint of which is very small (only seen with the microscope); the style may be thicker or thinner, the apex is somewhat bristle-shaped, and this bristle-shaped part is longest and most distinct, when the style is thin¹. Epistoma is not narrow; the jowls are almost not developed, only present as a small rim. Clypeus is somewhat horse-shoe-shaped. Proboscis is short, not as long as the head is high; it is directed downwards or more or less forwards. Labrum is strong, straight, broad at the base and semitubular, with three short points at the apex; hypopharynx is well developed, as long as labrum, canaliculated, and pointed at the apex; it has two, somewhat deep excisions below the apex, so that there are three points in all, the middle the longest; the maxillæ are shorter, very thin and thread-like, the maxillary palpi one-jointed, somewhat club-shaped with dilated apex, and somewhat compressed; labium is about of the length of the labrum or a little longer, the labella are somewhat shorter than the basal part. Thorax is rectangular, arched above; pro- and metathorax very small. There are no specialised dorsocentral and acrostichal bristles, the disc being uniformly clothed with short hairs, but these are, however, divided into three parts by two longitudinal, bare stripes, the hairs on these parts answering to the dorsocentral and acrostichal bristles. On the sides of the disc only a notopleural and a postalar bristle present. Scutellum has six marginal bristles. Metapleura are bare. Abdomen is slender; it consists in the usual way of eight segments; in the male

¹ Loew says in his monograph (Neue Beitr. zur Kenntn. der Dipt. VI, 1859, 44) that the second joint of the style „erscheint . . . entweder in Folge seiner kurzen aber dichten Behaarung plump, höchstens am Ende borstenförmig zugespitzt, oder es hat die Gestalt einer kurzen, dicken Borste.“ From this passage it might be thought, that it is only when the style is thick, that it is densely hairy, but it is also hairy, when it is thin, and it is in both cases constructed about in the same way, the only difference being the thickness and the presence of a terminal, bristle-shaped, bare part in the thin style, which part is very short or almost wanting in the thick style. Loew speaks only of the second joint, but it is more correct to speak of the whole style, as the small basal joint is of the same thickness as the second, and under a lens not to be discerned from this.

the last segment is small and hidden. The exterior genitalia are small; they consist of a small forceps, formed of a pair of somewhat broad lamellæ, and above them there is a small, styliform process, which is directed upwards. In the female the abdomen is pointed, and the eighth segment forms a long, slender, compressed ovipositor, which is curved a little upwards. The legs are somewhat slender, the hind legs are longest; the hind femora are in both sexes somewhat long and thickened, and have rows of spines on the apical part below towards each side; the hind tibiæ are shorter than the femora, curved at the base, and when laid up towards the femora, they are placed between the rows of spines. The legs are short-haired, only the hind femora have long hairs above in the basal part, and the hind tibiæ have somewhat longish hairs below; there are no distinct apical spurs. There are two claws, two pulvilli, and a thin, somewhat claw-shaped empodium with bristles on the lower side. The wings have the mediastinal vein not quite reaching the margin; the cubital vein is unforked, and thus there is one cubital cell; the discal vein is forked, and there are thus four posterior cells, and the discal cell sends three veins to the margin,

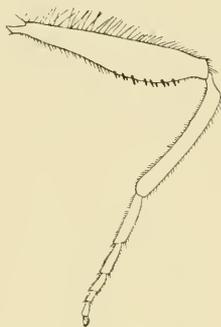


Fig. 75. *Oe. flavipes*,
hind leg. $\times 15$.

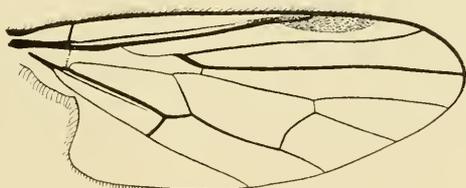


Fig. 76. Wing of *Oe. flavipes*.

the third is the upper branch of the postical vein, which closes the discal cell below; the discal cell is somewhat long, and also the basal cells are long; the lower branch of the postical vein is only slightly recurrent, not parallel with the margin, and meeting the anal vein almost rectangularly; the anal vein is straight, reaching the margin; the anal cell is a little shorter than the second basal cell. Stigma present, sometimes very weak. The axillary lobe is large. Alula almost not developed, fringed at the margin. Alar squamula small, likewise fringed.

So far as I am aware the developmental stages of the genus are not

known. I possess two specimens of *Oe. flavipes*, which are stated to have been bred from wood; probably then the larvæ live in decaying wood, but they are certainly carnivorous.

The species of *Oedalea* occur in woods, especially on open, but somewhat shaded places; they have a somewhat heavy flight; they must be considered carnivorous. They seem everywhere to be rather rare. The species are not sufficiently studied, probably because the material for examination is generally small. The best work about them is still Loew's monograph from 1859.

The genus comprises 10 species from the palæarctic region, 4 have hitherto been found in Denmark.

Table of Species.

- | | |
|--|-------------------------|
| 1. Wings with two brown patches at the anterior margin, one at each end of the stigma, this latter almost colourless | 1. <i>hybotina</i> . |
| — Wings without patches, stigma brown | 2. |
| 2. Hind femora with the apical part brown or blackish; scutellar bristles yellow | 3. <i>stigmatella</i> . |
| — Hind femora quite yellow | 3. |
| 3. Scutellar bristles yellow; antennæ long, the style somewhat thick | 2. <i>flavipes</i> . |
| — Scutellar bristles black; antennæ shorter, the style bristle-shaped | 4. <i>Holmgreni</i> . |

1. *Oe. hybotina* Fall.

1815. Fall. Dipt. Suec. Empid. 31, 39 (*Empis*). — 1820. Meig. Syst. Besch. II, 536, 1, Tab. XXI, Fig. 27. — 1842. Zett. Dipt. Scand. I, 245, 1. — 1859. Loew, Neue Beitr. zur Kenntn. der Dipt. VI, 47, 3. — 1862. Schin. F. A. I, 80. — 1903. Kat. paläarkt. Dipt. II, 259.

Male. Eyes touching; epistoma black, shining; palpi black. Occiput black, with black, below with whitish hairs. Antennæ long.



Fig. 77. Antenna of *Oe. hybotina*. $\times 65$.

blackish brown; the basal joints may be lighter; the style is broad, almost as broad as the apex of the third joint. Thorax black, shining; the disc clothed with short, somewhat adpressed, greyish white hairs, leaving two narrow stripes bare. Of bristles a notopleural and a small postalar bristle present, both yellow, and besides some smaller hairs in the præsutural depression. Scutellum with six

yellow marginal bristles. Pleura black, shining. Abdomen likewise black, shining, with whitish yellow hairs. Venter similarly coloured and haired, sometimes a little lighter at the base. Legs pale yellow, hind femora dark brown on the apical half, but the apex again yellow, hind tibiæ brownish black, the base whitish yellow; the anterior tarsi brownish, hind tarsi darker brown, the basal part of the metatarsus yellow. The legs are short-haired with yellow hairs; the hind femora have long, yellow hairs above in the basal part; on the ventral side there are two rows of short, somewhat strong, black spines on the apical part. Wings hyaline, slightly yellowish tinged. Veins somewhat thick, brown or dark brown, the apex of the lower branch of the discal vein thin and evanescent, but it may be traced to the margin. Stigma slightly yellowish, almost colourless, at the inner end of it a small brown patch, and a similar at its apex, which latter is produced down into the cubital cell, and a very faint, band-like continuation downwards may be present. Halteres yellow.

Female. Similar to the male, but the eyes well separated, the frons black shining. Ovipositor blackish, brownish yellow towards the base.

Length 3,5 m m.

This species is at once recognised by the two patches on the wing.

Oe. hybotina is very rare in Denmark, only three specimens, a male and two females, have been taken; vicinity of Copenhagen (H. J. Hansen), Dyrehaven (Drewsen) and on Lolland at Maribo (Schlick); on the latter locality it was taken on $\frac{5}{6}$.

Geographical distribution: — Northern and middle Europe down into France; towards the north to northern Sweden.

2. *Oe. flavipes* Zett.

1842. Zett. Dipt. Scand. I, 247, 3 et 1849. VIII, 2998, 3. — 1859. Loew, Neue Beitr. zur Kenntn. der Dipt. VI, 48, 4. — 1903. Kat. paläarkt. Dipt. II, 259. — *Empis minuta*: 1815. Fall. Dipt. Suec. Empid. 32, 40, p. p. — *Oedalea minuta*: 1820. Meig. Syst. Besch. II, 356, 2 et 1838. VII, 101. — 1842. Zett. Dipt. Scand. I, 247, 4. — 1862. Schin. F. A. I, 81.

Male. Eyes touching; epistoma black, shining; palpi black. Occiput likewise black, shining, with black, below with white hairs. Antennæ long, blackish brown, the style is less broad and much shorter than in *hybotina*. Thorax black, shining, with short, somewhat adpressed, greyish white hairs, leaving two narrow, bare stripes. Of

bristles a notopleural and a postalar bristle present, both yellow, and besides there are some small hairs in the præsutural depression. Scutellum with six yellow marginal bristles. Pleura black, shining.



Fig. 78. Antenna of *Oe. flavipes*. $\times 65$.

Abdomen black, shining, with whitish yellow hairs. Venter similarly coloured and haired. Abdomen may be slightly translucently brownish towards the base. Legs whitish yellow, hind tibiæ blackish brown, the base whitish, front tibiæ generally somewhat brownish, but the base pale; the hind femora often slightly brownish just at the apex; tarsi brownish, the basal part of the hind metatarsi yellow. The legs are short-haired with pale yellow hairs; the hind femora have long, yellow hairs above on the basal half or more, the hairs becoming short towards the apex; below there are rows of short, black spines on each side on the apical part. Wings somewhat brownish tinged, especially towards the apex. Veins brown to dark brown. Stigma brown. Halteres yellow.

Female. Quite similar to the male, but the eyes well separated, frons black, shining. Ovipositor blackish. (In my only female specimen the notopleural bristle is black).

Length 3—3,7 mm.

Oe. flavipes is somewhat rare in Denmark; Charlottenlund (Stæger), Dyrehaven, and on Lolland at Maribo (Schlick). The dates are $^{6/6}$ — $^{16/7}$. Two specimens from Dyrehaven are stated to have been bred from wood.

Geographical distribution:— Northern and middle Europe down into France; towards the north to middle Sweden.

3. *Oe. stigmatella* Zett.

1842. Zett. Dipt. Scand. I, 246, 2. — 1859. Loew, Neue Beitr. zur Kenntn. der Dipt. VI, 49, 8. — 1862. Schin. F. A. I, 81. — 1903. Kat. paläarkt. Dipt. II, 259.

Male. Eyes touching; epistoma black, shining; palpi blackish brown. Occiput black, shining, with black, below with whitish hairs. Antennæ somewhat short, blackish brown, the style thin, bristle-shaped. Thorax black, with very short, whitish yellow hairs, leaving two narrow, bare stripes. Of bristles a notopleural and a postalar bristle present, both yellow, and besides a couple of smaller hairs in

the præsutural depression. Scutellum with six long, yellow bristles. Pleura black, shining. Abdomen likewise black, shining, with somewhat long, whitish yellow hairs. Venter brownish to yellowish, gener-



Fig. 79. Antenna of *Oe. stigmatella*. $\times 65$.

ally darker towards the apex. Legs whitish yellow, hind femora with the apical half dark brown, hind tibiæ dark brown, the basal part white; anterior tarsi light brownish, the metatarsi almost quite pale, the hind tarsi darker brown, only the very base of the metatarsi yellow. The legs pale yellowish haired quite in the usual way, and the hind femora likewise with black spines below on the apical part. Wings slightly tinged. Veins brown. Stigma brown. Halteres pale yellow.

Female. Similar to the male, but the eyes well separated, the frons black, shining. The hairs on abdomen a little shorter than in the male, and the venter generally yellow; ovipositor black or brownish.

Length 3,5 mm.

This species is distinguished from the preceding by the bristle-shaped antennal style and the dark apical part of the hind femora; also the venter seems always to be more or less pale. — Immature specimens may have the thoracic disc and the pleura lighter to brownish or reddish.

Oe. stigmatella is like the preceding a rare species; only six specimens are known; Ordrup Mose (Stæger); on Lolland at Maribo and Ryde (Schlick); the dates are only $^{10}/_6$ — $^{18}/_6$.

Geographical distribution:— Northern and middle Europe down into Austria; towards the north to northern Sweden. (It has been recorded from North America, but is later described by Melander as *Oe. ohioensis*; see Mel. Trans. Amer. Ent. Soc. XXVIII, 1902, 347).

4. *Oe. Holmgreni* Zett.

1852. Zett. Dipt. Scand. XI, 4267, 3—4. — 1859. Loew, Neue Beitr. zur Kenntn. der Dipt. VI, 49, 7. — 1903. Kat. paläarkt. Dipt. II, 259.

Male. Eyes touching; epistoma black; proboscis straight, palpi black. Occiput black, shining, with black, below with whitish hairs. Antennæ not long, very slightly longer than in *stigmatella*, blackish brown, the style thin, bristle-shaped and very short. Thorax black, shining, with short, greyish white hairs, leaving two very narrow, bare stripes. Of bristles a notopleural and a postalar bristle present,

both black; besides there are smaller hairs in the præsutural depression. Scutellum with six black bristles. Pleura black, shining. Abdomen likewise black, shining, with not long, whitish yellow hairs.



Fig. 80. Antenna of *Oe. Holmgreni*. $\times 65$.

Venter similarly coloured and haired. Legs yellow to dark, almost brownish yellow, front and hind tibiæ blackish brown, the basal part yellow, middle tibiæ more or less brownish or quite yellowish; all tarsi brown, sometimes pale just at the base. The legs yellow-haired quite in the usual way, and the hind femora likewise with rows of black spines below in the apical part; the hairs on the tarsi somewhat darkened. Wings blackish brown fumigated. Veins blackish or dark brown. Stigma blackish brown. Halteres more or less dark yellow to brownish yellow.

Female. Quite similar to the male, but the eyes well separated, the frons black, shining. Abdomen shorter haired than in the male; ovipositor slender, black or blackish.

Length 2,8—3,5 mm.

This species is known from *stigmatella* by the pale hind femora, and it differs from the three other species by the black scutellar bristles, and the darker tibiæ and tarsi. Strobl says (Mitth. Ver. Steierm. 1892, 93) that it differs from *flavipes* by the longer antennal style; the style is much thinner, but I find it not at all longer.

Oe. Holmgreni is as rare as the preceding species; Nyraad at Vordingborg (J. C. Nielsen), Tisvilde and on Langeland at Lohals (the author), on Lolland at Maribo (Schlick); my dates are $7/6$ — $11/7$. It occurs, on open, somewhat shaded places in woods.

Geographical distribution:— Northern and middle Europe down into Styria; towards the north to middle Sweden.

10. **Ocydromia** Meig.

Species of somewhat small size and of a slender shape, and of black or yellow colour. The head is about globular, a little narrower than thorax and slightly longer than broad. Occiput is arched or almost conical; it has some small hairs. Eyes large, occupying the whole front part of the head; they are touching for a long distance in both sexes; in the male the facets in the upper half part are slightly larger than below. The incision in the middle of the inner eye-margin distinct. On the vertex there are three ocelli and some

hairs. The antennæ are inserted near to each other in the middle; they are three-jointed, the two basal joints are short, the first cylindrical, the second almost globular, the third joint is about as long as



Fig. S1. Antenna of *O. glabricula*. $\times 80$.

the two basal together; it is ovate and bears above, somewhat behind the apex, a long arista, which is, so far as I could detect, not articulated to the joint.¹ Epistoma is high and very narrow; jowls are not developed, the eyes going quite to the mouth aperture. The proboscis is short, only just reaching out of the mouth aperture; labrum is strong, semitubular, high at the base and with a three-lobed apex; hypopharynx is of the same length, pointed towards the apex. I could not detect the laciniae of the maxillæ on the dried material I had for examination; the maxillary palpi are one-jointed, short; labium is about of the length of labrum, with small labella. Thorax is rectangular, high and strongly arched above. There are very thin and short uniserial dorsocentral and biserial acrostichal hairs; there are also small and inconspicuous humeral, notopleural, supraalar and postalar hairs. Scutellum has six marginal bristles. Metapleura with short, fine hairs. Abdomen is in the male long and slender, cylindrical and consisting of eight segments, the eighth is small; the exterior genitalia are small, consisting of a pair of somewhat complicated lateral lamellæ, forming a kind of forceps. In the female the abdomen is thicker, somewhat compressed, likewise consisting of eight segments and terminating with two small and short lamellæ. The legs are long and slender, the hind legs the longest. They are densely haired, but there are no specialised apical spurs on the tibiæ. There are two claws, two pulvilli, and a small, linear, pointed empodium, bearing bristles below. The wings have the mediastinal vein not reaching the margin; the cubital vein is unforked, thus one cubital cell; the discal vein likewise unforked, so that there are only three posterior cells; sometimes a little veinlet is present, indicating a beginning of an upper branch of the discal vein. The discal cell sends only two veins to the margin, the lower is the upper branch of the postical vein, which closes the discal cell below. The

¹ I have examined antennæ treated with potash under a magnification of more than 100, and I could detect no articulation; in spite of this result I feel not quite certain, and in the related *Leptopeza* the antennæ are five-jointed, the arista being two-jointed and articulated to the third joint.

lower branch of the postical vein goes downwards and meets the anal vein rectangularly; the anal vein reaches the margin and is a little curved at the apex. The discal cell is somewhat long; also the

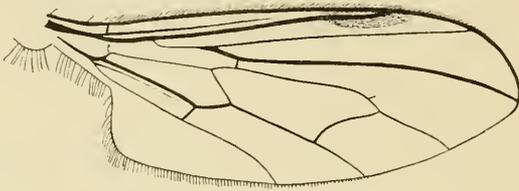


Fig. 82. Wing of *O. glabricula*.

basal cells are long, and the anal cell shorter than the second basal cell. Stigma present. The axillary lobe well developed. Alula not developed, the margin here fringed. Alar squamulae small, with a long fringe at the margin.

The larva is described by Beling (Arch. für Naturgesch. 48, 1, 1882, 213); it is cylindrical, attenuated towards the anterior end, twelve-jointed and of yellowish white colour. The last segment is somewhat short and broad, and slightly, longitudinally furrowed; on the end of it is a truncate, membranous tooth with a broad base, and with the apex directed upwards; above the tooth the terminal spiracles are placed. The abdominal segments have small, transverse swellings (Kriechschwien) on the ventral side. The larva is 6 mm. long and 0,6 mm. thick. The pupa is yellowish, it has two teeth on the front side of the head, and some erect hairs on the head. The abdominal segments have each above at the hind margin a transverse row of short, brown spines. The pupa is 3 mm. long. The larvæ were found on a field below decaying vegetables; the imagines developed on $^{15}/_5$ to $^{9}/_6$.

The species occurs in low herbage on humid places in woods and on meadows. It is carnivorous, Poulton (l. c.) records it from England with *Sciara* sp. as prey.

The genus comprises only one species, also found in Denmark.

1. *O. glabricula* Fall.

1815. Fall. Dipt. Suec. Empid. 33, 42 (*Empis*). — 1820. Meig. Syst. Besch. II, 352, 1, Tab. XXI, Fig. 23. — 1842. Stæg. Krøyer's Tidsskr. IV, 101. — 1842. Zett. Dipt. Scand. I, 236, 1. — 1862. Schin. F. A. I, 82. — 1903. Kat. paläarkt. Dipt. II, 260. — *Ocydromia ruficollis* (non Meig.): 1827. Macq. Soc. Sc. Lille, 1827, 146, 2. — *Ocydromia rufipes*: 1820. Meig. Syst. Besch. II, 353, 3, et auct. cet. — *Ocydromia scutellata*: 1820. Meig. Syst. Besch. II, 354, 5, et auct. cet. — *Ocydromia dorsalis*: 1830.

Meig. Syst. Besch. VI, 334, 6. — *Ocydromia nigripennis* (non Fabr.): 1830. Meig. l. c. 7. — *Ocydromia melanopleura*: 1840. Loew, Programm. 1840, 19, 4.

Male. Epistoma very narrow, black shining; palpi blackish. Occiput black, slightly shining, above with blackish, below with pale hairs. Antennæ black. Thorax dark æneous, brightly shining. The dorso-central and acrostichal bristles inconspicuous, very short and thin, dark. There are some small humeral, a couple of notopleural, a supraalar and a postalar bristle, but all very inconspicuous. The præsutural depression is somewhat densely clothed with short hairs. Scutellum black, with six yellowish or brownish marginal bristles, the two median long and straight, the lateral curved. Pleura black, shining, downwards more reddish or yellowish. Abdomen black, shining, on the sides the incisures a little pale; it is clothed with long, erect, brownish or blackish hairs, those at the hind margin of the segments longer and stronger. Venter blackish brown or more or less pale, with a little shorter hairs. Legs yellowish, the posterior femora more or less brownish, but pale towards the base; all tibiæ and tarsi brown to brownish black. All legs are somewhat densely and longish haired, the hairs are longest on the dorsal and ventral side; below the femora the hairs are vertically erect, on the anterior femora sparse and distant. All the hairs are lighter or darker brownish. Wings blackish. Veins black. Stigma brown. Halteres darker or paler brownish.

The above description is from the malè, such as it most commonly occurs here; it answers to *melanopleura* Loew. A little less common is the var. *scutellata*; it has the scutellum yellow, and likewise the pleura more or less yellowish, and the legs and halteres lighter; also the brownish colour on abdomen is more extended.

Female. Thorax yellowish or reddish, brightly shining, with a smaller or larger, generally quadratic or rectangular blackish spot on the middle in front. Scutellum and pleura yellow. Abdomen yellow, with the hind part of the dorsal segments black; the hairs pale. Legs yellow, the anterior tibiæ and all tarsi more or less brownish. Wings hyaline. Halteres yellow. Such is the common form of the female here; it has been taken together with the common form of the male, and in copula with it. The form answers to *glabricula* Meig. Not rarely the female has the thoracic disc nearly quite black, only reddish behind, and the wings yellowish or a little brownish. This form would about answer to *dorsalis* Meig.

Length 3,5—4,5 mm.

As seen from the 'description and the synonymical list this species

varies very much, and it has therefore been divided into several species, which were generally founded only on one of the sexes. Sufficient account of its synonymy is given by Stæger (Krøyer's Tidsskr. IV, 1842—43, 98) and in the Kat. paläarkt. Dipt. The single sex does not vary so much, and each sex has its own varieties; the female is, even in its darkest forms, always paler than the male; the darkest variety of the male (*melanopleura*), and the pale form of the female (*glabricula*) are most common. The different varieties, which are, for the rest, connected by transitions, are not easily determined by use of the literature, because the earlier writers generally did not note the sex. To be sure Meigen does so for some of his species, but this is, as already noted by Stæger l. c., erroneous, and Meigen's species are, in spite of his statements, always founded only on one sex; as the exterior sexual difference is only small, Meigen has evidently had no clear idea of the sexes. Fallén on the other hand has identified the two sexes of the species correctly. Schiner gives a good account of the varieties, but the sexes are intermingled; thus he says of var. *glabricula*, that the abdomen is thick and compressed; this is because the variety comprises only the female. Strobl (Mittheil. Ver. Steierm. 1892, 94) divides the forms into three varieties, and says that all varieties occur in both sexes, but this is certainly not correct.

O. glabricula is a common species in Denmark; at Copenhagen in gardens, Lersøen, Ermelund, Geel Skov, Boserup at Roskilde, Tisvilde, Frederikssund; on Langeland at Lohals; on Funen at Odense, Veflinge and Strib; in Jutland in Greisdalen at Vejle, at Nebsager near Horsens, Hald near Viborg and Frederikshavn; finally on Bornholm at Rø. It is found during the whole summer, my dates are $18/6$ — $9/9$. It occurs especially on humid, somewhat shaded places in woods, and on meadows, often in great numbers; it is seen hovering slowly and somewhat low, or sitting in the herbage.

Geographical distribution: — Europe down into Italy; towards the north to northern Scandinavia, and in Finland. It occurs also in North America. It is thus a widely distributed, and everywhere rather common species.

11. **Leptopeza** Macq.

(1827. *Lemtopeza*).

Species of somewhat small size, and of black or yellow colours. The head is globular, almost as broad as thorax, arched behind. Occiput haired. Eyes large, occupying the whole front side of the head; they are touching in both sexes or (*sphenoptera*) very narrowly separated in both sexes, but in the latter case on the other hand touching

below the antennæ. The facets seem to be of equal size. There is a small incision in the middle of the inner eye-margin. There are three ocelli on the vertex, and a pair of forwards curved hairs. The

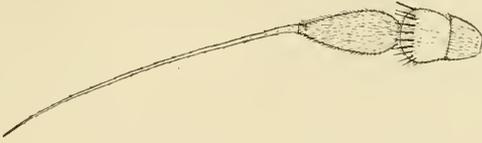


Fig. 83. Antenna of *L. flavipes*. $\times 80$.

antennæ are inserted near to each other, in or above the middle; they are five-jointed, the basal joints are short, the first cylindrical, the second almost globular; the third joint is somewhat elongated, conically tapering and compressed; it terminates with a long, two-jointed, apical arista, the first joint of which is very short. Epistoma is high and very narrow, or (*sphenoptera*) not present, the eyes here touching. There are no jowls developed, the eyes going quite to the mouth aperture. The proboscis is short, only just reaching out of the aperture. I have not been able to examine the mouth parts, which are probably similar to those in *Ocydromia*. Thorax is rectangular, high, and very arched above. Pro- and metathorax small. There are short, uniserial dorsocentral and bi- or pluriserial acrostichal bristles or hairs. A notopleural and a postalar bristle generally present, sometimes also a supraalar bristle, and there may be other small hairs present at the sides of the disc. Scutellum has two or a greater number of marginal bristles. Metapleura with short, fine hairs, or (*sphenoptera*) bare. Abdomen is slender; it consists in the usual way of eight segments, the last is small or hidden. The male genitalia form a smaller or larger forceps with unsymmetrical arms, between them a thin, sinuous penis curves upwards. In the female the eighth segment forms generally a long, compressed, sword-shaped ovipositor, which at the apex bears a small joint, terminating with a pair of thin styles; in *sphenoptera* the eighth segment is shorter, conical, not compressed, but likewise with a joint with two styles at the apex. The legs are somewhat long and slender, the hind legs longest, the hind tibiæ may be a little thickened towards the apex. The legs are haired with shorter or longer hairs, and have bristles to a various degree; also apical spurs on the tibiæ are present. There are two claws, two pulvilli, and a linear, pointed and bristle-bearing empodium. The wings have the mediastinal vein not reaching the margin; the cubital vein is unforked and thus one cubital cell; the discal vein likewise unforked, thus three posterior cells, and the discal cell sending

two veins to the margin, the lower is the upper branch of the postical vein, which closes the discal cell below; sometimes there is a small veinlet indicating a beginning of an upper branch of the discal vein, and further the wing-membrane has always a fold here; the lower branch of the postical vein is somewhat recurrent; the anal vein does not reach the margin. The discal cell is of moderate length; the basal cells rather large, the anal cell a little shorter than the second basal cell. Stigma absent, but the apical part of the costal cell may be more or less coloured. The axillary lobe well developed. Alula not developed, the margin here fringed. Alar squamula small, with a long fringe. — In *sphenoptera* the discal cell is very long, and the axillary lobe almost not developed.

So far as I am aware the developmental stages of *Leptozeza* are not known.

The species of this genus occur in woods, in low herbage and on bushes on open, but humid and somewhat shaded places.

Of the genus 6 species are known from the palæarctic region; two have hitherto been found in Denmark.

Table of Species.

1. Thorax black in the male, yellow in the female; wings with the axillary lobe well developed, and the discal cell moderately long 1. *flavipes*.
- Thorax black in both sexes, the prothoracic parts silvery; wings narrow, with the axillary lobe almost not developed, and the discal cell very long 2. *sphenoptera*.

1. *L. flavipes* Meig.

1820. Meig. Syst. Besch. II, 353, 4, ♂ (*Ocydromia*). — 1842. Stæg. Krøyer's Tidsskr. IV, 99. — 1842. Zett. Dipt. Scand. I, 242, 2, et 1849. VIII, 2997, 2, et 1859. XIII, 4979, 2, ♂. — 1862. Schin. F. A. I, 82. — 1903. Kat. palæarkt. Dipt. II, 261. — *Ocydromia ruficollis*: 1820. Meig. Syst. Besch. II, 353, 3, Tab. XXI, Fig. 24, ♀. — 1842. Zett. Dipt. Scand. I, 241, 1, et 1849. VIII, 2996, 1, et 1859. XIII, 4979, 1, ♀.

Male. The very narrow epistoma blackish; palpi yellow. Occiput blackish, at the top with long, black hairs, for the rest yellow-haired. Antennæ black or brownish black. Thorax black, shining; the disc is clothed with short, whitish hairs, which are so arranged, that there is a uniserial dorsocentral row on each side, while the acrostichal hairs are pluriserial and occupy the whole middle space; the dorsocentral hairs are the longest, and they become long and bristly behind; in front both the acrostichal and dorsocentral hairs change into a dense pruinosity. There are some small humeral hairs, one long and some shorter notopleural bristles, a supraalar and a postalar

bristle, all yellow; besides there may be some smaller hairs. Scutellum with eight to ten pale yellow marginal bristles. Pleura black, very slightly pruinose. Abdomen black, shining, sometimes a little translucently brownish; it is clothed with long, pale yellowish hairs, which are a little longer at the hind margin of the segments. Venter similarly coloured, a little shorter haired. Genitalia not large and not swollen. Legs pale yellow; the coxæ, especially the posterior somewhat darkened, hind femora a little brownish, hind tibiæ and tarsi brown, the tibiæ paler towards the base, anterior tarsi brownish, pale at the base. Hind tibiæ somewhat thickened towards the apex, and the metatarsi slightly thickened. The legs are densely and longish haired, especially above and below, the hairs below the femora are vertically erect; the middle femora have some bristles on the antero-dorsal side, the middle tibiæ two rows of long bristles on the dorsal

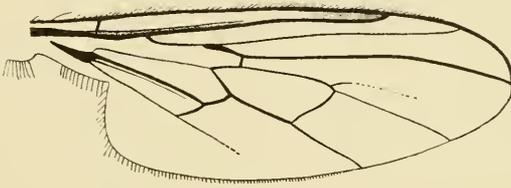


Fig. 84. Wing of *L. flavipes*.

side (with about three bristles in each row); the hind tibiæ have some bristles on the dorsal side towards the apex. The hairs and bristles are yellow to pale brownish. Wings slightly yellowish tinged. Veins brown. No stigma present. Halteres yellow.

Female. Differing from the male in colour; thorax yellow or reddish yellow; abdomen yellow, but with broad, transverse, black spots on the segments, so that it has only narrow, pale incisures, or the spots quite confluent and abdomen black, only with some triangular lateral yellow spots; venter more or less pale. Ovipositor long, compressed, curved upwards and sword-like. Legs as in the male or a little paler.

Length 4—5 mm.

L. flavipes is very rare in Denmark and has only been taken a few times many years ago, by Stæger in Charlottenlund. It occurred in the middle of June, and was taken on *Corylus avellana*.

Geographical distribution: — Europe down into Spain and Italy; towards the north to northern Scandinavia, and in Finland; it occurs also in North America.

2. *L. sphenoptera* Loew.

1873. Loew, Besch. eur. Dipt. III, 215, 136. — 1903. Kat. paläarkt. Dipt. II, 261.

Male. Eyes not quite touching, but leaving a very narrow, black frontal stripe; on the other hand they are touching below the antennæ, so that no epistoma is present. Proboscis yellow, palpi black. Occiput grey, with black, downwards with pale hairs. Antennæ inserted above the middle, black or brownish black, the third joint somewhat elongated. Thorax black, shining; the prothoracic parts both above and on the sides with a beautiful silvery pruinosity. The dorsocentral and acrostichal bristles short and thin, black; the former uniserial, not longer behind, the latter biserial. A long and strong notopleural and a shorter postalar bristle present, both black; besides there are some small hairs on the humeri and in the præsutural depression. Scutellum with two long, black marginal bristles and a pair of small hairs laterally. Pleura black, somewhat shining. Abdomen black, shining, it may be somewhat translucently pale towards the base and at the sides; it is clothed with pale yellow hairs and has somewhat stronger marginal bristles on the segments. Venter brownish or more or less pale, with pale yellowish hairs. The exterior genitalia form a forceps with large, swollen arms, and there is a long, somewhat sinuous penis, which is curved upwards. Legs yellowish white or yellow, the hind tibiæ brownish towards the apex; the hind tibiæ are very slightly thickened and curved a little outwards towards the apex; tarsi brownish outwards, the last joints blackish. The legs are somewhat sparingly clothed with shorter and longer hairs; the front femora have short, strong hairs on the anterior side; the posterior femora have long, erect hairs below, and the hind femora an apical bristle on the anterior side; the middle tibiæ have some long bristles on the antero- and postero-dorsal side; the hind tibiæ are ciliated below and

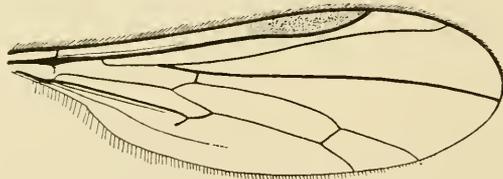


Fig. 85. Wing of *L. sphenoptera*.

with some long, thin hairs, the ciliation is dense towards the apex, above there is a pair of bristles near the apex. The hairs are paler or darker brown, the bristles black. Wings narrow, and with the

axillary lobe very slightly developed; they are somewhat blackish tinged. Veins black; the discal cell very long and narrow, and hence the veins issuing from it short; the anal vein weak and not reaching the margin. No stigma. Halteres white.

Female. Quite similar to the male, also in the structure of the head. The eighth abdominal segment forms a short, conical ovipositor, terminating with two somewhat long, thin styles.

Length 2.8—3.4 mm.

This species is very interesting with regard to the structure of the head and the wings, and it might perhaps, as already suggested by Loew, serve as type for a separate genus.

L. sphenoptera is very rare in Denmark, and it was for the first time taken in 1909; Ordrup Krat and Ermelund (the author); my dates are $7/8$ — $9/9$, so that it is evidently a late occurring species. It occurs on humid, somewhat open places in woods and thickets in the low herbage; it was seen hovering slowly over the plants and was taken sitting on *Urtica* and *Impatiens*.

Geographical distribution: — Europe down into Italy, and further into North Africa; its northern limit lies in Denmark, and it occurs also in England (according to specimens sent to me from Mr. Verrall).

12. **Euthyneura** Macq.

(*Anthalia* Zett.)

Small species, of black, rarely yellow colour (*pallida* Zett.). The head globular, slightly narrower than thorax, arched behind and here with some hairs. Eyes large, in the male either touching or very narrowly separated, in the female well separated; the incision in the inner eye-margin present. Vertex with three ocelli and a pair of small bristles. Antennæ inserted near to each other, in the middle; they are short, consisting of five joints; the two basal joints are short, the third a little elongated, compressed and somewhat ovate, but pointed at the apex; the two last joints form a very short style. Epistoma is somewhat narrow; jowls not developed. The proboscis is shorter or longer, from somewhat shorter than the head to about twice as long; it is stretched horizontally forwards or obliquely downwards; the maxillary palpi are one-jointed, somewhat long and a little compressed; they rest on the proboscis. The mouth parts I have otherwise not been able to examine. Thorax is rectangular, high, and arched above; pro- and metathorax very small. The thoracic disc has



Fig. 86. Antenna of *Eu. Gyllenhali*. $\times 70$.

short hairs, which are generally arranged as uniserial dorsocentral and quadriserial acrostichal bristles. Scutellum has four to six marginal bristles. Metapleura bare. Abdomen not specially slender; it consists in the usual way of eight segments, the last is small or hidden. The male genitalia are small, forming a small forceps. In the female the abdomen is pointed, terminating with a shorter or longer ovipositor. Legs not specially long, the hind legs the longest. They are clothed with shorter or longer hairs; tibiæ without apical spurs. There are two claws, two pulvilli, and a small, linear, bristle-bearing empodium. Wings with the cubital vein unforked (? *furcata* Zett.),

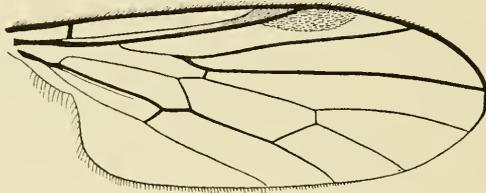


Fig. 87. Wing of *Eu. Gyllenhali*.

thus one cubital cell; the discal vein forked, thus four posterior cells, and three veins going from the discal cell to the margin, the third of which is the upper branch of the postical vein, which closes the discal cell below; the lower branch of the discal vein sometimes (*myrtilli*) not reaching the margin; the lower branch of the postical vein somewhat recurrent, meeting the anal vein almost rectangularly; the anal vein long, straight, reaching to or quite near to the margin; the basal cells somewhat large; the anal cell considerably shorter than the second basal cell. Stigma present. The axillary lobe well developed. Alula not present, the margin here haired. Alar squamula small, fringed at the margin.

The developmental stages of the genus are not known.

The species of *Euthyneura* occur in woods on more or less humid places. Zetterstedt records the various species from the leaves and flowers of *Betula*, *Salix* and *Sorbus*. The species are for a great part boreal. Of the nine recorded European species four are only known from Scandinavia, and in all eight occur in Scandinavia to its northern parts, only one species is only known from middle Europe. The species are all rare, and become especially rare towards the south; thus Strobl notes, that of the four species known from Austria there has only been taken one female of each.

Of the genus 9 species are known from the palæarctic region, two have hitherto been found in Denmark.

Table of Species.

1. Wings with a brownish patch from the stigma down towards the discal cell; tarsi pale 1. *Gyllenhali*.
 — Wings without any brownish patch; tarsi with the four last joints more or less blackish 2. *myricae*.

1. *Eu. Gyllenhali* Zett.

1838. Zett. Ins. Lapp. 538, 1. (*Anthalia*). — 1842. Zett. Dipt. Scand. I, 249, 1. (*Anthalia*). — 1862. Schin. F. A. I, 79. (*Anthalia*). — 1903. Kat. paläarkt. Dipt. II, 262.

Male. Eyes touching; epistoma black, shining. Proboscis only half as long as the head is high or slightly longer; palpi blackish, with some hairs. Occiput black, slightly greyish, with black, downwards with pale hairs. Antennæ black or brown, the third joint rather broad. Thorax black, shining; it is clothed with somewhat short, pale hairs, forming about uniserial dorsocentral and quadriserial acrostichal rows; the hindmost hair in the dorsocentral rows is long. A distinct notopleural and postalar bristle present, both pale yellow. Scutellum with four pale marginal bristles. Metapleura black, shining. Abdomen likewise black, shining, clothed with pale brownish or yellowish hairs, those at the hind margin of the segments a little stronger. Venter similarly coloured, a little shorter haired. Legs yellow, hind femora and tibiæ a little brownish in the middle. The legs are short-haired with yellowish hairs, hind femora with somewhat longer hairs above. Wings hyaline. Veins more or less pale brown. Stigma brown; from the latter a brownish patch goes downwards towards the discal cell; anal vein long, straight, but not quite reaching the margin. Halteres yellow or whitish yellow.

Female. Similar to the male; eyes separated, frons black, shining; legs as in the male, but the hind legs not browned. Ovipositor short. Length 2,3—2,5 mm.

Eu. Gyllenhali is very rare in Denmark, only three specimens, a male and two females, are known; Ordrup Mose (Stæger); on Lolland in Bukke Skov (Schlick); the dates are $^{30}/_6$ — $^6/_7$.

Geographical distribution: — Northern and middle Europe down into Carinthia; towards the north to northern Scandinavia.

2. *Eu. myricae* Hal.

1851. Hal. Walk. Ins. Brit. I, 111, 2. — 1903. Kat. paläarkt. Dipt. II, 262. — *Rhamphomyia consobrina*: 1838. Zett. Ins. Lapp. 541, 70. — *Anthalia rostrata*: 1842. Zett. Dipt. Scand. I, 250, 2, et 1849. VIII, 2998, 2.

Male. Eyes not quite touching, leaving a narrow, black, shining frontal stripe; epistoma likewise black, shining. Proboscis long, somewhat longer than the head is high, directed forwards; palpi black, with some hairs. Occiput black, a little greyish, with black hairs. Antennæ black or blackish. Thorax black, shining, clothed with very short dark hairs, indistinctly forming uniserial dorsocentral and quadriserial acrostichal rows; the hindmost dorsocentral hair is long. A distinct notopleural and postalar bristle present, both black; besides there are some smaller hairs. Scutellum with six black marginal bristles. Pleura black, shining. Abdomen likewise black, shining, clothed with yellow hairs, those at the hind margin of the segments very slightly longer than the others. Venter black, a little shorter haired. Legs yellow or dirty yellowish, tibiæ except the base somewhat brownish, the apex of the metatarsi and the following joints blackish. Legs more or less short-haired with yellowish hairs, hind femora with longer hairs above. Wings hyaline. Veins pale yellowish. Stigma light brownish. Halteres yellow or dirty yellowish.

Female. Similar to the male; the frons a little broader; the notopleural, postalar and scutellar marginal bristles yellowish brown (in my not quite mature specimen). Ovipositor somewhat long and slender.

Length about 2,3 mm.

Eu. myricæ is very rare in Denmark, only two specimens, a male and a female, have been taken, one by Stæger, probably in Ordrup (the specimen mentioned by Zetterstedt l. c. VIII), and one in Tyvekrogen on $\frac{7}{16}$ 1909 (the author). I think it certain, that the species is *myricæ*, though Zetterstedt says, that the eyes in the male are „conniventes“. — I have followed the catalogue in calling the species *myricæ* Hal., though I see no reason, why it should not be named *consobrina* Zett.

Geographical distribution: — Northern Europe, from the northern Scandinavia to Denmark, and in England.

4. Hemerodromiinae.

Eyes separated in both sexes, sometimes the frons narrower in the male than in the female; the eyes may be touching below the antennæ. The facets not larger above than below, but when the eyes are touching below the antennæ, the facets are enlarged in the front part of the eye. The eyes sometimes hairy. Antennæ three- to five-jointed; when five-jointed they terminate in a two-jointed arista or style; in *Hemerodromia* the arista is undivided, the antennæ thus four-jointed, and in *Trichopeza* the third joint tapers into a long,

undivided arista, which is not articulated to the joint. Proboscis short, at most about as long as the head is high; maxillæ present or absent; the maxillary palpi one-jointed or indistinctly two-jointed. Metapleura with a few bristles, or with shorter hairs, or finally bare. Legs with the front coxæ more or less elongated, the front femora often thickened, and the front legs raptorial and specially armed. Wings with the cubital vein forked, or (*Chelipoda*, *Phyllodromia*) unforked; discal vein forked, four posterior cells; a discal cell present, sending three veins to the margin, or only two veins and then the upper is branched; or a discal cell not present. The basal cells of about equal length, or the second either shorter or longer than the first; the anal cell present and as long as or shorter than the second basal cell, or the anal cell wanting; anal vein shorter or longer, or quite wanting; the lower branch of the postical vein recurrent, or meeting the anal vein at a right angle, or quite absent. Axillary lobe small or frequently wanting. No alula. Stigma present or absent.

Table of Genera.

- | | |
|--|-----------------------------|
| 1. Cubital vein forked | 2. |
| — Cubital vein unforked | 6. |
| 2. Discal cell absent, or when present sending two veins to the wing-margin, the upper branched i. e. the second posterior cell pedunculated; front coxæ much elongated, almost as long as the femora, these latter considerably thickened | 15. <i>Hemerodromia</i> . |
| — Discal cell present, sending three veins to the wing-margin; front coxæ not much elongated, not more than half as long as femora, these latter not or slightly thickened | 3. |
| 3. The upper branch of the cubital vein connected (normally) with the radial vein by a cross-vein | 4. |
| — The upper branch of the cubital vein not connected with the radial vein | 5. |
| 4. Wings hyaline | 14. <i>Synamphotera</i> . |
| — Wings brown, with hyaline spots | 16. <i>Dolichocephala</i> . |
| 5. Antennæ five-jointed, third joint somewhat short; proboscis thick, shorter than the head is high | 13. <i>Clinocera</i> . |
| — Antennæ three-jointed, long, third joint band-shaped, terminating in a long arista, not articulated to the joint; proboscis thin, as long as the head is high | 17. <i>Trichopeza</i> . |
| 6. No discal cell | 18. <i>Chelipoda</i> . |
| — A discal cell present | 19. <i>Phyllodromia</i> . |

13. **Clinocera** Meig.

Species of small to medium size (to about 8 mm), and of slender shape; the colour is brown or grey, very often olive-brown above,

bright grey below. Head somewhat globular, but generally broader than long, as broad as or slightly narrower than thorax, only slightly arched behind; the lower part of the head may be more or less elongated downwards. Occiput with bristles on the upper part. Eyes somewhat large, round and somewhat prominent; they are well separated in both sexes, sometimes the frons is slightly narrower in the male than in the female; the distance between the eyes below the antennæ is generally larger in female than in the male.¹ The facets are of equal size. The eyes are short but densely hairy; the incision in the inner eye-margin is generally small. The vertex is broad; the three ocelli are placed on a prominent tubercle, which is situated somewhat forwards on the vertex; there are two ocellar bristles, and there may also be lateral bristles on the vertex. The antennæ are



Fig. 88. Antenna of *Cl. Zetterstedti*. $\times 80$. (The direction of the arista is not natural).

inserted near to each other, somewhat high, always above the middle; they are short, five-jointed, the two basal joints short, the first somewhat obconical, the second almost globular, the third a little longer, somewhat onion-shaped and compressed, terminating with a long, hairy arista, generally curved downwards, which consists of two joints, the first short. Epistoma is broader or narrower, rather high on account of the somewhat high insertion of the antennæ; its lower margin may be straight, or incised in different ways. Jowls are distinctly present, broader or narrower, sometimes very broad and descending far below the eyes, and then the whole lower part of the head is elongated. The mouth parts are somewhat curious; the oral cone is very small, or no real cone is developed; clypeus is in some cases distinctly present and more or less horse-shoe-shaped; epistoma, or this together with the jowls, is then more or less incised in the lower margin, and the incision is occupied by the clypeus (*Chamaedipsia*, *Roederia*, *Eucelidia*, *Philolutra* and *Wiedemannia*); in other cases epistoma goes longer downwards without incision, and then the clypeus seems not to be separated, at most present as a small, elevated keel. Proboscis is short and thick, generally only stretching out of the

¹ Zetterstedt says under his *Brachystoma* in the generic description: „Mas: oculis infra antennis conniventibus“, and under the species *Wesmaelii* he repeats this, but it is erroneous.

aperture with the labella. Labrum is very short, broad and arched; its front margin is not pointed but straight, and beset with small dents; hypopharynx is very broad, it is divided into a somewhat long, median, more or less narrow and pointed lobe, and two shorter and broader lateral lobes; there are no maxillæ, but one-jointed or indistinctly two-jointed maxillary palpi, which are somewhat dilated towards the end and somewhat compressed; in rest they are curved forwards and cover the labrum. Labium has a short, well chitinised basal part, a little longer and somewhat broader labella, which are directed forwards, and cleft to the base. Thorax is rectangular, rather long, somewhat arched above. Prothorax is distinct, but small, metathorax very small, and there is a small, distinct metasternum. There are long, uniserial dorsocentral bristles, sometimes with some shorter bristles between them in the same row; the acrostichal bristles short, biserial, often absent. A humeral bristle (rarely two to three), a post-humeral, one or generally two notopleural, a supraalar and a postalar bristle present; sometimes the supraalar bristle is absent. Scutellum with two, rarely more, long marginal bristles; sometimes there are besides smaller hairs. Metapleura with fine, shorter or longer hairs.¹ Abdomen somewhat slender, consisting of eight segments; the first segment short, the second the longest. The exterior genitalia in the male are somewhat curious, and remind one of the structure in *Hilara*. The seventh and eighth abdominal segments are suddenly lower than the preceding, and they are not quite chitinised above, but they are here covered by the genitalia, which are directed forwards. It thus looks as if there were only six dorsal segments. The genitalia consist of a forceps, formed of two pairs of lamellæ, an outer, shorter pair, and an inner, longer and in shape generally more complicated pair; the first pair answers to the lower and the second pair to the upper lamellæ, but on account of the recurved direction of the forceps, the outer, lower lamellæ lie more upwards. Below there is a somewhat pointed ventral lamella, which is stretched straight out or curved upwards, and from the apex of it issues the thread-like, more or less sinuous penis. In the female the abdomen is pointed, the eighth segment is smaller or larger, and terminates with two small and short styles. The legs are long and slender, the front coxæ somewhat, but not much elongated; the front femora are often a little thickened at the base. The legs are chiefly short-haired, the front femora may

¹ Mik says (Wien. ent. Zeitg. VIII, 1889. 150) about *Cl. stylifera*, that this species has no notopleural hairs; I think it possible, that these fine hairs have been lost.

have stronger bristles below; the tibiæ have no distinct apical spurs. There are two claws, two pulvilli, and a long pulvilliform empodium, generally longer than the claws; in *Bergenstammia nudipes* Loew the pulvilli and empodium are rudimentary. The wings have the median vein reaching the margin; the cubital vein is forked and thus two cubital cells; the discal vein likewise forked, thus four posterior cells and the discal cell sending three veins to the margin, the third is the upper branch of the postical vein, which closes the discal cell below; the lower branch of the postical vein somewhat recurrent. The basal cells not large, the second shorter than the first; the anal cell as long or almost as long as the second basal cell; the anal vein not reaching beyond the anal cell, or sometimes longer, nearly reaching the margin. The discal cell shorter or longer, sometimes very long and narrow; it is either truncate or pointed outwards. The costa has sometimes somewhat strong bristles. Stigma present or absent. The axillary lobe is very small, almost not developed. Alula wanting, the wing here fringed at the margin. Alar squamula very small, with long hairs at the margin.

The developmental stages of *Clinocera* are, so far as I am aware, hitherto not known.

The species of *Clinocera* are easily known among the Empids, as they have a somewhat characteristic exterior. They occur all near water, especially at rapidly flowing streams, some also at stagnant water. I think all species are capable of running on the surface of the water, as Loew states with regard to *Cl. pusilla*, and as I have myself observed with regard to *Cl. stagnalis*. They are also seen flying above the water, and sitting on stones and the like in and near it. The pubescence of the body and the hairiness of the eyes give them great resistance against being wet. They are certainly carnivorous, though I am not aware that any direct observation has been made. The genus goes far towards the north, *Cl. stagnalis* is thus found in Greenland, where otherwise of Empids only two species of *Rhamphomyia* occur.

It is curious to note, that the species of *Clinocera*, the species of the Dolichopodid genus *Hydrophorus* and some species of the Ephydriids, which all live in the same way, and chiefly show the same behaviour, also show great mutual resemblance; the resemblance not only concerns the colours, but also the shape of the front legs, and even to some degree the construction of the mouth; certainly some common factor with regard to their way of feeding must be present. The species of *Clinocera* may be known at once from the very similar species of *Hydrophorus* by the confluence in the latter of the discal and second basal cell, and by the shape of the discal cell; also the

incision in the inner eye-margin is absent in *Hydrophorus*, and the antennal arista is not terminal.

Of the genus 55 species are known from the palæarctic region; 6 have hitherto been found in Denmark.

The genus has by Mik been divided into a number of genera, which have, however, scarcely higher rank than subgenera.

Table of Subgenera.

- | | |
|--|--------------------------|
| 1. Wings without stigma; no acrostichal bristles; cheeks and jowls separated..... | 2. |
| — Wings with stigma; acrostichal bristles present; cheeks and jowls confluent..... | 3. |
| 2. Wings not spotted; discal cell somewhat pointed towards the apex..... | I. <i>Clinocera</i> . |
| — Wings spotted; discal cell truncate at the apex..... | II. <i>Heleodromia</i> . |
| 3. All femora with a pair of præapical bristles; wings with somewhat strong bristles on the costa; stigma elongated..... | III. <i>Eucelidia</i> . |
| — Femora without præapical bristles; wings without strong bristles on the costa; stigma roundish..... | IV. <i>Wiedemannia</i> . |

I. Subg. *Clinocera* Meig. s. str.

Wings without stigma. Discal cell not long, but somewhat pointed outwards; anal vein not going beyond the anal cell. Clypeus not separated from epistoma; jowls not descending below the eyes, and hence cheeks and jowls not confluent, but separated by an excision. No acrostichal bristles, and no small bristles in the dorsocentral rows. Scutellum with two bristles.

One Danish species..... I. *nigra*.

1. *Cl. nigra* Meig.

1804. Meig. Klass. eur. zweifl. Ins. I, 292, 1, Tab. XIV, Fig. 20—25, et 1820. Syst. Besch. II, 113, 1, Tab. XVI, Fig. 4. — 1858. Loew, Wien. ent. Monatschr. II, 254, nota 3. — 1862. Schin. F. A. I, 85. — 1881. Mik, Verhandl. zool. bot. Gesell. Wien, XXXI, 325, Tab. XVI, Fig. 4—5. — 1903. Kat. palæarkt. Dipt. II, 263. — *Paramesia Roberti*: 1835. Macq. Suit. à Buff. II, 657, 2. — *Chinocera Roberti*: 1858. Loew, Wien. ent. Monatschr. II, 254, 9. — 1862. Schin. F. A. I, 84. — *Heliodromia unicolor*: 1834. Curt. Brit. Entom. 513, 3. — *Hemerodromia unicolor*: 1862. Schin. F. A. I, 83.

Male. Frons and vertex dark olive-brown, greyish at the sides; epistoma of the same colour, its lower margin greyish white. Palpi blackish. Occiput grey, with black, bristly hairs above, fine, whitish hairs below. Antennæ black. Thorax dark olive-brown, with three

indistinct, lighter stripes in the middle, abbreviated behind, the median the lightest. On the disc there are five long, black dorsocentral bristles, but no acrostichal bristles. Further a small humeral bristle, a posthumeral, a notopleural and a postalar bristle, all black, but there is no supraalar bristle. Scutellum with two black marginal bristles. Pleura slate-grey, metapleura with fine, pale hairs. Abdomen olive-brown above, in certain directions with an almost reddish reflex; the sides together with the venter slate-grey; it is sparingly clothed with very short, pale hairs, only longer on the first segment. The two pairs of genital lamellæ somewhat narrow, straight, the lower grey, the upper longer, shining black. Penis brown, thin, curved at the apex. Legs black; coxæ greyish pruinose. The legs have short.

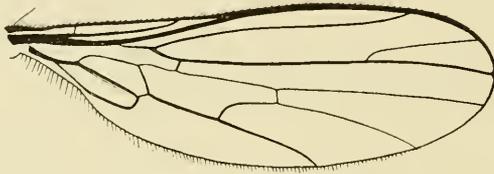


Fig. 89. Wing of *Cl. nigra*.

pale hairs, towards the end of the hind tibiæ they are a little longer; below the front femora there are two rows of very short, chiefly black, spine-like bristles. Wings somewhat blackish tinged. Veins black; costa only with fine hairs. Halteres black.

Female. Quite similar to the male except the differences in the exterior genitalia; front femora without bristles.

Length 3.4—4 mm.

Cl. nigra has first been known as belonging to our fauna in this year (1910), when I caught it at Hald near Viborg in Jutland, on $^{25}/6$ and $^{26}/6$; it was present in great numbers at a saw-mill, sitting on a boarding constantly washed by water; it was taken several times in copula.

Geographical distribution:— Europe down into France; its northern limit seems to lie in Denmark.

II. Subg. *Heleodromia* Hal.

Wings more or less spotted on account of a seaming of the cross-veins. No stigma. The discal cell not long, truncate at the apex; anal vein long, nearly reaching the margin. Clypeus not separated from the epistoma, with the margin straight. Jowls not descending below the eyes, and hence the cheeks and jowls not con-

fluent. No acrostichal bristles, and no small bristles in the dorso-central rows. Scutellum with two bristles. Front femora with stronger or small bristles below.

Table of Species.

1. Radial vein straight; only the cross-veins and the base of the cubital fork seamed, the wing thus with three spots; front femora with very small bristles 2. *stagnalis*.
- Radial vein undulated; besides the cross-veins and the base of the cubital fork also the base of the upper branch of the postical vein seamed, and moreover a spot on the upper branch of the discal vein, the wing thus with five spots; front femora with strong bristles at the base 3. *Wesmaelii*.

2. *Cl. stagnalis* Hal.

1833. Hal. Entom. Mag. 1, 159. — 1838. Meig. Syst. Besch. VII, 93, 13 (*Hemerodromia*). — 1858. Loew, Wien. entom. Monatschr. II, 246, 4. — 1862. Schin. F. A. I, 84. — 1887. Mik. Verh. zool. bot. Gesell. Wien, XXXI, 326, Tab. XVI, Fig. 6—7. — 1903. Kat. paläarkt. Dipt. II, 264. — *Brachystoma Westermanni*: 1838. Zett. Ins. Lapp. 558, 1. — 1842. Zett. Dipt. Scand. I, 360, 1.

Male. Frons and vertex olive-brown; epistoma silvery white; palpi brownish black. Occiput grey, with black, bristly hairs above, fine, whitish hairs below. Antennæ black. Thorax olive-brown, with two dark brown median stripes, abbreviated behind. On the disc there are five long, black dorsocentral bristles, but no acrostichal bristles. Further a humeral bristle, a posthumeral, two notopleural, a supraalar and a postalar bristle, all somewhat long, black. Scutellum with two black marginal bristles. Pleura slate-grey or almost bluish grey, metapleura with fine, yellowish white hairs. Abdomen likewise slate-grey, with a broad, olive-brown, longitudinal dorsal stripe; it is sparingly clothed with short, pale yellowish hairs, which are a little longer at the margin of the first dorsal segment. Venter slate-grey, the hind margin of the segments paler. Exterior genitalia moderately large, both pairs of lamellæ somewhat blade-like, generally directed forwards and closed; the outer (lower) lamellæ grey, the inner (upper) longer, black, shining. Penis blackish, thin, curved at the end. Legs dark brown; coxæ, and partly also the femora, grey, the apical part of the femora reddish. The legs short-haired with brownish hairs; hind tibiæ with a little longer hairs ventrally on the apical half part; the front femora with a row of a little longer hairs below, which are stronger, bristle-like and black towards the apex. Wings hyaline or slightly greyish tinged. Veins dark brown or blackish; the medial cross-vein, the base of the cubital fork and the cross-veins

closing the discal cell apically are brownish seamed, so that the wing shows three more or less distinct, brownish spots; anal vein very weak. No stigma. Halteres brown.

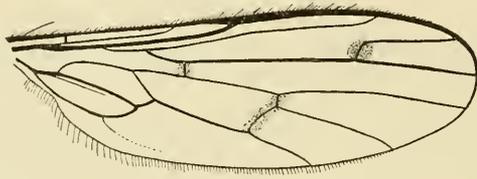


Fig. 90. Wing of *Cl. stagnalis*.

Female. Similar to the male in all respects, except the differences in the exterior genitalia.

Length 3,5–4,2 mm.

Cl. stagnalis seems to be somewhat rare in Denmark, and not many specimens have been caught, all in Jutland; at Silkeborg, Hald Sø (the author), Struer (H. J. Hansen) and Tinbæk Mølle at Lindenberg Aa (J. P. Kryger); the dates are ²⁴/₆ to August. It occurs near or over water, at Hald Sø I took it on the humid border and on the surface just at the border.

Geographical distribution: — Europe down into Italy and Spain. It goes far towards the north, in Scandinavia to the northernmost parts, and it has been caught on the Faroe-Islands and in Greenland; in the latter I took it running on the surface of shallow water pools in somewhat great number.

3. *Cl. Wesmaelii* Macq.

1835. Macq. Suit. à Buff. II, 656, 1, Tab. XXIV, fig. 17 (*Paramesia*). — 1838. Meig. Syst. Besch. VII, 79, 3 (*Brachystoma*). — 1842. Zett. Dipt. Scand. I, 364, 6, p. p. (*Brachystoma*). — 1858. Loew, Wien. entom. Monatschr. II, 257, 11. — 1862. Schin. F. A. I, 85. — 1881. Mik, Verh. zool. bot. Gesell. Wien, XXXI, 326. — 1903. Kat. paläarkt. Dipt. II, 264.

Male. Frons and vertex olive-brown; epistoma silvery white; palpi blackish. Occiput grey, above with black bristles, below with whitish hairs. Antennæ black or brownish black. Thorax olive-brown, with two longitudinal, darker brown stripes, abbreviated behind; the space between the stripes greyish brown. The disc has five long, black dorsocentral bristles in each row, but no acrostichal bristles. Further a humeral bristle, a posthumeral, two notopleural, a supraalar and a postalar bristle, all long, black. Scutellum with two black marginal bristles. Pleura light bluish grey, metapleura brownish, with

fine yellow hairs. Abdomen grey, with a broad, olive-brown, longitudinal dorsal stripe; it is sparingly clothed with short, pale yellow hairs, a little longer at the margin of the first dorsal segment. Venter grey. Exterior genitalia chiefly resembling those in *stagnalis*. Legs brown, tarsi darker towards the end; coxæ greyish pruinose, and also the base of the front femora slightly greyish pruinose. The legs with short, brown to blackish hairs, hind tibiæ with somewhat longer hairs ventrally on the apical half; front femora with some black bristles ventrally at the base, and besides with a row of exceedingly short, nearly punctiform bristles. Wings hyaline, slightly greyish. Veins

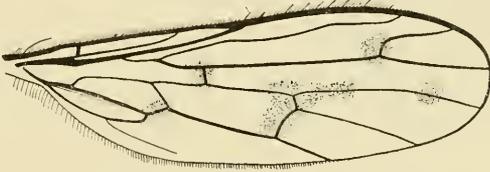


Fig. 91. Wing of *Cl. Wesmaelii*.

dark brown or blackish, the radial vein somewhat undulated; the medial cross-vein, the base of the cubital fork, the base of the upper branch of the postical vein and the cross-veins closing the discal cell apically, brownish seamed, the brownish colour at the end of the discal cell stretching somewhat out along the upper branch of the discal vein, and outwards to it a roundish spot on the branch; thus the wing shows in all five brownish spots; anal vein long, but not quite reaching the margin. No stigma. Halteres blackish brown.

Female. With exception of the differences in the exterior genitalia quite similar to the male.

Length about 4 mm.

Cl. Wesmaelii seems to be rare in Denmark, only one specimen, a female, has been taken on $^{25}/_6$ 1874 on a window in Rugballegaard near Vejle (Schlick).

Geographical distribution:— Europe down into Italy; towards the north to middle Sweden.

III. Subg. *Eucelidia* Mik.

Stigma present, elongated; discal cell long, pointed towards the apex; anal vein not reaching beyond the anal cell; costa with somewhat strong spines. Clypeus horse-shoe-shaped, separated from the epistoma; jowls somewhat descending below the eyes and hence not separated from the cheeks. Acrostichal bristles present; no small

bristles in the dorsocentral rows. Scutellum with two bristles and some small hairs. All femora with a pair of præapical bristles.

One Danish species. 4. *Zetterstedti*.

4. *Cl. Zetterstedti* Fall.

1823. Fall. Dipt. Suec. Suppl. I, 7, 36--37 (*Empis*). — 1842. Zett. Dipt. Scand. I, 362, 4 (*Brachystoma*). — 1858. Loew, Wien. entom. Monatschr. II, 249, 6. — 1862. Schin. F. A. I, 84. — 1881. Mik, Verhandl. zool. bot. Gesell. Wien, XXXI, Tab. XVI, Fig. 11. — 1903. Kat. paläarkt. Dipt. II, 266.

Male. Vertex, frons and epistoma brownish; palpi black. Occiput grey, with black, bristly hairs above, long, whitish hairs below. Antennæ black. Thorax dark olive-brown, unicolorous, at most with traces of a pair of longitudinal stripes. The disc has five long, black dorsocentral bristles in each row, and very short and thin, biserial acrostichal bristles. Further a humeral bristle, a posthumeral, two notopleural and a postalar bristle, all long, black; there is no supraalar bristle; besides there are small hairs anteriorly in the præsutural depression. Scutellum has two black marginal bristles, and some small hairs. Pleura brownish grey, metapleura with short, whitish hairs. Abdomen olive-brown above, bluish grey along the sides; it is clothed with short, blackish hairs. Venter grey or bluish grey, with whitish yellow hairs. The exterior genitalia directed forwards, the outer (lower) lamellæ rounded at the end, the inner (upper) lamellæ longer, drawn out into two small, rounded processes at the end, beset with longish hairs, the lower lamellæ likewise with somewhat long hairs. Penis brown, thread-like, sinuous at the apex. Legs black or blackish; coxæ greyish brown pruinose, and also the base of the femora more or less greyish. The legs are short-haired with brownish to blackish hairs, the front femora with a little longer hairs below towards the base; all femora with two subapical black bristles, one on the anterior

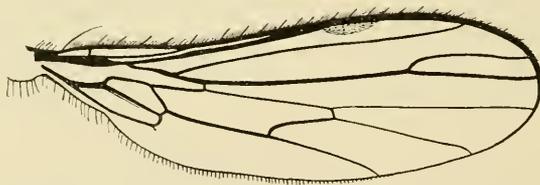


Fig. 92. Wing of *Cl. Zetterstedti*.

and one on the posterior side; hind tibiæ with longish, bristly hairs above and below in the apical half part, longest below. Wings blackish tinged. Veins black. Stigma blackish brown; costa with

somewhat strong bristles between the ordinary hairs. Halteres blackish brown, the peduncle, except the base, yellow.

Female. Quite agreeing with the male with exception of the differences in the exterior genitalia.

Length 4.3—5 mm.

Cl. Zetterstedti has only recently been known as belonging to our fauna, and it has only been taken on two occasions, at Hald near Viborg on ²⁸/₆ 1910 (the author) and at Bangsbo near Frederikshavn on ³¹/₇ 1909 (Th. Mortensen); in the former locality I took only one single specimen, sitting on a stone at a rapidly running brook, among specimens of *Cl. rhynchops*, this latter species being numerous; at the latter place it was flying in great numbers over a small swiftly flowing stream in the downs, and sitting on stones in it.

Geographical distribution: — Northern and middle Europe down into Austria; towards the north to middle Scandinavia.

IV. Subg. *Wiedemannia* Zett.

Stigma present, roundish; discal cell long, pointed at the apex; anal vein not reaching beyond the anal cell. Clypeus horse-shoe-shaped, separated from the epistoma; jowls descending much below the eyes, and thus not separated from the cheeks. Acrostichal bristles present; small bristles present in the dorsocentral rows between the long bristles. Scutellum with two bristles and small hairs.

Table of Species.

1. Stigma lying well before the base of the cubital fork, the curve of the radial vein below it rather large 5. *bistigma*.
— Stigma lying above the base of the cubital fork, the curve of the radial vein below it small 6. *rhynchops*.

5. *Cl. bistigma* Curt.

1834. Curt. Brit. Entom. 513, 2 (*Heliodromia*). — 1858. Loew, Wien. entom. Monatschr. II, 243, 1. — 1862. Schin. F. A. I, 84. — 1881. Mik. Verh. zool. bot. Gesell. Wien, XXXI, 327. — 1903. Kat. paläarkt. Dipt. II, 267. — *Wiedemannia borealis*: 1838. Zett. Ins. Lap. 559, 1 et 1842. Dipt. Scand. I, 365, 1. — *Wiedemannia juvenilis*: 1842. Zett. Dipt. Scand. I, 362, 2.

Male. Vertex and frons brownish, greyish along the eye-margin; epistoma light grey; palpi black. Occiput grey, but the brown colour continues from the vertex down the middle of the occiput as a broad band. Jowls long, going far down below the eyes. Occiput with black bristles above, white hairs below. Antennæ black. Thorax olive-brown; on the disc there are about five long, black dorsocentral

bristles in each row, and between them there are shorter bristles; small acrostichal bristles present. Further generally two humeral bristles, a posthumeral, two notopleural and a postalar bristle, but no supraalar bristle; the bristles are black; besides there are small hairs behind the humeri and in the præsutural depression. Scutellum with two black marginal bristles and numerous small hairs. Pleura light bluish grey, metapleura with fine, whitish hairs. Abdomen olive-brown above, bluish grey at the sides; it has short, dark, at the sides pale hairs. Venter light bluish grey, with whitish hairs. Exterior genitalia large, the outer (lower) lamellæ grey, the inner (upper) large, thin and compressed, blade-shaped, of light brown colour; the lower lamellæ have somewhat long, yellow hairs. Legs blackish or dark brownish; coxæ light grey pruinose, and also the femora more or less pruinose; the legs are more or less short-haired with brownish to blackish hairs, hind tibiæ with some single bristly hairs below.

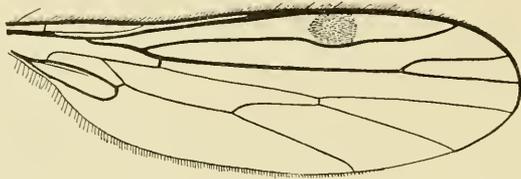


Fig. 93. Wing of *Cl. bistigma*.

Wings hyaline, slightly greyish. Veins black or brown. The stigma forming a large, roundish, blackish or brown spot, and the radial vein forming a distinct curve below it; it is placed considerably before the base of the cubital fork; sometimes it is continued a little beyond the radial vein. Halteres blackish brown.

Female. Agreeing with the male; the eighth ventral segment somewhat long, conical.

Length 4—4,2 mm.

Cl. bistigma is rare in Denmark, and has only been taken in earlier time, and hitherto only in Jutland at Store Aa and at Hobro (Jacobsen).

Geographical distribution:— Northern and middle Europe down into Austria; towards the north to northern Scandinavia, and in Finland.

6. *Cl. rhynchops* Now.

1868. Now. Verh. Nat. Ver. Brünn, VI, 89, Tab. II, Fig. 6. — 1869. Loew, Besch. europ. Dipt. I, 268, 159. — 1881, Mik, Verh. zool. bot. Gesell. Wien, XXXI, 327, Tab. XVI, Fig. 15. — 1903. Kat. paläarkt. Dipt. II. 267.

Male. Vertex and frons olive-brown; epistoma blackish grey; palpi blackish. Occiput brown above, grey downwards; above with black bristles, downwards with white hairs. Jowls long, going far down below the eyes. Antennæ black. Thorax olive-brown; on the disc there are about six long, black dorsocentral bristles in each row, and between them shorter hairs; small acrostichal bristles present. Further two to three humeral bristles, a posthumeral, two notopleural and a postalar bristle, all black, but there is no supraalar bristle; besides there are some small hairs in the præsutural depression. Scutellum with two black marginal bristles, and several small hairs. Pleura bright bluish grey, metapleura with fine, whitish hairs. Abdomen olive-brown above, the sides and the venter bluish grey; it is clothed with short hairs, which are dark above, whitish at the sides and on the venter. The exterior genitalia are somewhat curious; the outer (lower) lamellæ are small, somewhat broad, grey; the inner (upper) lamellæ are large and complicated, each sends a styliform process forwards, which is curved a little upwards and inwards, somewhat dilated towards the end, and short-haired; together the two processes form a fork; backwards each lamella is drawn out into a small, triangular process, which is directed a little downwards; the inner lamellæ are brownish black. Penis is brown, thin, directed straightly forwards. The seventh and eighth ventral segments are rather large. Legs black, very slightly shining; coxæ bluish grey pruinose. The legs are short-haired with brown to blackish hairs, palest below the femora; the hairs are longish below the front femora and towards the end on the hind tibiæ, and these latter have some

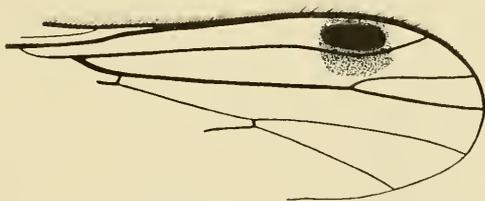


Fig. 94. Wing-part of *Cl. rhynchops*.

bristly hairs below. Wings hyaline. Veins black, somewhat strong. Stigma roundish, black or brownish; it is placed just above the base of the cubital fork and thus much nearer to the apex of the wing than in *bistigma*; the radial vein forms a not large curve below the stigma, and this curve is, in accordance with the place of the stigma, near the apex of the vein; the second cubital cell is slightly longer

than in *bistigma*; generally the stigma stretches below the radial vein, this then passing through it. Halteres black or brownish black.

Female. Quite agreeing with the male; the eighth ventral segment somewhat large.

Length 3,5—5,5 mm., the latter size only reached by the female.

This species is easily distinguished from *bistigma* by the position of the stigma, and in the male by the totally different genitalia.

Cl. rhynchops was hitherto not known as Danish, and has first been introduced as belonging to our fauna in this year (1910), when I took it in Jutland at Hald near Viborg on $^{25}/_6$ — $^{28}/_6$; it was present in great numbers generally sitting on stones in and by a rapidly flowing brook.

Geographical distribution:— Europe down into Styria, and in England; its northern limit lies in Denmark.

14. *Synamphotera* Loew.

Species of somewhat small size and of yellow colour. Head globular, as broad as thorax. Occiput arched, very short-haired. Eyes not specially large, round; they are somewhat broadly separated in both sexes; the facets are of equal size. The incisure in the inner eye-margin small. Vertex with three ocelli. The antennæ are inserted



Fig. 95. Antenna of *S. pallida*. $\times 70$.

near to each other, in the middle; they are short, five-jointed; the two basal joints short, the third ovate, compressed, terminating in a short, two-jointed style, the basal joint of which is short, the apical joint terminates with a bristle-shaped part. Epistoma is narrow; jowls very

small. Proboscis is short, but I have otherwise not been able to examine the mouth parts. Thorax rectangular, somewhat arched above; pro- and metathorax small. There are no bristles on thorax, only scarcely perceptible dorsocentral hairs. Scutellum with short bristles. Metapleura bare. Abdomen consists of eight segments. The male genitalia are large, consisting of two pairs of lamellæ which are directed upwards; penis is very thick, curved upwards and forwards. In the female the abdomen terminates with a thick, conical ovipositor, directed upwards. The legs are somewhat slender, the hind legs the longest; the front coxæ only slightly elongated. The legs are short-haired, the tibiæ without apical spurs. There are two claws, two pulvilli, and a bristle-shaped em-

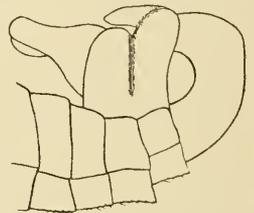


Fig. 96. *S. pallida*, male genitalia.

podium with bristles below. The wings have the mediastinal vein reaching the margin; the cubital vein is forked and the upper branch is (normally) connected with the radial vein by a small cross-vein,

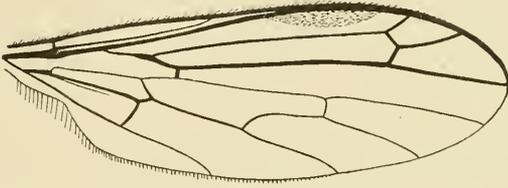


Fig. 97. Wing of *S. pallida*.

there are thus three cubital cells; discal vein forked and thus four posterior cells; the discal cell long, sending three veins to the margin, the third is the upper branch of the postical vein, closing the discal cell below; the lower branch of the postical vein is rectangular to the anal vein; this latter reaches the margin; the first basal cell slightly longer than the second, and the anal cell a little shorter than the second basal cell. Stigma present. Axillary lobe small, the angle very obtuse. Alula not developed, the margin here with hairs. Alar squamula small, haired at the margin.

The development stages are not known.

The genus comprises only one species, also found in Denmark.

1. *S. pallida* Loew.

1858. Loew, Zeitschr. für gesamt. Naturw. XI, 455, et 1871. Beschr. eur. Dipt. II, 253, 138. — Kat. paläarkt. Dipt. II, 267.

Male. Vertex and frons somewhat dark yellow, the ocellar triangle grey; epistoma, proboscis and palpi yellow. Occiput yellow with short hairs. Antennæ short, yellow, darker towards the apex; the third joint pointed ovate, compressed, with a short style. Thorax yellow, with an indication of four, slightly darker stripes; it is very short and sparingly haired. Scutellum with short, yellow marginal bristles. Pleura yellow. Abdomen likewise yellow, with short, yellow hairs. Venter yellow. Exterior genitalia large; the lower lamellæ directed upwards and with a vertical impression, indicating a division into two lobes, the posterior of these is the highest and above it is drawn out into a forwards pointing process; the upper lamellæ are somewhat triangular, pointing forwards in over abdomen and with a little tooth in the upper margin. Penis is very thick, curved upwards and forwards. Legs yellow, very short-haired with yellow hairs. Wings

hyaline, slightly yellowish. Veins brown or pale brown. Stigma faint, yellowish. Halteres yellow, somewhat large.

Female. Quite similar to the male; the ovipositor thick, conical, directed upwards.

Length 3 mm.

S. pallida is very rare in Denmark, only a pair in copula has been taken, on Lolland in Merrits Skov at Maribo on ¹⁴/₆ 1873 (Schlick).

Geographical distribution:— Europe down into Italy; its northern limit is in Denmark. It is everywhere a rare species, only few specimens are known; the female was not known to Loew.

Remarks: Loew notes, that there is some irregularity in the wing-venation of his four specimens, two specimens were normal, with a cross-vein between the upper cubital branch and the radial vein, one specimen had the cross-vein only in one wing, and one specimen had no cross-vein at all; it is curious, that my specimens also show such an irregularity; the female has the wings normal, but in the male only the right wing is normal, the left is irregular, but in another way than in Loew's specimens, as it is here not the cross-vein but the base of the cubital fork, which is absent, so that we get a forked radial vein and an unforked cubital vein.

15. **Hemerodromia** Meig.

Species of small size and slender shape; the colours are yellowish to dark grey or brown. The head is elongated and of an ovate shape, its longest axis is about in the longitudinal direction of the body; it is somewhat, more or less, flattened, and as broad as or narrower than thorax; the mouth aperture lies on the lower side. Occiput is arched, short-haired, and with a couple of very small bristles. The eyes are large, more or less elongated in the longitudinal direction of the head; they are separated in both sexes, the frons sometimes being slightly narrower in the male than in the female; in some species the eyes are touching below the antennæ in both sexes; in this latter case the facets in the front part of the eye are enlarged; otherwise they are of equal or almost equal size. The incisure in the inner eye-margin is present, but small. In the living specimens the eyes are somewhat metallic, generally violet above, æneous green below. The vertex has a small ocellar tubercle with three ocelli and a pair of very small hairs. The antennæ are inserted near to each other, a little above the middle; they are short, four-jointed; the two basal joints short, the third a little elongated, pointed oval and compressed, it terminates with a short somewhat thread-like arista, which

is not, so far as I could detect, divided into two joints; the arista is either bare (*precatoria*, *stigmatica*, *melanocephala*) or hairy (*raptora*, *oratoria*). Epistoma is narrow; when the eyes are touching below the antennæ it forms a very narrow triangle. The jowls are distinct, but small, and not descending below the eyes, or slightly descending posteriorly, where they are going over in the occiput. Proboscis is about as long as the head is high or a little longer, it is stretched downwards and curved a little inwards. Labrum is somewhat strong, as long as proboscis, curved somewhat downwards, and three-pointed at the apex, but the median point is slightly chitinised; it is semi-tubular or nearly tubular; on the inside, a little behind the apex, there is at each edge an elongated part, beset with dents or spines. Hypopharynx is as long as labrum and likewise curved downwards, it is canaliculated, somewhat broad, a little dilated towards the apex which is almost spoon-shaped and slightly pointed. The maxillæ are somewhat shorter than labrum; they are weakly chitinised, very thin blades, beset with some very small hairs, and at the apex cleft into a number of long, fine, bristle-like processes; the maxillary palpi are somewhat long, one-jointed, a little compressed, and densely hairy; they are also weakly chitinised. Labium is as long as labrum, the labella are a little longer than the basal part, cleft to their base; the whole labium is very slightly chitinised. Thorax is somewhat long, rectangular or sometimes narrowed in front; it is not much arched above; prothorax is small, somewhat neck-shaped, metathorax very small. The dorsocentral and acrostichal hairs are very small, scarcely visible. A notopleural and sometimes also a postalar bristle present. Scutellum has two bristles or only small hairs. Metapleura bare. Abdomen is slender, consisting of eight segments, the first is short; in the male the eighth segment is small or hidden. The male genitalia consist of a larger or smaller ventral lamella, and of upper and lower lateral lamellæ forming a forceps. In the female the abdomen is pointed, the eighth segment more or less attenuated and followed by a shorter or longer segment, terminating with two short, styli-form lamellæ. The legs are long and slender; the front legs are specially developed in both sexes; the coxæ are long, from somewhat shorter to almost as long as the femora; the femora are much thickened, and the tibiæ curved at the base; the femora have on the ventral side two rows of short spines, and outwards to them a row of long bristles on each side; the tibiæ have a row of short spines below and a long spine at the apex; the front legs are thus raptorial, and they are so fitted, that the tibiæ can be laid up between the spines on the femora. For the rest the legs are short-haired, and there are no apical spurs

on the tibiæ. There are two claws, two pulvilli and a linear empodium with bristles at the margin. The wings have the mediastinal vein not reaching the margin, (in *raptoria* the mediastinal vein is wanting, or at all events so weak, that it is practically wanting); the cubital vein is forked, and thus there are two cubital cells; the discal vein likewise forked, thus four posterior cells. — For the rest the wings fall, with regard to venation, into two categories, answering to the two groups of species in the genus, which for the rest each ought to be a separate genus. In the first group (*precatória*, *stigmatica*, *melanocephala*) (*Hemerodromia* s. str.) the subcostal vein is long, and the radial and cubital veins issue near the middle of the wing; a discal cell is present sending two veins to the margin, the upper is branched, the lower is the upper branch of the postical vein, closing the discal cell below; an anal cell is present, and the anal vein is a little recurrent; the first basal cell is a little longer than the second, the anal cell much shorter; stigma is present. In the second group (*raptoria*, *oratoria*) (*Microdromia* Big.) the subcostal vein is short, the radial and cubital veins issue near the base; there is no discal cell and generally no anal cell, the lower branch of the postical vein wanting or only indicated, and the anal vein generally wanting; the second basal cell is much longer than the first; stigma absent. — The axillary lobe is very small. Alula not developed, the margin here fringed. Alar squamula is narrow, long fringed at the margin.

The developmental stages of *H. precatória* have been described and figured quite recently by Brocher (Ann. de Biologie lacustre, IV, 1909, 44, fig. 1—2). The larva lives in the mud in streamlets. It has a length of 6 mm.; the body is spindle-shaped, but most attenuated towards the head, more obtuse at the posterior end and here provided with a pencil of six to seven hairs. The abdominal segments have small, transverse swellings below. The tracheal system is described as closed, and the two large lateral tracheal trunks terminate at each end of the body with „un bouquet de fines trachées“, the larva may thus be termed amphipneustic. The pupa resembles chiefly other Empid pupæ, but it seems only to have girdles of small spines but no long bristles above on the abdominal segments. The eight pairs of spiracles are continued out into long threads, which are supposed to be tracheal gills. Thus both larva and pupa are evidently adapted to live in water. According to the observation of Brocher of a larva in the aquarium it seems to attach itself a little above the water before pupation.

The species of *Hemerodromia* occur in, or in the neighbourhood of woods, generally in the vicinity of water, at the border of lakes

or streamlets, or in other humid places; they are found on bushes and in low herbage and grass. I have never seen any species with prey, but they are certainly carnivorous, and they use no doubt the front legs in capturing the prey. Zetterstedt says: „Victus e minorum Dipterorum rapina.“ The species seem generally to be somewhat rare, but this is, I think, to some degree due to their smallness.

The genus comprises about 12 to 15 species (three are doubtful) from the palæarctic region; 5 have hitherto been found in Denmark.

Table of Species.

- | | | |
|--|----|-----------------------|
| 1. Discal cell present | 2. | |
| — Discal cell not present | 4. | |
| 2. Wing stigma more or less roundish, the radial vein curved below it | 3. | |
| — Wing stigma elongated, the radial vein not curved below it | 3. | <i>melanocephala.</i> |
| 3. Thorax grey; male genitalia with the ventral lamella large, protruding and swollen; female ovipositor evenly attenuating | 1. | <i>precatoria.</i> |
| — Thorax yellowish or light brownish; male genitalia not with the ventral lamella large and protruding; female ovipositor generally somewhat suddenly narrowed | 2. | <i>stigmatica.</i> |
| 4. The base of the discal fork lying a little more apically than the apex of the radial vein | 4. | <i>raptoria.</i> |
| — The base of the discal fork lying a little more basally than the apex of the radial vein | 5. | <i>oratoria.</i> |

1. *H. precatoria* Fall.

1815. Fall. Dipt. Suec. Emp. 10, 12, et 34, 12 (*Tachydromia*). — 1822. Meig. Syst. Besch. III, 63, 2, Tab. XXIII, Fig. 13. — 1842. Zett. Dipt. Scand. I, 266, 7. — 1862. Schin. F. A. I, 83. — 1864. Loew, Wien. entom. Monatschr. VIII, 238, 1. — 1882. Mik, Wien. ent. Zeitg. I, 41, Tab. I, Fig. 13—15. — 1903. Kat. paläarkt. Dipt. II, 268. — *Hemerodromia monostigma*: 1822. Meig. Syst. Besch. III, 62, 1, Tab. XXIII, Fig. 6. — 1842. Zett. Dipt. Scand. I, 267, 8.



Fig. 98. Antenna of *H. precatoria*. $\times 100$.

Male. Frons whitish grey, epistoma white; palpi whitish. Occiput somewhat dark grey, with short, pale hairs, and a few a little longer hairs. Antennæ yellow, with the apical part of the third joint

brownish; arista not quite short. Thorax dark grey, with a broad median stripe and the sides lighter, almost yellowish grey; it might also be termed yellowish grey with two dark grey stripes. A notopleural and a postalar bristle present, both yellow. Scutellum with two yellow marginal bristles. Pleura grey. Abdomen greyish black or dark brown, with short, pale yellowish hairs, especially at the hind margin of the segments. Venter yellow, short-haired. Genitalia with the ventral lamella large, protruding and somewhat bladder-like, the upper lamellæ not excised at the end, blackish, and also the lower lamellæ dark. Legs yellow, the two last joints on the posterior tarsi brown, on the front tarsi only very slightly darkened. The legs are short-haired with yellow hairs, front femora with two rows of very short, black spines below, and outwards to these about five yellow bristles on each side; front tibiæ with short, brown bristles below, and with a strong spine at the apex. Wings hyaline. Veins blackish or

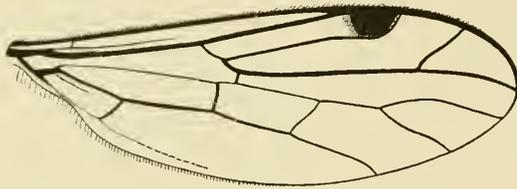


Fig. 99. Wing of *H. precatória*.

dark brown. Stigma black or blackish brown, roundish, the radial vein forming a curve below it; discal and anal cell present, anal vein long but weak. Halteres whitish yellow.

Female. Agreeing with the male; the frons very slightly broader. Ovipositor as thick as abdomen, because the eighth segment is long, while the following part is rather small.

Length 4.2—5 mm.

H. precatória is rare in Denmark; Ordrup Mose (Stæger), Rørvig, and in Jutland at Hald near Viborg (the author); my dates are $9/6$ — $17/8$. It occurs at borders of brooks, especially on somewhat shaded places, under trees; at Hald I took it in company with the two following species.

Geographical distribution:— Europe down into Italy; towards the north to middle Sweden, and in Finland. It is also recorded to occur in North America in Canada.

2. *H. stigmatica* Schin.

1862. Schin. F. A. I, 83. — 1903. Kat. paläarkt. Dipt. II, 269.

Male. Frons greyish white, epistoma white; palpi whitish. Occiput light grey or whitish grey, with short, pale hairs and a few longer bristles. Antennæ yellow, with a very short arista; the apical part of the third joint sometimes very slightly brownish. Thorax lighter or darker yellow or light brownish, with a whitish grey pruinosity; it has two distant, more or less narrow, somewhat indistinct, brownish or brownish grey stripes. A notopleural and a postalar bristle present, both yellow. Scutellum with two yellow marginal bristles and generally a small hair outside to them on each side. Pleura yellow or light brownish, whitish grey pruinose. Abdomen brownish with paler incisures, and with short, pale yellowish hairs. Venter pale yellow. Genitalia with the ventral lamella arched, but not large and protruding, the upper lamellæ dark brownish, the apex not excised but pointed, and the point turned a little downwards. Legs yellow, the two last joints on all tarsi black or blackish brown, on the front tarsi often only brown. The hairs and spines on the legs quite as in the preceding species. Wings hyaline. Veins pale brown. Stigma brown, the radial vein forming a distinct curve below it; discal and anal cell present, anal vein long, weak. Halteres white or whitish yellow.

Female. Agreeing with the male; the ovipositor thinner than abdomen, which is caused by the eighth segment being short, while the following part is thin and rather long.

Length 3,8—4,5 mm.

The species is recognised from *preparatoria* by the lighter colour, and it has also a shorter antennal arista and a more distinct curve of the radial vein below the stigma. When doubt arises the genitalia give certain characters in both sexes; the ventral lamella in the male genitalia is much larger, projecting and swollen in *preparatoria*, while it is much smaller and not projecting in *stigmatica*; the ovipositor (i. e. the eighth segment and the following part) is at the base as thick (high) as the end of abdomen in *preparatoria*, but thinner (lower) in *stigmatica*, but this latter character is not easily used, when the abdomen is shrivelled by exsiccation; for the rest there is also a character in the structure of the head; in *preparatoria* the upper, hinder corner of the eye is more pronounced than in *stigmatica* in which latter it is much rounded; the head is in the latter species relatively longer and more flattened.

H. stigmatica seems like the preceding to be somewhat rare in Denmark, and has hitherto only been taken in Jutland; Holstebro (H. J. Hansen), at Hald near Viborg (the author), at Hobro (Jacobson) and Tinbæk Mølle at Lindenberg Aa (J. P. Kryger); it has been taken from $24/6$ to August. It occurs on quite the same localities as the preceding and together with this and the following.

Geographical distribution:— Europe down into Spain; its northern limit lies in Denmark (see below).

Remarks: The above two species are certain and distinct, but the earlier descriptions, which were for the greatest part based on the colours, are often misleading. Loew, as is well known, took the two species together with the following as varieties, or more correctly, as stages of maturity of one species. Schiner's description of *stigmatica* is also incorrect. I have in the synonymy followed the Kat. paläarkt. Dipt., but I think it otherwise possible, that Zetterstedt's *monostigma* is identical with the present species, which also was the opinion of Schiner, and Loew (l. c. 241) says the same. If so the present species goes towards the north to middle Sweden. Whether Meigen's *preparatoria* and *monostigma* belong to *preparatoria* or *stigmatica* is, I think, not possible to decide after his descriptions; what he says about the colour points towards *stigmatica*.

3. *H. melanocephala* Hal.

1833. Hal. Entom. Mag. I, 158. — 1882. Mik, Wien. ent. Zeitg. I, 41, Tab. I. Fig. 16—18. — 1903. Kat. paläarkt. Dipt. II, 268. — *Hemerodromia flavella*: 1838. Zett. Ins. Lapp. 543, 4 et 1842. Dipt. Scand. I, 256, 6. — 1862. Schin, F. A. I, 83.

Male. This species resembles *stigmatica* very much. Frons brownish yellow. Antennæ yellow, arista short. Thorax yellow, somewhat greyish pruinose, with two indistinct brownish stripes, and in the middle a lighter, somewhat yellowish stripe. Abdomen brownish, venter yellow. The genitalia have the ventral lamella small, not protruding, the upper lamellæ dark brownish, with a round excision at



Fig. 100. Wing-part of *H. melanocephala*.

the apex, which is thus divided into two processes; the lower lamellæ yellow. Legs yellow, the last joint on all tarsi dark brownish or blackish, the fourth joint slightly brownish. The legs haired and

spined as in the other species, the hairs on the ventral side of the middle tibiæ stronger. Wings hyaline. Veins blackish. Stigma faint, yellowish, elongated, the radial vein not curved below it; discal and anal cell present, anal vein long, weak. Halteres whitish yellow.

Female. Agreeing with the male; frons slightly broader. Ovipositor somewhat short.

Length 3,5 mm.

This species is at once recognised by the elongated, not roundish wing stigma, below which the radial vein forms no curve; in the male the genitalia are also characteristic. Mik says l. c. that the antennæ have „ein kurzes Endgriffelchen“, but there is a short, but distinct arista; Mik's figure 17 looks as if the arista was broken off.

H. melanocephala is, as the two preceding species, rare in Denmark, only four specimens, a male and three females have been taken, one in earlier time, without particular locality, and three at Hald near Viborg on ²⁷/₆ and ²⁸/₆ 1910 (the author). It occurs on quite the same localities as the two preceding, and at Hald I took it occurring in company with them.

Geographical distribution: — Europe down into Italy; towards the north to northern Scandinavia.

Remarks: The name *melanocephala* is generally in use for this species, and so also in the Kat. paläarkt. Dipt., and I have therefore also used it, but as Haliday considered the species as identical with *Empis melanocephala* Fabr. (*Chelipoda*), it should correctly bear the next name viz. *flavella* Zett.

4. *H. raptoria* Meig.

1830. Meig. Syst. Besch. VI, 341, 10. — 1842. Zett. Dipt. Scand. I, 264, 4, et 1859. XIII, 4984, 4. — 1864. Loew, Wien. entom. Monatschr. VIII, 243, 3. — 1903. Kat. paläarkt. Dipt. II, 369.

Male. Frons and vertex grey; eyes touching below the antennæ, and with the facets in front enlarged; epistoma white; palpi whitish. Occiput grey, with short, pale hairs. Antennæ yellow, arista darker,



Fig. 101. Antenna of *H. raptoria*. $\times 100$.

fully as long as the third joint (when seen with a lens, in which case the narrowed outer part of the third joint looks as if belonging to the arista,

the real arista is a little shorter than the third joint). Thorax blackish brown, a little greyish pruinose, the humeri and a median, backwards broader stripe yellow; the yellow colour of the humeri sometimes continued stripe-like a little backwards. The short hairs on the disc pale. There is a yellow notopleural bristle. Scutellum yellow, postscutellum brownish black; scutellum has only short hairs. Pleura yellow, meta- and hypopleura black, somewhat greyish pruinose. Abdomen brownish black, with very short, pale hairs; the last segment and the hind margin of the foregoing yellow, so that there is a yellow, transverse band in front of the genitalia. Venter yellow. Genitalia black, large and swollen, the upper lamellæ with hooks at the apex, the ventral lamella long, triangular, pointed. Legs yellow, the tarsi slightly brownish at the end; front coxæ long, almost as long as the femora. The legs are short-haired with yellow hairs, the front femora and tibiæ armed in the usual way. Wings hyaline. Veins yellowish brown; there is no discal and no anal cell, the anal vein wanting, and the lower branch of the postical vein only indicated; the radial vein is short; the base of the fork of the discal vein lies a little more apically than the apex of the radial vein. No stigma. Halteres whitish yellow.

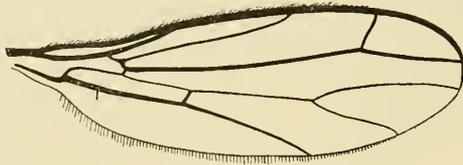


Fig. 102. Wing of *H. raptoria*.

Female. Agreeing with the male; eyes likewise touching below the antennæ and with the facets in front enlarged. Ovipositor black, in front of it a yellow, transverse band.

Length 2,8—3,5 mm.

H. raptoria has only been taken once, but in rather great number, in Lersøen at Copenhagen on ¹⁷/_s 1841; it was found sitting on reeds.

Geographical distribution: — Northern and middle Europe down into France; towards the north to northern Sweden, and in Finland.

5. *H. oratoria* Fall.

1815. Fall. Dipt. Succ. Empid. 10, 12, et 34, 12 (*Tachydromia*). — 1822. Meig. Syst. Besch. III, 63, 3, Tab. XXIII, Fig. 12. — 1842. Zett.

Dipt. Scand I, 262, 2. — 1862. Schin. F. A. I, 83. — 1864. Loew, Wien. entom. Monatschr. VIII, 244, 4. — 1903. Kat. paläarkt. Dipt. II, 268.

Male. Frons and vertex grey; eyes not touching below the antennæ; epistoma very narrow, white; palpi yellowish white. Occiput grey, with short, pale hairs. Antennæ whitish, with a short, generally darker arista. Thorax yellow, sometimes dark yellow to brownish yellow, somewhat greyish pruinose; a darker median stripe may sometimes be present. There is a yellow notopleural bristle. Scutellum only with short hairs. Pleura yellow. Abdomen dark brown to blackish brown, with very short, pale hairs, the two last segments yellow. Venter yellow. Genitalia black, less swollen than in *raptoria*. Legs yellow, the end of the tarsi very slightly brownish; front coxæ not so long as in *raptoria*, shorter than the femora. The legs haired and armed quite as in the other species. Wings hyaline, with yellowish to pale brown veins; no discal and no anal cell, both the anal vein and

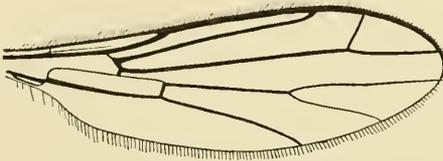


Fig. 103. Wing of *H. oratoria*.

the lower branch of the postical vein wanting; radial vein longer than in *raptoria*; the base of the fork of the discal vein lying a little more basally than the apex of the radial vein. No stigma. Halteres yellowish white.

I do not know the female; it is stated to agree with the male, as Loew l. c. declares, that the differences in the colour of the thorax, mentioned in the descriptions of Fallén and Zetterstedt, are not present.

Length 3 mm.

This species is easily distinguished from *raptoria* by the differences in the wing-venation.

H. oratoria is very rare in Denmark, only one specimen, a male, has been taken in Greisdalen at Vejle in August (H. J. Hansen).

Geographical distribution: — Northern and middle Europe down into France; towards the north to northern Scandinavia, and in Finland.

16. **Doliechocephala** Macq.

Small, delicate, dark coloured species. Head elongated downwards, pointed towards the mouth aperture and somewhat pyriform; its longest axis forms an angle with the longitudinal axis of the body; the mouth aperture is found at its point; it has thus quite another shape than the elongated, somewhat flattened head in *Hemerodromia* with the mouth aperture on the lower side, but it resembles the head in some species of *Clinocera*. Occiput slightly arched, with some bristles above. Eyes somewhat large, elongated downwards, widely separated in both sexes, and with the facets of equal size; they are densely short hairy. The incisure in the inner eye-margin distinct. There are three ocelli lying on an ocellar tubercle somewhat forwards, and there is a pair of ocellar bristles. The antennæ are in-

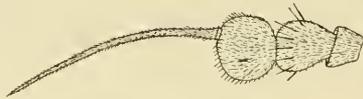


Fig. 104. Antenna of *D. irrorata*. $\times 85$.

serted near to each other a little above the middle; they are short, consisting of five joints; the two basal joints are short, the third a little longer, somewhat roundish or disciform, and compressed; it has at the apex, somewhat above, a long, downwards curved, two-jointed arista, the basal joint of which is very short, ring-like. Epistoma is somewhat narrow; clypeus is, so far as I could observe, not really separated from the epistoma, but forms the lower part of this and is somewhat keel-shaped. The small jowls descend a little below the eyes, but they are not in connection with the clypeus, as the eyes stretch far down. Proboscis is short and somewhat thick; the mouth parts much resemble those in *Clinocera*; labrum is short, broad and arched, and it is beset with strong tubercle-shaped teeth; hypopharynx is about as long as the proboscis, of the same shape as in *Clinocera*, broad at the base and with a long pointed median process, and two short, rounded, lobe-shaped lateral processes; I could find no maxillæ but there are one-jointed maxillary palpi, which are curved upwards, resting on the labrum. Labium is short, the labella somewhat large and broad, fully as long as the basal part, and cleft to their base. Thorax is elongated rectangular, a little narrowed in front, somewhat arched above; prothorax is small and likewise metathorax. There are long, uniserial dorsocentral bristles, but no acrostichal bristles; further a humeral bristle, a posthumeral, a notopleural and a postalar bristle. Scutellum with two marginal bristles. Metapleura

bare. Abdomen consists in the usual way of eight segments; the male genitalia somewhat resemble those in *Clinocera*; the seventh and eighth segments are lower than the foregoing and more or less covered by the genitalia; these latter consist of two pairs of lamellæ, forming a forceps, and below there is a ventral lamella. Penis is somewhat thick in the basal part, curved at the apex. In the female the abdomen is pointed, and it terminates with two small, styliform lamellæ. The legs are slender, the front coxæ only little elongated, about half as long as the femora. The legs are short-haired, and the tibiæ have no apical spurs. There are two claws, two pulvilli, and a small, linear, bristle-bearing empodium. The wings are brownish with hyaline spots; the mediastinal vein reaches the margin; the subcostal vein is short; the cubital vein is forked, and the upper branch is connected with the radial vein by a cross-vein, there are thus three cubital cells; the discal vein is likewise forked, and there are thus four posterior cells; the discal cell is long and sends three veins to the margin, the third is the upper branch of the postical vein, which closes the discal cell below; the lower branch of the postical vein goes straightly down, vertically towards the wing-margin. The anal vein goes not distinctly beyond the anal cell; the second basal cell is shorter than the first, the anal cell as long as the second basal cell. No stigma. Axillary lobe and alula not developed, the wing-margin fringed. Alar squamula very small and narrow, a little haired at the margin.

So far as I am aware the developmental stages are not known.

The species of *Dolichocephala* are small, nice and delicate flies, easily known by the brown, spotted wings. They occur in the herbage and grass in woods and fens, at the border of water, and on the whole in humid places. The structure of the head and the mouth, and also of the male genitalia seems to show, that the genus is nearly allied to *Clinocera*.

Of the genus 4 species are known from the palæarctic region, two of which have hitherto been found in Denmark.

Table of Species.

1. Wings with hyaline spots in the subcostal and first cubital cell, the radial and cubital veins somewhat undulated 1. *irrorata*.
- Wings without hyaline spots in the subcostal and first cubital cell, the radial and cubital veins not undulated 2. *guttata*.

1. *D. irrorata* Fall.

1815. Fall. Dipt. Suec. Empid. 13, 17 (*Tachydromia*). — 1822. Meig. Syst. Besch. III, 66, 9, Tab. XXIII, Fig. 11 (*Hemerodromia*). — 1842. Zett.

Dipt. Scand. I, 324, 1 (*Ardoptera*). — 1862 Schin. F. A. I, 85. (*Ardoptera*). — 1903. Kat. paläarkt. Dipt. II, 270.

Male. Frons grey with two darker impressions; vertex grey, the ocellar triangle brown, and this colour prolonged triangularly backwards. Epistoma light grey; palpi black. Occiput grey with black bristles above, short, whitish hairs below. Antennæ black. Thorax æneous brown, somewhat shining, with a whitish grey middle line, which is narrowest in the middle and here sometimes interrupted; also the lateral margin is somewhat whitish grey. Dorsocentral bristles long, black. Further a humeral bristle, a posthumeral, a notopleural and a postalar bristle, all black. Scutellum with two black marginal bristles. Pleura grey pruinose. Abdomen black, shining, slightly æneous, with short, pale hairs. Venter black. Legs reddish brown, posterior coxæ grey pruinose, the extreme apex of the tibiæ and the tarsi towards the end dark brown or blackish. The legs short-haired with brownish hairs. Wings brown with a number

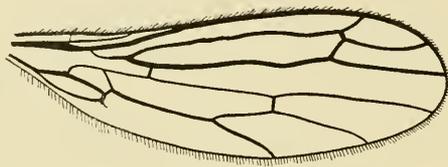


Fig. 105. Wing of *D. irrorata*.

(about twenty) of hyaline spots, and with the base yellowish; some of the spots may be indistinct or confluent, and the number is therefore not quite constant, but there are six along the anterior margin. Veins black or blackish brown, the radial and cubital veins somewhat undulated. No stigma. Halteres yellow or reddish yellow.

Female. Quite similar to the male with exception of the differences in the exterior genitalia.

Length 2—3 mm.

D. irrorata is somewhat common in Denmark; Lersøen at Copenhagen, Damhussøen, Ruderhegn, Ererslev Hegn; on Langeland at Lohals, and in Jutland at Hald near Viborg. My dates are $^{24}/_6$ — $^{12}/_9$. It occurs on shaded, humid places in woods, in fens and at the borders of water.

Geographical distribution: — Northern and middle Europe down into France; towards the north to northern Sweden, and in Finland. It occurs also in North America.

2. *D. guttata* Hal.

1833. Hal. Entom. Mag. I, 161. (*Leptosceles*). — 1903. Kat. paläarkt. Dipt. II, 269.

Male. Frons and vertex black, a narrow, V-shaped, grey line stretches from the ocellar tubercle down the occiput, with the point backwards; on each side of the tubercle, at the eye-margins, a whitish shining spot is seen. Epistoma grey; palpi black. Occiput black, with black bristles above, short, whitish hairs below. Antennæ black. Thorax æneous black, shining, with a slight and indistinct whitish middle line. Acrostichal bristles long, black. Further a humeral bristle, a posthumeral, a notopleural and a postalar bristle, all black. Scutellum with two black marginal bristles. Pleura blackish, a little greyish pruinose. Abdomen æneous black, shining, very short-haired with brownish hairs. Venter black. The genital forceps with two long, thin, curved hooks. Legs yellowish; posterior coxæ greyish pruinose, the knees, the apex of the tibiæ and the tarsi towards the end brownish to blackish. The legs short-haired with brownish hairs. Wings blackish grey or brown, with some (about eight) white spots, of which four, one in the third cubital cell, two in the apical part of the first posterior cell and one in the second posterior cell, are most distinct, the others weaker and sometimes indistinct; the subcostal and first cubital cells have no spots, thus there are none at the anterior margin; the first cubital cell is slightly lightened. Veins blackish, the radial and cubital veins not undulated. No stigma. Halteres dark yellowish to blackish.

Female. Quite similar to the male with exception of the sexual differences.

Length 2—2,6 mm.

Remarks: The halteres in this species seem to be able to vary from yellow to blackish (var. *nigrohalterata* Strobl).

D. guttata has only been taken quite recently, and only five specimens, three males and two females, in Geel Skov on ^{15/9} and ^{23/9} 1909 (the author). It was taken in a small fen in the wood on *Calla palustris*.

Geographical distribution: — Europe down into Spain; its northern limit lies in Denmark.

17. *Trichopeza* Rond.

Medium sized, dark coloured species of slender shape. The head somewhat broader than long and a little broader than thorax, only slightly arched behind, and here with some bristles. Eyes large,

occupying the whole front side of the head, and a little prominent, so that frons and vertex are a little impressed; they are short-hairy; above the antennæ they are well separated in both sexes, but below they are touching for a long distance¹. The facets in the front part of the eye are enlarged in both sexes. The incisure in the inner eye-margin is distinct. The vertex has three ocelli and a pair of ocellar bristles. The antennæ are inserted near to each other, considerably



Fig. 106. Antenna of *T. longicornis*. $\times 55$.

above the middle; they are extraordinarily long, three-jointed; the first joint is cylindrical, a little elongated, the second almost globular, the third is a little compressed and tapers evenly into a long, downwards curved arista, which cannot under the microscope be seen to be articulated at any point. Epistoma is very small on account of the long connection of the eyes; the jowls are almost not developed. Clypeus is somewhat horse-shoe-shaped. Proboscis is somewhat thin, scarcely as long as the head is high; it is stretched downwards. Labrum is of the length of proboscis, strong, semitubular, three-pointed at the apex; hypopharynx is as long as labrum, thin, slightly dilated at the apex and pointed; the maxillæ are somewhat shorter, lancet-like blades; the maxillary palpi are not short, they are one-jointed, thin at the base but dilated and somewhat ovate towards the apex, and with some long hairs. Labium has the labella not large, shorter than the basal part, and cleft to their base. Thorax is rectangular, somewhat high and much arched above; pro- and metathorax small. The disc has long, uniserial dorsocentral bristles but no acrostichal bristles. Further a humeral bristle, a posthumeral, a larger and a smaller notopleural, a supraalar and postalar bristle; besides there is a bristle inwards to the humeri. Scutellum with two marginal bristles. Metapleura bare. Abdomen is somewhat long and slender, it consists of eight segments, the first is short, the second the longest. In the male the seventh and eighth segments are lower than the preceding and covered by the genitalia; these latter have a construction recalling somewhat that in *Hilara*; they consist of a compressed lower part, perhaps representing the ventral lamella, above this part

¹ Meigen says, that the eyes of the male are touching above, but this is, as already noted by Schiner, erroneous, but none of these authors mention, that they are touching below, whereas Stein (l. c.) correctly notes this.

terminates with a pair of hooks, and inwards there is a pair of small lamellæ; in the interior lies also a long, curved, thread-like penis; for the rest the apparatus is not quite symmetrical. In the female the abdomen is somewhat thick towards the apex, and the ovipositor is somewhat curious; only six not transformed abdominal segments can be counted; the seventh dorsal segment is large, somewhat roof-shaped, and excised at the apex, the seventh ventral segment is likewise large, triangularly pointed backwards; hidden in the interior lies a small eighth segment, terminating with small styles. The legs are long and slender; the front coxæ are only slightly elongated, half as long as the femora, these latter are very slightly thickened; the front femora have bristles below, and the posterior tibiæ have long bristles; there are somewhat small apical spurs on the posterior tibiæ. There are two claws, two small pulvilli and a small, linear, bristle-bearing empodium. The wings with the mediastinal vein not reaching the margin;

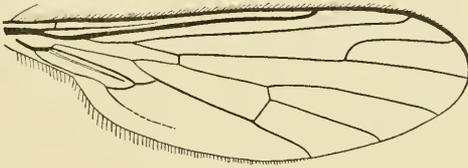


Fig. 107. Wing of *T. longicornis*.

the cubital vein forked, thus two cubital cells; the upper branch of the vein long, parallel with the main branch; the discal vein forked, thus four posterior cells; the discal cell long, sending three veins to the margin, the third is the upper branch of the postical vein, which closes the discal cell below; the lower branch of the postical vein recurrent, almost parallel with the margin; the second basal cell shorter than the first, the anal cell slightly shorter than the second basal cell; anal vein very weak, not reaching the margin. Stigma present, very faint. Axillary lobe small. Alula not present, the margin here fringed. Alar squamula narrow, without fringe at the margin.

The developmental stages of the genus are not known.

The species of this genus is easily known by its long antennæ; it is recorded to occur on meadows near water.

The genus comprises only one species, also occurring in Denmark.

1. *T. longicornis* Meig.

1822. Meig. Syst. Besch. III, 12, 1, Tab. XX, Fig. 6—7 (*Brachystoma*).

— 1842. Zett. Dipt. Scand. I, 363, 5, et 1859. XIII, 5004, 5 (*Brachystoma*).

- 1862. Schin. F. A. I, 87. — 1903. Stein, Wien. ent. Zeitg. XXII, 225.
— 1903. Kat. paläarkt. Dipt. II, 270.

Male. Frons and vertex velvet black, just above the antennæ a brownish, triangular point. Palpi yellow. Occiput grey, with black bristles above and paler hairs below. Antennæ black or brownish black. Thorax shining, blackish, but somewhat brownish grey pruinose, and hence a little dullish. Dorsocentral bristles long, black. Further a humeral bristle, a posthumeral, two notopleural, a supraalar and a postalar bristle, all black; besides there is a bristle inwards to the humeri. Scutellum with two black marginal bristles. Pleura brownish grey pruinose, generally somewhat reddish below the wing-root. Abdomen black or slightly brownish, greyish pruinose and therefore somewhat dull, sparingly clothed with short, brownish hairs. Venter of the same colour. Legs yellow, the posterior tibiæ brown, sometimes the base lighter, front tibiæ only slightly or not at all browned; tarsi brown or black; the middle tarsi are very curious, the third joint is excised below, and has at the apex a tooth, which is directed inwards, somewhat dilated at the apex and here with two hairs; at the base the joint has two bristles. Front femora slightly thickened with bristly hairs below on the basal part, some of which are long; the posterior femora short-haired, with a single, long bristle near the apex on the anterior side, sometimes also one or two weaker; the middle femora with some short, bristly hairs below at the base, and the hind femora with a little longish hairs above at the base; front and hind femora with a short, dense, whitish pubescence on the ventral side; the front tibiæ with a row of dense, short, erect hairs below, and a few bristly hairs above on the basal part; middle tibiæ short-haired, with a pair of long bristles on the antero- and postero-ventral side; hind tibiæ with bristly hairs above and below, and with a couple of long bristles on the anterior and on the ventral side; the number of the long bristles is not quite constant, generally greatest in the female. The hairs on the legs are brownish, the bristles blackish to black. Wings yellowish or slightly brownish tinged. Veins brown. Stigma very faint. Halteres whitish yellow.

Female. Similar to the male; the middle tarsi simple; the short, whitish pubescence also present below the middle femora. The ovipositor, i. e. the seventh abdominal segment, is densely haired with slightly longish, reddish brown hairs, which are strongest and densest at the hind margin of the dorsal segment. The wings more brownish than in the male.

Length 5—5,7 mm.

Stein (l. c.) says, that all femora in the male have the short,

dense pubescence below, but this is erroneous, in the male only the front and hind femora have this pubescence, but in the female it is present on all femora; Stein has probably examined a female and then concluded the facts to be the same in the male.

T. longicornis is rare in Denmark and has only been taken on two occasions, on Lolland at Maribo (Schlick), and in Jutland at Frijsenborg near Aarhus (H. J. Hansen); on the latter locality it was taken in great numbers. The dates are $^{11}/_6$ to towards the end of July.

Geographical distribution: — Europe down into Italy; towards the north to middle Sweden. Stein took his specimens when it was cloudy weather, and they were sitting at the points of branches or on fir-needles.

18. **Chelipoda** Macq.

Small, yellow coloured species. Head somewhat elongated, and slightly flattened, as broad as thorax. Occiput somewhat arched, with a few bristles above. Eyes somewhat large, a little elongated, with the hinder margin roundly incised. They are separated in both sexes, but below the antennæ only narrowly separated; the facets are of equal size. In the living specimens the eyes are metallic green, violet behind in the male and unicoloured metallic green in the female. The incisure in the inner eye-margin is small but distinct. Vertex with a small tubercle with three ocelli and a pair of bristles. The antennæ

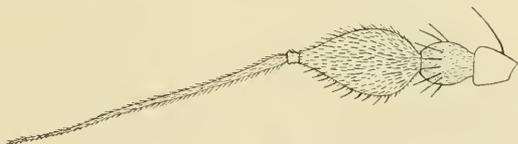


Fig. 108. Antenna of *Ch. melanocephala*. $\times 100$.

are inserted near to each other, somewhat below the middle; they are five-jointed, the two basal joints are short, the third a little elongated, pyriform and compressed, terminating with a long, two-jointed arista, the basal joint of which is very short. Epistoma is very narrow, a little broadened downwards; jowls not developed. Proboscis is short, stretched downwards. The mouth parts I have otherwise not been able to examine, they are very probably similar to those in the following genus *Phyllodromia*. Thorax is rectangular, a little narrowed in front, not much arched above; pro- and metathorax small. There are a few (four, two in each row) long, uniserial dorsocentral bristles, the anterior is placed inwards to the humeri; there are no acrostichal

bristles; further a notopleural and a supraalar bristle present. Scutellum with two marginal bristles. Metapleura with a few bristles.¹ Abdomen consists of eight segments. The exterior male genitalia are large, they resemble somewhat the genitalia in *Hilara*; the seventh and eighth abdominal segments are lower than the preceding and covered by the genitalia; these latter consist of a large, strongly compressed piece, which above and in front has a pair of lamellæ with hooks; perhaps the lower piece answers to the ventral lamella. In the female the abdomen is pointed towards the apex and terminates with a thin ovipositor formed of two small, slightly downwards curved styliform lamellæ. Legs thin and slender; the front coxæ elongated, more than half as long as the femora; the front femora thickened in both sexes, with two rows of strong bristles below, and besides with rows of very small, tubercle-shaped spines; the front tibiæ are a little curved and can be laid up towards the femora between the rows of the bristles; the front legs are thus raptorial as in *Hemerodromia*. For the rest the legs are short-haired; tibiæ without apical spurs. There are two claws, two small pulvilli and a small, linear empodium

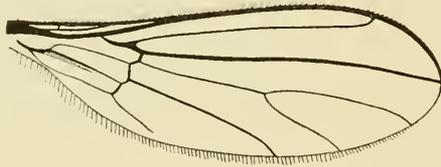


Fig. 109. Wing of *Ch. melanocephala*.

with bristles at the margin. Wings with the subcostal vein short; the cubital vein unforked, thus one cubital cell; the discal vein forked and thus four posterior cells; no discal cell; the lower branch of the postical vein going straightly downwards; the second basal cell a little shorter than the first, the anal cell as long as the second basal cell; anal vein not reaching the margin. No stigma. Axillary lobe not developed. No alula, the wing-margin here only short fringed. Alar squamula very narrow, with some long hairs at the margin.

The developmental stages are not known.

The small and delicate species occurs especially in woods on shaded and humid places.

The genus comprises only one species, also occurring in Denmark.

¹ Girschner says (Ill. Zeitschr. für Entom. 1897, 557) that of the *Hemerodromiinae* only *Clinocera* has hairs on the metapleura, but both the present and the following genus have distinct metapleural bristles.

1. **Ch. melanocephala** Fabr.

1794. Fabr. Ent. Syst. IV, 407, 21 (*Empis*), et 1805. Syst. Antl. 144, 8 (*Tachydromia*). — 1842. Zett. Dipt. Scand. I, 269, 1 (*Phyllodromia*). — 1903. Kat. paläarkt. Dipt. II, 271.

Male. Vertex and frons grey, the ocellar triangle blackish; epistoma white; palpi yellow. Occiput grey, with whitish hairs. Antennæ yellow, the third joint and the arista black. Thorax yellow, distinctly greyish pruinose; the margin of the disc with a narrow, dark or blackish line, stretching from one wing-root anteriorly round to the other; sometimes a dark, median, posteriorly narrowed line is present. There are four long, yellow dorsocentral bristles, two in each row. Further a notopleural and a supraalar bristle, both yellow. Scutellum with two, yellow marginal bristles. Pleura yellow. Abdomen blackish or brownish above, with short, yellow hairs. Venter yellow. The large genitalia and the two last abdominal segments yellow, the genitalia somewhat dark above. Legs yellow, a stripe on the posterior side of the front femora, and the tip of the tarsi blackish or brown. The legs with short, yellowish hairs, the front femora with two rows of long, black or dark brown bristles below. Wings hyaline, slightly yellowish. Veins brownish. No stigma. Halteres yellow.

Female. Similar to the male, but the front femora without any dark stripe. Ovipositor thin.

Length 2,2—2,5 mm.

Ch. melanocephala is not rare in Denmark; vicinity of Copenhagen, Charlottenlund, Ruderhegn, Nordskoven at Jægerspris; on Lolland at Maribo, and on Langeland at Lohals; in Jutland at Laven near Silkeborg, Hald near Viborg and at Sæby, and finally on Bornholm at Almindingen. The dates are $^{24}/_6$ — $^{23}/_8$. It occurs in woods on humid and shaded places, on bushes and in low herbage and grass; at Hald I took it in somewhat large numbers in the wood on *Vaccinium* growing below oak-trees.

Geographical distribution: — Northern and middle Europe down into France; towards the north to northern Scandinavia, and in Finland.

19. **Phyllodromia** Zett.

Species of small size and yellow or grey colour. Head somewhat elongated and slightly flattened, a little broader than thorax. Occiput somewhat arched, with a few bristles above. Eyes somewhat large and elongated; they are separated in both sexes, below the antennæ only narrowly separated; the facets are of equal size; the incision in the inner eye-margin very small. The vertex has a tubercle with

three ocelli and a pair of bristles. The antennæ are inserted near to each other, a little below the middle; they resemble those in *Chelipoda* and are likewise five-jointed, the two basal joints are short, the third somewhat elongated, pointed ovate and compressed, it terminates with a long, two-jointed arista, the basal joint of which is very small. Epistoma very narrow, a little broadened downwards; jowls not developed. The clypeus is formed of two chitinous lists. Proboscis is short, stretched downwards; labrum is strong, semitubular, as long as the proboscis; it is high at the insertion, curved a little downwards at the apex and three-pointed; hypopharynx is as long as labrum, with parallel sides, pointed, and not dilated at the apex; the maxillæ are a little shorter, they are somewhat broad elliptical blades, bearing some hairs and terminating in some bristle-like processes; the maxillary palpi are one-jointed, club-shaped, and with some bristles. Labium has the labella relatively large, longer than the basal part and cleft to their base. Thorax is rectangular, not much arched above; prothorax is small, but distinctly seen as a neck-shaped part; metathorax small. The thoracic disc has a few uniserial dorsocentral bristles (two, or only one in each row; perhaps the anterior bristle, which is placed inwards to the humeri, does not belong here and in *Chelipoda* in reality to the dorsocentral bristles); no acrostichal bristles. A notopleural and a supraalar bristle present. Scutellum with two marginal bristles. Metapleura with a few bristles. Abdomen consists of eight segments, but in the male the last are more or less hidden. The exterior genitalia in the male are rather large; they are mainly constructed as in *Chelipoda*; the two last abdominal segments are lower than the others, the genitalia have a large, more or less compressed piece below and above a pair of lamellæ, terminating with some hooks and curved forwards in over abdomen; in the interior there is a curved penis. In the female the

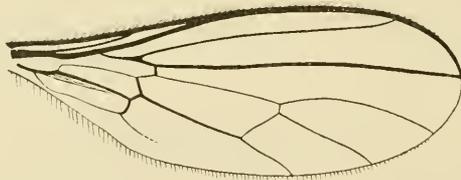


Fig. 110. Wing of *Ph. vocatoria*.

abdomen is pointed, and it terminates with a pair of more or less distinct, styliform lamellæ. The legs are constructed and armed quite as in *Chelipoda*; the front coxæ almost as long as the femora. There

are two claws, two small pulvilli and a small, linear empodium with bristles. The wings also are in venation and shape like those in *Chelipoda*, but a discal cell is present. No stigma. Alar squamula very narrow, with long hairs at the margin.

The developmental stages are not known.

The small species of this genus occur in woods on bushes and in low herbage on humid places.

Of the genus 3 species occur in the palæartic region, but one of them (*supplicatoria* Meig.) is doubtful; two are found in Denmark.

Table of Species.

1. Thorax mainly yellow; a pair of distinct bristles on the middle of the disc; male genitalia large, reaching in over abdomen beyond the middle; female ovipositor with short, indistinct styles. 1. *vocatoria*.
- Thorax mainly grey; no pair of distinct bristles on the middle of the disc; male genitalia smaller; female ovipositor with two distinct styles. 2. *albisetæ*.

1. *Ph. vocatoria* Fall.

1815. Fall. Dipt. Suec. Empid. 12, 15 (*Tachydromia*). — 1842. Zett. Dipt. Scand. I, 270, 2. — 1903. Kat. paläarkt. Dipt. II, 271.

Male. Frons and vertex grey, the ocellar tubercle blackish; epistoma white; palpi yellowish. Occiput grey, darker behind, with black bristles above and somewhat long, whitish hairs below. Antennæ yellow, the third joint often darker, arista pale yellowish. Thorax yellow or reddish yellow, distinctly greyish pruinose, with a dark middle stripe, which is broadest in front, and often indistinct behind. Dorsocentral bristles two in each row, long, black. A notopleural and a supraalar bristle present, both black. Scutellum with two black marginal bristles. Pleura yellow, somewhat pruinose. Abdomen is brownish or blackish grey above, with yellowish hairs. Venter yellow. The exterior genitalia are yellow, very large, reaching forwards beyond the middle of abdomen. Legs yellow, the last tarsal joint brownish or blackish. The legs short-haired with yellowish hairs, longest on the hind tibiæ; the front femora with two rows of strong, blackish bristles below. Wings hyaline, slightly yellowish. Veins brownish. Halteres yellow.

Female. Quite similar to the male; the ovipositor without distinct styles.

Length 2—2,3 mm.

Ph. vocatoria is not rare in Denmark; Charlottenlund, Bøllemosen, Ørholm, Svenstrup between Roskilde and Ringsted, and Tisvilde; on

Lolland at Maribo and Ryde; on Funen at Odense; in Jutland at Horsens and at Hald near Viborg, and finally on Bornholm at Rø. My dates are $^{26}/_6$ — $^{22}/_7$. It occurs in woods on open, somewhat shaded places on bushes and in low herbage.

Geographical distribution:— Northern and middle Europe down into France; towards the north to northern Sweden. It is also recorded to occur in North America.

2. *Ph. albiseta* Zett.

1838. Zett. Ins. Lapp. 544, 8 (*Hemerodromia*). — 1842. Zett. Dipt. Scand. I, 271, 3. — 1862. Schin. F. A. I, 86. — 1903. Kat. paläarkt. Dipt. II, 271. — *Hemerodromia vocatoria*: 1822. Meig. (non Fall), Syst. Besch. III, 65, 7, Tab. XXIII, Fig. 15.

Male. Frons and vertex grey, the ocellar tubercle blackish; epistoma white; palpi yellowish. Occiput dark grey, with black bristles above, and somewhat long, whitish hairs below. Antennæ yellow, third joint dark brown or black, arista white. Thorax grey, sometimes a little yellowish towards the sides. There is only a bristle in front, inwards to the humeri; on the middle there is but a pair of very small, scarcely observable hairs on each side; further a notopleural and a supraalar bristle; all the bristles black. Scutellum with two black marginal bristles. Pleura yellow, a little pruinose. Abdomen dark grey, with short, yellowish hairs. Venter grey. Exterior genitalia dark yellowish or brownish, smaller than in *vocatoria*. Legs yellow, with the last tarsal joint dark; they are haired and armed quite as in *vocatoria*. The wings as in *vocatoria*, but the discal cell narrower. Halteres whitish yellow.

Female. Quite similar to the male; venter sometimes yellowish; the ovipositor terminating with two distinct styles.

Length 2—2,6 mm.

This species is distinguished from *vocatoria* in the male by the smaller and darker genitalia, and in the female by the distinct styles at the end of abdomen; in both sexes the absence of a middle bristle on the thoracic disc is a good character, and also the shape of the discal cell, though this may vary a little in both species; finally the colour of thorax is grey in *albiseta*, yellow in *vocatoria*.

Ph. albiseta is rare in Denmark, and was for the first time taken in 1909 in Geel Skov on $^{5}/_9$ — $^{23}/_9$ (the author). It occurred in a little fen in the wood, especially on the leaves of *Calla palustris*. It seems to be a late occurring species.

Geographical distribution:— Northern and middle Europe down into France; towards the north to northern Scandinavia.

5. Tachydromiinae.

Eyes generally separated above the antennæ in both sexes; below the antennæ either likewise separated (*Chersodromia*, *Tachydromia*), or they are here touching in both sexes, and in the latter case either the facets in the front part of the eye enlarged, likewise in both sexes (*Stilpon*, *Tachypeza*, *Tachista*) or all facets of equal size, (*Drapetis* (eyes not quite touching), *Elaphropeza*). Rarely the eyes are touching above the antennæ in both sexes, and then the facets in the front part are enlarged (*Symballophthalmus*). Sometimes the eyes are short-haired or microscopically haired (*Drapetis*, *Stilpon*, *Chersodromia*, *Elaphropeza*). Antennæ four- to five-jointed, terminating with a two-jointed or unjointed arista, which is generally apical, rarely (*Stilpon*) dorsal (apparently). Proboscis short, sometimes curved inwards towards the sternum. No maxillæ; maxillary palpi one-jointed. Metapleura bare, or with very short hairs (*Drapetis*). Legs shorter or longer; sometimes the front femora thickened, sometimes both front and middle femora, especially the latter, and the middle tibiæ with an apical spine; the pair or pairs of legs in question are then specially armed and raptorial. Wings with the cubital vein unforked; the discal vein likewise unforked; three posterior cells and no discal cell. Basal cells somewhat large, of equal length, or the second longer than the first; anal cell present and shorter than the basal cells, or wanting, and in accordance herewith the anal vein present or wanting; when present the vein is however weak; the lower branch of the postical vein present or absent. Axillary lobe small or somewhat developed. No alula. No stigma.

Table of Genera.

- | | |
|--|---------------------------|
| 1. Anal cell absent | 2. |
| — Anal cell present, anal vein more or less weak, but distinct; basal cells of about equal length | 7. |
| 2. First basal cell shorter than the second | 3. |
| — First basal cell as long as the second | 25. <i>Chersodromia</i> . |
| 3. Legs rather short; body short and robust; colour black or grey; wings without markings | 4. |
| — Legs somewhat slender; body not robust; wings with dark markings, or at all events some veins seamed, or when hyaline the thorax is yellow | 5. |
| 4. Frons triangular; arista terminal | 20. <i>Drapetis</i> . |
| — Frons with parallel margins; arista dorsal | 21. <i>Stilpon</i> . |
| 5. Third antennal joint short, ovate; front femora considerably thickened; wings more or less dark marked; thorax black | 6. |
| — Third antennal joint a little longer, conical; front femora not thickened; wings hyaline; thorax yellow | 24. <i>Elaphropeza</i> . |

6. Lower branch of the postical vein present 22. *Tachypeza*.
 — Lower branch of the postical vein absent 23. *Tachista*.
 7. Eyes touching in both sexes; upper margin of
 the third antennal joint straight 26. *Symballophthalmus*.
 — Eyes separated in both sexes; third antennal joint
 ovate or conical, its upper margin not straight. 27. *Tachydromia*.

20. **Drapetis** Meig.

Very small, dark coloured species of a somewhat thick-set shape. Head a little narrower than thorax, somewhat short, higher than broad. Occiput slightly arched, with a pair of bristles above, and sometimes with smaller hairs. Eyes high; they are separated above in both sexes, but reaching near to each other just above the antennæ, and the frons is thus triangular; below the antennæ the eyes are touching or almost touching in both sexes; the hind margin is sinuous or has a round incision. The facets are of equal size. The incision in the inner eye-margin somewhat large. The eyes are microscopically hairy. The vertex has a tubercle with three ocelli and two or four bristles. The antennæ are inserted near to each other, a little above the middle; they are five-jointed; the first joint is short, the second a little longer, the third is pointed ovate or conical, and compressed, it bears at the apex a long, straight, two-jointed arista, the first joint of which is exceedingly short, ring-like; the arista is directed somewhat downwards. The second basal joint of the antennæ has a shorter or longer bristle below. Epistoma is very narrow, when the eyes are touching only consisting of a low, triangular part. Jowls are present, but small, descending slightly below the eyes. Proboscis is short, directed downwards and backwards and curved a little inwards at the apex. Labrum is as long as labium, very high at its insertion, semitubular, and curved downwards with the apex; it is three-pointed, but the median lobe is much shorter than the lateral; on the inside of the labrum there is at each edge, about in the middle, a pavement of small tubercles, and the lateral lobes have a spine near the apex and one a little more backwards; hypopharynx is of the same length as labrum, likewise semitubular, strongly chitinised and black in the apical part; the apex is curved downwards with an angular bend. I could detect no maxillæ, but there are one-jointed, ovate maxillary palpi. Labium has somewhat large labella with strong bristles. Thorax is short, quadrangular or almost roundish, slightly arched above; pro- and metathorax small. The disc has a uniform fine pubescence and various bristles which are present on the whole disc, forming indistinct dorsocentral and acrostichal rows, or there are only a few

dorsocentral bristles backwards. There are some notopleural and a postalar bristle, sometimes also a posthumeral bristle. Scutellum with two long, marginal bristles. Metapleura with very short, scarcely observable hairs. Abdomen somewhat robust, consisting of eight segments; in the male it terminates with a small, knob-like forceps. In the female the abdomen is pointed, terminating with two small styli-form lamellæ. Legs somewhat robust, front and hind femora somewhat thickened, the middle femora less or not thickened; in some species the hind tibiæ are tooth-like prolonged beyond the insertion of the metatarsus. The legs are short-haired and with more or fewer, generally only few bristles; the tibiæ may be with or without apical spurs. The hind tibiæ have at the apex on the postero-ventral side a small elevation which has a dense, short pubescence, and the same pubescence is generally found on the posterior side of the metatarsus; it is this elevation which is in some species prolonged as a tooth beyond the insertion of the tarsus, as mentioned above. There are two claws, two pulvilli and a very small empodium, terminating in a bristle and with bristles on the lower side. The wings with a short mediastinal vein, not reaching the margin; the subcostal vein terminates about in the middle of the costa; the cubital vein unforked and thus one cubital cell; the discal vein likewise unforked and thus three posterior cells; no discal cell; the lower branch of the postical vein wanting, and no anal cell present; anal vein likewise absent or only indicated; the second basal cell longer than the first. No stigma. Axillary lobe somewhat well developed. Alula not developed, the margin here fringed. Alar squamula small and narrow, fringed at the margin.

The developmental stages of *Drapetis* are not known.

The species of this genus are rather easily known by their thick-set shape and short, broad thorax. They occur especially on fields and commons in grass and low herbage, but do not seem to belong to woods. The species, or some of them, seem to hibernate as imago, thus I possess *D. aterrima* taken with the sieve on $20\frac{1}{2}$ in flood refuse, and Zetterstedt mentions *D. flavipes* (*Tachydromia nigra*) as taken under stones in October.

Of the genus 13 (14?) species are known from the palæarctic region; 5 have hitherto been found in Denmark.

Table of Species.

1. The apex of the hind tibiæ prolonged tooth-like beyond the insertion of the metatarsus 1. *aterrima*.
- The apex of the hind tibiæ not prolonged beyond the insertion of the metatarsus 2.

2. Halteres pale; hind tibiæ with strong bristles 2. *setigera*.
 — Halteres dark; hind tibiæ without strong bristles 3.
 3. Wings hyaline, cross-veins distant 3. *assimilis*.
 — Wings brownish tinged or hyaline, cross-veins near to each other 4.
 4. Wings more or less brownish tinged; the cubital vein curved upwards at the apex and here thin, discal vein almost straight 4. *exilis*.
 — Wings almost hyaline; cubital vein curved downwards towards the apex and terminating with full thickness, discal vein with a curve behind the postical cross-vein 5. *pusilla*.

1. *D. aterrima* Curt.

1834. Curt. Brit. Entom. 397, 3. — 1851. Walk. Ins. Brit. 1, 136, 1. — 1859. Loew, Neue Beitr. zur. Kennt. d. Dipt. VI, 40, nota. — 1903. Kat. paläarkt. Dipt. II, 273. — *Tachydromia nigritella*: 1842. Zett. Dipt. Scand. I, 298, 32. — *Drapetis nigritella*: 1903. Kat. paläarkt. Dipt. II, 274. — *Drapetis nervosa*: 1859. Loew, l. c. 37, 3.

Male. Frons and vertex black; ocellar tubercle with two bristles; epistoma black above, grey below; palpi grey with black hairs.



Fig. 111. Antenna of *D. aterrima*. $\times 85$.

Occiput blackish above, grey downwards along the posterior eye-margin; it has a pair of long, black bristles above. Antennæ black, the second joint with a long bristle, the third joint somewhat short ovate. Thorax black, shining, with a greyish, somewhat adpressed pubescence; towards behind there is a couple of somewhat longer, black dorso-central bristles. There are two notopleural and a postalar bristle, all black. Scutellum with two black marginal bristles and some smaller hairs. Pleura black, shining. Abdomen likewise black, shining, with short, dark or brownish hairs. Venter of the same colour. Legs black, trochanters, knees and the apex of the tibiæ reddish; tarsi reddish or brownish; the front tibiæ may be almost quite pale. The posterior tibiæ are on the postero-ventral side prolonged beyond the insertion of the tarsus in a tooth-shaped way, the tooth is reddish. The front femora are somewhat thickened, and have a few long hairs below, the hind femora have some bristles below on the apical part; at the apex of the



Fig. 112.
D. aterrima,
hind leg. $\times 45$.

front femora there is a bristle on the anterior and posterior side, on the middle femora a specially strong bristle on the anterior side; the hind tibiæ have fine, slightly longish hairs above and below, and all tibiæ have apical spurs. The hairs are paler or darker brownish, the bristles blackish. Wings hyaline. Veins blackish brown; the cross-veins near to each other; the discal vein thin from somewhat after

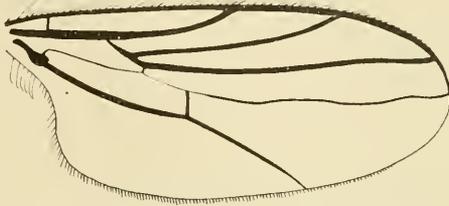


Fig. 113. Wing of *D. aterrima*, the mediastinal vein not seen.

the base to a little beyond the postical cross-vein, the last part of the vein is slightly undulated. Halteres brownish yellow to brownish.

Female. Quite similar to the male, only the abdomen pointed. Length 1,6—2 mm.

I have determined this species by comparison with specimens of *aterrima* sent to me from Mr. Verrall, but in reading Loew's description of his *nervosa*, which according to the Kat. paläarkt. Dipt. is identical with *nigritella* Zett., I find no distinguishing character, e. g. the absence of the bristles on the anterior part of the thoracic disc, the bristles on the legs and the venation of the wings are quite in accordance; I have therefore no doubt, that *aterrima* Curt. and *nigritella* Zett. = *nervosa* Loew are identical.

D. aterrima is somewhat rare in Denmark, but has however been taken on several localities; at Copenhagen (Schlick), Rørvig (the author); on Møen at Maglevandsfaldet (J. C. Nielsen); on Langeland at Lohals (the author) and in Jutland at Nymindegab (Th. Mortensen). The dates are $^{24}/_2$ — $^{24}/_7$; on the former date it was taken with the sieve in flood refuse at Copenhagen, it was present in rather great numbers, and it would thus seem as if it hibernates as imago.

Geographical distribution:— Northern and middle Europe down into Germany; towards the north to southern Sweden.

2. *D. setigera* Loew.

1859. Loew, Neue Beitr. zur Kenntn. d. Dipt. VI, 39, 6. — 1862. Schin. F. A. I, 96. — 1903. Kat. paläarkt Dipt. II, 274.

Male. Frons, vertex and epistoma black; ocellar tubercle with two bristles. Palpi grey. Occiput black, grey downwards along the

eye-margin, with two long, black bristles above. Antennæ black, the second joint with a somewhat long bristle below; the third joint somewhat elongated. Thorax black, shining, with a somewhat adpressed, greyish pubescence and beset with somewhat long, black



Fig. 114. Antenna of *D. setigera*. $\times 100$.

bristles, representing both dorsocentral and acrostichal bristles. Further a posthumeral bristle, some notopleural and a postalar bristle, all black, but they are fused with other bristles on the sides of the disc. Scutellum with two long, black marginal bristles and smaller hairs. Pleura black, shining. Abdomen likewise black, shining, with a short, pale pubescence. Venter similarly coloured and haired, the hairs towards the apex darker. Legs black, trochanters and knees reddish, generally the tibiæ, especially the hind tibiæ, and the tarsi brownish to reddish. The anterior femora with bristles at the apex on the anterior and posterior side, the one on the anterior side strongest, especially on the middle femora; the hind femora with a few bristles below towards the apex; the anterior tibiæ with apical spurs, the hind tibiæ with a row of strong bristles on the antero-dorsal side. The hairs are yellowish or brownish, the bristles black. Wings hyaline. Veins paler or darker brown; the cross-veins near to each other; the discal vein thin from the medial cross-vein to somewhat beyond the postical cross-vein; a thin anal vein indicated. Halteres whitish yellow to yellow.

Female. Quite similar to the male with exception of the pointed abdomen.

Length 1,8—2,3 mm.

D. setigera is somewhat rare in Denmark, but has been taken on several localities; at Copenhagen; on Falster at Resle; on Funen at Hoffnangave; on Fænø, and in Jutland at Horsens and at Gjerlev near Randers Fjord; the dates are $^{28}/_5$ — $^{20}/_7$.

Geographical distribution:— Northern and middle Europe down into Germany; its northern limit lies in Demark.

3. *D. assimilis* Fall.

1815. Fall. Dipt. Suec. Empid. 8, 5 et 34, 5 (*Tachydromia*). — 1859. Loew, Neue Beitr. zur Kenntn. d. Dipt. VI, 41, 8 (*affinis, lapsus*). — 1862.

Schm. F. A. 1, 95. — 1903. Kat. paläarkt. Dipt. II, 272. — *Drapetis nigra*: 1830. Meig. Syst. Besch. VI, 344, 2. — *Drapetis minima*: 1838. Meig. Syst. Besch. VII, 100, 4.

Male. Frons, vertex and epistoma black; ocellar tubercle with about four small bristles. Palpi greyish brown. Occiput black, shining, with a pair of bristles and some small hairs above. Antennæ black or blackish, the second joint with a short bristle below, the third short ovate. Thorax black, shining, with a very short, brownish grey pubescence, and only with a pair of longer bristles behind. There are some blackish notopleural bristles and a postalar bristle. Scutellum with two black marginal bristles and a pair of weaker bristles outwards. Pleura black, shining. Abdomen black, somewhat shining, with a short, pale brownish pubescence; venter similarly coloured and haired. Legs black or brownish, trochanters and knees reddish, front coxæ pale; the legs may vary in colour to quite yellowish, especially in the female. The hind femora with a few blackish bristles below at the apex, anterior femora with fine hairs below; bristles at the

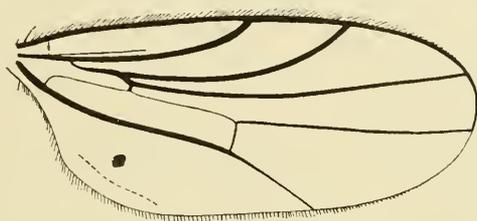


Fig. 115. Wing of *D. assimilis*.

apex of the anterior femora scarcely observable; for the rest the legs short-haired, and the tibiæ without apical spurs. Wings hyaline. Veins brown; the cross-veins distant; the discal vein thin from the base to the postical cross-vein; a thin anal vein is indicated. Halteres blackish or brown.

Female. Quite similar to the male, the abdomen is pointed.

Length 1,5—1,7 mm.

D. assimilis seems to be very rare in Denmark, only three specimens are known, taken many years ago, one from Westermann's collection, labelled Copenhagen, and two from Stæger, probably taken at Ordrup.

Geographical distribution:— Northern and middle Europe down into France; towards the north to southern Sweden. — It is also recorded to occur in North America, but this seems to be erroneous, at all events the species enumerated by Melander (Trans. Amer.

Ent. Soc. XXVIII, 1902, 208, Pl. V, figs. 12, 17, 24) as *nigra* Meig. is not *assimilis* as is shown with certainty by the figure of the wing, which has the cross-veins much nearer to each other than *assimilis*. About Walker's statement (List of the Spec. of Dipt. Ins. in the Coll. of the Brit. Mus. III, 1849, 511) I can say nothing.

4. *D. exilis* Meig.

1822. Meig. Syst. Besch. III, 91, 1, Tab. XXIII, Fig. 25—28, et VI, 344. — 1859. Loew, Neue Beitr. zur Kenntn. d. Dipt. VI, 42, 10. — 1862. Schin. F. A. I, 95. — 1903. Kat. paläarkt. Dipt. II, 273.

Male. Frons and vertex black; ocellar triangle with four short bristles; epistoma black; palpi greyish. Occiput black, above with a pair of short bristles and some smaller hairs. Antennæ black, the second joint with a very short bristle below. Thorax black, shining, with short, somewhat adpressed, yellowish grey pubescence; the disc has a couple of longer, black bristles behind. There are some black notopleural and a postalar bristle, perhaps also a supraalar bristle. Scutellum with two black marginal bristles and some very small hairs. Pleura black, shining. Abdomen black, somewhat shining, with short, yellowish grey, towards the sides darker hairs. Venter similarly coloured and haired. Legs black, front coxæ and all trochanters yellowish, front tibiæ yellowish to brownish; sometimes also the front femora, the middle tibiæ and the apex of the hind tibiæ yellowish to brownish and all tarsi brownish. The legs are short-haired, front femora with very small bristles at the apex on both sides, middle femora with a longer bristle on the anterior side, hind femora with a pair of bristles below at the apex; all femora with fine hairs below; hind tibiæ with fine hairs on the dorsal side among which a few stronger hairs. Tibiæ without apical spurs. The hairs pale, the

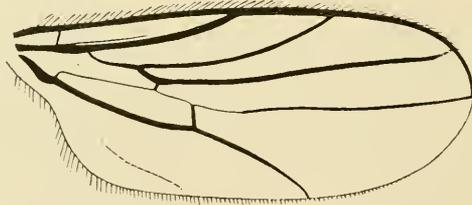


Fig. 116. Wing of *D. exilis*.

bristles blackish. Wings brownish tinged, especially on the anterior part. Veins blackish brown to black, the subcostal vein somewhat

near to the margin; the apex of the cubital vein curved a little upwards, thin and nearly evanescent before reaching the margin; the discal vein thin from the base to considerably behind the postical cross-vein; the cross-veins near to each other; a thin anal vein indicated. Halteres black or brownish black.

Female. Quite similar to the male; abdomen more pointed.

Length 1,5—2 mm.

D. exilis seems to be the most common of our species; Amager, Ørholm, at Skelskør; on Langeland at Lohals, and on Bornholm at Rønne; at Lohals I caught the species in rather great numbers with the net on a clover-field. My dates are only $^{26}/_6$ — $^{5}/_7$.

Geographical distribution: — Northern and middle Europe down into France; its northern limit is hitherto in Denmark.

5. *D. pusilla* Loew.

1859. Loew, Neue Beitr. zur Kenntn. d. Dipt. VI, 42, 9. — 1862. Schin. F. A. I, 96. — 1903. Kat. paläarkt. Dipt. II, 274. — *Drapetis exilis* (non Meig.): 1842. Zett. Dipt. Scand. I, 328, 2.

Male. Frons and vertex black; ocellar triangle with four short bristles; palpi greyish. Occiput blackish, with a pair of bristles and short hairs above. Antennæ black, second joint with a very short bristle below. Thorax black, shining, with a short, somewhat adpressed, brownish pubescence, behind there is a pair of longer, black bristles. Small notopleural and a postalar bristle present. Scutellum with two black marginal bristles and some small hairs. Pleura black, shining. Abdomen black, slightly shining, with short, dark brown hairs. Venter black. Legs black, anterior femora more or less brown at the apex, front tibiæ yellowish brown, middle tibiæ more or less brown and hind tibiæ brown towards the apex; tarsi brown. Legs short-haired with brownish hairs; front femora with a small bristle

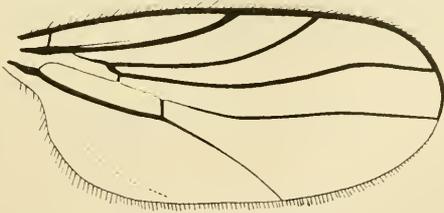


Fig. 117. Wing of *D. pusilla*.

at the apex on the posterior side, and middle femora with a similar bristle on the anterior side. Tibiæ without apical spurs. Wings hya-

line or almost hyaline. Veins blackish; the cubital vein curved distinctly downwards towards the apex; the discal vein thin from the base to somewhat behind the discal cross-vein, outwards to this cross-vein it has a distinct curve with the convex side downwards; the cross-veins are near to each other; the apical part of the postical vein somewhat suddenly thin; a very thin anal vein indicated. Halteres blackish.

Female. Quite similar to the male; abdomen pointed.

Length 1,5—1,7 mm.

This little species resembles *exilis*, but is distinguished by the almost hyaline wings, the cubital vein which is curved downwards and not thin at the apex, and the distinct curve of the discal vein; also the front coxæ are not yellow, at most a little paler at the apex.

D. pusilla is very rare in Denmark, only two specimens, a male and a female, are known, one from Westermann's collection, labelled Copenhagen, and one taken on Langeland at Lohals on ³/₇ 1909 (the author).

Geographical distribution:— Europe down into Italy; towards the north to southern Sweden.

21. **Stilpon** Loew.

Very small species of partly dark, partly yellow colour. Head about as broad as thorax, short but high, much higher than broad. Occiput a little arched, with a few bristles above. Eyes large and high; above they are well separated in both sexes, and they do not go nearer to each other downwards, so that the frons has the same breadth above and below and the margins are parallel; below the antennæ the eyes are touching in both sexes, and the facets are here a little enlarged likewise in both sexes. The hind margin of the eyes are curved slightly forwards; the incision in the anterior margin is distinct. The eyes are densely short-haired. On the vertex



Fig. 118. Antenna of *S. graminum*. $\times 100$.

there are three ocelli and a couple (four) of ocellar bristles. The antennæ are inserted near to each other a little below the middle; I

could only see four joints; the basal joints are short, the third joint also short, somewhat compressed, it tapers on the dorsal side near the apex into a short process which bears a long, straight, unjointed arista¹. Epistoma is very small; the jowls do not descend below the eyes. Proboscis is short, stretched downwards and a little inwards, and the apex is curved a little inwards; there are one-jointed, compressed maxillary palpi, with strong bristles at the apex, but for the rest I have not been able to examine the mouth parts more particularly; probably they resemble those in *Drapetis*. Thorax is rectangular, but only slightly elongated and not much arched above; pro- and metathorax small. There are no bristles on the disc, but a posthumeral and a pair of notopleural bristles. Scutellum has two marginal bristles. Metapleura pruinose, but without hairs. Abdomen short and robust; I think it consists of eight segments, but in the male they are not to be counted. The male genitalia form a small forceps. In the female eight abdominal segments are visible, and abdomen is pointed. The legs are short; the front femora strongly thickened; the middle tibiae are relatively short, considerably shorter than the femora. The legs are short-haired and with a few bristles; the tibiae without apical spurs. There are two claws, two pulvilli and a very small empodium. The wings narrow, the subcostal vein very short, the radial vein termina-

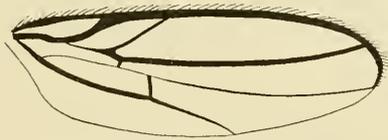


Fig. 119. Wing of *S. graminum*.

ting before the middle of the wing; the cubital vein unforked, thus one cubital cell; the discal vein likewise unforked, thus three posterior cells; no discal cell; the lower branch of the postical vein wanting and no anal vein present; first basal cell short and narrow, second longer and much broader. No stigma. Axillary lobe somewhat developed. No alula. Alar squamula very small, a little fringed at the margin.

The developmental stages are not known.

¹ It will thus be seen, as also shown by fig. 118, that the arista is not in reality dorsal, but seen with a lens it looks so, because the process from the third joint is then taken to be the basal part of the arista, and also because the hairs on the lower side of the third joint seem to form part of the joint; in reality there is only a slight difference between the facts here and in *D. aterrima*, while in *setigera* the arista is more distinctly terminal.

The very small species of this genus occur on fields and meadows, generally near water.

The genus comprises 3 palæarctic species; one is hitherto found in Denmark. •

1. *S. graminum* Fall.

1815. Fall. Dipt. Suec. Empid. 15, 21. (*Tachydromia*). — 1822. Meig. Syst. Besch. III, 72, 10. (*Tachydromia*), et 1838. VII, 95, 11. (*Tachypeza*). — 1842. Zett. Dipt. Scand. I, 320, 10. (*Tachypeza*). — 1859. Loew, Neue Beitr. zur Kenntn. d. Dipt. VI, 43, 11. — 1862. Schin. F. A. I, 95. (*Drapetis*). — 1903. Kat. paläarkt. Dipt. II, 274.

Male. Vertex and frons grey; palpi pale, yellow. Occiput grey with some black bristles above. Antennæ yellow, the third joint and the arista dark brown. Thorax black, but the colour more or less hidden by a dense grey pruinosity, and further there is a short, pale pubescence. A posthumeral and a pair of notopleural bristles present, all black. Scutellum with two black marginal bristles. Pleura black, shining, but grey pruinose above. Abdomen dirty yellowish, with scarcely perceptible, pale hairs. Venter of the same colour. The exterior genitalia black. Legs yellow, tarsi a little brownish towards the ends. The legs short-haired with yellowish hairs; the front and hind femora with somewhat fine, longish hairs below; the middle femora with about three a little stronger bristles, and with a black bristle at the apex on the anterior side; the middle tibie distinctly haired above and below. Wings somewhat narrow, a little brownish tinged. Veins brown; the discal vein thin from the base to the postical cross-vein. Halteres yellow.

Female. Quite similar to the male; abdomen generally a little paler; ovipositor black.

Length 1,3 mm.

S. graminum is not rare in Denmark, but it has, however, not been taken many times, probably on account of its smallness; at Lersøen by Copenhagen and at Sorø Sø; my dates are ¹⁵/₄ to June. At Sorø Sø I took it with the sieve from flood refuse on ¹⁵/₄, so that it might be thought to have hibernated.

Geographical distribution: — Europe down into Italy; towards the north to middle Sweden, and in Finland.

22. *Tachypeza* Meig.

Species of a somewhat small size and a slender shape, and of dark colours. Head about as broad as thorax, somewhat elongated,

higher than broad. Occiput somewhat conical, with a few bristles above. Eyes high; they are in both sexes separated above the antennæ, leaving a narrow frons between them; below the antennæ they are touching, and the facets are here in both sexes a little enlarged; the hind margin is a little incurved, the lower posterior corner drawn a little out backwards. The incision in the middle of the inner eye-margin distinct. In the living specimens the eyes are brown and a little metallic. There are three ocelli, placed somewhat forwards, so that the upper posterior corner of the eye lies somewhat behind the ocelli. No ocellar bristles. The antennæ are inserted somewhat near to each



Fig. 120. Antennæ of *T. nubila*. $\times 100$.

other, about in the middle; they are four-jointed, the basal joint is very short, almost ring-like, the second somewhat longer, the third ovate, compressed and terminating with a long, unjointed arista, forming the fourth joint. Epistoma is very small on account of the touching eyes. Jowls not developed. Proboscis short, stretched downwards and more or less inwards (backwards). Clypeus consists of two small lists. Labrum is as long as labium, semitubular or almost tubular, strong, high at the base and three-pointed at the apex, the lateral lobes are somewhat hook-shaped, the median broad and rounded, beset with spines below; hypopharynx is a lancet-shaped blade, as long as the labrum, pointed and with a pair of spines below at the apex. There are no maxillæ, but ovate, compressed, one-jointed maxillary palpi, with strong bristles at the apex. Labium has somewhat large labella with some bristles, they are not cleft quite to their base, and between them there is a relatively large, median lobe. Thorax is elongated, rectangular, a little narrowed in front, and not much arched above; the humeri are distinctly marked off by an impressed furrow. Pro- and metathorax are small, the latter however visible as a narrow rim behind the postscutellum. There are uniserial dorsocentral and biserial acrostichal bristles on the disc, but they are very small, almost punctiform and scarcely observable; there are two notopleural bristles. Scutellum with two marginal bristles. Metapleura bare. Abdomen somewhat slender; it consists of eight segments, but the last is small and hidden; the first dorsal segment is very short, and there is no chitinised first ventral segment. The male genitalia are somewhat large; they consist (*nubila*) of a large ventral piece, and above it lies a pair of complicated, not symmetrical lamellæ, and perhaps still a

pair of lamellæ inwards; the genitalia are somewhat different in the various species. In the female the abdomen is pointed, and the eighth segment terminates with two thin styles. The legs are long and slender, the hind legs longest, the front legs the shortest; the front coxæ a little elongated; the front femora are thickened in both sexes, also the middle femora are a little thickened; sometimes also the front tibiæ are somewhat thickened, and then most in the male; the tarsi are long. Front and middle femora have two rows of very short spines below, between which the tibiæ can be laid up. For the rest the legs are short-haired and with very few bristles. Tibiæ without, or the anterior tibiæ with very small apical spurs. There are two claws, two pulvilli and a small, linear empodium with bristles below. Wings

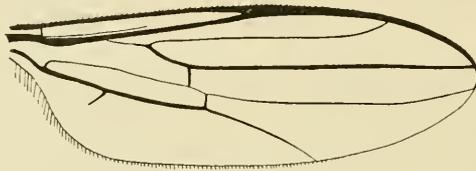


Fig. 121. Wing of *T. nubila*.

with the mediastinal vein short and weak, not reaching the margin; the cubital vein unforked and thus one cubital cell; the discal vein likewise unforked and thus three posterior cells; no discal cell; the lower branch of the postical vein present and somewhat recurrent, but no anal vein or anal cell is present; the basal cells long, the second a little longer than the first. No stigma. The axillary lobe somewhat developed, the axillary angle very shallow. No alula, the margin here a little fringed. Alar squamula very small, fringed at the margin.

The developmental stages are not known. Boie mentions (Stett. Ent. Zeitg. VIII, 1847, 331), that he has bred a *Tachydromia* from flowers of *Bidens cernuus*; the species might belong to the present or the following genus, but there is no doubt some mistake here.

The species of this genus are rather characteristic by their elongated shape, and also by their behaviour; they occur especially on the stems of trees and on boards, and they are here seen running swiftly about with the wings parallel over abdomen, but they fly rarely. I have never taken them with prey, but they are known to be raptorial, as is also indicated by the shape of the anterior legs. Poulton records in the work cited above *T. nubila* with *Cecidomyia* sp. as prey.

Of the genus 6 to 9 species are known from the palæarctic region (three are doubtful); two have hitherto been found in Denmark.

Table of Species.

1. Thorax somewhat shining; wings brown with base and apex hyaline; front tibiæ not thickened 1. *fuscipennis*.
 — Thorax pruinose, dull; wings with the cubital and the basal part of the postical vein brownish seamed; front tibiæ somewhat thickened 2. *nubila*.

1. **T. fuscipennis** Fall.

1815. Fall. Dipt. Suec. Empid. 14, 19 (*Tachydromia*). — 1822. Meig. Syst. Besch. III, 71, 5 (*Tachydromia*), et 1838. VII, 95, 6. — 1842. Zett. Dipt. Scand. I, 315, 4. — 1860. Loew, Zeitschr. für Entom. Breslau. XIV, 14, 3. — 1862. Schin. F. A. I, 93. — 1903. Kat. paläarkt. Dipt. II, 275.

Male. Frons and vertex greyish black; palpi whitish, with black bristles. Occiput grey, with a few black bristles above, and densely beset with whitish hairs below, the hairs forming a longitudinal stripe on each side. Antennæ yellow. Thorax black, somewhat shining, with a slight and very short pubescence. There are two black, notopleural bristles. Scutellum with two black marginal bristles. Pleura black, shining, a little pruinose downwards and towards behind. Abdomen blackish brown or brownish, with a very sparse and short, pale pubescence. Venter similarly coloured, the last ventral segment with long hairs. The exterior genitalia black. Legs yellow, on the hind legs the femora, the tibiæ except the base and the tarsi, except the base of the metatarsus, brownish; also the anterior tibiæ may be a little brownish. Front tibiæ not thickened, slightly curved, and also the middle tibiæ very slightly curved. The legs are short-haired with pale hairs, the middle coxæ and the base of the middle femora have a few blackish bristles; the front femora with a short, dense pubescence below. Wings more or less brown with the base and the apex clear, thus they may also be described as having a broad, brown middle band; the colour is darkest towards the anterior margin. Veins paler or darker brownish. Halteres whitish yellow.

Female. Similar to the male; the ovipositor black; the bristles below the base of the middle femora stronger.

Length 2,8 to fully 3,5 mm.

T. fuscipennis is rare in Denmark, I know only four specimens, a male and three females; vicinity of Copenhagen, Ordrup and on Lolland at Maribo; the dates are $1/7$ — $12/7$. It occurs generally on the stems of trees.

Geographical distribution: — Europe; towards the north to northern Sweden, and in Finland.

2. *T. nubila* Meig.

1804. Klass. eur. zweifl. Ins. 1, 239, 9. (*Tachydromia*). — 1860. Loew, Zeitschr. für Entom. Breslau, XIV. 12, 2. — 1903. Kat. paläarkt. Dipt. II, 275. — *Tachydromia nervosa*: 1822. Meig. Syst. Besch. III, 72, 8. — 1862. Schin. F. A. I, 94. — *Tachypeza nervosa*: 1838. Meig. Syst. Besch. VII, 59, 9. — 1842. Zett. Dipt. Scand. 1, 317, 6. — *Tachydromia truncorum* (non Fall.): 1822. Meig. Syst. Besch. III, 71, 6. — *Tachypeza truncorum* (non Fall.): 1838. Meig. Syst. Besch. VII, 95, 7.

Male. Vertex and frons grey; palpi yellowish, with black bristles at the apex. Occiput grey, with a few black bristles above, and dense white hairs below. Antennæ yellow, apex and the arista generally dark. Thorax brownish grey pruinose, dull; there are two black notopleural bristles. Scutellum with two black marginal bristles. Pleura brownish grey pruinose. Abdomen black, somewhat shining, sometimes brownish black; it has very short, pale hairs. Venter similarly coloured and haired, but the hairs towards the apex darker; the last ventral segment with longer, dark hairs. Legs paler or darker yellow, front femora with a dark patch above or on the posterior side and with a black stripe below, middle and hind femora more or less brownish on the apical part; front tibiæ black except the base, and the base of the front metatarsi black, hind tibiæ with the apex black and with a more or less distinct, brownish ring near the base. The front tibiæ are straight, considerably thickened, the middle tibiæ straight. The legs are short-haired with yellowish hairs; the middle coxæ and the base of the middle femora with a few black bristles, the front coxæ with a spine at the apex on the posterior side. Wings slightly brownish; the cubital and the basal part of the postical vein with a broad seam. Veins brown or blackish. Halteres whitish yellow.

Female. Similar to the male, but the front femora with no black stripe below, the front tibiæ less thickened and the metatarsi not black at the base.

Length 2,8—3,5 mm.

This species is easily distinguished from *fuscipennis* besides by the colour of the wings also by the very different shape of the front tibiæ.

T. nubila is very common in Denmark, running on the stems of trees; vicinity of Copenhagen, Hellerup, Ordrup Mose, Dyrehaven, Bøllemosen, Geel Skov, Tyvekrog, Tisvilde and at Sorø; on Langeland

at Lohals; in Jutland in Vejle Nørreskov, at Hald near Viborg and at Frederikshavn, and finally on Bornholm at Allinge; my dates are 12/6—25/9.

Geographical distribution:— Europe down into Italy; towards the north to northern Scandinavia, and in Finland.

23. **Tachista** Loew.

Small species of black colour, and with blackish banded or variegated wings. — The whole structure of the body in this genus quite agrees with that in *Tachypeza*. The generic distinction lies in the wings, the lower branch of the postical vein being totally absent. For the rest I find only the following differences (at all events so far as concerns the Danish species): Small ocellar bristles present, or (*annulimana*) wanting; more or less distinct dorsocentral and acrostichal bristles present, the former sometimes long and strong behind, the latter scarcely observable, practically absent; humeral bristles sometimes, and postalar bristles always present. Scutellum with two or four marginal bristles.

The developmental stages are not known (see above under *Tachypeza*).

The species of this genus are very characteristic and easily known by their banded wings. They are generally seen running on stems and boards like the species of *Tachypeza*, and they show the same behaviour; they have the wings lying flat over the abdomen and are not unlike small Hemipters. Some species are found running on the ground or in the sand at the borders of water and at the seashore.

Of the genus 18 species (one doubtful) are found in the palæarctic region; 4 have hitherto been found in Denmark.

Table of Species.

- | | |
|--|------------------------|
| 1. A greyish white spot above the front coxæ | 2. |
| — No greyish white spot above the front coxæ | 2. <i>annulimana</i> . |
| 2. Wings only brownish at the apex | 4. <i>terricola</i> . |
| — Wings more blackish marked | 3. |
| 3. Wings with two blackish bands | 1. <i>arrogans</i> . |
| — Wings blackish, with the base white and a hyaline spot
in the second posterior cell | 3. <i>sabulosa</i> . |

1. **T. arrogans** L.

1761. Linn. Fn. Suec. 1857 (*Musca*). — 1822. Meig. Syst. Besch. III, 68, 1 (*Tachydromia*). — 1842. Zett. Dipt. Scand. I, 312, 1 (*Tachypeza*). — 1860. Loew, Zeitschr. für Entom. Breslau, XIV, 20, 4. — 1862. Schin.

F. A. I, 93 (*Tachydromia*). — 1903. Kat. paläarkt. Dipt. II, 276. — *Musca cimicoides*: 1781. Fabr. Spec. Ins. II, 447, 61. — *Tachydromia cimicoides*: 1805. Fabr. Syst. Antl. 144, 4. — 1862. Schin. F. A. I, 93.

Male. Frons and vertex black, shining; palpi whitish haired, with a black bristle at the apex. Occiput black, shining, with a few black bristles above. Antennæ yellow, the third joint and the arista blackish or brown. Thorax black, shining, a little æneous, with very short, black hairs. A notopleural and a postalar bristle present, both black. Scutellum with four black marginal bristles. Pleura black shining; the propleural part whitish grey pruinose, so that there is a triangular, whitish grey spot above the front coxæ. Abdomen black, shining, with short, brownish hairs. Venter similarly coloured, the hairs longer and darker. Legs yellow; the front coxæ whitish pruinose anteriorly, the posterior coxæ black or brown; the anterior femora more or less blackish or brownish above and at the apex, the tibiæ, except the base, blackish; hind legs except the base of the tibiæ, and sometimes also of the femora, black or blackish; the last tarsal joints blackish. The front femora somewhat, the middle femora slightly thickened. The legs are short-haired with pale hairs, on the postero-ventral side of the hind femora a few longer hairs; the anterior femora with the

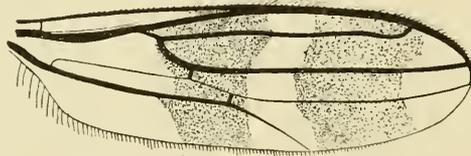


Fig. 122. Wing of *T. arrogans*.

ordinary rows of short spines below. Wings hyaline, with two broad, blackish bands. Veins dark brown; the radial vein distant from the margin, curved almost rectangularly upwards at the apex. Halteres white.

Female. With exception of the pointed abdomen quite similar to the male.

Length 2,2—2,7 mm.

T. arrogans is a very common species in Denmark, generally occurring on stems and on boards and walls, but also in herbage, generally on humid ground; vicinity of Copenhagen, Amager, Ørholm, Nordskoven at Jægerspris, Rørvig and at Skelskør; on Langeland at Lohals; on Funen at Hoffmangave and Strib; in Jutland at Sminge near Silkeborg, Gjerlev near Randers Fjord, Hald near Viborg and at Bangsbo near Frederikshavn. My dates are ¹⁸/₆—¹⁸/_s.

Geographical distribution:— Europe down into Italy; towards the north to northern Sweden, and in Finland.

2. *T. annulimana* Meig.

1822. Meig. Syst. Besch. III, 69, 2 (*Tachydromia*), et 1838. VII, 95, 3 (*Tachypeza*). — 1860. Loew, Zeitschr. für Entom. Breslau, XIV, 28, 10. — 1862. Schin. F. A. 1, 93 (*Tachydromia*). — 1903. Kat. paläarkt. Dipt. II, 276. — *Tachypeza albitarsis*: 1842. Zett. Scand. I, 313, 2.

Male. Vertex and frons black, shining, the latter dull above the antennæ. Palpi large, with long, whitish yellow hairs and a black bristle at the apex. Occiput grey pruinose with a few black bristles above, and with white hairs below. Antennæ black or brown, the basal joints reddish. Thorax black, shining, with short, black hairs, the two last hairs in each dorsocentral row are strong bristles, so that there are four strong bristles posteriorly on the disc. A notopleural and a postalar bristle present, both black and strong. Scutellum with four black marginal bristles. Pleura black, shining, the propleural parts not grey, so that there is no grey spot above the front coxæ. Abdomen black, shining, with short, brownish hairs. Venter of the same colour, the hairs towards the apex a little longer and darker. Legs black and yellowish; the front coxæ yellow, the posterior coxæ black, front femora black, with the base and apex yellowish, sometimes also yellowish in the middle, so that there are two blackish rings; middle femora yellowish, a little brownish above; anterior tibiæ blackish, with the base narrowly yellowish; the hind legs blackish, except the base of the tibiæ; all tarsi with the two first joints yellow or whitish yellow with dark apex, the three last joints blackish. Front femora strongly thickened, middle femora moderately thickened; front tibiæ somewhat thickened, middle tibiæ with a broad, inwards curved tooth at the apex on the ventral side. Anterior femora with rows of long, yellow hairs below, but without spines; middle femora with a black bristle at the apex on the antero-dorsal, and a shorter and weaker on the postero-dorsal side; for the rest the legs short-haired, only on the postero-ventral side of the hind femora a few longer hairs on the basal half. Wings hyaline, with two blackish brown bands as in *arrogans*, but the hyaline band between them broader. Veins dark brown, the radial vein curved in the middle and lying much nearer to the costa than in *arrogans*. Halteres white.

Female. Similar to the male; the front femora a little less thickened, and broadly yellow at the base, and the hairs below the anterior femora shorter; the middle tibiæ simple, and the bristles at the apex of the middle femora small.

Length 2,5—3 mm.

This species greatly resembles *arrogans* at first sight, but it is easily recognised by the absence of the grey spot above the front coxæ, by the bristles on thorax and the radial vein lying nearer to the costa, further by the want of the short spines below the anterior femora but instead with longer hairs, and in the male by the tooth at the apex of the middle tibiæ.

T. annulimana is rarer in Denmark than *arrogans*; at Lersøen, Sorø, Tisvilde, Frederikssund and in Nordskoven at Jægerspris; in Jutland at Sminge near Silkeborg and at Bangsbo near Frederikshavn, and finally on Bornholm at Allinge; my dates are $18/6$ — $13/7$. It occurs in the same way as *arrogans*.

Geographical distribution:— Europe down into Italy; towards the north to northern Sweden, and in Finland.

3. *T. sabulosa* Meig.

1830. Meig. Syst. Besch. VI, 342, 56 (*Tachydromia*), et 1838. VII, 95, 12 (*Tachypeza*). — 1860. Loew, Zeitschr. für Entom. Breslau, XIV, 17, 2. — 1862. Schin. F. A. I, 93 (*Tachydromia*). — *Tachypeza fenestrata*: 1842. Zett. Dipt. Scand. I, 318, 7.

Male. Vertex and frons black, shining; palpi with whitish yellow hairs and a black bristle at the apex. Occiput greyish pruinose above, black, shining downwards; it has black bristles above, whitish bristles downwards. Antennæ brownish with the base yellow. Thorax greyish pruinose, it has distinct, but short, black dorsocentral bristles. There are about three humeral bristles, a stronger and a pair of weaker notopleural and a postalar bristle, all black. Scutellum with four black marginal bristles. Pleura black, shining; the propleural parts whitish grey pruinose, thus there is a whitish grey, triangular spot above the front coxæ; also the hypopleura grey pruinose. Abdomen greyish pruinose, with short hairs. Venter blackish, with a little longer, dark hairs. Legs blackish; front coxæ yellowish, greyish pruinose on the anterior side; the anterior femora yellowish at the base and more broadly at the apex; the anterior tibiæ yellowish on the basal part; hind femora a little yellowish at the apex, and the tibiæ at the base. Sometimes the anterior femora are more broadly yellowish at base and apex, the black colour then forming a broad ring in the middle. The black parts of the legs are slightly pruinose. Front femora much thickened in such a way, that there is a large swelling in the middle on the postero-ventral side; the middle femora somewhat thickened; the middle tibiæ curved a little inwards at the apex. The legs are short-haired, the anterior femora have the ordinary

rows of short spines below, the middle femora a few longer hairs below at the base, and the hind femora are distinctly haired below. Wings blackish brown with about the basal third part hyaline, somewhat white, and with a hyaline spot in the second posterior cell, stretching also a little above the discal vein, or also the first posterior cell almost quite hyaline. Veins brown. Halteres white.

Female. Similar to the male, but the anterior femora less thickened, and the middle tibiæ not curved at the apex.

Length about 2,5 mm.

This species is at once recognised by the colour of the wings, and in the male by the strongly swollen front femora. As Zetterstedt says: „Stæg. in litt.“ the name *fenestrata* was due to Stæger.

T. sabulosa is rare in Denmark and has hitherto only been taken in Jutland at Silkeborg (as mentioned by Zetterstedt) and at Frederikshavn (Th. Mortensen), six specimens in all; it has been taken in July. It occurs running in the sand at the borders of streams and at the sea-shore.

Geographical distribution: — Northern and middle Europe down into Germany; its northern limit lies in Denmark.

4. *T. terricola* Zett.

1819. Zett. Vetensk. Akad. Handl. 1819, 81, 34 (*Tachydromia*). — 1822. Meig. Syst. Besch. III, 72, 9 (*Tachydromia*). — 1823. Fall. Dipt. Suec. Suppl. I, 6, 20—21 (*Tachydromia*). — 1842. Zett. Dipt. Scand. I, 320, 9, et 1849. VIII, 3011, 9 (*Tachypeza*). — 1860. Loew, Zeitschr. für Entom. Breslau, XIV, 17, 1. — 1903. Kat. paläarkt. Dipt. II, 277.

Male. Frons and vertex black, shining, the former narrow; palpi somewhat short, yellow haired, with a black bristle at the apex. Occiput black, shining, with a few black bristles above. Antennæ yellow, the arista slightly darker. Thorax black, shining, with very short, black hairs. A notopleural and a postalar bristle present, both black. Scutellum with two black marginal bristles. Pleura black, shining; the propleural parts whitish pruinose, so that there is a large, whitish spot above the front coxæ. Abdomen black, shining, with short, brownish hairs. Venter black. Exterior genitalia and the last ventral segment with somewhat long, dark hairs. Legs yellow; sometimes the tibiæ and the hind femora at the apex a little brownish; the front tarsi with the apex of the metatarsus and the whole fourth and fifth joint brown; on the posterior tarsi the apex of the three first joints and the two last joints quite or almost quite brown. The anterior femora only slightly thickened; the middle femora at the base with a little excision, beset with blackish bristles. For the rest

the legs short-haired with yellowish hairs; the middle tibiæ a little bent at the apex and with a small, tooth-like process on the ventral side. Wings hyaline; the apex above the cubital vein from a little before the end of the radial vein more or less dark brownish fumigated. Veins brown or blackish brown, the cubital vein indistinctly brownish seamed. Halteres whitish yellow.

The female I do not know, according to the descriptions it mainly resembles the male.

Length fully 2 mm.

T. terricola is very rare in Denmark, there has only been taken one specimen, viz. the one mentioned by Zetterstedt l. c. VIII, and sent to him from Stæger under the name *Tachypeza apicata* n. sp. It was a female, and it was taken on $14/6$ 1848. The species is at present not represented in our collection. According to Zetterstedt the species occurs on shores and at borders of lakes and streams, running in the sand and on the ground, and here very liable to escape observation. Loew mentions l. c., that he has only taken it below green turfs.

Geographical distribution: — Northern and middle Europe down into Germany; towards the north to southern Sweden.

24. **Elaphropeza** Macq.

Small yellow and blackish species. Head about globular, narrower than thorax; occiput arched, with a few bristles above. Eyes large, in both sexes separated above the antennæ, leaving a narrow frons between them; below the antennæ they are touching in both sexes. The facets are of equal size. The incision in the inner eye-margin distinct; the hind margin with a shallow incision. The eyes are microscopically haired. In the living specimens the eyes are brown, slightly metallic. Three ocelli and ocellar bristles are present.



Fig. 123. Antenna of *E. ephippiata*. $\times 90$.

The antennæ are inserted near to each other, in the middle; they are five-jointed, the basal joint very short, the second a little longer, the third is conical and bears a long, two-jointed arista, which is directed somewhat downwards, and with the basal joint very short. Epistoma is very short on account of the touching eyes; jowls not developed. Proboscis is short, directed downwards; the maxillary palpi one-jointed, compressed. The mouth parts I have otherwise

not been able to examine. Thorax is slightly elongated, almost quadratic; pro- and metathorax small. The thoracic disc is only clothed with short hairs, which are, however, divided into dorsocentral and acrostichal hairs by two narrow, bare stripes. A notopleural bristle, a supraalar and a postalar bristle present. Scutellum with two marginal bristles. Metapleura bare. Abdomen consists of eight segments, but the last are in the male hidden; the exterior genitalia in the male are somewhat large, and resemble those in *Tachypeza*. In the female the abdomen is pointed, and it terminates with two small, styliform lamellæ. The legs are somewhat slender, the front coxæ almost not elongated; they are short-haired, with few bristles. The front tibiæ have small apical spurs. There are two claws, two pulvilli, and a small, somewhat claw-shaped empodium. Wings with the

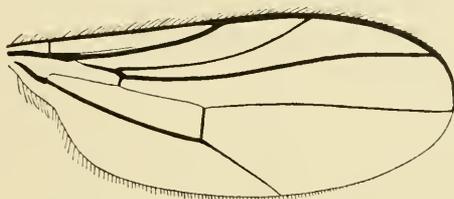


Fig. 124. Wing of *E. ehippiata*.

mediastinal vein short, not reaching the margin; the subcostal and the radial vein likewise short, the first terminating before the middle of the wing; the cubital vein unforked, one cubital cell; the discal vein likewise unforked and three posterior cells; no discal cell; the lower branch of the postical vein and the anal vein wanting, thus no anal cell. No stigma. First basal cell short, the second much longer. Axillary lobe small, the axillary angle very shallow. No alula, the margin here fringed. Alar squamula very small and narrow, with a few long hairs.

The developmental stages are not known.

The small species occurs mainly in woods in low herbage.

To the genus only one palæarctic species belongs, also occurring in Denmark.

1. *E. ehippiata* Fall.

1815. Fall. Dipt. Suec. Empid. 11, 14 (*Tachydromia*). — 1822. Meig. Syst. Besch. III, 65, 8, Tab. XXIII, Fig. 10 (*Hemerodromia*). — 1842. Zett. Dipt. Scand. I, 326, 1. — 1862. Schin. F. A. I, 95. — 1903. Kat. paläarkt. Dipt. II, 278.

Male. Vertex and frons brownish black; palpi yellow. Occiput dark brown or blackish, with pale brownish bristles and hairs. Antennæ

yellow, the third joint and the arista brownish. Thorax yellow or reddish yellow, shining, with two black or brownish black stripes behind, one on each side, in front of the scutellum. The disc is uniformly clothed with yellow hairs, but two narrow, bare stripes indicate a division into dorsocentral and acrostichal hairs; the innermost row of the former (the real dorsocentral hairs) are longer behind. A notopleural bristle, a supraalar and a postalar bristle present, all yellow. Scutellum black, with two yellow or brown marginal bristles. Pleura yellow, hypopleura black above the hind coxæ. Abdomen black or blackish, pale at the base, and also sometimes at the apex in front of the genitalia. Venter similarly coloured or almost quite pale. Abdomen is clothed with yellow hairs, which are long at the hind margin of the last visible segment; at the sides of the middle segments (fourth and fifth) there are curious, broad, scaly, dark hairs. Venter with short, pale hairs. Legs yellow, the last tarsal joint brownish. The hind tibiæ slightly thickened just at the apex. The femora with fine, longish hairs below, the front femora with a small bristle at the apex on the anterior and one on the posterior side, the middle femora with a stronger bristle on the anterior side; the tibiæ with fine hairs above and below, longest on the hind tibiæ; these latter with a pair of bristles on the dorsal side. All hairs pale yellow. Wings hyaline. Veins brown, the basal part of the discal vein colourless. Halteres white or whitish yellow.

Female. Similar to the male, but abdomen pointed.

Length 2—2,3 mm.

E. ephippiata is not rare in Denmark; Dyrehaven, at Svenstrup between Roskilde and Ringsted; on Lolland at Maribo; in Jutland in Greisdalen at Vejle and at Horsens, and finally on Bornholm. The dates are in July and August. It occurs in woods and thickets on bushes and in low herbage.

Geographical distribution:— Europe down into Italy; towards the north to middle Sweden.

25. **Chersodromia** Walk.

Species of small to very small size (1—4 mm.), but of a somewhat robust shape, and of grey or blackish colours. Head a little narrower than thorax, and a little higher than broad; occiput somewhat arched, with four or only two long bristles (vertical bristles) above, and besides with smaller hairs. Eyes higher than broad; they are equally separated above the antennæ in both sexes, and the facets are of equal size; below the antennæ they are likewise separated. The eyes are short but densely hairy, in the smaller species this is

difficult to see without the microscope; their hind margin is slightly incurved, and the lower posterior corner is pointed. The incision in the inner eye-margin is distinct and not small. The vertex has three ocelli, and some (four) bristles, or these latter are wanting. The antennæ are inserted near to each other, about in the middle; they



Fig. 125. Antenna of *Ch. hirta*. $\times 90$.

are short, five-jointed; the first joint is short, the second a little longer and with bristles, which are longest below; the third joint is ovate, dilated downwards and compressed, it bears at the apex a longer or shorter, two-jointed arista, the basal joint of which is very short; the arista is directed somewhat downwards. Epistoma is somewhat broad and broadened downwards, its lower part is a little arched; it is confluent with the jowls, which descend more or less below the eyes. Clypeus is a small, nearly quadratic piece, excised in the lower margin; it is not quite separated from the epistoma. Proboscis is about half as long as the head is high, it is strong and well chitinised, curved a little downwards and directed backwards, towards the sternum. Labrum is as long as labium, strongly chitinised, very high at the base and curved downwards towards the apex, it is here divided into three long, claw-like points, the lateral are strong and have a spine below in the middle, the median is less chitinized and beset with bristles on the lower side; hypopharynx is as long as labrum, very strongly chitinised, black, and curved downwards with the pointed apex; there are no maxillæ but one-jointed, ovate and compressed maxillary palpi with long bristles. Labium has the basal part and the labella of about equal length, the latter are cleft about to their base, and they bear strong bristles; there is a somewhat large median lobe between the labella. Thorax is slightly elongated, almost quadratic, a little arched above. Pro- and metathorax small. Short biserial acrostichal bristles are present, and generally longer uniserial dorsocentral bristles, but these latter are fused with short hairs, clothing the sides of the disc, and the dorsocentral bristles are sometimes not longer than the lateral hairs, and in this case they are not distinct. A humeral bristle, a posthumeral, some notopleural, a supraalar and a postalar bristle are present; sometimes the posthumeral bristle is absent, and in one case (*incana*) there is only a notopleural bristle

present in all. Scutellum with two to four marginal bristles, or (*incana*) without bristles. Metapleura without hairs. Abdomen somewhat flattened, consisting of eight distinctly visible segments. The male genitalia are large or somewhat large, they consist of a large, arched plate below, and some complicated, more or less hook-shaped pieces above, forming a forceps. In the female the abdomen is pointed and terminates with two styliform lamellæ. In all species the abdomen has a fine pruinosity, which is arranged in such a way, that when abdomen is viewed in a certain direction one half of it looks grey the other blackish or at all events a difference in the colour is seen, the dividing line lying along the middle; when abdomen is then viewed in another direction the difference in the hue changes to the reverse. The legs are somewhat robust, not long; front coxæ only very slightly elongated; front femora more or less, but generally not much thickened. The legs are mainly short-haired or a little longish haired, and more or less beset with bristles; the tibiæ generally with subapical or apical bristles or spurs. There are two claws, two rather large pulvilli and a small, linear empodium with bristles below. Wings with the mediastinal vein not reaching the margin; the cubital vein unforked and thus one cubital cell; the discal vein likewise unforked, thus three posterior cells; no discal cell; the lower branch of the postical vein and the anal vein absent, thus no anal cell; the two basal cells of equal length. No stigma. In one species (*arenaria*) the wings are small, but with a normal venation. The axillary lobe somewhat developed, the axillary angle shallow. Alula not developed, the margin here fringed. Alar squamula very small, with long hairs at the margin.

The developmental stages of *Chersodromia* are not known.

These small flies are very characteristic among the Empids; when running on the sand they are at first sight often not recognised as Empids, as their exterior may to some degree recall that of small Muscids or Borborids. They occur on sandy sea-shores, some species (e.g. *cursitans*) may also occur at streams and lakes. The Danish species have hitherto been taken only in a few localities, but they are probably much more widely distributed at our shores. In one locality I took *cursitans*, *difficilis*, *arenaria* and *incana* together, but it was interesting to see, that there seemed to be some difference with regard to the exact places, on which they occurred; *cursitans* and *difficilis* were especially running on the wet sand and quite down to the water; the bright grey *incana* on the other hand was seen a little longer inwards, where the sand was dry and hence of white colour; *arenaria* was especially running between stones and in the sea-weed

on the shore, slipping along very swiftly in it. These differences were, to be sure, not absolute, but however very marked. Most species seem to be widely distributed, down into North Africa. The species are certainly strong robbers, which is indicated by their very powerful mouth parts.

Of the genus 8 species are known from the palæarctic region; 5 are found in Denmark, but of these one species is here described as new, the total number of species thus increasing to 9.

Table of Species.

- | | |
|--|------------------------|
| 1. Colour light grey; wings milk-white..... | 5. <i>incana</i> . |
| — Colour dark grey or blackish; wings not milk-white..... | 2. |
| 2. Wings small, not longer than abdomen..... | 4. <i>arenaria</i> . |
| — Wings of ordinary size, longer than abdomen..... | 3. |
| 3. Halteres more or less pale; hind femora with bristles; largest species (3—4 mm.)..... | 1. <i>hirta</i> . |
| — Halteres dark; hind femora without bristles (except the apical one); smaller species (1,8—2,4 mm.)..... | 4. |
| 4. Legs somewhat greyish pruinose, middle tibiæ without bristles; radial vein terminating much nearer to the apex of the subcostal than to the apex of the cubital vein..... | 2. <i>cursitans</i> . |
| — Legs somewhat shining, middle tibiæ with some bristles; radial vein terminating in the middle between the apex of the subcostal and cubital vein..... | 3. <i>difficilis</i> . |

1. Ch. hirta Walk.

1836. Walk. Entom. Mag. III, 180 (*Tachypeza*). — 1903. Kat. paläarkt. Dipt. II, 278.

Male. Frons and vertex greyish black; seen from in front the frons is grey; epistoma blackish grey; palpi black with black bristles. Occiput black, a little greyish, with four long bristles above, and otherwise with short, black bristles. Antennæ black. Thorax black, slightly greyish pruinose and slightly shining. There are short, biserial acrostichal bristles, separated by a bare interstice from the somewhat long, uniserial dorsocentral bristles; outwards to these latter the disc is clothed with short hairs, and the dorsocentral bristles can only be discerned from these by their length. A humeral bristle, a post-humeral, some notopleural, a supraalar and a postalar bristle present; all hairs and bristles black. Scutellum with two black marginal bristles. Pleura black, somewhat greyish pruinose, above the middle coxæ a strongly shining, polished black spot. Abdomen black, a little greyish pruinose and slightly shining; it has short, black hairs, which are a little longer at the hind margin of the eighth segment. Venter coloured and haired in the same way. Exterior genitalia large, the ventral

plate black-haired. Legs black, the front femora somewhat thickened. The front femora with a row of strong hairs above and two rows below; middle femora with shorter hairs below, and with bristles on the antero-dorsal side in the apical half; hind femora with bristles on the antero-dorsal and on the ventral side; all femora with a strong bristle on the anterior side near the apex; front tibiæ with a few bristles on the dorsal side, and two long, subapical bristles on the ventral side; middle tibiæ short-haired, with a few short bristles above and a long, subapical bristle below; hind tibiæ with long bristles on the dorsal, anterior and ventral side in the apical two thirds, and the hind metatarsi with a bristle in the middle on the posterior side; for the rest the legs densely short-haired, especially the anterior tibiæ densely ciliated below. All hairs and bristles black. Wings greyish,

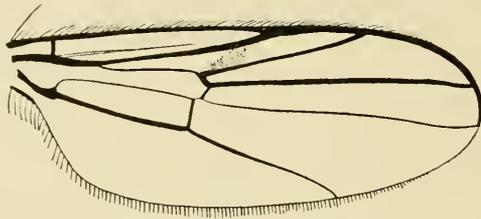


Fig. 126. Wing of *Ch. hirta*.

a little brownish towards the anterior margin. The veins thick, brown, the postical cross-vein quite perpendicular. Halteres yellow or reddish yellow.

Female. Similar to the male; abdomen very short-haired, and pointed.

Length 3—4 mm.

In not fully mature specimens the legs may be somewhat brownish.

Ch. hirta has hitherto been taken only on the sea-shore at Tisville; it was present in rather great numbers, and it occurs probably also in other places in Denmark at sea-shores. It was for the first time taken in 1909 on the 10/7 and 11/7 (the author). It was also taken in copula.

Geographical distribution: — Europe and down into North Africa; it is not known north of Denmark, but it occurs in England.

2. *Ch. cursitans* Zett.

1819. Zett. Vetensk. Akad. Handl. 1819, 82, 36 (*Empis*). — 1823. Fall. Dipt. Suec. Suppl. I, 7, 20—21 (*Tachydromia*). — 1842. Zett. Dipt. Scand. I, 322, 12 (*Tachypeza*). — 1903. Kat. paläarkt. Dipt. II, 278.

Male. Frons and vertex dark grey; epistoma and palpi light grey. Occiput greyish, with four long, black bristles above, and with short

hairs downwards. Antennæ black, the arista paler towards the apex. Thorax black, but distinctly greyish pruinose, with irregularly biserial, short acrostichal bristles and longer, uniserial dorsocentral bristles; besides the sides of the disc are clothed with short hairs. Further a humeral bristle, a posthumeral, some notopleural, a supraalar and a postalar bristle. All hairs and bristles black. Scutellum with two long, black marginal bristles, and a short outer bristle on each side. Pleura grey pruinose, above the middle coxæ a strongly shining, black, polished spot. Abdomen black, somewhat greyish pruinose, with short, dark hairs. Venter similarly coloured and haired. Exterior genitalia large, as broad as the last abdominal segment, slightly shining, and terminating with some hooks. Legs black or reddish brown, somewhat greyish pruinose; the front femora only slightly thickened. The anterior femora with fine, longish hairs below; all femora with a long bristle on the anterior side near the apex; the front tibiæ short-haired with a pair of long, subapical bristles on the ventral side; middle tibiæ densely short-ciliated below, with one ventral subapical bristle, but otherwise without bristles; hind tibiæ with bristles on the dorsal, anterior, and antero-ventral side; hind metatarsi considerably longer than the second joint, with a small bristle on the posterior side. The hairs and bristles mainly black. Wings a little brownish,

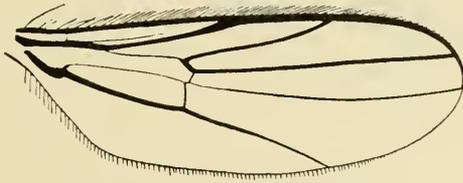


Fig. 127. Wing of *Ch. cursitans*.

especially towards the anterior margin. The veins dark brown, the discal vein pale from the base to a little beyond the postical cross-vein; this latter a little oblique; the radial vein terminating much nearer to the apex of the subcostal vein than to the apex of the cubital vein. Halteres blackish, the peduncle reddish.

Female. Similar to the male; abdomen pointed.

Length 1,8—2,4 mm.

Ch. cursitans is probably not rare in Denmark at the shores, but it has hitherto only been taken at Vemmetofte in June 1884 (H. J. Hansen), on Langeland at Lohals, where it was taken in great numbers on $\frac{2}{7}$ 1909 (the author) and in Jutland at Hald Sø on the sandy border on $\frac{25}{6}$ 1910 (the author). It runs on the humid sand almost quite down to the water; when chased it flies for a short distance.

It was several times taken in copula. This species occurs both on the sea-shore and on borders of fresh water.

Geographical distribution:— The species is hitherto known from Scandinavia, England and Denmark; it goes towards the north to middle Sweden. Zetterstedt also records the species both from sea-shores and from the borders of streams and lakes, e. g. at Wettern.

3. *Ch. difficilis* n. sp.

This species resembles *cursitans* to so high a degree that I shall only give the differences:

Male. Occiput with only two bristles above. The acrostichal bristles are more regularly biserial. A humeral bristle, some notopleural, a supraalar and a postalar bristle are present, but I could detect no posthumeral bristle. The exterior genitalia are smaller, narrower than the last abdominal segment, and greyish pruinose; they terminate with an upwards curved, black, shining process, which is dilated and spoon-shaped at the apex. The legs black or reddish brown, sometimes still paler, somewhat shining, not pruinose; the middle tibiæ with a pair of bristles on the dorsal side and one on the anterior side. The hind metatarsi not much longer than the second

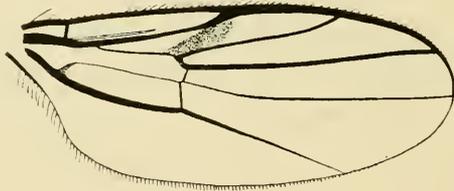


Fig. 128. Wing of *Ch. difficilis*.

joint. Wings a little greyish or brownish, a space, bordered behind by an oblique line stretching from the base of the cubital vein to the end of the subcostal vein and below by the cubital vein, is distinctly brown; the radial vein terminates in the middle between the ends of the subcostal and the cubital vein, at the same distance from each.

Female. Similar to the male; abdomen pointed.

Length 1,8—2,4 mm.

This species resembles *cursitans* very much, but is distinguished with certainty by the shining legs, the bristles on the middle tibiæ and especially by the direction of the radial vein; in the male also the genitalia are characteristically different. I was in doubt which of the two species, the present or the foregoing, was in reality *cursitans* Zett., but as Zetterstedt mentions expressly the grey legs, I think

there can be no doubt, that the preceding species is *cursitans*; nor does Zetterstedt mention the distinct brownish colour on the wings.

Ch. difficilis seems to be as common in Denmark as *cursitans*; it has hitherto only been taken on the sea-shore at Vemmetofte in June 1884 (H. J. Hansen), at Tisvilde and on Langeland at Lohals in 1909 on $\frac{2}{7}$ — $\frac{13}{7}$ (the author). At Lohals it was as frequent as *cursitans* and found running in company with this in quite the same way, and it was also taken in copula.

Geographical distribution:— Besides in Denmark the species also occurs in England according to specimens sent to me from Mr. Verrall.

4. *Ch. arenaria* Hal.

1833. Hal. Entom. Mag. I, 161 (*Tachypeza*). — 1835. Walk. Entom. Mag. III, 180 (*Tachypeza*). — 1903. Kat. paläarkt. Dipt. II, 278. — *Tachypeza brevipennis*: 1838. Zett. Ins. Lapp. 548, 8, et 1842. Dipt. Scand. I, 323, 13, et 1859. XIII, 4996, 13.

Male. Frons and vertex grey; epistoma and palpi of the same colour. Occiput likewise grey, with four long, black bristles above and with shorter hairs downwards. Antennæ blackish brown or brown. Thorax grey, with short, biserial acrostichal bristles, and longer, uniserial dorsocentral bristles; the sides of the disc with short hairs. Further a humeral bristle, some notopleural, a small supraalar and a postalar bristle. All the hairs and bristles black. Scutellum with two black marginal bristles. Pleura grey pruinose, above the middle coxæ a small, black, shining, polished spot. Abdomen black, slightly greyish pruinose, with short, dark hairs. Venter of the same colour, with a little longer hairs. Exterior genitalia not large. Legs more or less dark to almost blackish ferruginous, somewhat shining; the front femora somewhat thickened. The femora with short, fine hairs below, and the hind femora with a few bristles at the apex below; all femora with a bristle at the apex on the anterior side; the anterior tibiæ short-haired, the front tibiæ with a pair, the middle tibiæ with one ventral subapical bristle; the hind tibiæ with bristles on the dorsal, anterior and antero-ventral side in the apical half. The hairs dark brownish or blackish, the bristles black. The wings small and short, not longer than abdomen, somewhat brownish, especially towards the anterior margin, the base of the subcostal cell clearer (as in *difficilis*). The veins brown, the discal vein pale from the base to considerably beyond the postical cross-vein. Halteres brown or blackish brown, the peduncle paler.

Female. Similar to the male; abdomen longer and pointed.

Length 1,3—2 mm.

Ch. arenaria is probably common at our sea-shores, it has hitherto been taken at Tisvilde and on Langeland at Lohals on $\frac{2}{7}$ — $\frac{13}{7}$ 1909

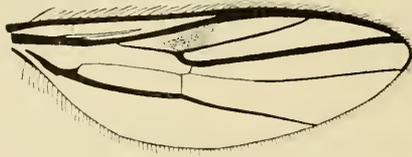


Fig. 129. Wing of *Ch. arenaria*.

(the author); it was present in great numbers together with the three preceding species. It is especially found running in the sea-weed on the shore among which it slips swiftly, and it seems never to fly, for which, I think, the wings are not sufficiently developed.

Geographical distribution: — Scandinavia, Denmark and England; it goes towards the north to northern Sweden but it is not known south of Denmark and England.

5. *Ch. incana* Walk.

1851. Walk. Ins. Brit. 1, 138, 3. — 1903. Kat. paläarkt. Dipt. II, 278.

Male. Frons and vertex grey; epistoma and palpi whitish grey. Occiput grey, only with short hairs, but without bristles. Antennæ blackish or brownish, arista short. Thorax light grey, the disc clothed with short, white hairs, which are divided by two bare stripes into biserial acrostichal hairs and dorsocentral hairs, which latter are fused with the hairs on the sides. There is one white notopleural bristle, but I could detect no other bristles. Scutellum without bristles. Pleura light grey, above the middle coxæ a more or less distinct, very small, black, polished spot. Abdomen light grey, venter of the same colour; some small white hairs are seen only at the sides. Legs blackish, a little greyish pruinose; the knees more or less reddish; generally the hind tibiæ and especially the metatarsi pale. The front femora a little thickened. The legs are short-haired; the anterior femora with fine, short hairs below; the front tibiæ with a pair of ventral subapical bristles, the middle tibiæ with a pair of bristles near the apex; the hind tibiæ with a few bristles at the apex on the dorsal and anterior side. The wings somewhat milk-white. Veins pale brown. Halteres whitish.

Female. Quite similar to the male; abdomen pointed.

Length 1,2—1,6 mm.

Ch. incana will certainly be found to be common in many places at our sea-shores; it has hitherto only been taken in 1909 at Tisvilde, on Langeland at Lohals (the author) and on Funen at Strib (Th. Mortensen); my dates are $\frac{1}{7}$ — $\frac{10}{7}$. It was present in great numbers running together with the other species of *Chersodromia*, and it was taken several times in copula. This beautiful species was seen especially at a little longer distance from the water than the other species, where the sand was dry; in this place its light grey colour coincided well with the colour of the sand, so that it was not easily seen.

Geographical distribution:— Europe and down into northern Africa; it is not known north of Denmark and England.

Remarks: Becker suggests (Zeitschr. für syst. Hymenopt. und Dipt. VII, 1907, 119) that the present species may be identical with *speculifera* Walk.; I have determined my species by comparison with specimens of *incana* sent to me from Mr. Verrall; they agree in all respects, and all have a black, polished spot on the pleura, but it is small and not very distinct.

26. **Symballophthalmus** Beck.

This genus is in most respects quite similar to the following genus *Tachydromia*, I shall therefore only give the differences. The head is globular, not higher than broad. The eyes are in both sexes touching above the antennæ for a long distance; the facets in the front part of the eye are enlarged; below the antennæ the eyes are separated. In the living specimens the eyes are bluish violet. The antennæ are inserted distinctly below the middle; the third joint has another shape than in



Fig. 130. Antenna of *S. dissimilis*. $\times 130$.

Tachydromia, its upper margin is straight so that it is dilated only downwards. The maxillary palpi are not squamiform but band-shaped. Epistoma is not narrow, and it is somewhat short. Thorax and abdomen as in *Tachydromia*, the former with somewhat indistinct uniserial dorsocentral and biserial acrostichal bristles. One notopleural bristle present. Scutellum with six bristles. The legs somewhat slender; the femora not thickened, and the middle tibiæ without

apical spine. The legs are mainly short-haired, and there is no such armature on the middle legs as in *Tachydromia*. Wings almost without axillary lobe, and the axillary angle very shallow.

The developmental stages are not known.

Of the genus only one species is known, also occurring in Denmark.

1. *S. dissimilis* Fall.

1815. Fall. Dipt. Suec. Empid. 9, 9 (*Tachydromia*). — 1822. Meig. Syst. Besch. III, 85, 41 (*Tachydromia*). — 1842. Zett. Dipt. Scand. I, 308, 44 (*Tachydromia*). — *Macroptera pictipes*: 1889. Beck. Wien. Ent. Zeitg. VIII, 80, Tab. 1, Fig. 3—5. — *Symballopthalmus pictipes*: 1889. Beck. l. c. 285. — *Symballopthalmus cyanopthalmus*: 1893. Strobl, Mittheil. Ver. Steierm. 1892, 123.

Male. Vertex black; epistoma blackish, dull above, shining below. Palpi yellow. Occiput greyish black, with white hairs which are somewhat long above. Antennæ yellowish or brownish. Thorax black or brownish black, shining, with short, pale hairs which form indistinct dorsocentral and acrostichal rows. One long, yellow notopleural bristle present. Scutellum with six fine, yellow marginal bristles. Pleura black or brownish black, somewhat shining. Abdomen black, the basal part yellowish; it is clothed with longish, pale yellowish hairs. Venter similarly coloured and haired. Legs yellow, the apex of the hind femora, the hind tibiæ and all tarsi brownish, sometimes the base of the metatarsi paler. The legs are short-haired with yellowish hairs, the femora with a little longer hairs below; the front metatarsi with long, somewhat bristle-like hairs on the posterior side. Wings hyaline, the subcostal cell somewhat yellowish. The veins pale brown. Halteres pale yellowish.

Female. Similar to the male; the front metatarsi without long hairs; abdomen pointed.

Length 2—2,5 mm.

Remarks: The statements by the various authors with regard to the colour of the antennæ and legs are somewhat different, the species may evidently vary somewhat in this respect, the colour of the brownish parts being lighter or darker to blackish.

S. dissimilis is rare in Denmark, only five specimens have been taken many years ago in Charlottenlund in June by Stæger.

Geographical distribution: — Northern and middle Europe down into Styria and Switzerland; towards the north to middle Sweden.

27. **Tachydromia** Meig.*(Platypalpus* Macq.)

Species of small to very small size; the colours are generally black, more or less covered by a light pruinosity on thorax, or quite black; sometimes they are yellow. Head somewhat globular, generally a little higher than broad, and a little narrower than, or as broad as thorax; occiput somewhat arched, generally with a pair of bristles and some shorter hairs above, and longish hairs below. Eyes higher than broad; they are separated above the antennæ in both sexes, the frons more or less narrow; below the antennæ they are likewise but narrowly separated, and sometimes almost touching. The facets are of equal size. The hind margin of the eyes is slightly incurved. The incision in the inner eye-margin is distinct. In the living specimens the eyes are brown, a little metallic. The vertex has a tubercle with three ocelli and (generally) a pair of ocellar bristles. The antennæ are inserted near to each other, about in the middle or slightly above. They are shorter or longer, five-jointed; the basal joint is very small, the second globular, the third joint is more or less elongated, sometimes rather long, attenuated towards the apex and compressed; it bears a terminal, two-jointed, shorter or longer arista, the basal joint of which is very short; the second joint of the antennæ bears bristles. Epistoma is narrow, sometimes very narrow. The jowls are present as a small rim. Clypeus is incised in the lower margin. The proboscis is short, not as long as the head is high, directed downwards. Labrum is as long as labium, strong, high at the base; it is three-pointed at the apex, the two lateral lobes are strong, curved down as hooks, and with a spine a little behind the apex. Hypopharynx is as long as labrum, likewise strong, lancet-like pointed with the outer apex curved a little downwards; behind the apex it is serrated in the margin in about the outer half part. There are no maxillæ but one-jointed, smaller or larger, sometimes very large maxillary palpi; they are compressed, almost squamiform, hairy and with a few bristles at the apex. Labium has the labella as long as the basal part, they are beset with some bristles and cleft about to their base; there is a pointed median lobe. Thorax is rectangular, a little arched above; pro- and metathorax small, the latter is visible above as a narrow rim, but there seems to be no chitinised metasternum. There are generally short, uniserial dorsocentral and biserial acrostichal hairs; the dorsocentral hairs may be more or less fused with hairs on the sides of the disc; generally, but not always, one or two of the hindmost dorsocentral hairs are longer bristles. Sometimes

the disc is uniformly clothed with short hairs which may be more or less distinctly divided by two bare or weaker haired stripes into dorsocentral and acrostichal hairs. One to three notopleural bristles and a postalar bristle present, generally also a humeral, and sometimes a posthumeral bristle. Scutellum has two or four marginal bristles, in the first case the lateral bristles are represented by a small hair on each side. Metapleura without hairs. Abdomen consists of eight segments, but in the male the eighth dorsal segment is hidden; the first segment is short, and weakly chitinised on the ventral side. The male genitalia are more or less knob-like; they consist of a large arched plate lying ventrally; on the left side there is a lamella-shaped piece, and above there is a pair of more complicated pieces, which are more or less hidden by the two other pieces; the lamella on the left side has a row of long, downwards hanging hairs at its lower margin. In the female the abdomen is pointed, the two last (seventh and eighth) segments are narrower than the others and form an ovipositor, terminating with two small styles; these two segments are generally of a dull grey colour in contrast to the other, black, shining segments. The legs are rather characteristic; they are strong, the front coxæ are very slightly longer than the posterior coxæ; the front femora are more or less thickened,

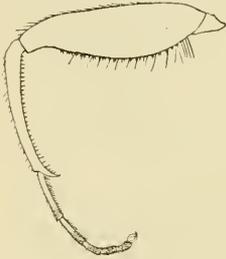


Fig. 131. *T. flavipes*,
middle leg. $\times 15$.

and the middle femora still more; the middle tibiæ are shorter than the femora, and terminate on the ventral side with a strong, downwards curved apical spine; the front femora have two rows of fine bristles below; the middle femora have two rows of black, short, almost tubercle-shaped spines below, and outwards to them on the postero-ventral side a row of fine bristles; the middle tibiæ have a row of black spines below, similar to those on the femora, but a little longer and with a fine apex; the middle tibiæ are adapted to be laid up between the rows of spines on the femora, and also the front legs act in a similar way; on the anterior side of the middle femora towards the apex there are a few bristles. For the rest the legs are short-haired, at most with a few small bristles on the dorsal side of the front and hind tibiæ, and stronger hairs below the hind femora. Tibiæ without apical spurs. — Such is the ordinary shape and armature of the legs, but there may be some variations. In some cases the anterior femora are almost not thickened, the front femora sometimes not at all; the apical spine on the middle tibiæ may be small or quite wanting; sometimes there are no long

bristles on the postero-ventral side of the middle femora, but instead the spines in the row here are longer and more bristle-like. In rare cases the last joints on the front tarsi are dilated. — There are two claws, two pulvilli, and a small, linear empodium with strong bristles below. Wings with the mediastinal vein not reaching the margin; the cubital vein unforked, thus one cubital cell; the discal vein likewise unforked, thus three posterior cells; no discal cell; the lower branch of the postical vein more or less recurrent; the anal vein more or less weak especially at the base, but present and thus an anal cell present; the basal cells long and of about equal length, the anal cell short, not half as long as the basal cells. No stigma. The axillary lobe somewhat developed, the angle obtuse. Alula not developed, the margin here fringed. Alar squamula small, fringed at the margin.

The larval stage of *T. (Platypalpus) major* is described by Beling (Verh. zool. bot. Gesell. Wien, XXXVIII, 1888, 2). The larva is cylindrical, spindle-shaped, 6 mm. long, 1,5 mm. in diameter; it consists of twelve segments; the colour is yellowish white. The abdominal segments have small, transverse swellings (Kriechschwielien) on the ventral side. There are terminal spiracles on the last segment, and below them a short, truncate, tooth-like process. Beling does not mention the prothoracic spiracles. The larva was found on the ground under moss in a wood. According to Brauer (Denkschr. der kais. Akad. der Wissensch. math. nat. Cl. XLVII, 1883, 64) Boie has also mentioned the development of a species of the genus, (*Platypalpus*) (Scholtz, Zeitschr. für Entom. Breslau, 1849).

The species of this genus are very characteristic in their whole appearance and especially in the development of the legs. They are found on fields, commons and meadows in the grass and low herbage, and in or at woods on bushes; they run swiftly on the leaves of bushes and lower plants, but they also fly rather well. With regard to their occurrence there is a somewhat marked difference between the species; the pruinose species are especially found outside woods on sunny fields and meadows, while the black shining, and the yellow species are most often found in woods on open, somewhat shaded and generally more or less humid places. The species are strong robbers; I have taken *T. fulvipes* with *Aphidius* sp., *Chironomus* sp. and a small Chloropid, and *T. pallidiventris* with *Urophora solstitialis* L. as prey, and I have seen a *Tachydromia* with *Microchrysa polita* L. as prey; in the two last cases the prey was thus much larger than the *Tachydromia*; further I have in my collection several species which still have remnants of insects between the closed middle

femora and tibiæ. Poulton records from England, in the work cited several times above, *T. pallipes* with *Liposcia discolor* Marsh., *T. cursitans* with *Sciara* sp. and *Tachydromia* sp., and *T. minuta* with *Alloxysta* sp. and finally an undetermined *Tachydromia* with an undeterminable fragmentary insect as prey. — Of several of the species of *Tachydromia* the females are much more commonly met with than the males.

Of the genus about 137 species are known from the palæarctic region; 33 have hitherto been found in Denmark, but of these two are here described as new, the total number of palæarctic species thus increasing to about 139.

Table of Species.

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|--|-------------------------|
| 1. Thorax black, but covered by a more or less dense, grey, brownish or yellowish pruinosity and not or slightly shining; when so slightly pruinose that it is black and shining (<i>exigua</i>), the antennæ are short and the femora more or less black; (in the second group with a shining thorax the antennæ are either long or, when short, the femora are yellow) | 2. |
| — Thorax yellow or black, shining, not pruinose | 22. |
| 2. Thoracic and scutellar bristles yellow, thorax densely pruinose | 3. |
| — Thoracic and scutellar bristles black, thorax less densely pruinose; when the bristles are brown or dark yellow (<i>exigua</i>) thorax is very slightly pruinose, shining | 20. |
| 3. Antennæ quite black | 4. |
| — Antennæ quite yellow or with the basal joints yellow | 9. |
| 4. All coxæ yellow | 5. |
| — Coxæ not quite yellow, more or less black; legs obviously haired | 6. <i>fulvipes</i> . |
| 5. Third antennal joint short, much shorter than the arista; abdomen quite black or with grey bands only on the first segments | 6. |
| — Third antennal joint longer, twice or thrice as long as broad at the base and about as long as the arista | 7. |
| 6. Middle femora much thickened, tarsi black annulated; size 2,5—3,5 mm. | 1. <i>flavipes</i> . |
| — Middle femora less thickened, tarsi generally not distinctly annulated; size 1,8—2,3 mm. | 4. <i>cothurnata</i> . |
| 7. Third antennal joint long and narrow, thrice as long as broad at the base; tarsi not annulated | 8. |
| — Third antennal joint shorter, twice as long as broad at the base; abdomen quite black; tarsi black annulated | 3. <i>strigifrons</i> . |
| 8. Abdomen with grey bands on all segments; middle tibiæ with a large spine; size 2,5—3 mm. | 2. <i>maculipes</i> . |

- Abdomen without bands; middle tibiae almost without spine; size 2 mm. 5. *interjecta*.
9. Antennae dark with the two basal joints yellow. 10.
- Antennae quite yellow. 18.
10. Front coxae and femora except the apical part black 7. *annulipes*.
- All legs yellow 11.
11. Abdomen yellow 12. *varia*.
- Abdomen black 12.
12. Pleura with a black, polished spot above the middle coxae 13.
- Pleura without any black, polished spot 17.
13. Apical spine on the middle tibiae small 10. *articulata*.
- Apical spine on the middle tibiae not small 14.
14. Palpi large; cubital and discal vein curved equally towards each other; size 3,5—4,3 mm. 13. *cursitans*.
- Palpi small; size not beyond 3,5 mm. 15.
15. Abdomen quite black; tarsi not annulated; anterior femora only slightly thickened; size 1,5 mm. 9. *calceata*.
- Abdomen with grey bands on the first segments; anterior femora more thickened; tarsi more or less annulated; size at least 2,5 mm. 16.
16. Third antennal joint short, distinctly shorter than the arista; anterior femora not much thickened; tarsi indistinctly annulated; cubital vein almost straight. 8. *bicolor*.
- Third antennal joint longer, slightly shorter than the arista; anterior femora more thickened; tarsi annulated; cubital vein curved downwards 11. *pallidiventris*.
17. Frons narrow; discal vein strongly curved and bending upwards in a long curve; bands on abdomen not broad. 14. *candicans*.
- Frons broader; discal vein with a smaller, somewhat sudden curve before the apex; abdomen with broad bands 15. *fasciata*.
18. Cubital and discal vein distinctly converging; middle femora considerably thicker than front femora; size 4—5 mm. 16. *major*.
- Cubital and discal vein slightly converging or almost parallel; anterior femora of about equal thickness; size 2—2,8 mm. 19.
19. Antennae and legs yellow; tarsi distinctly black annulated. 17. *flavicornis*.
- Antennae white; legs whitish or pale yellowish; tarsi not, or indistinctly brownish annulated 18. *albicornis*.
20. Two long dorsocentral bristles behind in each row; scutellum with four distinct, black bristles 21. *agilis*.
- One long dorsocentral bristle behind in each row; scutellum with only two distinct bristles. 21.
21. Middle tibiae with the basal part black; legs longish haired; thorax pruinose with a shining middle line 19. *minuta*.

- Middle tibiæ not black on the basal part; legs short-haired; thorax very slightly pruinose, shining. 20. *exigua*.
22. Thorax yellow. 23.
- Thorax black 25.
23. Thorax quite yellow 24.
- Thorax with a black middle line. 24. *pectoralis*.
24. Epistoma yellow; the thoracic disc uniformly clothed with short hairs; the three last joints on the front tarsi dilated. 22. *lutea*.
- Epistoma black; the thoracic disc with uniserial dorso-central and biserial acrostichal hairs; front tarsi simple 23. *exilis*.
25. Third antennal joint short or slightly elongated, antennæ, excluding arista, shorter than the head. 26.
- Third antennal joint much elongated, antennæ, excluding arista, as long as or longer than the head. 30.
26. The thoracic disc uniformly clothed with hairs 27.
- The thoracic disc with uniserial dorso-central and biserial acrostichal bristles 28.
27. Third antennal joint very short, slightly longer than broad; notopleural and scutellar bristles yellow 25. *macula*.
- Third antennal joint a little elongated, considerably longer than broad; notopleural and scutellar bristles black 29. *pallipes*.
28. Antennæ yellow. 28. *thoracica*.
- Antennæ dark 29.
29. Middle femora somewhat thickened, the apical spine rather large; middle tibiæ without a special pubescence 26. *fuscicornis*.
- Middle femora almost not thickened, the apical spine almost wanting; middle tibiæ with a special, dense pubescence on the apical half 27. *ciliaris*.
30. Arista dark, shorter than the third joint. 31.
- Arista white, longer than the third joint 32.
31. Posterior coxæ, apical part of the hind femora, and front tibiæ black 30. *nigritarsis*.
- Legs yellow 31. *longicornis*.
32. Arista long, longer than the rest of the antennæ; legs chiefly yellow. 32. *albisetæ*.
- Arista shorter, about as long as the third joint, legs chiefly black 33. *albocapillata*.

1. *T. flavipes* Fabr.

1794. Fabr. Ent. Syst. IV, 406, 19 (*Empis*). — 1805. Fabr. Syst. Antl. 142, 1. — 1822. Meig. Syst. Besch. III, 81, 32. — 1842. Zett. Dipt. Scand. I, 273, 1. — 1862. Schin. F. A. I, 87 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 283.

Male. Vertex and frons grey, the latter narrow with parallel margins; epistoma white; palpi somewhat small, yellow, with white hairs. Occiput grey, with yellow bristles above, white hairs below.

Antennæ black, the third joint short, somewhat longer than broad at the base,¹ much shorter than the arista. Thorax brownish yellow pruinose; all bristles yellow; two distinct long dorsocentral bristles



Fig. 132. Antenna of *T. flavipes*. $\times 100$.

behind. Scutellum with two marginal bristles and a smaller hair on each side, all yellow. Pleura grey pruinose, anteriorly a little yellowish; above the middle coxæ a black, polished spot. Abdomen black, shining, either quite black or the anterior segments with greyish front margins at the sides. It is clothed with short, yellowish hairs. Venter black. Legs together with the coxæ dark yellow or reddish yellow; the apex of the tarsal joints black, and the tarsi thus black annulated; sometimes the femora may be more or less brownish above. Front femora somewhat, middle femora much thickened. The legs are yellowish haired, the front tibiæ have some small, darker or paler bristles on the dorsal side; the hairs below the hind femora a little strong. Wings a little yellowish. Veins yellow at the base, pale brownish to blackish brown outwards. Halteres yellow.

Female. Similar to the male except the pointed abdomen.

Length 2,5—3,5 mm.

T. flavipes is a common species in Denmark; Utterslev Mose, Ordrup Mose, Ermelund, Dyrehaven, Ørholm, Tisvilde, Frederikssund; on Langeland at Lohals; in Jutland in Greisdalen at Vejle, at Gjerlev near Randers Fjord, Hald near Viborg, Thisted, Sæby, Lønstrup and Frederikshavn, and on Læsø; finally on Bornholm at Allinge; my dates are ¹⁷/₆—²⁰/₈. It occurs on bushes and in low herbage both in woods and outside, on fields and meadows.

Geographical distribution:— Europe down into Italy; towards the north to northern Sweden, and in Finland.

2. *T. maculipes* Meig.

1822. Meig. Syst. Besch. III, 79, 27. — 1842. Zett. Dipt. Scand. I, 274, 2. — 1862. Schin. F. A. I, 87 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II. 285.

¹ I have given the comparisons of the length and breadth of the third antennal joint in this and the following species, such as they are generally seen with a lens; exact measurements under the microscope will show the joint relatively longer, but with a lens the outer, thin part of the joint will show itself as the basal part of the arista.

Male. Vertex and frons grey. The head is smaller, especially lower than in *flavipes*, and hence the frons is lower, and it is a little broadened upwards. Epistoma white, likewise shorter than in *flavipes*, and very narrow below the antennæ; palpi pale yellow, somewhat small. Occiput grey, with yellow bristles above, white hairs below. Antennæ black, rather long, the third joint elongated, somewhat narrow, thrice as long as broad at the base and about as long as the



Fig. 133. Antenna of *T. maculipes*. ♂. $\times 100$.

arista. Thorax brownish yellow pruinose; all bristles yellow, the short bristles in front less distinct than in *flavipes*; only one distinct, long dorsocentral bristle behind. Scutellum with two yellow bristles and a smaller hair on each side. Pleura light grey pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining; the front margin of the segments with a narrow, grey band, interrupted in the middle. Abdomen is clothed with short, pale yellow hairs. Venter black. Legs together with the coxæ dark or reddish yellow, the tarsi, except metatarsus, brown; sometimes the posterior femora somewhat brownish above. Front femora somewhat, middle femora considerably thickened, but both pairs are, I think, a little less thickened than in *flavipes*. The legs are yellowish haired, no bristles on the front tibæ, or these only very slightly stronger than the other hairs; the hairs below the hind femora a little finer than in *flavipes*. Wings hyaline or very slightly yellowish. Veins brown, paler at the base. Halteres yellow.

Female. Similar to the male; the third antennal joint a little shorter than the arista; abdomen pointed.

Length 2.5—3 mm.

This species is distinguished from *flavipes* especially by the longer and more narrow third joint of the antennæ; also the smaller head is somewhat characteristic, and likewise the colour of the tarsi; also it seems that there are two notopleural bristles against three (generally) in *flavipes*. All specimens I have seen had grey bands on abdomen, and this is thus also characteristic for the species; finally it seems, in contrast to *flavipes*, to have only one long dorsocentral bristle behind.

T. maculipes is much rarer in Denmark than *flavipes*; Charlottenlund, Tyvekrog; the dates are $^{26}/_6$ — $^{1}/_9$.

Geographical distribution: — Europe down into Italy; towards the north to middle Sweden, and in Finland; it seems to be rarer towards the north than *flavipes*.

3. *T. strigifrons* Zett.

1849. Zett. Dipt. Scand. VIII, 3005, 4—5. — 1903. Kat. paläarkt. Dipt. II, 288.

Male. Vertex and frons grey; epistoma white; palpi small and short, white haired. Occiput grey, with yellow bristles above, white hairs below. Antennæ black, the third joint elongated, twice or more



Fig. 134. Antenna of *T. strigifrons*. $\times 100$.

than twice as long as broad at the base, and slightly shorter than the arista; it is distinctly pubescent. Thorax brownish grey pruinose; all bristles yellow. Scutellum with two yellow marginal bristles and on each side a small hair. Pleura grey pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining, without bands it is clothed with slightly longish, pale yellowish hairs. Venter black. Legs yellow, tarsi black annulated. Front femora somewhat, middle femora somewhat more thickened. The legs are yellow haired; front tibiæ with some small bristles, which are only slightly stronger than the other hairs. Wings hyaline or very slightly yellowish. Veins pale brown. Halteres yellowish.

Female. Similar to the male; abdomen pointed.

Length 2,5 to about 3 mm.

This species is distinguished from *flavipes* by the longer third antennal joint, and from *maculipes* by the absence of bands on abdomen, the annulated tarsi, as also the third antennal joint is a little shorter. Zetterstedt says „Stæg. in litt.“, so that the name is originally due to Stæger.

T. strigifrons seems to be somewhat rare in Denmark, besides the specimens mentioned by Zetterstedt we have still some specimens from Stæger, probably taken at Ordrup; further it has been taken at Ørholm, Tisvilde and in Jutland at Lønstrup and Frederikshavn; it will probably prove to be more common when better recognised, but it has hitherto often been confused with *maculipes* and *flavipes*, also by Stæger. My dates are $20/r-12/s$.

Geographical distribution: — The species is hitherto only known from Denmark, but this is probably because it has not been recognised, or perhaps not considered as a separate species.

Remarks: The species is very nearly related to *flavipes* and *fulvipes*, and I am not quite sure, that it is a distinct species; it might then perhaps be a form of *fulvipes* with quite yellow legs and coxæ. I have examined Zetterstedt's type-specimens, the thoracic disc is in these somewhat rubbed, as also suggested by Zetterstedt. Frey (Zeitschr. für syst. Hymenopt. and Dipt. 1907, 410) places the species in the group with black thoracic bristles, but this is erroneous, as all the bristles are yellow; probably then Frey has had another species.

4. *T. cothurnata* Macq.

1827. Macq. Soc. Sc. Lille, 1827, 100, 17 (*Platypalpus*). — 1838. Meig. Syst. Besch. VII, 98, 54. — 1842. Zett. Dipt. Scand. I, 283, 13. — 1862. Schin. F. A. I, 88 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 282.

Male. Frons and vertex grey; epistoma white; palpi small, white haired. Occiput grey, with yellow bristles above, white hairs below. Antennæ black, third joint short, shorter than the arista. Thorax greyish yellow, or sometimes more light grey, and not very densely pruinose; all bristles yellow. Scutellum with two yellow marginal bristles and a small hair on each side. Pleura grey or light grey pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining; indistinct grey bands may be present at the sides on the first segments; it is clothed with short, pale yellowish hairs, which are longer at the sides. Venter black. Legs paler or darker yellow, also the coxæ; generally the tarsi have the last two or three joints blackish, but sometimes the whole tarsus is blackish or brownish annulated. The front femora slightly, the middle femora a little more thickened, but both pairs not much thickened. The legs are yellow haired, front and hind tibiæ with a few small bristles on the dorsal side. Wings a little yellowish. Veins brownish, paler at the base. Halteres yellowish white.

Female. Quite similar to the male; abdomen pointed.

Length 1,8—2,3 mm.

This species I can distinguish from *flavipes* only by the smaller size and the less thickened legs; generally also the tarsi are not distinctly annulated.

T. cothurnata is not common in Denmark; Amager, Charlottenlund; on Langeland at Lohals, and on Bornholm at Rø; my dates are only ²⁰/₆—²/₇.

Geographical distribution:— Northern and middle Europe down into France; towards the north to northern Scandinavia, but rare; and in Finland.

5. **T. interjecta** n. sp.

Of this species I have only the female. Frons and vertex dark grey; epistoma grey; palpi small, whitish. Occiput grey, with black hairs above, whitish hairs below. Antennæ black, the third joint much elongated, longer than the arista. Thorax dark grey, somewhat slightly pruinose; the bristles dark yellow; a humeral bristle and two, somewhat strong notopleural bristles present. Scutellum has two long, dark yellow marginal bristles and a weaker hair on each side. Pleura greyish pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining, without bands; it is clothed with short, pale hairs, a little longer at the sides. Venter black. Legs, including the coxæ, somewhat dark yellow; tarsi with the last four joints and the tip of metatarsus blackish brown. The anterior femora slightly thickened; the spine at the apex of the middle tibiæ exceedingly small, almost wanting. The legs yellowish haired; the bristles on the anterior side of the middle femora present in the whole length. Wings hyaline. Veins dark brown to black. Halteres pale yellow.

Length 2 mm.

This species resembles *T. cothurnata* very much, but it is at once distinguished by the long third joint of the antennæ, and the minute spine on the middle tibiæ. In the latter character it resembles *T. cryptospina* Frey (Acta Soc. pro Faun. et Flor. Fenn. 31, No. 9, S), and I should not have hesitated in determining it as this species, were it not for the third antennal joint, which in *cryptospina* is described as short „fast ründlich“; besides *cryptospina* has weak, yellowish white thoracic bristles and black annulated tarsi.

T. interjecta must be rare in Denmark, I have taken only one specimen, a female, at Tisvilde on $\frac{1}{7}$ 1910. It was taken with the net on low herbage in the outskirts of a wood.

Geographical distribution:— The species is only known from Denmark.

6. **T. fulvipes** Meig.

1822. Meig. Syst. Besch. III, 78, 25. et 1830. VI, 342. — 1862. Schin. F. A. I, 89 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 284. — *Tachydromia fascipes*: 1893. Strobl, Miith. Ver. Steierm. 1892, 120.

Male. Frons and vertex grey; epistoma white; palpi small, whitish yellow haired. Occiput grey, with yellow bristles above,

white hairs below. Antennæ black, the third joint elongated, about as long as the arista, but relatively shorter than in *maculipes*, and broader at the base. Thorax yellowish grey pruinose, but not densely, and somewhat shining, all bristles yellow. Scutellum with two yellow marginal bristles, and a small hair on each side. Pleura grey pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining, with short, but distinct greyish white hairs. Venter black. Legs yellow, the base of the coxæ blackish, and sometimes the posterior coxæ quite black; the front coxæ may be quite or almost quite yellow; the middle femora with a blackish or brownish ring, most distinct above, hind femora with a more or less distinct ring near the apex; sometimes also the front femora more or less blackish or brownish; not rarely the blackish markings are slight to nearly disappearing; tarsi black annulated. Front and middle femora somewhat thickened, the latter not much more than the former, and I think scarcely as much as in *flavipes* and *maculipes*. The legs are distinctly yellowish or whitish grey haired, and the hairs are a little longish; the front tibiæ have a few small bristles. Wings hyaline. Veins brown or blackish, pale towards the base. Halteres whitish yellow.

Female. Similar to the male; the black markings on the legs generally more distinct; abdomen pointed.

Length 2,7—3,5 mm.

This species may be somewhat difficult to distinguish; it resembles both *flavipes*, *maculipes* and *strigifrons*; it is generally distinguished by the more or less blackened coxæ, but this may sometimes be slightly marked; the third joint of the antennæ is longer than in *flavipes*, but shorter than in *maculipes*. The distinct hairiness of the legs is generally mentioned in the descriptions, and may also be somewhat characteristic, though I do not think the legs are much longer haired than in the preceding species, but the hairs are more obvious, I think partly on account of the darker colour of the legs. All my specimens have the abdomen without bands. The species certainly must be *fulvipes*, as it has yellow thoracic bristles, while *fascipes* according to Strobl (l. c. 122, *notata*) and Frey (Zeitschr. für syst. Hymenopt. und Dipt. 1907, 411) has black bristles. Otherwise the descriptions are somewhat different; Strobl speaks of bands on abdomen, while Frey says it is black, unicoloured, and Strobl ascribes the species a long third antennal joint, Frey a short. My specimens have small palpi, while Strobl speaks of large palpi. I doubt whether the forms of *flavipes* and *maculipes* with dark patches on the legs, mentioned by several authors, may not in reality be specimens of

fulvipes. Frey (Acta Soc. pro Faun. et Flor. Fenn. 1909, 31, No. 9, 9) suggests, that *fulvipes* is perhaps identical with *flavipes*, but I am not inclined to think so, as the former has a longer third antennal joint. On the other hand the species is perhaps not to be distinguished with certainty from *strigifrons*, as mentioned under this species.

T. fulvipes is somewhat common in Denmark; Hellerup, Ordrup Mose, Bøllemosen, Tyvekrog, Tisvilde, Frederikssund; on Langeland at Lohals; on Funen at Strib; in Jutland at Hald near Viborg, Struer, Holstebro, Søndervig, Jerup near Frederikshavn, Frederikshavn and Skagen; my dates are $\frac{7}{6}$ — $\frac{1}{9}$; it was taken in copula on $\frac{5}{8}$. It occurs both in woods and outside, but it seems to be most common on fields.

Geographical distribution: — Europe down into Italy; from Scandinavia it is not known with certainty, unless *notata* in Zetterstedt is identical with it, in which case it goes to southern Sweden. It occurs also in Finland.

Remarks: I think it probable, that Zetterstedt's *notata* is identical with *fulvipes*, as he mentions the species as sent from Stæger; Stæger's specimens in our collection labelled *notata* proved to be *fulvipes*, while *notata* Meig. = *fuscipes* Meig. has not been found in Denmark.

7. *T. annulipes* Meig.

1822. Meig. Syst. Beschr. III, 77, 21. — 1862. Schin. F. A. 1, 89 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 280. — *Tachydromia coxata*: Zett. Dipt. Scand. I, 281, 11 et 1849. VIII, 3006, 11.

Male. Frons and vertex grey; epistoma white; palpi small, whitish yellow haired. Occiput grey, with yellow bristles above, white hairs below. Antennæ black, the two basal joints yellow, the third joint a little elongated, shorter than the arista. Thorax brownish yellow pruinose, almost brassy, and the pruinosity not dense. There is only one long acrostichal bristle behind, and the short hairs in front are very short and inconspicuous. All bristles yellow. Scutellum with two yellow marginal bristles, and a small hair on each side. Pleura grey pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining, with short, yellow hairs. Venter black. Legs yellow; the front coxæ and the front femora except the apical part black; the tarsi black annulated, on the front tarsi the dark rings are deep black and very conspicuous, on the posterior tarsi they are more brownish and smaller. The anterior femora are somewhat thickened, the middle femora most strongly and the front femora especially at the base. The legs are yellow haired. Wings considerably

yellowish tinged. Veins yellow or pale brownish. Halteres whitish yellow.

Female. See below.

Length 2,6—2,9 mm.

This species is easily known by the colour of the legs.

T. annulipes is rare in Denmark; Ernielund (the author); on Bornholm at Rø (H. J. Hansen) and one specimen from Stæger, probably taken in Ordrup; in all three specimens, all males; the dates are ²²/₆ to July.

Geographical distribution:— Europe down into Italy; towards the north to southern Sweden.

Remarks: According to the descriptions I think, that *annulipes* Meig. and *coxata* Zett. are identical, as also suggested in the Kat. paläarkt. Dipt. Meigen mentions both sexes of *annulipes* and gives no difference between them, nor does Schiner do so. Zett. describes in Dipt. Scand. I, only the male of *coxata*, but in VIII he mentions the female and says, that it has all legs quite yellow. He further says, that the female was taken in copula with the male by Stæger. In our collection is, besides the male, also a female, labelled *coxata*, and it has yellow legs (there is no remark about the specimens having been taken in copula); I cannot with certainty decide, whether this female belongs in reality to the species or is perhaps only a specimen of *bicolor*; as Meigen notes no difference in colour from the male I should think the latter most probable, and then Stæger must have committed some error; but the question with regard to the female cannot be considered as settled.

8. *T. bicolor* Meig.

1804. Meig. Klass. eur. zweifl. Ins. I, 237, 2. — 1805. Fabr. Syst. Antl. 143, 2. — 1842. Zett. Dipt. Scand. I, 276, 5. — 1862. Schin. F. A. I, 88 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 281. — *Tachydromia dichroa*: 1822. Meig. Syst. Besch. III, 83, 36.

Male. Frons and vertex grey; epistoma white; palpi small, with white hairs. Occiput grey, with yellow bristles above, white hairs below. Antennæ black, the two basal joints yellow, the third joint short, shorter than the arista. Thorax greyish pruinose, slightly yellowish; all bristles yellow. Scutellum with two yellow marginal bristles and a small hair on each side. Pleura light grey pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining, the first segments with grey bands at the sides; it is clothed with short, pale yellowish hairs. Venter black. Legs yellow; the tarsi generally slightly brownish annulated, the last or two last joints

quite or nearly quite brown or black. Front femora slightly, middle femora somewhat thickened. The legs are yellowish haired. Wings pale yellowish; the veins likewise pale yellow, the cubital and discal

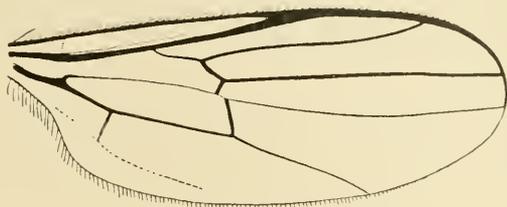


Fig. 135. Wing of *T. bicolor*.

vein almost parallel or often somewhat convergent. Halteres yellowish white.

Female. Quite similar to the male except the pointed abdomen. Length 2,5 to about 3 mm.

This species is generally characterised by the parallel cubital and discal vein, but these veins are often somewhat convergent, as also Strobl states. The species is not easily distinguished from *pallidiventris* (see below under this species).

T. bicolor is common in Denmark; Ermelund, Ørholm, Tisvilde, Nordskoven at Jægerspris; in Jutland at Aalborg; my dates are ¹⁸/₅—²¹/₇. It occurs on bushes at the outskirts of woods and in low herbage on fields, I think most commonly on the latter places.

Geographical distribution:— Europe down into Italy, and also down into North Africa; towards the north to middle Sweden, and in Finland.

9. *T. calceata* Meig.

1822. Meig. Syst. Besch. III, 87, 45. — 1842. Zett. Dipt. Scand. I, 282, 12. — 1862. Schin. F. A. I, 88 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 281.

Of this species I only know the female. Vertex and frons light grey; epistoma white; palpi not large, white haired. Occiput light grey with yellow bristles above, white hairs below. Antennæ black or brown, the basal joints yellow, the third joint short, considerably shorter than the arista and not much longer than broad. Thorax not densely light grey pruinose, a little shining; all bristles pale or whitish yellow. Scutellum with two pale marginal bristles, and a

very small hair on each side. Pleura light grey pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining, clothed with short, whitish hairs. Venter black. Legs yellow or pale yellow, the last tarsal joints brownish; anterior femora not much thickened, and the middle femora only slightly thicker than the front femora. The legs are clothed with yellowish hairs. Wings hyaline or slightly yellowish, with pale veins. Halteres whitish yellow.

Length about 1,5 mm.

T. calceata is very rare in Denmark, I know only one specimen, taken many years ago by Stæger, probably in Ordrup.

Geographical distribution: — Europe down into Italy; towards the north to northern Sweden, and in Finland.

10. *T. articulata* Macq.

1827. Macq. Soc. Sc. Lille, 1827, 98, 10 (*Platypalpus*). — 1838. Meig. Syst. Besch. VII, 98, 53. — 1842. Zett. Dipt. Scand. 1, 284, 15. — 1862. Schin. F. A. 1, 91 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 280.

Male. Frons and vertex grey; epistoma white; palpi small, yellowish. Occiput grey, with whitish bristles above, white hairs below. Antennæ black, the basal joints yellow, the third joint short, considerably shorter than the arista. Thorax greyish or brownish grey pruinose; all bristles yellow. Scutellum with two yellow marginal bristles and a small hair on each side. Pleura grey pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining, with very short, pale hairs. Venter black. Legs dark yellow, tarsi black annulated, the last joints may be quite black. The anterior femora only slightly thickened, and the middle femora not much thicker than the front femora; the apical spine on the middle tibiæ small and not pointed. The legs are yellowish haired. Wings hyaline; the veins blackish or brown, a little paler at the base. Halteres whitish yellow.

Female. Similar to the male.

Length about 2 mm.

This species is distinguished from *calceata* by the distinctly black annulated tarsi and the darker wing-veins; also the small spine on the middle tibiæ is characteristic.

T. articulata is not common in Denmark; Ermelund; on Langeland at Lohals, and on Funen at Odense; my dates are $\frac{2}{7}$ — $\frac{7}{8}$.

Geographical distribution: — Northern and middle Europe down into France; towards the north to southern Sweden, and in Finland.

11. *T. pallidiventris* Meig.

1822. Meig. Syst. Besch. III, 82, 35. — 1842. Zett. Dipt. Scand. I, 277, 6. — 1862. Schin. F. A. I, 88 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 287. — *Tachydromia longiseta*: 1842. Zett. Dipt. Scand. I, 278, 7.

Male. Frons and vertex grey; epistoma white; palpi not large, yellow. Occiput grey, with yellow bristles above, white hairs below. Antennæ black or brown, the basal joints yellow, the third joint somewhat elongated, about as long as the arista or a little shorter. Thorax yellowish pruinose; all bristles yellow; the short hairs in front distinct and obvious. Scutellum with two yellow marginal bristles, and a small hair on each side. Pleura grey pruinose, a little yellowish upwards; above the middle coxæ a black, polished spot. Abdomen black, shining, the two first segments with grey bands at the sides; it is clothed with short, yellowish hairs. Venter blackish or paler to yellow, especially towards the base. The exterior genitalia somewhat large. Legs yellow, the tarsi blackish or brownish annulated, the last joint generally deep black for the largest part. The front femora somewhat, the middle femora considerably thickened. The legs are yellow haired, front and hind tibiæ with some small bristles on the dorsal side, these bristles may be darker. Wings hyaline or a little yellowish. The veins yellow, a little darker towards the apex, the cubital and discal vein somewhat convergent. Halteres whitish yellow.

Female. Similar to the male; the venter sometimes more distinctly pale.

Length 2,5 to about 3,5 mm.

The species is very similar to *bicolor*; I find it distinguished by the distinctly longer third antennal joint, the thicker anterior femora, and the distinctly annulated tarsi; the cubital and discal vein are as a rule more convergent, especially the cubital vein is generally curved downwards, while it is about straight in *bicolor*, the curvature of the discal vein may, on the contrary, often be similar in the two species. Also the pale venter is a helping character, but not always present, and also other species may show the venter somewhat pale. Further I think the bristles, and also the short hairs, on thorax are longer, and there are three distinct notopleural bristles, but only two in *bicolor*.

T. pallidiventris is a common species in Denmark, and more common than *bicolor*; Copenhagen in gardens, Amager, Hellerup, Ordrup Mose, Ermelund, Nøddebo, Tyvekrogen, Tisvilde, Frederiks-

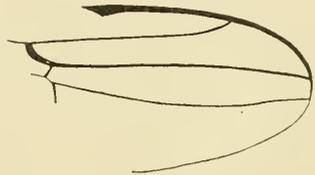


Fig. 136. Wing-part of
T. pallidiventris.

sund, Rørvig, Sorø, and Nyraad near Vordingborg; on Langeland at Lohals; on Funen at Veflinge and Hoffmansgave; in Jutland in Højebæk Dal at Vejle, Nebsager near Horsens, at Sminge and Laven near Silkeborg, Hald near Viborg, Søndervig, Holstebro, Struer, Gjerlev near Randers Fjord, Aalborg, Thisted and Frederikshavn. My dates are $18/5-1/9$. It occurs especially in low herbage on fields, but also on bushes in the outskirts of woods.

Geographical distribution: — Europe down into Italy, and also down into North Africa; towards the north to northern Sweden, but here rare; and in Finland.

12. *T. varia* Walk.

1851. Walk. Ins. Brit. I, 126, 14 (*Platypalpus*). — 1862. Schin. F. A. I, 88 (*Platypalpus*). — 1887. Becker, Berl. ent. Zeitschr. XXXI, 134, 102. — 1903. Kat. paläarkt. Dipt. II, 288.

Of this species I know only the female. Frons and vertex grey, slightly yellowish; epistoma whitish; palpi of medium size, yellow. Occiput grey, slightly yellowish, with yellow bristles above, white hairs below. Antennæ black, the basal joints yellow, the third joint considerably shorter than the arista. Thorax yellowish pruinose; all bristles yellow; there are three distinct notopleural bristles. Scutellum with two yellow marginal bristles, and a smaller hair on each side. Pleura grey pruinose; the black, polished spot above the middle coxæ small. Abdomen yellow, somewhat shining, the middle part of the dorsum somewhat brownish; abdomen is clothed with short, yellow hairs. Venter yellow. Ovipositor black. Legs yellow; tarsi distinctly but narrowly blackish annulated. Front femora not much, middle femora considerably thickened. The legs are yellow haired, the front and hind tibiæ have some distinct, brownish bristles on the dorsal side. Wings yellowish tinged. Veins yellow, cubital and discal vein somewhat convergent. Halteres whitish yellow.

Length about 3,5 mm.

Remarks: The species is generally described with two rows of brown spots on abdomen, but the spots often more or less confluent.

T. varia is very rare in Denmark, only one specimen, a female, has been taken at Charlottenlund on $20/7$ 1905 (the author).

Geographical distribution: — Northern and middle Europe down into Switzerland; it has its northern limit in Denmark and England; it is generally a rare species, but Becker l. c. records it as common at St. Moritz on bushes of *Salix* and *Alnus*, but only females.

13. *T. cursitans* Fabr.

1781. Fabr. Spec. Ins. II, 447, 60 (*Musca*). — 1805. Fabr. Syst. Antl. 143, 3. — 1842. Zett. Dipt. Scand. I, 280, 10. — 1862. Schin. F. A. I, 88 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 282.

Male. Vertex and frons grey; epistoma somewhat broad, white haired; palpi yellow, somewhat large, fully half as long as the proboscis. Occiput grey, with whitish bristles above, white hairs below. Antennæ black or brown, the basal joints and generally also the base of the third joint yellow, the third joint somewhat elongated, but not as long as the arista. Thorax yellowish grey pruinose, with two approximated darker grey stripes in the middle, abbreviated behind; there are three distinct notopleural bristles; all bristles yellow. Scutellum has generally six yellow marginal bristles, of which the inner and outer pair are short, the intermediate pair long. Pleura light grey pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining; at the sides with grey bands, which are somewhat large on the first two segments, small on the others; it is clothed with short, yellowish white hairs. Venter black. The exterior genitalia somewhat small. Legs yellow, tarsi brownish to blackish annulated, sometimes indistinctly, and the tarsi almost quite yellow. Front femora only slightly, middle femora somewhat more thickened. The legs are short-haired with yellow hairs. Wings somewhat yellowish tinged. Veins brownish, yellow towards the base; the cubital and discal vein somewhat convergent, both being curved towards each other. Halteres white or yellowish white.

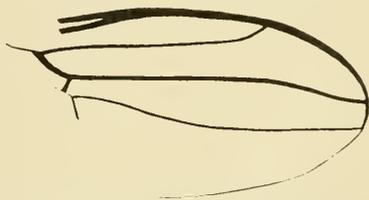


Fig. 137. Wing-part of *T. cursitans*.

Female. Quite similar to the male; abdomen pointed.

Length 3,5—4,3 mm.

T. cursitans is not precisely common in Denmark; Ermelund, Ordrup, Nyraad at Vordingborg, on Egholm at Skelskør, and on Langeland at Lohals; my dates are $18\frac{1}{5}$ — $6\frac{1}{7}$. It occurs on bushes at the outskirts of woods.

Geographical distribution:— Europe down into Spain (var. *hispanica* Strobl) and Italy; towards the north to southern Sweden, and here rare; and in Finland.

14. *T. candicans* Fall.

1815. Fall. Dipt. Suec. Empid. 10, 11. — 1822. Meig. Syst. Besch. III, 85, 42. — 1842. Zett. Dipt. Scand. I, 285, 17, (var. a et b). — 1862.

Schin. F. A. I, 89 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 281. — *Tachydromia ventralis*: 1822. Meig. Syst. Besch. III, 85, 40. — *Platypalpus ventralis*: 1862. Schin. F. A. I, 88.

Male. Head somewhat high. Vertex and frons grey, the latter very narrow; epistoma white; palpi pale yellow, large, half as long as proboscis. Occiput grey, with yellow bristles above, white hairs below. Antennæ black or blackish, the two basal joints yellow, the third joint a little elongated, shorter than the arista. Thorax grey or light grey pruinose, with two indistinct, darker grey stripes in the middle, abbreviated behind, and generally only observable in front; there are (generally) only two notopleural bristles; all bristles whitish or whitish yellow. Scutellum with four pale yellow marginal bristles, the lateral shortest. Pleura light grey pruinose; no black spot above the middle coxæ. Abdomen black, shining, with distinct grey bands at the sides; it is clothed with short, pale yellow hairs. Venter black, often more or less yellow. Legs yellow, generally pale yellow, the last tarsal joints brownish or blackish; sometimes the tarsi indistinctly

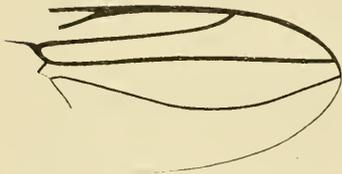


Fig. 138. Wing-part of *T. candicans*.

brownish annulated. Front femora almost not, middle femora a little thickened. The legs are yellowish haired. Wings hyaline, slightly yellowish tinged. Veins darker or paler yellow; cubital and discal vein much converging in such a way, that the cubital vein is slightly curved, almost straight, the discal vein bending upwards with a long curve. Halteres whitish.

Female. Similar to the male; abdomen pointed.

Length. This species varies much in size, the length is 2,5—4 mm.

This species is easily known by the absence of the black spot on the pleura, and the strongly curved discal vein; also its narrow frons and slightly thickened anterior femora are characteristic.

T. candicans is common in Denmark; Copenhagen in a garden, Ordrup Mose, Dyrehaven, Tyvekrog; on Langeland at Lohals; on Funen at Odense and Hoffmangave; in Jutland at Nebsager near Horsens, and finally on Bornholm at Almindingen; my dates are ¹⁸⁷⁶ to August. It occurs on bushes near and in woods, not rarely on somewhat shaded and humid places.

Geographical distribution:— Europe down into Italy; towards the north to northern Sweden, and in Finland.

15. *T. fasciata* Meig.

1822. Meig. Syst. Besch. III, 86, 43, Tab. XXIII, Fig. 22. — 1862. Schin. F. A. I, 89 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 283. — *Tachydromia candicans* var. c: 1842. Zett. Dipt. Scand. I, 285, 17.

Male. Vertex and frons grey, the latter broader than in *candicans*; epistoma white; palpi yellow, large, half as long as proboscis. Occiput grey, with whitish yellow bristles above, white hairs below. Antennæ blackish or brownish, the two basal joints yellow, the third joint short and shorter than the arista. Thorax yellowish grey pruinose, with two more or less distinct, grey stripes in the middle, abbreviated behind; all bristles yellow. Scutellum with four yellow marginal bristles, the two lateral small. Pleura grey pruinose; no black spot above the middle coxæ. Abdomen black, shining; all segments with grey, triangular spots at the sides, meeting or almost meeting in the middle; on the sides the spots occupy the whole length of the segment, while they are narrow and pointed towards the middle. Abdomen is clothed with short, yellowish hairs. Venter black, but not rarely more or less pale. Legs yellow or pale yellow, tarsi with the last joints blackish or brownish, and generally more or less distinctly but narrowly brownish or blackish annulated. Front femora somewhat, middle femora considerably thickened. The legs are yellow haired. Wings hyaline, slightly yellowish tinged. Veins brownish, yellow towards the base; cubital and discal vein converging, the discal vein with a somewhat sudden curve before the apex. Halteres whitish yellow.

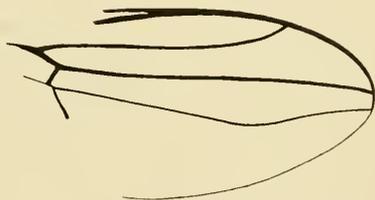


Fig. 139. Wing-part of *T. fasciata*.

Female. Similar to the male; abdomen pointed.

Length. This species varies in size like *candicans*, generally it is 3,5—4,5 mm., but sometimes specimens may be found down to 2,5 mm.

This species can, on account of the absence of the black spot on the pleura, only be confused with *candicans*, but it is distinguished by the larger bands on abdomen, a different curvature of the discal vein, and also by the broader frons and the more thickened anterior femora.

T. fasciata is not rare in Denmark; Amager, Ordrup Mose, Ermelund, Dyrehaven, Ørholm, Geel Skov, Tyvekrog; on Langeland at Lohals; my dates are $18/5$ — $5/7$. It occurs in the same places as *candicans*.

Geographical distribution:— Europe down into Italy, and further down into North Africa; towards the north to northern Sweden.

16. *T. major* Zett.

1842. Zett. Dipt. Scand. I, 287, 18. — 1862. Schin. F. A. I, 88. (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 285. — *Tachydromia cursitans* (non Fabr.): 1804. Meig. Klass. der eur. Zweifl. Ins. I, 237, 1. et 1822. Meig. Syst. Besch. III, 83, 38, Tab. XXIII, Fig. 23.

Male. Vertex and frons grey; epistoma white; palpi whitish yellow, large, more than half as long as the proboscis. Antennæ yellow, arista brown; the third joint short, considerably shorter than the arista. Thorax greyish yellow pruinose, with two indistinct, grey middle stripes, disappearing backwards; there are two distinct notopleural bristles; all bristles yellow. Scutellum with four yellow marginal bristles, the lateral small. Pleura grey pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining, the first segments with grey bands at the sides, and generally also the following segments with narrow bands; abdomen is clothed with short, pale yellow hairs. Venter black. Legs yellow or pale yellow,

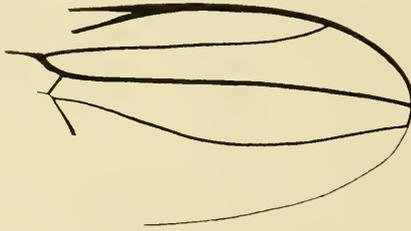


Fig. 140. Wing-part of *T. major*.

tarsi a little brownish towards the end. Front femora somewhat, middle femora considerably thickened. The legs are yellow haired. Wings somewhat yellowish. Veins brown or dark brown, yellow towards the base, cubital and discal vein converging, the cubital vein very slightly curved, the discal vein evenly and somewhat strongly curved, but not as much as in *cursitans*. Halteres yellowish white.

Female. Similar to the male; abdomen pointed.

Length 4—5 mm.

This species is most like *cursitans*, and has like this a black spot on the pleura, but it is distinguished, besides by the quite yellow antennæ, by a somewhat different course of the cubital vein which is more straight than in *cursitans*, while on the contrary the

discal vein is more curved in the present species than in *cursitans*; finally the tarsi are quite yellow.

T. major is somewhat common in Denmark; Ordrup Mose, Dyrehaven, Ørholm, Nyraad at Vordingborg; on Funen at Odense and Veflinge; in Jutland in Greisdalen at Vejle, at Silkeborg and at Frederikshavn; my dates are $\frac{7}{6}$ to August. It occurs especially on bushes in the outskirts of woods.

Geographical distribution: — Northern and middle Europe down into Austria; towards the north to northern Sweden, and in Finland. Besides it goes down into Spain, if the form *minor* Strobl is in reality the present species.

17. *T. flavicornis* Meig.

1822. Meig. Syst. Besch. III, 83, 37. — 1842. Zett. Dipt. Scand. I, 278, 8. — 1862. Schin. F. A. I, 88. (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 283.

Male. Frons and vertex yellow or greyish yellow; epistoma white; palpi large, whitish. Occiput yellow or greyish yellow, with yellow bristles above, white hairs below. Antennæ yellow, arista blackish brown, the third joint short, much shorter than the arista. Thorax yellowish or bright yellow pruinose; there are two distinct notopleural bristles; all bristles yellow. Scutellum with two yellow marginal bristles, and a small hair on each side. Pleura grey pruinose, upwards a little yellowish; above the middle coxæ a black, polished spot. Abdomen black, somewhat (not much) shining; each segment with a large, triangular, grey spot at the sides, almost meeting in the middle; at the sides the spots occupy the whole length of the segment. Abdomen is clothed with short, yellow hairs. Venter black, sometimes more or less pale. The exterior genitalia not large, directed somewhat upwards. Legs yellow, the tarsi distinctly black annulated. The anterior femora distinctly thickened, the two pairs equally thick. The legs are yellow haired. Wings hyaline, very slightly yellowish. Veins yellow, the cubital and discal vein a little converging. Halteres yellowish white.

Female. Similar to the male; abdomen pointed.

Length 2,3—2,8 mm.

This beautiful little species is easily distinguished by the light yellow colour which is also extended to the head, and by the large bands on abdomen; also the equally thick anterior femora are characteristic.

T. flavicornis is common in Denmark; Copenhagen in a garden,

Amager, Hellerup, Ordrup Mose, Tyvekrog; on Funen at Strib; my dates are $\frac{3}{6}$ — $\frac{10}{8}$. It occurs on fields and commons in low herbage.

Geographical distribution:— Northern and middle Europe down into France; towards the north to northern Scandinavia, and in Finland; besides the species goes still farther towards the south, down into North Africa.

Remarks: Zetterstedt says: „Individua (σ φ), quæ e Dania sub hoc nomine a D. Stæger obtinui, majore jure ad speciem sequentem [*albicornis*] referenda mihi videntur“. How this may be I cannot say, the specimens in our collection, labelled *flavicornis* and originating from Stæger, are certainly the present species.

18. *T. albicornis* Zett.

1842. Zett. Dipt. Scand. I, 279, 9. — 1903. Kat. paläarkt. Dipt. II, 279.

Male. Frons and vertex white or greyish white; epistoma yellowish white; palpi large, white and white haired. Occiput greyish white, with white bristles above, white hairs below, the latter are specially long, longer than usual. Antennæ white, the arista more or less darkened towards the apex; the third joint very short, not much longer than the basal joints, and only half as long as the arista. Thorax light grey pruinose; there are two distinct notopleural bristles; all bristles white. Scutellum with two white marginal bristles and on each side a small hair. Pleura white or greyish white pruinose, with a very small, black, polished spot above the middle coxæ. Abdomen black, shining, with grey bands at the sides, the bands generally somewhat large, sometimes smaller and only distinct in front: abdomen is clothed with short, whitish hairs. Venter black, or often more or less pale, especially at the base. Legs pale yellow to whitish, tarsi dark at the apex, and sometimes more or less brownish annulated, especially the anterior tarsi. The anterior femora a little thickened and of equal thickness. The legs are pale yellow or whitish haired. Wings hyaline. Veins pale yellow, the cubital and discal vein about parallel. Halteres white.

Female. Quite similar to the male, except the pointed abdomen. Length 2—2,5 mm.

This little species is nearly related to *flavicornis*, but it is distinguished by the colour which both on head, thorax and legs is much whiter, the tarsi are only indistinctly annulated, and the cubital and discal vein more parallel; besides the species is smaller.

T. albicornis is rare in Denmark; Vesterfælled (Stæger) and on Funen at Odense (H. J. Hansen); the dates are in June and July. It seems to occur on fields.

Geographical distribution: — Europe down into Spain; towards the north to southern Sweden.

19. *T. minuta* Meig.

1804. Meig. Klass. der eur. zweifl. Ins. I, 238, 38, et 1822. Syst. Besch. III, 76, 20. — 1842. Zett. Dipt. Scand. I, 303, 38. — 1862. Schin. F. A. I, 89 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 286. — *Tachydromia annulata*: 1815. Fall. p. p. Dipt. Succ. Empid. 7,2. — 1822. Meig. Syst. Besch. III, 77, 22.

Male. Frons and vertex grey; epistoma white; palpi small, white haired. Occiput grey, with yellow bristles above, white hairs downwards. Antennæ black, the third joint short or slightly elongated, shorter than the arista. Thorax black, finely brownish grey pruinose, the pruinosity always leaving an indistinctly bordered middle stripe bare; there is only one long dorsocentral bristle behind, and one notopleural bristle; all bristles black (rarely dark brown). Scutellum with two black marginal bristles, and on each side a small hair which is yellow. Pleura dark greyish pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining, with short, pale grey hairs. Venter black. Legs black, the anterior trochanters and extreme apex of the coxæ, and the base and apex of all femora yellow; the base of the hind femora often broadly yellow, and the apex of the posterior femora often indistinctly reddish; the front tibiæ brown, paler at the base, the middle tibiæ brown or yellow, black on the basal part, hind tibiæ brownish or yellow, black at the base and apex or only at the apex; tarsi yellow or brown, broadly black annulated, the last joints black. The front femora a little thickened, the middle femora slightly more thickened. The legs are distinctly and somewhat longish haired with yellowish grey hairs; front tibiæ with some small bristles on the dorsal side. Wings hyaline. Veins black or dark brown. Halteres whitish.

Female. Similar to the male; abdomen not much attenuated towards the apex and rather suddenly pointed.

Length 2,3—2,7 mm.

This species is, besides other characters, characteristic from the shining middle stripe on thorax; it seems somewhat curious, that this fact has not hitherto been mentioned in the descriptions.

T. minuta is very common in Denmark; Copenhagen in gardens, Amager, Utterslev Mose, Charlottenlund, Ordrup Mose, Ørholm, Geel Skov, Birkerød, Tyvekrog, Tisvilde, Frederikssund, Boserup near Roskilde, Nyraad at Vordingborg; on Langeland at Lohals; on Funen at Odense; in Jutland in Vejle Nørreskov, at Nebsager near Horsens,

Hald near Viborg, at Søndervig, Thisted and Frederikshavn; finally on Bornholm at Allinge; my dates are $\frac{3}{6}$ — $\frac{1}{9}$. It occurs especially on fields and commons in grass and low herbage, often in very great numbers.

Geographical distribution:— Europe down into Spain and Italy: towards the north to northern Scandinavia, and in Finland. It is everywhere a common species.

Remarks: Zetterstedt mentions, besides *minuta*, also *T. annulata* from Denmark, but I think this is erroneous, and the species is not found in our collection. I have seen four specimens from Zetterstedt's collection, labelled *annulata*, two of them were *minuta*, they had the basal part of the middle tibiæ distinctly darkened; the other two were *fulvipes*.

20. *T. exigua* Meig.

1822. Syst. Besch. III, 81, 31. — 1862. Schin. F. A. 1, 89 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 283. — *Tachydromia femoralis*: 1842. Zett. Dipt. Scand. 1, 299, 34. — *Platypalpus femoralis*: 1862. Schin. F. A. 1, 90.

Male. Frons and vertex black, shining; epistoma narrow, white; palpi somewhat small, white. Occiput greyish, with brownish bristles above, white hairs below. Antennæ black, the third joint short, about half as long as the arista. Thorax black, shining, very slightly pruinose; one long dorsocentral bristle and one notopleural bristle present; the bristles are blackish brown to dark yellowish. Scutellum with two similarly coloured marginal bristles, and on each side a small hair. Pleura black, shining, only grey pruinose below. Abdomen black, shining, with short, yellow or brownish hairs. Venter black. Legs with the front coxæ yellow, the posterior coxæ more or less black at the base; the femora yellow, the front femora with a black patch or stripe above, middle femora black in about the apical two thirds, hind femora in the apical half; the tibiæ yellow or more or less brownish; the tarsi brown, darkest towards the apex. The front femora a little, the middle femora slightly more thickened. The legs are short-haired with yellowish hairs. Wings hyaline. Veins brown, the upper branch of the postical vein thinner towards the apex, the lower branch distinct in its whole length. Halteres whitish.

Female. Similar to the male, except the pointed abdomen.

Length 1,7—2 mm.

This species is very similar to *minuta*, but distinguished by the smaller size, the less pruinose thoracic disc and pleura, the shorter

third antennal joint, and by the legs being much shorter haired; also the colour of the legs is different.

T. exigua is not common in Denmark; vicinity of Copenhagen and at Boserup near Roskilde; I know no time for its capture.

Geographical distribution:— Northern and middle Europe down into Austria and Styria; towards the north to southern Sweden, and in Finland.

21. *T. agilis* Meig.

1822. Meig. Syst. Besch. III, 80, 29. — 1842. Zett. Dipt. Scand. I, 275, 4. — 1862. Schin. F. A. 91 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 279.

Male. Frons and vertex dark grey; epistoma very narrow, white; palpi dark, small, greyish haired. Occiput dark grey, with black bristles and hairs above, white hairs below. Antennæ black, the third joint a little elongated and a little shorter than the arista. Thorax greyish brown pruinose, but not densely and a little shining; there are two long dorsocentral bristles behind, and two notopleural bristles; all the bristles and hairs black. Scutellum with four black marginal bristles, the median the longest. Pleura dark greyish pruinose; above the middle coxæ a black, polished spot. Abdomen black shining, the first segments with narrow, grey bands at the sides; it is clothed with short, pale yellow hairs. Venter black. The exterior genitalia somewhat thick. Legs yellow or reddish yellow, the posterior coxæ black; the tarsi black annulated, the last three or four joints so broadly that they are almost or quite black; sometimes the anterior femora somewhat blackish above and the hind femora with a broad black ring. The front femora somewhat, the middle femora considerably thickened. The legs are yellow haired, the front and hind tibæ with a few small, blackish bristles on the dorsal side, and also the bristles at the apex on the anterior side of the middle femora are black; the hind femora with a row of short, blackish or brown bristles below; the hairs below the front femora are not long, and the ordinary long hairs on the postero-ventral side of the middle femora not much developed. Wings about hyaline. Veins blackish or dark brown; the postical vein generally disappearing just before the margin; the anal vein very weak, and the lower part of the lower postical branch likewise very weak. Halteres dirty whitish.

Female. Similar to the male, but the legs generally blacker, often the anterior femora more or less black, and the hind femora quite or almost quite black, and also often the hind tibæ black; the hairs below the hind femora not bristly.

Length 2,7 to about 3,5 mm.

T. agilis is as common in Denmark as *minuta*; Amager, Vesterfælled, Charlottenlund, Lyngby Mose, Geel Skov, Tyvekrog, Nøddebo and at Boserup near Roskilde; in Jutland at Nymindegab; my dates are $18\frac{1}{5}$ — $13\frac{1}{7}$. It occurs in the same places as *minuta*, but it seems to be an earlier occurring species.

Geographical distribution.— Northern and middle Europe down into Austria and Styria; towards the north to southern Sweden, and here rare; and in Finland.

22. *T. lutea* Meig.

1804. Meig. Klass. der eur. zweifl. Ins. I, 238, 7. — 1815. Fall. Dipt. Suec. Empid. 10, 10. — 1822. Meig. Syst. Besch. III, 89, 51. — 1842. Zett. Dipt. Scand. I, 294, 26. — 1862. Schin. F. A. 1, 91 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 285. — *Tachydromia pallida*: 1822. Meig. Syst. Besch. III, 90, 53. — *Tachydromia glabra*: 1842. Zett. Dipt. Scand. I, 295, 27.

Male. Vertex and frons yellow, the latter sometimes greyish or grey; epistoma whitish yellow; palpi small, yellow, and the proboscis of the same colour. Occiput yellow, sometimes somewhat greyish, with yellow bristles above, whitish hairs below. Antennæ yellow, the third joint or the apical part of it brown; it is short, not much longer than broad and scarcely half as long as the arista. Thorax yellow, shining; the disc is uniformly clothed with short, yellow hairs; a pair of bare stripes indicate a division into dorsocentral and acrostichal hairs; one long dorsocentral bristle and two notopleural bristles present; all bristles yellow. Scutellum with two yellow marginal bristles, and on each side a small hair. Pleura yellow, slightly greyish pruinose; above the middle coxæ a shining space. Abdomen yellow, with longish, pale yellow hairs. Venter yellow. The exterior genitalia somewhat small. Legs quite yellow, the last tarsal joints generally a little brownish; the three last joints on the front tarsi somewhat dilated. The front femora very slightly, the middle femora somewhat thickened; the middle tibiæ short, not much more than half as long as the femora, the apical spine small. The legs are yellow haired. Wings yellowish tinged. Veins brownish, yellow towards the base. Halteres yellow.

Female. Similar to the male; abdomen pointed and shorter haired.

Length 2,5—3,5 mm.

T. lutea is not properly common in Denmark; Charlottenlund, Ordrup Mose, Bøllemosen, Ruderhegn, Tisvilde; in Jutland at Rye

near Silkeborg; my dates are $^{28}/_6$ — $^2/_8$. It occurs in the outskirts of woods, and on shaded places in woods on bushes.

Geographical distribution:— Europe down into Italy; towards the north to middle Sweden, and in Finland.

Remarks: Zetterstedt has a curious note under this species, as he says: “♀ vivipara”, but without further statements.

23. *T. exilis* Meig.

1822. Meig. Syst. Besch. III, 90, 54. — 1862. Schin. F. A. I, 91 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 283.

Male. Frons and vertex grey or dark grey; epistoma black, shining, very narrow; palpi somewhat large, white, more than half as long as the proboscis; the latter black at the apex. Occiput grey, with yellow bristles above, white hairs below. Antennæ brown, the basal joints yellow, the third joint a little elongated, but shorter than the arista. Thorax yellow, a little pruinose but somewhat shining. The dorsocentral and acrostichal hairs as usual uniserial and biserial respectively; only one long dorsocentral bristle behind; two distinct notopleural bristles present; all bristles and hairs yellow. Scutellum with two yellow marginal bristles, and on each side a small hair. Pleura yellow, slightly pruinose; above the middle coxæ a shining spot. Abdomen yellow, the middle segments generally black; it is clothed with short, yellow hairs. Venter yellow. Legs yellow, the last tarsal joint distinctly black; the front tarsi simple. The front femora slightly, the middle femora a little more thickened; the middle tibiæ short, the apical spine small. The legs are yellow haired, there are no long bristles on the postero-ventral side of the middle femora, but the spines in the row here are long and more bristle-like. Wings yellow, with likewise yellow veins; the postical cross-vein a little nearer to the base than the middle cross-vein.¹ Halteres pale yellow.

Female. Similar to the male; abdomen always quite yellow, and pointed.

Length 2—2,5 mm.

¹ This character, already noted by Meigen, needs some explanation. In all species of *Tachydromia* the two cross-veins are placed quite near to each other, but the exact placement may vary a little in the same species, the postical cross-vein, however, is always just below, or behind the middle cross-vein; in the former case the two cross-veins form an angle with the tip towards the base of the wing; *exilis* is the sole species, in which the postical cross-vein is placed a little more basally than the middle cross-vein; but also in this species the place is not always the same, and sometimes it may lie just below the middle cross-vein.

This species is easily known from *lutea* by the smaller size, the black epistoma, the simple front tarsi and the ordinary rows of hairs on the thoracic disc. Meigen describes the frons as black, and likewise Frey (Act. Soc. pro Faun. et Flor. Fenn. 31, 1909, No. 9, 8); all my specimens have a grey frons such as mentioned by Scholtz (Zeitschr. für Entom. Breslau, V, 1851, 58). The third antennal joint seems to be able to vary from yellow to brown.

T. exilis is not uncommon in Denmark; Charlottenlund, Ermelund, Dyrehaven, Tisvilde; in Jutland at Frederikshavn; my dates are $18/6$ — $13/7$; it was taken in copula on $10/7$. It occurs in woods on similar places as *lutea*.

Geographical distribution:— The species is hitherto only known from Denmark, Germany and Finland.

24. *T. pectoralis* Fall.

1815. Fall. Dipt. Suec. Empid. 9, 8. — 1822. Meig. Syst. Besch. III, 87, 46. — 1842. Zett. Dipt. Scand. I, 295, 28. — 1862. Schin. F. A. I, 91 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 287. — *Tachydromia stramineipes*: 1842. Zett. Dipt. Scand. I, 296, 29.

Male. Frons and vertex dark grey; epistoma whitish grey, very narrow; palpi white, more than half as long as the black proboscis, but not very broad. Occiput dark grey, with whitish hairs above and below. Antennæ black, the third joint considerably shorter than the arista. Thorax reddish or reddish yellow, shining, with a broad, black median stripe, abbreviated a little behind the middle; sometimes the stripe is narrowed behind, and it may be continued as a narrow stripe to the scutellum. The disc is uniformly clothed with short, yellow hairs; there is one longer dorsocentral bristle behind, and one distinct notopleural bristle, both yellow; no humeral bristle. Scutellum with two dark yellow marginal bristles, and on each side a small bristle. Pleura yellow, slightly greyish pruinose, sternopleura shining, generally, but not always, more or less blackish. Abdomen black, shining, with short, yellow hairs. Venter black. Legs yellow, the last tarsal joint blackish, on the anterior tarsi generally only blackish on the apical part; femora sometimes a little brownish. The front femora slightly, the middle femora somewhat thickened; the apical spine on the middle tibiæ small. The legs are yellow haired; there are no long bristles on the postero-ventral side of the middle femora, but the spines in the row here long and more bristle-like. Wings yellow. Veins brown; the united part of the costal and subcostal vein black, or (var. *stramineipes*) pale. Halteres pale yellow.

Female. Similar to the male; abdomen pointed.

Length 2—2,5 mm.

This beautiful species is at once recognised by the colour; it seems on account of the uniform clothing of the thoracic disc to be nearest allied to *lutea*.

T. pectoralis is not rare in Denmark; Charlottenlund, Ermelund, Dyrehaven, Tisvilde; on Funen at Odense and Veflinge; in Jutland in Vejle Nørreskov, at Nebsager near Horsens, Hald near Viborg and at Frijsenborg; finally on Bornholm at Rønne; my dates are $25/6$ — $9/9$. It occurs in woods on shaded, somewhat humid places on bushes and in low herbage, and it is a somewhat late occurring species.

Geographical distribution:— Northern and middle Europe down into France; towards the north to middle Sweden, and in Finland.

25. *T. macula* Zett.

1842. Zett. Dipt. Scand. I, 289, 20. — 1887. Becker, Berl. Entom. Zeitschr. XXXI, 134, 99. — 1903. Kat. paläarkt. Dipt. II, 285.

Male. Frons and vertex black, shining; epistoma narrow, black; palpi somewhat large, yellow; proboscis black. Occiput black, somewhat greyish pruinose, with yellow bristles above, white hairs below. Antennæ black or brownish, the third joint very short, triangular, slightly longer than broad and not half as long as the long arista; the antennæ are distinctly pubescent. Thorax black, shining; the disc densely and uniformly clothed with not quite short, greyish pubescence; one long dorsocentral bristle behind and two notopleural bristles present, all yellow. Scutellum with two yellow marginal bristles, and on each side a small hair. Pleura greyish pruinose, or more correctly, with short pubescence, sternopleura shining. Abdomen black, shining, with somewhat longish, yellow hairs. Venter black. The exterior genitalia large, a little swollen. Legs yellow, the four last tarsal joints brown, and on the anterior tarsi also the metatarsus more or less brown; the posterior femora have an oblong, well defined, brown spot above at the apex. The front femora not, the middle femora much thickened; the apical spine on the middle tibiæ somewhat small. The legs are yellow haired; the front femora short haired below. Wings yellowish. Veins brown. Halteres yellowish white.

Female. Similar to the male; abdomen pointed; the posterior femora with the spot indistinct or wanting.

Length 3,2 to about 4 mm.

T. macula is very rare in Denmark, only two specimens, a male and a female, are known, probably from the vicinity of Copenhagen.

Geographical distribution:— Northern and middle Europe down into Switzerland; towards the north to northern Sweden.

26. *T. fuscicornis* Zett.

1842. Zett. Dipt. Scand. I, 291, 23. — 1862. Schin. F. A. I, 90 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 284. — *Tachydromia palipes* (non Fall.): 1822. Meig. Syst. Besch. III, 74, 14.

Male. Frons and vertex black, shining; epistoma exceedingly narrow, greyish white; palpi whitish yellow, not large, about half as long as the black proboscis. Occiput grey, with yellow bristles above, white hairs below. Antennæ blackish or brown, the third joint short, about half as long as the arista. Thorax black, shining, somewhat greyish pruinose at the margin; the uniserial dorsocentral and biserial acrostichal hairs present in the ordinary way, distinct and somewhat long; there are two somewhat long dorsocentral bristles behind and two notopleural bristles; all the hairs and bristles yellow. Scutellum yellowish pruinose, with two yellow marginal bristles, and on each side a small hair. Pleura somewhat greyish pruinose, sternopleura black, shining. Abdomen black, not much shining, with somewhat longish, yellow hairs. Venter black. The exterior genitalia somewhat large, the row of hairs on the left side dense, and the hairs long and of deep yellow colour. Legs yellow, the last tarsal joint generally more or less brownish. The front femora slightly, the middle femora somewhat thickened; the middle tibiæ more than two thirds of the femora in length, the apical spine rather large, black at the apex. The legs are yellow haired. Wings yellow. Veins brownish, yellow at the base. Halteres yellowish white.

Female. Similar to the male; abdomen pointed and a little shorter haired.

Length 2,3 to about 3 mm.

T. fuscicornis is not rare in Denmark, but it has hitherto only been taken in the vicinity of Copenhagen; Lersøen, Ermelund, Dyrehaven; my dates are only $18/6$ — $24/6$. It occurs in low herbage in woods on open, somewhat shaded and humid places.

Geographical distribution:— Europe down into Spain; towards the north to northern Sweden, and in Finland.

27. *T. ciliaris* Fall.

1815. Fall. Dipt. Succ. Empid. 33, 1—2. — 1822. Meig. Syst. Besch. III, 86, 44. — 1842. Zett. Dipt. Scand. I, 289, 21. — 1862. Schin. F. A. I, 90 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 281.

Male. Frons and vertex greyish; epistoma exceedingly narrow, whitish; palpi somewhat large, whitish. Occiput greyish, with yellow hairs above, white hairs below. Antennæ black or brownish black, distinctly pubescent, the third joint short, about half as long as the

arista. Thorax black, shining; the uniserial dorsocentral and biserial acrostichal hairs somewhat distinct; there are about two a little longer dorsocentral bristles behind, and two notopleural bristles; all the hairs and bristles are yellow. Scutellum with two yellow marginal bristles, and on each side a somewhat long hair. Pleura somewhat greyish pruinose, sternopleura black, shining. Abdomen black, shining, with a little longish, yellow hairs. Venter black, sometimes a little pale at the base. The exterior genitalia large and much swollen, forming a large knob on account of the ventral plate being large and arched, it is short-haired with blackish hairs. Legs yellow or reddish yellow, the posterior femora often a little brownish; the last tarsal joint black. The front femora not and the middle femora almost not thickened; the apical spine on the middle tibiæ so short and stubby, that it is almost wanting. The legs are yellow haired; there are no long bristles on the postero-ventral side of the middle femora, but the spines in the row here are long and bristle-like in the basal part; the apical half of the middle tibiæ is generally a little darkened, and it is clothed with a very short and dense, greyish yellow pubescence. Wings hyaline, slightly greyish or yellowish. Veins blackish. Halteres pale yellow.

Female. Similar to the male; abdomen pointed, ovipositor (eighth segment) very long.

Length 2,5—3,5 mm. (the latter size taken from the female, the ovipositor included).

This species is at once recognised by the large male genitalia, the long female ovipositor, and in both sexes by the curious pubescence on the apical half of the middle tibiæ.

T. ciliaris is not uncommon in Denmark; Ordrup Mose, Ermelund, Bøllemosen; on Funen at Veflinge and in Jutland at Hald near Viborg and at Sæby; my dates are $^{26}/_6$ — $^{20}/_8$. It occurs like the preceding in woods on bushes and in low herbage on humid and somewhat shaded places, and it is a somewhat late occurring species.

Geographical distribution:— Northern and middle Europe down into Styria; towards the north to middle Sweden, and in Finland.

28. *T. thoracica* n. sp.

Of this species I have only the female. Frons and vertex grey; epistoma white; palpi yellow, large, slightly shorter than the black proboscis. Occiput grey, upwards yellowish pruinose, with yellow hairs above, white hairs below. Antennæ yellow, arista brown; the third joint short, about half as long as the arista. Thorax black, shining, the margin yellow pruinose, the pruinosity continued in-

wards on the humeri. The uniserial dorsocentral and biserial acrostichal hairs short and few in number, greyish yellow; there are no long dorsocentral bristles; one distinct, yellow notopleural bristle (and one weaker). Scutellum with two brown marginal bristles, and on each side a small hair; postscutellum yellow pruinose. Pleura black, shining, only pruinose in front, above the front coxæ and above the hypopleura. Abdomen black, somewhat shining, with very short, yellowish hairs. Venter black. Legs yellow, tarsi narrowly and indistinctly brownish annulated, the last joint blackish; the middle knees distinctly black. The front femora a little, the middle femora more thickened; the apical spine on the middle tibiæ rather large, black at the apex. The legs are yellowish haired. Wings hyaline. Veins yellow or pale brownish. Halteres yellow.

Length 2,7 mm.

This species is characterised by the yellow antennæ, the few hairs on the thoracic disc, and the want of longer dorsocentral bristles behind.

T. thoracica seems to be very rare in Denmark, only one specimen, a female, has been taken on Langeland at Lohals on $\frac{3}{7}$ 1909 (the author).

Geographical distribution: — Besides in Denmark the species also occurs in Germany, as Mr. Becker, who has seen my specimen, has kindly communicated to me, that he also has the species in his collection.

29. *T. pallipes* Fall.

1815. Fall. Dipt. Suec. Empid. 8, 6 p. p. — 1842. Zett. Dipt. Scand. I, 305, 40, et 1849. VIII, 3009, nota. — 1862. Schin. F. A. I, 90 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 287. — *Tachydromia flavipalpis*: 1822. Meig. Syst. Besch. III, 74, 15. — 1842. Zett. Dipt. Scand. I, 288, 19. — *Platypalpus flavipalpis*: 1862. Schin. F. A. I, 90.

Male. Frons and vertex black, slightly greyish; epistoma narrow, black; palpi yellow, large, as long or almost as long as the black proboscis. Occiput greyish, with pale bristles above and whitish hairs below. Antennæ black or brownish black, the third joint elongated triangular, considerably shorter than the arista. Thorax black, shining, the margin slightly greyish pruinose; the disc is uniformly and densely clothed with short, greyish yellow hairs; a pair of indistinct, scarcely observable, weaker haired stripes indicate a division into dorsocentral and acrostichal hairs; there is one longer, yellow dorsocentral hair behind, and two black notopleural bristles; no humeral bristle. Scutellum with two black marginal bristles. Pleura greyish pruinose;

above the middle coxæ a large, black, polished spot. Abdomen black, shining, with a little longish, yellow hairs. Venter black, sometimes paler towards the base. Legs yellow, the last four tarsal joints generally brownish or blackish brown. The front femora very slightly, the middle femora considerably thickened; the middle tibiæ about two thirds of the femora in length, the apical spine small and truncate. The legs are yellowish haired. Wings hyaline or very slightly yellowish. Veins brown or blackish. Halteres yellowish white or white.

Female. Similar to the male; abdomen pointed.

Length 2,5—3,3 mm.

This species cannot be confused with any of the three preceding species, as it is distinguished by the uniform pubescence on the thoracic disc; in this respect, and also otherwise, it resembles *macula*, but this species has a much shorter third antennal joint, and yellow thoracic and scutellar bristles.

T. pallipes is somewhat rare in Denmark; Copenhagen in gardens (the author), Lersøen (Stæger); my dates are from July to ²⁴/_s.

Geographical distribution:— Northern and middle Europe down into France; towards the north to northern Sweden, and in Finland.

30. *T. nigritarsis* Fall.

1815. Fall. Dipt. Suec. Empid. 34, 1—2. — 1822. Meig. Syst. Besch. III, 74, 13. — 1842. Zett. Dipt. Scand. I, 307, 43. — 1862. Schin. F. A. I, 91 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 286.

Male. Frons and vertex broad, black, the former a little greyish pruinose, the latter shining; epistoma narrow, black; palpi small, whitish. Occiput greyish black, with two distinct, black bristles above and white hairs below. Antennæ black, long, about as long as the head, the third joint elongated, considerably longer than the short arista. Thorax black, shining, with a well defined, greyish pruinose margin; the uniserial dorsocentral and biserial acrostichal hairs short, black; there is one longer dorsocentral bristle behind, and there are two notopleural bristles, all black. Scutellum greyish pruinose, with two black marginal bristles. Pleura dark greyish pruinose, sternopleura shining. Abdomen black, shining, with a little longish, yellowish hairs. Venter black. Legs yellow; the posterior coxæ black, the front coxæ a little blackish at the base; the apical part of the hind femora black, the middle femora generally blackish or brownish above in the apical part; the front tibiæ almost quite black, the hind tibiæ generally blackish at the base; the four last tarsal joints, and generally also the apex of the metatarsus black. The front femora somewhat, the middle femora more thickened; the apical spine on

the middle tibiæ almost wanting. The legs are yellowish or pale brownish haired. Wings hyaline. Veins black. Halteres pale yellow.

Female. Similar to the male; abdomen pointed and shorter haired.

Length 2,3—2,5 mm.

T. nigratarsis is not common in Denmark, but has, however, been taken at several places; Lersøen, Tyvekrog, Tisvilde, at Vemmetofte; on Langeland at Lohals; on Funen at Hoffmansgave; in Jutland at Hald near Viborg, Struer, Hobro and Frederikshavn; my dates are $12/6$ to August. It occurs in woods on bushes and on low herbage on somewhat humid and shaded places.

Geographical distribution:— Europe down into Spain and Italy; towards the north to northern Sweden, and in Finland.

31. *T. longicornis* Meig.

1822. Meig. Syst. Besch. III, 73, 12, Tab. XXIII, Fig. 17. — 1903. Kat. paläarkt. Dipt. II, 284. — *Tachydromia pubicornis*: 1838. Zett. Ins. Lapp. 553, 15, et 1842. Dipt. Scand. I, 304, 39.

Male. Frons and vertex grey; epistoma narrow, whitish grey; palpi small, whitish; proboscis black. Occiput grey, with two long and some short, black bristles above and with white hairs below.

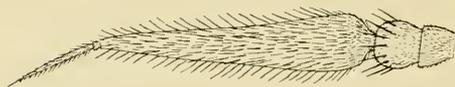


Fig. 141. Antenna of *T. longicornis*. $\times 100$.

Antennæ black, sometimes a little pale at the base, long, distinctly pubescent; the third joint is much elongated, narrow, more than twice as long as the short arista. Thorax black, shining, brownish pruinose at the margin; the uniserial dorsocentral and biserial acrostichal hairs yellow; there is one long dorsocentral bristle behind and there are two notopleural bristles, all dark brown or black. Scutellum brownish pruinose, with two dark brown or black marginal bristles, and on each side a smaller hair. Pleura dark greyish pruinose; above the middle coxæ a black, polished spot. Abdomen black, shining, with short, yellowish hairs; venter black. Legs yellow or reddish yellow, the four last tarsal joints brown or blackish. The front femora somewhat, the middle femora slightly more thickened; the apical spine on the middle tibiæ almost wanting. The legs are yellow haired; the bristles towards the apex on the anterior side of the

middle femora blackish. Wings hyaline. Veins brownish or pale brown. Halteres yellow or yellowish white.

Female. Similar to the male; abdomen pointed.

Length 2 to about 3 mm.

T. longicornis is somewhat rare in Denmark; Charlottenlund, Ermelund, Geel Skov, at Sorø and at Nyraad near Vordingborg; in Jutland at Hald near Viborg; my dates are $7/6-15/9$. It occurs like the preceding in woods on bushes and in low herbage on shaded places; it is a somewhat late occurring species; I have taken it in copula on $9/9$.

Geographical distribution: — Europe down into Spain and Italy; towards the north to northernmost Scandinavia, and in Finland.

32. *T. albiseta* Panz.

1806. Panz. Faun. germ. CIII, 17. — 1822. Meig. Syst. Besch. III, 73, 11. — 1842. Zett. Dipt. Scand. I, 310, 46. — 1903. Kat. paläarkt. Dipt. II, 279. — *Tachydromia castanipes*: 1822. Meig. Syst. Besch. III, 79, 26. — *Platypalpus castanipes*: 1862. Schin. F. A. I, 90.

Male. Vertex and frons grey, the latter narrow; epistoma exceedingly narrow, the eyes here almost touching; palpi small, whitish. Occiput greyish black, with two black bristles above, and short, yellowish hairs below. Antennæ black, long, the third joint elongated; the arista white, longer than the rest of the antennæ. Thorax black, shining, with a narrow, well defined, grey pruinose margin; the uniserial dorsocentral and biserial acrostichal hairs black, very short and scarcely observable; there is no long dorsocentral bristle behind, but there is one black notopleural bristle. Scutellum with two black marginal bristles. Pleura black, shining, the propleura, a stripe along the lower margin of the mesopleura and the pteropleura and hypopleura whitish grey pruinose. Abdomen black, shining, with short, yellowish hairs. Venter black. The exterior genitalia small, somewhat greyish pruinose, with some slender hooks at the apex. Legs slender, yellow, the front femora above and all tibiæ more or less brownish; the tarsi darker brown. The anterior femora almost not, the middle femora a little thickened; no spine at the apex of the middle tibiæ. The legs are pale brownish haired, the bristles on the postero-ventral side of the middle femora long, black; the hind femora with longish hairs below. Wings more or less greyish or brownish tinged. Veins brown or blackish, the cubital and discal vein converging, the lower branch of the postical vein much recurrent, parallel with the wing-margin. Halteres pale yellowish.

Female. Similar to the male; abdomen pointed.

Length 2,2 to about 3 mm.

T. albiseta is very rare in Denmark, only five specimens have been taken; Dyrehaven (H. J. Hansen); on Langeland at Lohals (the author), and on Funen at Odense and Veflinge (H. J. Hansen); my dates are only $\frac{30}{6}$ — $\frac{4}{7}$. The species occurs on bushes and in low herbage on shaded places in woods.

Geographical distribution: -- Europe down into Italy, and further into North Africa; towards the north to Lapland, and in Finland.

33. *T. albocapillata* Fall.

1815. Fall. Dipt. Suec. Empid. 9, 7 p. p. — 1822. Meig. Syst. Besch. III, 79, 28. — 1842. Zett. Dipt. Scand. I, 309, 45. — 1862. Schin. F. A. I, 90 (*Platypalpus*). — 1903. Kat. paläarkt. Dipt. II, 280.

This species resembles *albiseta* so much, that I shall only give the differences. The third antennal joint is longer, the antennæ, without the arista, fully as long as the head, the arista is shorter, about as long as the third joint. The legs together with the coxæ black, the apex of the femora, and the base of the anterior tibiæ generally paler; sometimes the legs are only dark brownish. The wings have the cubital vein a little more curved.

Length 2,2 to about 2,5 mm.

This species is distinguished from *albiseta* by the longer antennæ with a shorter arista, which is a quite constant character, and by the black or dark legs. The characters in the fumigation of the wings, mentioned by Strobl (Mitth. Ver. Steierm. 1892, 109), I find not confirmed, and when he speaks of a slightly pruinose thoracic disc in *albocapillata*, this is no doubt erroneous.

T. albocapillata is rare in Denmark; Amager, Ordrup Mose; on Funen at Hoffmansgave; in Jutland at Frederikshavn; and on Læsø; my dates are in July.

Geographical distribution:— Europe down into Italy; towards the north to middle Sweden, and in Finland.

Addenda et Corrigenda.

Part. II.

Page 33 Line 3 for "base" read "apex"

— 105 — 16 for "*Dichronia*" read "*Dichonia*"

— 131 — 23 for "*Ph. pulicara*" read "*Ph. pulicaria*".

Part. III.

Page 6 Line 22 for "*tesselata*" read "*tessellata*"

— 7 — 27 The number of Danish Empids is here given as 164, but since this was printed 6 species have been added, the total number thus being 170.

— 38 — 10 "*Rhamphomyia marginata*:" should be removed to the foregoing line before "1859".

— 49 After *Rh. sulcata* add:—

6a. *Rh. cinerascens* Meig.

1804. Meig. Klass. eur. zweifl. Ins. 230, 28 (*Empis*) et 1822. Syst. Beschr. III, 48. — 1862. Schin. F. A. I, 98. — 1903. Kat. paläarkt. Dipt. II, 223.

This species resembles in nearly all respects *sulcata* so very much that it is not necessary to give any description; the distinguishing character, and, so far as I see, the only real difference lies in the colour of the wings; these have at the posterior margin, about from the axillary angle to the apex of the postical vein or somewhat beyond this, a distinct, blackish border, which vanishes evenly inwards. Though this is a small difference, the border is, however, rather characteristic, and I think the species is quite certain. Schiner says, that the hind legs are not sulcated, but this is not correct, the hind legs may be sulcated or not, quite as in *sulcata*.

Length 6—7 mm.

Rh. cinerascens is very rare in Denmark, only two specimens, both females, have been taken in 1909 and 1910, one at Allerup near Esbjerg and one at Silkeborg (Esbén Petersen); the dates are $5/5$ — $2/6$, the species is thus a spring species.

Geographical distribution:— Northern and middle Europe down into Germany; it is not known north of Denmark.

Page 57 Line 15 for "on" read "or"

- 83 — 38 "*E. poplitea* Loew or a closely allied species". The species is described as new in 1902 by Melander as *E. aerobatica* (Melander Trans. Am. Ent. Soc. XXVIII, 1902, 323).
- 91 — 19 for "¹³/₁₇" read "¹³/₇"
- 131 To the geographical distribution of *E. tessellata* add that the species also goes down into North Africa.
- 154 To the geographical distribution of *H. quadrifaria* add that the species also goes down into North Africa.
- 190 — 14 for "in consists" read "it consists"
- 215 Footnote for "notopleural" read "metapleural"
- 217 — 34 for "*Chinocera*" read "*Clinocera*"
- 284 — 10 add "Kat. paläarkt. Dipt. II, 278. —"

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Synonyms are given in italics. References to Genera and Species which are not Danish have the page in italics.

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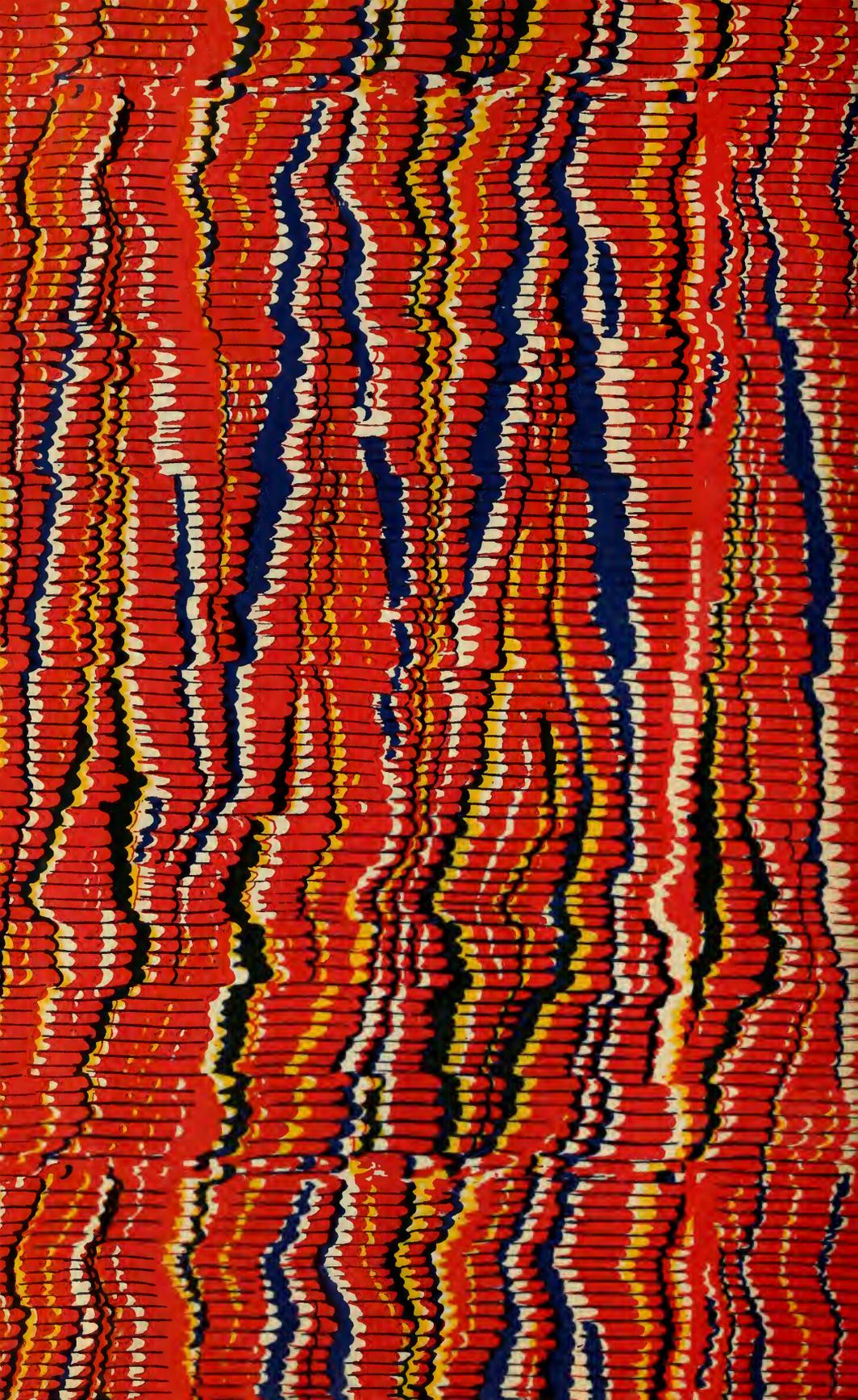
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