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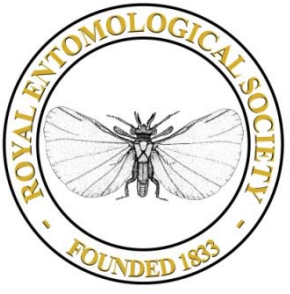

HANDBOOKS FOR

THE IDENTIFICATION

OF BRITISH INSECTS

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HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS

DIPTERA

2. NEMATOCERA : families TIPULIDAE TO CHIRONOMIDAE

By

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Contents of this Part:

HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS

The aim of this series of publications is to provide illustrated keys to the whole of the British Insects (in so far as this is possible), in ten volumes, as follows :

I. Part 1. General Introduction.
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II. Hemiptera.
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VI. Hymenoptera : Symphyta and Aculeata.
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IX. Diptera : Nematocera and Brachycera.
X. Diptera : Cyclorrhapha.

Volumes II to X will be divided into parts of convenient size, but it is not possible to specify in advance the taxonomic content of each part.

Conciseness and cheapness are main objectives in this new series, and each part will be the work of a specialist, or of a group of specialists. Although much of the work will be based on existing published keys, suitably adapted, it is expected that it will also include much new and original matter.

Parts will be issued, separately paged and priced, as they become available.

Orders for the Series or for separate parts may be placed with the Registrar at the Society's rooms now, but prices can only be quoted for those parts already in the press.

The Society is indebted to the Royal Society for a grant towards the cost of initiating this series of *Handbooks*.

A list of parts now available appears on the back cover.

DIPTERA

Family TIPULIDAE

By R. L. Coe

Characteristics.

Flies of the family Tipulidae may be recognized by their slender bodies and long, slender legs, the latter characteristic having given rise to the peculiarly apt nicknames " Daddy-long-legs " and " Craneflies." The term Craneflies is sometimes more broadly applied to include the related Dipterous families of Trichoceridae, Ptychopteridae and Anisopodidae, all the species of which are more or less long-legged. Scientifically, however, Tipulidae differ from these three families by having the following combination of characters: no ocelli, two anal veins, and a V-shaped suture dividing the praescutum from the scutum.

Most of the larger species belong to the subfamily Tipulinae (*Tipulidae longipalpi* or " long-palped craneflies "), while the remaining subfamilies, Cylindrotominae and Limoniinae (*Tipulidae brevipalpi* or " short-palped craneflies ") are composed mainly of the smaller species. In Britain there are 291 known species of Tipulidae, and 15 named varieties of these. The adults are usually grey, brown or black-bodied, although some handsome combinations of yellow and black occur (e.g. *Nephrotoma* spp.), and in otherwise sedately coloured species the wings are often attractively patterned with brown or black markings (e.g. *Tipula maxima* Poda, *Pedicia rivosa* Linnaeus and various *Limonia* spp.). In several other species the wing-membrane is strongly tinted yellowish (e.g. *Limonia bifasciata* Schrank).

Life-History.

Comparatively little is known of the early stages of the British Tipulidae, even in the genus *Tipula*, which includes some of the largest species in the family. In fact, the life-histories of little more than a dozen species have been ascertained in any detail. Students who contemplate taking up this fascinating and largely unexplored field of study will find Alexander's (1919–20) notes on breeding technique invaluable.

The eggs of Tipulidae are black, yellow, white or green in colour, and are deposited in a variety of media, the breeding habitats being very diverse. The great majority of species develop in the soil, and some of these are of economic importance because the larvae (termed " leather-jackets " on account of their tough integument) feed on the living tissues of grasses and other plants. *Tipula oleracea* Linnaeus and *T. paludosa* Meigen belong to this category. The grubs of the latter species, which is

by far the commoner of the two, cause considerable damage to pastures, grain-fields and to grasses on golf courses. *Nephrotoma flavescens* Linnaeus is a serious pest of cultivated grasses at times, and several other *Tipula* and *Nephrotoma* species (particularly *Tipula vernalis* Meigen) are suspected of being similarly destructive as larvae.

The larvae of some *Limonia* species are fungivorous, while amongst the TIPULINAE, *Tanyptera, Ctenophora* and a number of *Tipula* species breed in the decayed or partially decayed wood of deciduous trees.

CYLINDROTOMINAE are phytophagous in the larval stage, both on terrestrial and aquatic plants. The larvae are caterpillar-like and greenish or greenish-brown in colour, resembling their host-plants very closely. As early as 1776 Degeer gave an interesting account of a species of this group, describing the immature stages of *Phalacrocera replicata* Linnaeus, the larva of which clings to submerged plants in ponds in which currents keep the water in continual motion. Its body is provided with numerous long, flexible filaments, and it retains hold of the food-plant by means of large anal hooks. When disturbed, this curious larva curls into a ball in caterpillar fashion.

Among other aquatic larvae is that of *Dicranota bimaculata* Schummel, which lives in the sand or mud of streams and ponds, and is carnivorous, feeding on small red-worms of the genus *Tubifex*, and other minute creatures. It creeps about rapidly on the bottom by its well-developed pseudopods, and is also a capable swimmer.

At least one species breeds in salt water, larvae of *Geranomyia unicolor* Haliday having been discovered by Saunders (1930) in filamentous algae on a stone breakwater at Criccieth. Other TIPULIDAE, including *Tipula vittata* Meigen and *T. luna* Westhoff, breed in mud at the margins of streams, while the larvae of *Prionocera turcica* Fabricius (fig. 1*a*) have been found in the rich organic mud of marshes. The present writer (1941) has bred *T. fascipennis* Meigen, *T. cava* Riedel and *Nephrotoma quadrifaria* Meigen from dried cow-dung. There are many other breeding habitats in this family.

The duration of the larval stage in TIPULIDAE varies from about a month to the greater part of a year. Although transformation to the pupa usually takes place in or near to the larval habitat, some of the aquatic larvae migrate to the soil when fully grown. The pupa (fig. 1*b*) is mummy-like in appearance and brownish in colour, becoming darker as it approaches maturity. In the soil-breeding species, the mature pupa works its way to the surface of the soil, from which it finally projects, the thorax splits and the fly emerges. The duration of the pupal stage varies from about six days up to several weeks.

HABITS.

Little is known about the feeding-habits of adult TIPULIDAE, except that those species with an elongate rostrum and mouthparts (e.g. *Geranomyia*) feed on the nectar of tubular flowers. It seems likely that the majority of TIPULIDAE take no nourishment as adults.

The phenomenon of swarming is frequently observed in flies of the subfamily LIMONIINAE. Cuthbertson (1926) states that he has observed the habit in thirty-five species in the Clyde area. These dancing swarms are usually formed towards dusk, preparatory to, or for the purpose of,

mating. Such assemblies often include males only, the females resting in adjacent vegetation or elsewhere in the vicinity.

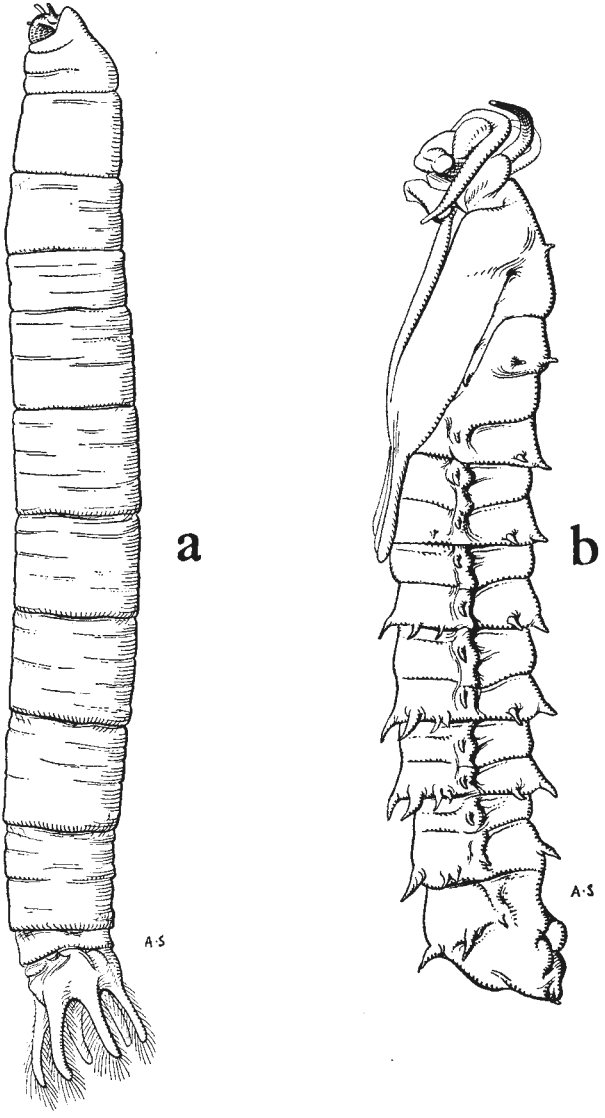

FIG. 1.—a. *Prionocera turcica* Fabricius (TIPULINAE), larva, lateral aspect (natural size 25 mm.). b. *Ctenophora pectinicornis* Linnaeus (TIPULINAE), pupa, lateral aspect (natural size 12 mm.).

Some TIPULIDAE, principally species of the genera *Dicranomyia* and *Geranomyia*, have the curious habit of bobbing up and down rapidly on

their long, slender legs while resting. This practice appears to be unconnected with sexual activities, and is common to both males and females.

Females of the soil-breeding species of TIPULIDAE, particularly some *Tipula* and *Nephrotoma*, may frequently be observed in gardens during the warmer months thrusting their ovipositors into the earth and depositing eggs in the drills thus made. Those species of TIPULIDAE that oviposit in soil have a moderately long, horny, usually narrow ovipositor, and in this connection it is interesting to note how the organ is specialized in structure for egg-laying in particular media. For example, the eggs of *Phalacrocera replicata* Linnaeus are deposited in the leaf-axils of certain plants, and the ovipositor is short, blunt and fleshy, the cerci being quite unchitinized. In contrast, the females of the genus *Tanyptera* are provided with an elongate, powerful and heavily chitinized ovipositor, the eggs being deposited

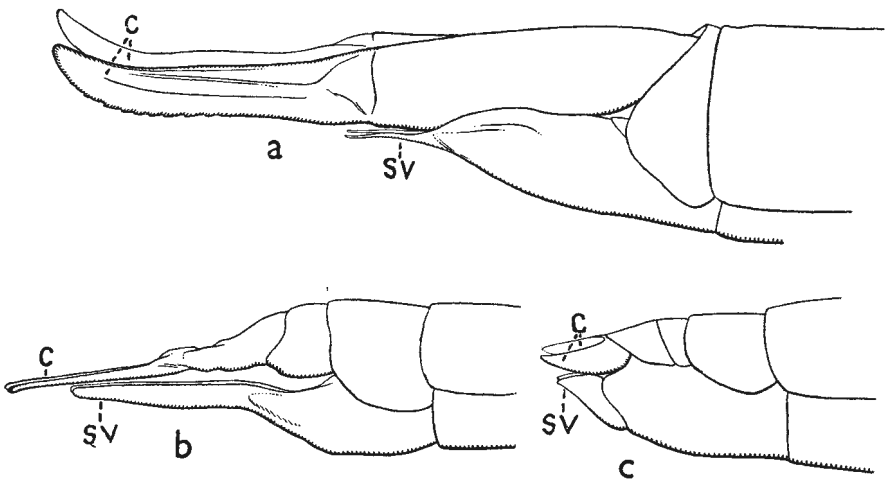

FIG. 2.—Female hypopygia (or ovipositors) of *Tipula* spp., lateral aspect (*C* = cerci; *SV* = sternal valves). a. *T. nubeculosa* Meigen. b. *T. unca* Wiedemann. c. *T. vernalis* Meigen.

in the partially, often very slightly, decayed wood of trees. In the allied genus *Ctenophora* egg-laying takes place in more completely decayed wood, and the ovipositor is less powerful and less heavily chitinized. In *Tipula nubeculosa* Meigen (fig. 2*a*) and some other species of *Tipula*, the cerci are very large, curved and serrated, while the sternal valves are rudimentary or almost obsolete. The reason for this specialized structure has not yet been ascertained.

COLLECTION AND PREPARATION.

The general technique for collecting adult Diptera applies to TIPULIDAE. It is important that teneral (i.e. newly-emerged) specimens should not be killed on capture, but placed alive in tubes for twenty-four hours so that the wing markings develop properly. In newly-emerged specimens the darker areas of the wing membrane are often barely discernible, and if the

fly is killed in that condition correct identification is rendered needlessly difficult.

Specimens should be prepared for study so that the different parts of the fly may be readily examined ; hence, it is inadvisable to " set " specimens by gumming on card or other materials with the legs outspread, however attractive this may be from the aesthetic viewpoint. Apart from simple pinning, an excellent method is to affix the specimen by the side of the thorax to the narrow end of an elongate triangular celluloid " point," with a pin through the broad end. A suitable cement is made by dissolving finely-cut slivers of celluloid in amyl acetate. A shallow, broad-mouthed jar is best for the purpose. After the celluloid has dissolved (a matter of twenty-four hours or so), stir the solution with a glass rod, and if too thick or thin, add more amyl acetate or celluloid until the desired consistency is obtained.

To mount the specimen, lay it on its side on a piece of white card or paper, drive a pin through the broad end of the " point," slide the " point " to the top of the pin, dab a little solution on the narrow end of the " point " and gently but firmly press it on to the side of the thorax of the specimen. The " point " may then be slid down the pin by means of forceps until it is at a suitable height for safety and ease of manipulation.

General Notes on the Keys.

In the following keys most species are separated primarily by external characters, salient features of the hypopygium being frequently appended. Species of some obscure groups of LIMONIINAE, however, cannot be distinguished satisfactorily by external characters (e.g. *Molophilus*), and with these primary use has been made of hypopygial differences. The notation of wing-veins is illustrated by figs. 6 (TIPULINAE) and 20 (LIMONIINAE), and the various parts of the hypopygium by figs. 2 (female hypopygia of *Tipula*), 5 (male hypopygia of *Tipula*), 8 (male hypopygium of a LIMONIINAE) and 28–30 (coxite and styles of male hypopygia of *Molophilus*). Although the precise meaning of any specialized term is usually explained where first mentioned in the text, when in doubt the student should refer to the Introduction which forms Part I of this volume of these Handbooks. Edwards (1938 : 4–14) gives a detailed account of the characters used in the classification of TIPULIDAE, with special regard to LIMONIINAE.

When the wing-markings of *Tipula* are being examined, the extent of any light or dark areas of the membrane is best seen against a black background. Many of the larger species of TIPULIDAE may be readily identified with a 15× hand-lens, but with the majority of species the use of a binocular microscope is essential.

It is hoped that the new keys to *Nephrotoma* and *Tipula* will facilitate the correct determination of species belonging to these genera. As an aid to the identification of some female *Tipula*, the relative lengths of the cerci and sternal valves of the ovipositor are sometimes given, and it should be noted that my measurements are from the lateral aspect and with the parts closely apposed.

Acknowledgments.

In preparing the keys to CYLINDROTOMINAE and LIMONIINAE I have used as a basis Edwards' *British Short-palped Craneflies*, and the figures

illustrating my keys to those subfamilies are taken without exception from that work, only minor alterations having been made to a few of the drawings.

The seventeen illustrations of TIPULINAE have been specially drawn by Mr. Arthur Smith.

KEY TO SUBFAMILIES.

1 Wing-vein Sc ending in R ; palpi long ; tibiae spurred ; antennae usually 13-segmented (including normally minute terminal segment) TIPULINAE (p. 6).

Sc usually ending in costa ; palpi usually short ; antennae usually 14- or 16-segmented 2

2 R_s only two-branched *and* tibiae spurred ..... CYLINDROTOMINAE (p. 22).

R_s with three branches *or* tibiae without spurs ..... LIMONIINAE (p. 22).

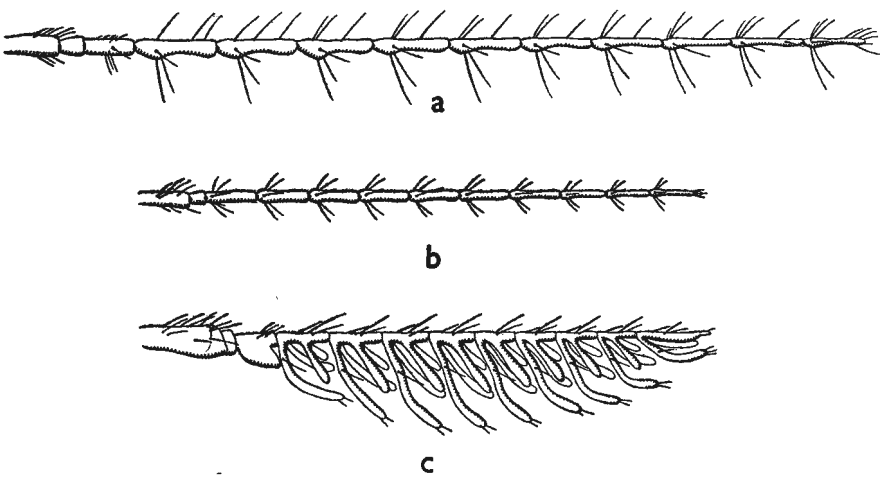

FIG. 3.—Male antennae of TIPULINAE, lateral aspect. a. *Tipula juncea* Meigen. b. *T. melanoceros* Schummel. c. *Ctenophora pectinicornis* Linnaeus.

Subfamily TIPULINAE.

KEY TO GENERA.

1 Wing without discal cell ; M_3 arises from M_1 ; tibiae without spurs **Dolichopeza** Curtis (p. 7).

Discal cell present ; M_3 arises from M_4 ; all tibiae spurred 2

2 Antennae without whorls of long hairs 3

Antennae with whorls of long hairs 6

3 ♂ antennae pectinated ; ♀ antennae serrated or simple ; shiny species ; ground colour yellow with black markings or almost all black 4

♂ antennae serrated ; ♀ simple ; dull species ; ground-colour brownish grey with black markings ..... **Prionocera** Loew (p. 7).

4 ♂ antennae with fourth and succeeding segments bearing a long basal process and a somewhat shorter subapical one. ♀ antennae with flagellar segments simple, and, apart from the first, short and roundish, broader than long **Dictenidia** Brullé (p. 7).

♂ antennae with fourth and succeeding segments bearing more than two processes ; ♀ flagellar segments serrated or mainly longer than broad 5

5 ♂ antennae with fourth and succeeding segments bearing two long basal processes and one rather short, roundish, subapical process. ♀ antennae with at least basal flagellar segment long, only terminal segments serrated; ovipositor more than one-third as long as the abdomen.....**Tanyptera** Latreille (p. 7).
♂ antennae with fourth and succeeding segments bearing two long basal processes and two somewhat shorter subapical ones (fig. 3*c*). ♀ antennae with all flagellar segments short, serrated; ovipositor less than one-fifth as long as the abdomen **Ctenophora** Meigen (p. 8).

6 Wing vein R_5 usually short; Sc ends close to base of R_5; cell 4 usually sessile; body colour black and yellow; body usually shiny; praescutum with three shiny black stripes (which may be partially, or entirely fused, or, on the other hand, in immature examples the median stripe may appear to be narrowly divided along its entire length).....**Nephrotoma** Meigen (p. 8).
R_5 usually long; Sc ends far from base of R_5; cell 4 always petiolate; body colour usually grey, brown or dull yellow, rarely black; praescutal stripes (when present) usually dull, rarely slightly shining **Tipula** Linnaeus (p. 11).

Genus **Dolichopeza** Curtis.

KEY TO SPECIES.

1 Slim, blackish-brown species; antennae 12-segmented; scape yellowish, pedicel often yellowish, flagellum dark brown; legs very long and slender; tips of metatarsus and following three segments white, rest of legs dark brown; wing-length 11–15 mm. *Frequent in damp woods. Generally distributed.* 4–6 **albipes** Stroem.

Genus **Prionocera** Loew.

KEY TO SPECIES.

1 Occiput, pronotum and praescutum with longish yellow hairs; all segments of antennal flagellum, except first in ♀, deeply serrate below; wing-length 13–15 mm. ♂ tergite 9 with hind corners rounded. *On moors, uncommon. N.W. Yorks, Glos (Bristol).* 6.....**pubescens** Loew.
Occiput, pronotum and praescutum with short yellow hairs; all segments of flagellum, except first in ♀, moderately serrate below.....2

2 ♂ tergite 9 with hind corners extended as long, somewhat pointed projections, a pair of rather short, outwardly directed apical intermediate lobes and a pair of closely approximated, short, tapering, downwardly directed apical median processes. ♂ ♀ wing-length 11–17 mm. *Frequent on moors. Generally distributed.* 5–9.....**turcica** Fabricius.
♂ tergite 9 with hind corners slightly extended as short blunt projections, a pair of rather short inwardly directed subapical intermediate lobes and a single, short, broad, truncate median projection; wing-length 15 mm. *Rare. Norfolk (Catfield).* 8 (1 ♂).....**proxima** Lackschewitz.

Genus **Dictenidia** Brullé.

KEY TO SPECIES.

1 Shining, black species; thorax black, with more or less extensive orange markings; abdomen entirely black in ♂, black with anterior orange markings to segments, spreading laterally, in ♀; wings with two large dark brown spots, one extending down from stigmatic area to discal cell, the other, somewhat smaller, situated at apex; legs orange, femora and tibiae black-tipped, tarsi blackish; wing length 10–15 mm. *Frequent in damp woods. Generally distributed.* 4–7 **bimaculata** Linnaeus.

Genus **Tanyptera** Latreille.

KEY TO SPECIES.

1 Coxae and trochanters entirely black; antennae entirely black; wing length 13–19 mm. ♂ abdominal tergites 2 and 3 mainly reddish, but witn continuously black median line, other tergites black. ♀ all femora black-tipped. *Uncommon. Generally distributed.* 5–6.....**nigricornis** Meigen.

Coxae at least brown-tipped, trochanters entirely yellowish-brown ; wing length 15–19 mm. ♂ all tergites black, or mainly orange without continuously black median line. ♀ at most posterior femora black tipped.....2

2 Antennae brownish or black ; ♂ abdomen entirely black, ♀ abdomen reddish only at base. *Frequent in damp woods. Generally distributed.* 4–6
atrata Linnaeus. **Typical form.**

Antennae extensively orange ; ♂ abdomen mainly orange, ♀ abdomen with tergites somewhat orange beyond base, and sternites extensively orange almost to base of ovipositor. *Frequent in damp woods. Generally distributed.* 4–6
atrata var. **ruficornis** Meigen.

Genus **Ctenophora** Meigen.

KEY TO SPECIES.

1 Wing strongly yellow-tinged, with large brown spot extending from stigma almost to wing tip, and downwards over outer half of discal cell ; abdomen yellow with broad blackish bands on basal and apical segments ; antennae yellow with long dark-brownish processes in ♂, yellow in ♀, in both sexes thickened and deeply serrate below ; wing length 13–19 mm. *Uncommon in woods. Staffs (Cannock Chase), Berks (Windsor Forest), Kent (Darenth), Hants (New Forest).* 6–7 .....**ornata** Meigen.

Wing strongly yellow-tinged on fore-margin only or quite clear, with small brown stigma only.....2

2 Abdomen with extensive black dorsal markings, which often spread laterally in ♀, but never form separate bands ; coxae, femora and tibiae brownish-yellow, the femora and tibiae often dark brown-tipped ; wings clear ; antennae (fig. 3c) mainly darkened ; wing length 15–19 mm. *Frequent in woods. Generally distributed.* 5–6.....**pectinicornis** Linnaeus.

Abdomen black-banded, the yellow ground-colour restricted to hind borders of segments ; coxae black, femora and tibiae brownish-yellow, hind femora with a broad dark-brown subapical ring, front and mid pairs often with a faint brownish subapical marking ; antennae mainly yellowish, the long processes in ♂ dark-brownish ; wing length 14–18 mm. *Uncommon in woods. Yorks southwards to Hants.* 5.....**flaveolata** Fabricius.

Genus **Nephrotoma** Meigen.

KEY TO SPECIES.

1 Praescutal stripes almost or completely fused.....2

Praescutal stripes well separated ; pleurae largely yellowish.....3

2 Pleurae, coxae and rostrum almost all black ; abdomen black with three or four yellow bands ; a dark shade crossing wing on veins below stigma and a dark shade at tip ; squama bare ; wing length 13–18 mm. ♂ tergite 9 short and broad, flattened on disc, with broad median apical incision ; sternite 8 rather compressed, simple, clothed with longish brown hairs. ♀ cerci rather long, blunt. *Frequent. Generally distributed.* 5–6, 8.....**crocata** Linnaeus.

Pleurae, coxae and rostrum mainly yellow ; abdominal tergites with more or less interrupted median dark stripe (broader and continuous in ♀), continuously yellow laterally, and a jagged, sometimes interrupted, dark stripe along side-margins ; wing clear, apart from the brown stigma ; squama bare ; wing length 10–15 mm. ♂ tergite 9 short and broad, flattened on disc, tip with roundish depression and slight emargination in middle ; sternite 8 with short, rather narrow, almost truncate median projection. ♀ cerci steadily tapering to a fine point. *Rare. Sussex (Sullington and Storrington).* 5–6
sullingtonensis Edwards.

3 A dark shade crossing wing on veins below stigma and a dark shade at tip ; tergites resembling last species, but median dark stripe in ♂ narrower and less interrupted ; squama with 4–8 long bristly hairs on dorsal surface towards posterior margin of wing ; wing length 12–15 mm. ♂ tergite 9 rather short, broad, broadly depressed on disc after base, and terminating with a median pair of more or less blackish triangular projections ; sternite 8 with a short, narrow, deep, yellow median projection. ♀ ovipositor small, cerci short and blunt, sternal valves rudimentary. *Common. Generally distributed.* 5–8
quadrifaria Meigen.

Any dark shade below stigma confined to basal section of R4 + 5; extreme wing-tip sometimes shaded (*guestfalica* and *analis*).....4

4 Tergites with transverse black bands distally, those on middle tergites usually extending narrowly to side-margins, actual side-margins otherwise normally yellow without a jagged dark stripe; wings clear, apart from the brown stigma; squama bare; wing length 14–18 mm. ♂ tergite 9 orange, usually with a broad dark median stripe, squarish, tip very slightly emarginate in middle; sternite 8 with a median triangular depression at tip, bounded by brushes of long incurved golden hairs. ♀ cerci frequently constricted before the rather blunt tip. *Common. Generally distributed.* 6–10.....**flavipalpis** Meigen.

Tergites with longitudinal dark median stripe (sometimes interrupted), continuously and broadly yellow laterally, side-margins often with a more or less jagged (sometimes interrupted) dark stripe or with dark spots.....5

5 Postnotum with well-developed, normally black hairs, particularly conspicuous posteriorly; squama with a cluster of 4–10 bristly hairs on dorsal surface towards posterior margin of wing; wing with brown stigma, dark shading over basal section of R4 + 5, and occasionally an almost imperceptible clouding at extreme wing-tip; wing length 11–14 mm. ♂ tergite 9 short and rather broad, narrowing towards tip, a median rounded depression usually present, tip rather deeply emarginate in middle; sternite 8 simple. ♀ ovipositor rather small, cerci pointed, sternal valves reduced. *Common. Generally distributed.* 6–8 **guestfalica** Westhoff.

Postnotum bare, or with weak, scattered, inconspicuous, normally pale pubescence only, practically absent posteriorly; squama bare (occasionally **scurra** has one or two fine hairs on or below posterior edge of squama towards hind margin of wing).....6

6 Praescutum usually without a black spot adjoining anterior end of the lateral stripe, but when present such spot always shining; sides of praescutum shining as on disc (less so in *maculata*).....7

Praescutum with dull black spot adjoining anterior end of the shining lateral stripe; sides of praescutum otherwise hardly, or not at all, shining.....12

7 Pleurae all yellow, apart from dark mark sometimes present immediately above base of halteres; ground-colour of abdomen usually, and thorax and head often, more brownish than yellow; wings clear, apart from the yellow, brown or, rarely, blackish stigma; wing length 15–20 mm. ♂ tergite 9 resembling *quadristriata*, but rather more swollen towards sides, tip more rounded and without an obvious pair of downwardly directed teeth; sternite 8 only slightly produced and rounded laterally, with scattered golden hairs, which are longer on middle towards tip but scarcely form a tuft. ♀ cerci rather blunt, sternal valves well developed. *Frequent. Generally distributed.* 6–9....**scurra** Meigen.

Pleurae with conspicuous black marks, including one on lower part of sternopleura and one immediately above base of halteres.....8

8 Stigma faint, yellow or light brown, wing otherwise clear; wing length 13–15 mm. ♂ tergites with median dark stripe broader than usual; tergite 9 unusually short, broad, flat, tip very slightly emarginate at middle; sternite 8 with rather long pale yellow hairs, and terminating with a conspicuous truncate median projection. ♀ ovipositor rather short, cerci pointed, sternal valves much reduced. *Frequent. Generally distributed.* 5–8.....**maculata** Meigen.

Stigma conspicuous, dark brown or black (at least in part).....9

9 A shining brown spot below front end of the lateral praescutal stripe (sometimes larger and joined to the stripe, usually separate and occasionally very small and faint); paratergite (the small strip at side of praescutum) mainly yellow; wing length 14–16 mm. ♂ tergite 9 rather short and narrow, deeply incised and with a large median depression; sternite 8 terminating at middle in a rather long pointed chitinized spike. ♀ cerci pointed, sternal valves much reduced. *Common locally. Scotland* (*Inverness, Morayshire, Banffshire*). 8–9.....**aculeata** Loew.

No dark spot below front end of lateral praescutal stripe.....10

10 ♂ antennae 19-segmented, flagellar segments strongly serrate, ♀ antennae 15-segmented, simple. ♂♀ pleurotergite usually all yellow, except for the small black mark immediately above the haltere, occasionally the upper part faintly brownish; wing length 14–17 mm. ♂ tergite 9 short and rather broad, deeply incised and with a broad median depression at base, swollen and rounded to-

wards sides ; sternite 8 with a long ventral extension, narrowly divided on median line soon after base so that the extended portion forms a pair of (normally) closely applied lobes, the tips of which bear a small tuft of short golden hairs. ♀ ovipositor small, cerci rather rounded at tips, sternal valves well developed. *Uncommon. Generally distributed.* 5–8 ..... **dorsalis** Fabricius.

Antennae 13-segmented in both sexes (as usual) ; pleurotergite with the upper part largely or entirely brown 11

11 Antennae with first flagellar segment as long as second and third together ; stigma entirely dark brown, or partly yellowish ; wing length 12–15 mm. ♂ antennae with flagellar segments strongly nodulose, segments 2–4 with well-developed nodule at tip as well as base ; tergite 9 short and broad, narrowing slightly towards tip, depressed on median line, swollen and rounded towards sides, tip with a moderate median emargination and a pair of short, downwardly-directed teeth ; sternite 8 with a wide semicircular incision and short blunt lateral extensions, and bearing a dense median tuft of downwardly directed rather long golden hairs and scattered golden hairs laterally. ♀ ovipositor slightly longer than in *dorsalis*. *Merioneth* (*Dyffryn*), *N. Devon* (*Braunton Burrows*). 7–8 ..... **quadristriata** Schummel.

Antennae with first flagellar segment much shorter than second and third together ; stigma entirely dark brown or blackish ; wing length 15–18 mm. ♂ antennae with weakly-developed nodules at base of segments, scarcely indicated at tip except on segment 2 ; tergite 9 as in *quadristriata*, but apical emargination slightly more extensive ; sternite 8 incised soon after base, the incision gradually and moderately widening, the sternite terminating laterally in a pair of rounded yellow knobs, which bear rather long golden hairs. ♀ ovipositor resembling that of *quadristriata*. Uncommon. Generally distributed. 6–7, 10 **lunulicornis** Schummel.

12 Wing-tip conspicuously and broadly darkened ; stigma large, conspicuous, dark brown ; pleurae with conspicuous black marks, or these partly or entirely orange ; wing length 14–16 mm. ♂ tergite 9 short, flat, rather broad, moderately and broadly depressed before the short median apical incision ; sternite 8 rather long, tip slightly and rather narrowly emarginate in middle, the entire sternite clothed with pale golden hairs, mainly rather long, those just before and at apex longer and incurved. ♀ cerci clubbed and rounded at tips, sternal valves well developed. *Uncommon. Generally distributed.* 6–7 .... **analis** Schummel.

Wing-tip not at all darkened (or rarely in **cornicina,** extreme tip narrowly and almost imperceptibly shaded) 13

13 Pleurae practically all yellow, with more or less obvious orange markings, including one on lower part of sternopleura ; stigma rather small, brown, varying in intensity but always distinct ; tergites with dark median stripe often very faint and sometimes absent on tergites 6 and 7 ; wing length 11–15 mm. ♂ tergite 9 short and rather broad, deeply and broadly depressed on disc for visible length, moderately swollen and rounded towards sides, with a rather short and broad median apical incision ; sternite 8 with a rather long, deep, yellow median projection, broad at base and gradually narrowing until just before the swollen, rounded, more or less whitish tip. ♀ cerci deep keeled, pointed, sternal valves reduced. *Frequent. Generally distributed.* 7–9 ..... **cornicina** Linnaeus.

Pleurae yellow, with conspicuous black markings, including one on lower part of sternopleura ; stigma rather small, yellow or light brown, faint ; tergites with median stripe blackish, conspicuous 14

14 Praescutal black stripes with the margins narrowly dull (particularly noticeable from behind) ; dark mark on occiput roundish, broad ; tergites with lateral dark dots, usually well separated, especially so towards base ; wing length 11–14 mm. ♂ tergite 9 unusually short, broad, rather flat, slightly depressed on disc and with a slight median incision at tip (these last two features more or less obvious) ; sternite 8 short, with a rounded median yellow projection. ♀ cerci deep keeled, pointed, sternal valves reduced. *Common. Generally distributed.* 6–9 ..... **flavescens** Linnaeus.

Praescutal stripes uniformly shining (as usual) ; dark mark on occiput elongate, narrow ; tergites with elongate lateral dark markings, sometimes merging ; wing length 10–15 mm. ♂ tergite 9 resembling *flavescens*, but rather deeply and broadly depressed on disc and swollen and rounded towards sides ; sternite

8 rather long, with median yellow projection, which is usually narrower than in *flavescens*. ♀ ovipositor resembles *flavescens*. *Frequent. Generally distributed.* 4–8 ..... **submaculosa** Edwards.

Genus **Tipula** Linnaeus.

KEY TO SPECIES.

1 Wing membrane with brownish streak along fore margin, merging into the yellow or brown stigma, and parallel pale streak below, otherwise greyish without obvious light or dark areas; squama usually with a few very short hairs 2
Wing membrane otherwise 4

2 Minimum space between eyes below at most subequal to maximum width of antennal scape (fig. 4*a*); antennae 13-segmented; usually greyish species, but abdomen occasionally somewhat ferruginous and often with a blackish median and/or lateral longitudinal stripe; wing length 18–28 mm. ♂ tergite 9 with median projection short (its breadth at base exceeding its length), and roundly bifurcated at apex, the bifurcations blackish; sternite 8 simple, 9 almost fused with tergite 9 (as in *paludosa* and *czizeki*). ♀ wings as long as abdomen; sternal valves usually extending to about two-thirds length of cerci, cerci only slightly clubbed at tips. *Common* (but less so than *paludosa*). *Generally distributed.* 4–10 (peak 5–6) ..... **oleracea** Linnaeus.
Such space between eyes at least one-and-a-half times the maximum width of scape (fig. 4*b*) 3

3 Antennae 14-segmented; grey species, but abdomen often somewhat ferruginous, and frequently with a blackish median and/or lateral longitudinal stripe; wing length 13–23 mm. ♂ tergite 9 with median projection elongate (its length at least equal to, and normally exceeding, its breadth at base) and roundly bifurcated at apex, the bifurcations blackish. ♀ wings shorter than abdomen; sternal valves usually extending to about three-quarters length of cerci, cerci rather strongly clubbed at tips. *Common. Generally distributed.* 5, 7–10 (peak 8–9) ..... **paludosa** Meigen.
Antennae 13-segmented; grey species; legs usually more extensively darkened than in *oleracea* and *paludosa*; wing length 20–22 mm. ♂ hypopygium, lateral view as in fig. 5*b*; tergite 9 with median projection resembling *paludosa*. ♀ wings as long as abdomen; ovipositor resembling *oleracea*. *Uncommon. Yorks, Lancs, Bucks, Herts.* 10 ..... **czizeki** de Jong.

4 Squama bearing a cluster of bristly hairs (at least two and usually more) on dorsal surface towards posterior margin of wing (fig. 5*d*), often more numerous in female. (NOTE.—These hairs are very small and inconspicuous in *maxima, vittata, cheethami, fulvipennis* and *luna*) 5
Squama bare 21

5 Cu running almost straight to just before wing margin (i.e. well past m-cu) 6
Cu distinctly curved down immediately after m-cu 7

6 ♂ basal segment of antennal flagellum clear yellow, following segments clear yellow or light brownish with black bases, apical segments usually darker; tergite 9 with a pair of lateral pointed projections besides the median projection. ♀ basal segment of flagellum clear yellow, following segments clear yellow with black bases, apical segments usually darker. ♂♀ halteres with base of knob usually light brownish; 6–10 long squamal hairs; wing length 11–15 mm. *Frequent. Sutherland southwards to Kent* (*Tunbridge Wells*). 5–8
variicornis Schummel.
♂ basal segment of flagellum obscurely yellowish or light brown, following segments dark brown with black bases; tergite 9 with median projection only. ♀ basal segment of flagellum light brownish, following segments light brownish with black bases, apical segments usually darker. ♂♀ halteres with base of knob usually blackish; 8–10 long squamal hairs; wing length 14–17 mm. *Uncommon. S.W. Ireland* (*Killarney*), *Westmorland* (*Dungeon Ghyll*), *N. Wales* (*Merioneth*), *Glamorgan* (*Swansea*), *Yorks* (*Barnsley*), *Dorset* (*Studland*), *Hants* (*New Forest*). 5–7 ..... **yerburyi** Edwards.

7 Wing conspicuously brown-patterned; costal cell brown 8
Wing otherwise; costal cell pale yellowish or clear, ending in distinct yellowish or brownish stigma 9

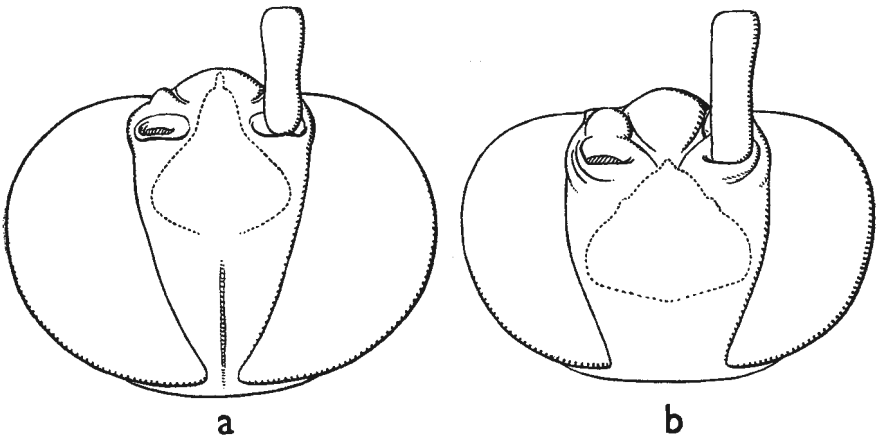

FIG. 4.—Heads of *Tipula* spp., antero-ventral aspect, outline, comparing width of left scape with space between eyes below. a. *Tipula oleracea* Linnaeus. b. *T. paludosa* Meigen.

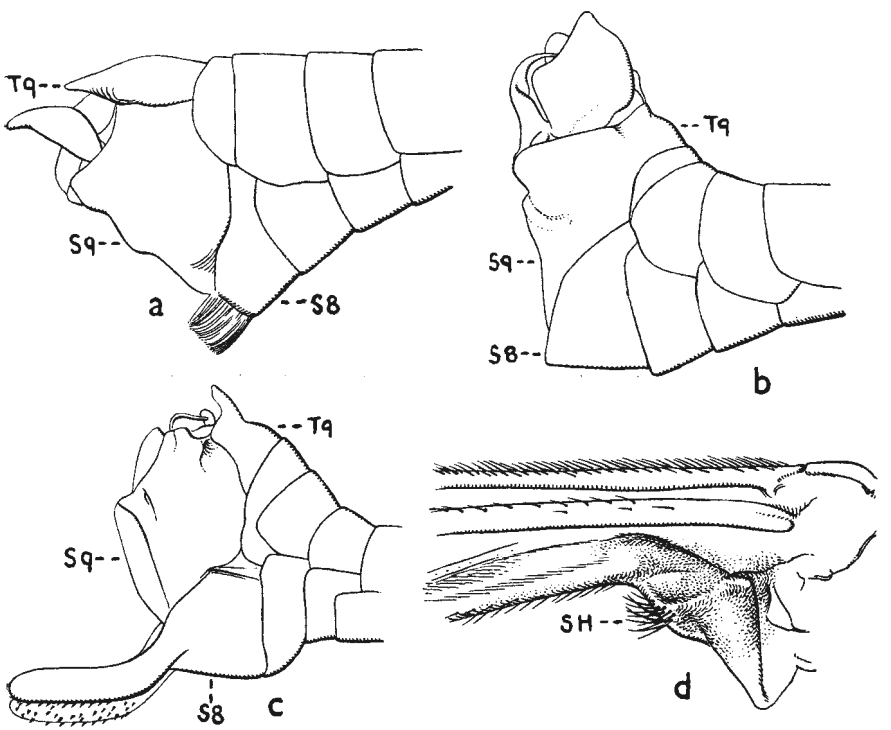

FIG. 5.—a–c. Male hypopygia of *Tipula* spp., lateral aspect (*T*9 = tergite 9; *S*8 and *S*9 = sternites 8 and 9). a. *Tipula luna* Westhoff. b. *T. czizeki* de Jong. (Note almost complete fusion of *T*9 and *S*9.) c. *T. staegeri* Nielsen. d. Wing-base of *T. lunata* Linnaeus, showing squamal hairs (*SH.*).

8 Wing with three large dark brown patches extending downwards from fore margin across the upper half; area below vein 1A with two brown patches (fig. 6); 8–20 very short squamal hairs; largest British *Tipula*, brownish-grey; wing length 22–30 mm. ♂ tergite 9 squarish, terminating in a pair of short, blunt, dull black downwardly extending median projections, and longer, yellow-tipped pointed lateral projections; sternite 8 simple. *Frequent mainly in woods. Generally distributed.* 4–8 ..... **maxima** Poda.

Brownish wing-markings less strongly defined and more restricted to fore margin; area below 1A greyish; 3–10 very short fine squamal hairs; rather large greyish species; wing length 17–20 mm. ♂ tergite 9 short and squarish, depressed apically on median line, median projection rather short, deeply bifurcated at tip, the bifurcations black-tipped and slightly divergent; apex of sternite 8 with dense internal brush of rather short golden hairs. *Frequent in damp woods. Generally distributed.* 4–6 ..... **vittata** Meigen.

9 Wing membrane with numerous whitish streaks and patches 10

Wing membrane either uniformly grey, apart from conspicuous whitish patch spreading down over discal cell, or grey (♂), yellowish-brown (♀) with some clouds (*fulvipennis*) 13

10 Sternopleura without distinct dark transverse markings 11

Sternopleura with distinct brownish or blackish transverse markings, bare (except rarely in *alpium*, which may have a few weak, scattered, pale hairs) 12

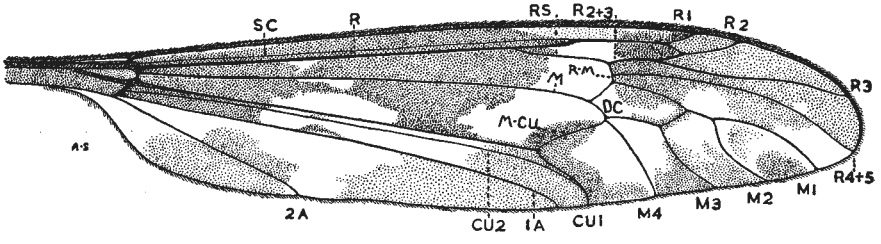

FIG. 6.—Wing of *Tipula maxima* Poda, showing notation of veins.

11 Sternopleura with distinct pale hairs across middle, anterior hairs rather long; wings not at all brown-tinged, cell M with whitish patch just beyond middle and often a less distinct one at tip; tergites yellow, reddish-yellow or brown with distinct dark lateral markings; 2–6 very short squamal hairs; wing length 14–19 mm. ♂ tergite 9 short, squarish, truncate, with a deep transverse pit on either side of median line at base and a narrow median incision at tip; sternite 9 long, its visible length about twice that of sternite 8, a short, peg-like process present just after middle. ♀ ovipositor normal, cerci scarcely tapering until tip. *Frequent on damp mossy rocks on mountains. Scotland southwards to Brecon* (*Llangynidr*). 5–6 ..... **cheethami** Edwards.

Sternopleura bare, or rarely with one or two weak hairs near front coxae; wings brown-tinged, cell M uniformly whitish, or brown towards tip; tergites yellow with strongly marked median black or brown stripe; 3–8 rather long squamal hairs; wing length 12–17 mm. ♂ tergite 9 short, with a broad apical V-shaped incision for more than half its visible length, and with a median depression and lateral subapical pits; sternite 9 shorter than sternite 8. ♀ ovipositor greatly reduced, cerci fleshy, almost triangular, sternal valves rudimentary (fig. 2*c*). *Common. Generally distributed.* 4–7 ..... **vernalis** Meigen.

12 Sternopleura with a continuous, strongly defined, broad, blackish stripe extending across the pleurae from the neck to a point below root of wing; 4–10 short squamal hairs; wing length 12–20 mm. ♂ sternite 8 only half as long as sternite 9, slightly concave, slightly ridged on median line at tip, edge without any tiny black bristles. ♀ sternal valves usually extending at most to one-third length of cerci. *Common. Generally distributed.* 4–9, 11 .... **rufina** Meigen.

Sternopleura with a broken brownish stripe, not extending across pleurae ; 2–4 short squamal hairs ; wing length 12–19 mm. ♂ sternite 8 about as long as sternite 9, rather deeply concave, not ridged and with a row of tiny black bristles along edge. ♀ sternal valves usually extending to almost half length of cerci. *Common, principally in mountainous areas, throughout Britain*..... 5–9
alpium Bergroth.

13 A dark grey spot between Cu_2 and 1A about midway across wing ; wing-membrane grey in ♂, yellowish-brown in ♀, vaguely clouded in both sexes ; tergites grey or ferruginous, usually with blackish lateral stripes ; 2–6 very short squamal hairs ; rather large species ; wing length 20–25 mm. ♂ tergite 9 short and broad, with broad median depression on apical half, and short, broad reddish or black median projection, which is sometimes more or less deeply bifurcate. ♀ sternal valves extending from one-half to two-thirds length of cerci, cerci clubbed at tips. *Frequent, mainly in woods. Generally distributed.* 5–9
fulvipennis Degeer.

No dark grey spot between Cu_2 and 1A ; membrane uniformly grey, apart from conspicuous whitish patch spreading down over discal cell.....14

14 Discal cell unusually short, not twice as long as high (widest point) ; whitish wing-patch in ♀ extending downwards to hind margin ; 6–10 very long squamal hairs ; wing length 16–21 mm. ♂ tergite 9 blackish, flattened above, with a broad median groove, and divided on apical half into two tapering processes which bear complicated depressed expansions towards their tips ; sternite 8 slightly concave at tip, with internal upturned tuft of dense compact pale yellow hairs and triangular lateral processes, which terminate with a long, fine, inwardly directed curved spine. ♀ ovipositor very small, fleshy ; cerci almost triangular, fringed below with long pale hairs. *Common. Westmorland southwards to Dorset* (*Parkstone*). 5–8.....**fascipennis** Meigen.

Discal cell elongate, at least twice as long as high (widest point) ; whitish wing-patch not extending to hind-margin in either sex.....15

15 Abdomen grey with more or less distinct median dark stripe on middle tergites only, and a dark lateral and ochreous sublateral stripe usually extending along all tergites ; 6–8 very short squamal hairs ; wing length 17–21 mm. ♂ hypopygium as in fig. 5*a* ; tergite 9 broad, squarish, flattened, terminating with a median pair of short parallel thumb-like projections ; sternite 8 keeled, with a very dense terminal tuft of golden hairs. ♀ sternal valves usually extending to at least three-quarters length of cerci. *Frequent. S.W. Ireland, Scotland southwards to Hants* (*New Forest*). 4–7.....**luna** Westhoff.

Abdomen yellowish.....16

16 Rather small, slim species ; wing length 10–15 mm. ; 6–8 long squamal hairs. ♂ flagellum with basal segment much longer than following segments, clear yellow ; sternite 8 with edge obviously concave, terminating with a tuft of longish, stiff, golden hairs. ♀ flagellum with basal segment about one-and-a-half times as long as following segment, pale clear yellow ; ovipositor fleshy, base short and triangular ; cerci short and stout. *Rare. Merioneth* (*Dolgelly*), *Hants* (*Pokesdown and Kings Somborne*). 7–8.....**helvola** Loew.

Medium-sized stoutish species ; wing length 15–22 mm.....17

17 Praescutum normally with greyish ground-colour.....18

Praescutum normally with yellowish ground-colour.....19

18 Praescutal stripes faint (especially lateral pair), median pair light brownish, often indistinctly separated, lateral pair greyish, brown ; 7–12 long squamal hairs. ♂ sternite 8 with a median ridge at apex, which bears a rounded brush of rather short, soft, yellow, downcurved hairs. ♀ ovipositor with tergal plate dark reddish, polished ; sternal valves extending to about half length of cerci ; cerci rather narrow, straight, not noticeably tapering for at least apical half, tips rounded. *Rare. Westmorland* (*Witherslack*), *N. Lancs* (*Grange*), *Glos* (*Brockweir*). 6–7.....**brevispina** Pierre.

Praescutal stripes distinct, clearly separated, brown or blackish ; 7–12 moderately long squamal hairs. ♂ genitalia large ; sternite 8 large, ending in a pair of longish thumb-shaped lateral processes, which terminate with a rather short, curved, tapering, inwardly-directed spine, and are fringed inwardly with longish abundant golden hairs. ♀ ovipositor with tergal plate blackish, polished ; sternal valves extending to about half length of cerci ; cerci broad, usually

slightly downcurved, not noticeably tapering for at least apical half, tips rounded. *Uncommon. Carnarvon southwards to Hants (New Forest).* 5–7 . . . . **selene** Meigen.

19 Flagellum with at least the first two segments entirely clear yellow or orange; praescutal stripes normally faint, pale brown or greyish; 8–10 long squamal hairs. ♂ genitalia rather small; sternite 8 small, ending in a pair of short, thumb-shaped lateral processes, which terminate with a long, almost straight, fine, inwardly directed spine, and are fringed inwardly with longish, sparse, pale golden hairs. ♀ sternal valves extending from half to two-thirds length of cerci, cerci distinctly curved downward, steadily tapering from base to the narrowly rounded tips. *Uncommon. Generally distributed.* 5–8 **peliostigma** Schummel.

Flagellum with at most the first segment entirely clear yellow or orange 20

20 Praescutum normally with four rather distinct brownish stripes; tergites glittering along middle line, and usually with a distinct narrow median brownish or blackish stripe; 7–10 long squamal hairs. ♂ sternite 8 with an inconspicuous median terminal tuft of short, forwardly directed soft golden or whitish hairs and a pair of short, broad lateral processes which end in a rather long, fine, inwardly-directed spine; sternite 9 with a pair of latero-ventral swollen whitish processes. ♀ sternites moderately shining (normally). *Common in woods. Generally distributed.* 5–9 . . . . . **cava** Riedel.

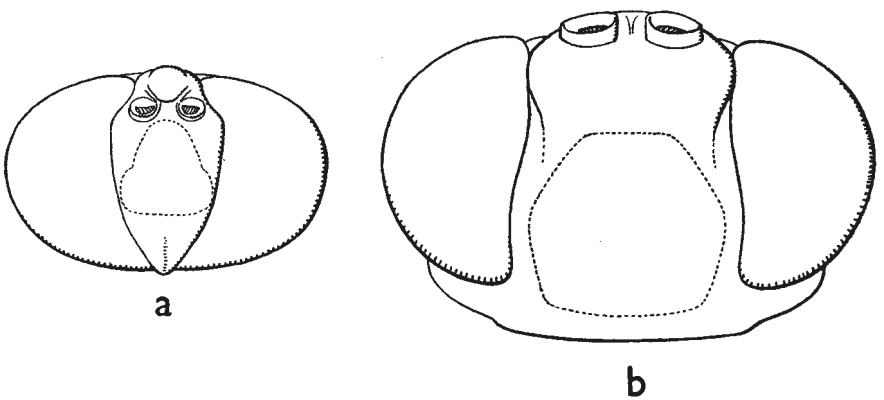

FIG. 7.—Heads of *Tipula* spp., antero-ventral aspect, outline, comparing space between eyes above and below. a. *Tipula signata* Staeger. b. *T. flavolineata* Meigen.

Praescutum normally with stripes almost merged into yellowish-red ground-colour; tergites moderately shining along middle line, and usually without a distinct median stripe; 10–15 long squamal hairs (fig. 5*d*). ♂ sternite 8 with a conspicuous median terminal tuft of long somewhat downwardly directed stiff golden hairs and a pair of thumb-shaped lateral processes which end in a very long, fine, inwardly directed spine; sternite 9 without whitish processes. ♀ sternites dull, or occasionally slightly shining on darker middle line only. *Common. Generally distributed.* 5–7 . . . . . **lunata** Linnaeus.

21 Minimum space between eyes below considerably less than minimum space between eyes above (fig. 7*a*). (In the mountain species, *excisa*, the eyes are widely spaced above and below, but normally the space above is considerably more than space below) 22

Such spaces subequal (fig. 7*b*), or space below only slightly less than space above 31

22 Wing-vein R_2 absent; wings faintly marmorate; thorax silvery-grey with four very indistinct light-brownish praescutal stripes; small species; wing length 6–12 mm. ♂ tergite 9 short and squarish, almost truncate, broadly depressed on median line; sternite 8 with apical brush of moderately long pale golden

hairs. ♀ sternal valves extending to nearly half length of cerci, cerci curved downward. *Rare. Hants* (*New Forest*), *Dorset* (*Chickerell*). 5
mutila Wahlgren.

R_2 present 23

23 R_2 not reaching costa ; wing-membrane with conspicuous small whitish patch in stigmatic area, otherwise completely greyish apart from pale yellowish costal stripe ; thorax greyish, praescutal stripes rather indistinct ; rather small species ; wing length 9–15 mm. ♂ tergite 9 short and broad, with a broad median depression, shallowly and rather broadly concave at tip, the concavity bordered with a tiny yellow projection at its outer limits. ♀ cerci curved downward, sternal valves considerably enlarged. *Rare. Hants* (*New Forest*). 7
sarajevensis Strobl (*microstigma* Pierre).

R_2 reaching costa ; wing-membrane with other obvious light or dark areas 24

24 Wing-cell M with clear area at base and towards tip 25

M at least somewhat clouded at base 26

25 Praescutum with five dark stripes, including a narrow median one ; wing length 17–21 mm. ♂ tergite 9 terminating with a pair of short, downwardly curved, bluntly pointed, shining brownish processes and a short, broad, pointed, blackish median projection ; sternite 8 almost truncate, terminating with a brush of long, dense, shining golden hairs. ♀ cerci steadily narrowing from base to the almost pointed tips. *Uncommon. Scotland* (*Inverness*) *southwards to Herts.* 6–8 ..... **truncorum** Macquart.

Praescutum with four dark stripes, the inner pair narrowly separated or partly or entirely united ; wing length 15–21 mm. ♂ tergite 9 terminating with a pair of short rounded lobes ; sternite 8 terminating with a pair of short, narrow, yellowish processes bearing pale golden hairs. ♀ cerci not at all tapering for at least apical half, tips rounded. *Frequent. Scotland* (*Clyde area*) *southwards to Sussex.* 5–7 ..... **irrorata** Macquart.

26 Wing-vein m–cu meeting discal cell at least one-third from base, and often at nearly half-way ; stigma pale brownish ; wing length 15–18 mm. ♂ antennae with flagellum strongly serrate, thick ; tergite 9 short, almost truncate at tip, with a heavily chitinized, polished, depressed plate terminating with a small median tooth ; sternite 8 simple, short, brownish. ♀ antennae thickened ; ovipositor large, cerci greatly enlarged, upcurved towards tips, serrated below ; sternal valves rudimentary. *Common on mountains* (*about* 2000 *ft. upwards*). *Scotland, Cumberland, Yorks, Carnarvon.* 6–8 ..... **excisa** Schummel.

(*T. scripta* Schummel occasionally has the eyes narrowly spaced below, and then runs to this couplet. This species is dealt with under couplets 61 (♂) and 66 (♀) ; its slender antennae amply distinguish it from *T. excisa.*)

m–cu meeting discal cell at most one-fourth from base ; ♂ antennae and ♀ ovipositor normal 27

27 Stigma yellowish or light brown 28

Stigma dark brown 29

28 Wing-cell 4 scarcely, or not at all, narrowed at apex ; wing markings faint ; praescutal stripes brownish, inner pair normally distinct to front margin ; wing length 14–17 mm. ♂ antennae as long as head and thorax together ; sternite 8 long, narrow apically, edge concave with a row of short brownish bristles, no long processes. ♀ ovipositor short and stout. *Frequent. Scotland* (*Dumfries*) *southwards to Isle of Wight* (*Freshwater*). 9–10 ..... **obsoleta** Meigen.

Cell 4 strongly narrowed at apex ; wing-markings more distinct ; praescutal stripes brownish, inner pair normally becoming faint before front margin ; wing length 15–18 mm. ♂ antennae shorter than head and thorax together ; sternite 8 terminating with a pair of unusually long pale yellow finger-shaped processes which are slightly incurved and bear numerous short black spines on their inner part ; sternite 9 keeled (fig. 5c). ♀ ovipositor rather long and slender. *Frequent. Generally distributed.* 9–10 ..... **staegeri** Nielson.

29 Wing-membrane light grey, pale markings rather large and somewhat vague ; praescutal stripes and postnotal markings brownish ; tergites entirely yellowish-orange ; rather large stout species ; wing length 15–18 mm. ♂ sternite 8 downturned, with a short median projection and a terminal pair of short, pale yellow, rounded processes, which bear numerous short black spines on their inner part. *Frequent. Lanark* (*Cleghorn*) *southwards to Surrey* (*Selsdon*). 9–11
signata Staeger.

Wing-membrane dark grey, pale markings distinct; praescutal stripes and postnotal markings blackish or dark brown, strongly defined; tergites with distinct dark markings, at least sublaterally.....30

30 Pale wing markings small; submedian pale spot in cell M normally outwardly concave; palpi slightly longer than head; slender, smaller species; wing length 10–16 mm. ♂ antennae shorter than head and thorax together; sternite 8 incised at hinder edge, and with a pair of short, yellow, thumb-like lateral projections which bear whitish hairs of varying lengths. *Common. Generally distributed.* 7–10.....**marmorata** Meigen.

Pale wing markings fairly large; pale spot in M not outwardly concave; palpi considerably longer than head; stouter, somewhat larger species; wing length 12–16 mm. ♂ antennae as long as head and thorax together; sternite 8 almost truncate, its hinder edge bearing several rows of tiny black teeth and with lateral brushes of long incurved golden hairs. *Rare. Scotland* (*Edinburgh*), *Worcester* (*Wyre Forest*). 8–9.....**serrulata** Lackschewitz.

31 Wing-membrane greyish or brownish apart from whitish patch in stigmatic area (small, or extending downwards over discal cell) and pale yellowish costal stripe. (*Note.*—Costal cell is darkened in *marginata*, while in some species vague pale streaks may be present below R_5, in cell Cu and in subapical cells, *but cell M has no well-defined pale patch shortly after middle*).....32

Membrane with other obvious light and dark areas (including a well-defined pale patch in cell M shortly after middle).....50

32 Postnotum covered with conspicuous strong black hairs (more abundant in ♂); wings short, especially in ♀, dark brownish, whitish patch in stigmatic area small and inconspicuous; vein R_5 short, scarcely longer than m-cu; thorax chocolate brown; femora yellowish or light brownish, or occasionally darkened except at base; small dark species; wing length 9–11 mm. ♂ tergite 9 squarish, depressed apically, with a rather deep median apical incision; sternite 8 simple; sternite 9 with a long, rather broad, convex median basal appendage, the apex slightly notched at middle. ♀ cerci rather broad, scarcely tapering for at least apical half, tips rounded. *Uncommon and local on marshy ground. Lancs* (*Southport*) *southwards to Somerset.* 6–8.....**nigra** Linnaeus.

Postnotum with weak, inconspicuous pale hairs, or bare.....33

33 All femora mainly blackish, only yellowish or reddish towards base; antennae entirely blackish; rather small, greyish species; wing length 7–14 mm. ♂ tergite 9 with a short, downwardly directed median projection at posterior margin; sternite 8 short, simple; sternites 8 and 9 heavily dusted greyish. ♀ wings more or less reduced; sternal valves short, extending only to one-third length of cerci. *Common on bogs. Ireland* (*Kerry*), *Scotland* (*Inverness*) *southwards to Hants* (*New Forest*). 3–7.....**subnodicornis** Zetterstedt.

T. pagana Meigen ♂ (couplet 41) occasionally has the femora more extensively darkened, but is readily distinguished from *T. subnodicornis* by the clear yellow pedicel of antenna and the haired tubercles arising from tip of sternite 8.

At least posterior femora mainly yellowish or reddish, distinctly blackish only towards tips.....34

34 Wing-vein R_2 not reaching costa (other characters, see under couplet 23). *Rare. Hants* (*New Forest*). 7.....**sarajevensis** Strobl (**microstigma** Pierre).

R_2 reaching costa.....35

35 Costal cell dark brown almost to stigma; thorax brownish on disc, shoulders grey; praescutal stripes indistinct or absent; tergites yellowish on middle line, 6–8 mainly blackish; small species; wing length 8–9 mm. ♂ tergite 9 with a short median forked projection; sternite 8 simple. ♀ cerci narrow, scarcely tapering for at least apical half, tips rounded. *Rare. Hants* (*New Forest*). 7.....**marginata** Meigen.

Costal cell pale yellowish.....36

36 Tergites with a distinct dark median stripe bordered laterally by lighter coloration.....37

Tergites with a yellow, orange **or** grey median stripe (distinct at least basally) bordered laterally by darker coloration. (*Note.*—*pagana* may have tergites almost entirely greyish or yellowish, and *flavolineata* may have tergites almost entirely orange, more frequently in ♂).....39

37 Flagellum with terminal segment long in both sexes (fig. 3*a*) ; rather large species ; wing length 14–21 mm. ♂ flagellum stout, strongly and bluntly serrate tergite 9 long, with broad triangular incision at apex ; sternite 8 with long pale median extension, edges incurved above and bearing tiny brownish teeth. ♀ abdomen exceptionally long, narrow and with almost parallel sides ; ovipositor very small ; cerci with long pale hairs, outwardly concave, the concave surface strongly corrugated, sternal valves rudimentary. *Rare. Scotland* (*Moray and Inverness*). 5–7 ..... **juncea** Meigen.

Flagellum with normal minute terminal segment in both sexes (fig. 3*b*). ♂ antennae not strongly serrate and ♀ abdomen normal **38**

38 Antennae more or less extensively yellowish ; wings strongly yellowish, including most veins ; abdomen with strikingly long pale golden pubescence ; rather large species ; wing length 8–20 mm. ♂ sternite 9 without a median plate-like attachment to the hinder edge. ♀ cerci moderately long and slender, reddish-yellow. *Frequent in marshy places. Generally distributed.* 8–10
luteipennis Meigen.

Antennae blackish ; wings not noticeably yellowish, veins mainly blackish ; abdomen with moderately long pale golden pubescence ; wing length 11–17 mm. ♂ sternite 9 with a median, plate-like, rounded, pale yellow attachment to the hinder edge. ♀ cerci short and stout, yellowish. *Frequent in marshy woods and on moors. Generally distributed.* 8–10 .... **melanoceros** Schummel.

39 Praescutum with light grey or yellowish median stripe 40

Praescutum with dark brown or blackish median stripe, distinct at least anteriorly 42

40 Thorax slightly shining ; costal cell strongly yellow-tinged ; tergites with conspicuous orange median and lateral stripes, often merging in ♂, usually restricted in ♀ ; large species ; wing length 16–25 mm. ♂ antennae very long ; tergite 9 flat, squarish, slightly extended at lateral corners, and with a median apical pair of short, downwardly directed, closely applied blackish processes. ♀ sternal valves varying from two-thirds of cerci to same length. *Frequent in woods. Generally distributed.* 5–6 ..... **flavolineata** Meigen.

Thorax entirely dull ; costal cell almost colourless ; tergites with vaguely defined yellow median stripe, or almost entirely greyish or yellowish, or with pale median marking on basal tergite only ; ♂ antennae moderately long 41

41 ♂ sternite 8 with rather broad tip, scarcely emarginate, edged with fringe of incurved pale hairs arising from tubercles, the median tubercles very distinct ; wing length 11–16 mm. ♀ wings only half as long as body ; wing length 4–5 mm. ; legs stoutish. *Frequent. Generally distributed.* 8–11
pagana Meigen. **Typical form.**

♂ sternite 8 with narrow tip, definitely emarginate, edged with fringe of incurved pale hairs except on median line, where there is usually a single hair arising from a small tubercle. ♀ wings longer than body ; legs slender ; ♂♀ wing length 13–15 mm. *Uncommon. Warwick* (*Sutton Coldfield*), *Sussex* (*Crowborough*), *Hants* (*New Forest*). 10
pagana Meigen. Macropterous form (subspecies **holoptera** Edwards).

42 Wing-membrane with the whitish patch in stigmatic area distinctly spreading down over basal part of discal cell 43

Whitish patch small and not distinctly spreading downwards (if a pale area in basal part of discal cell, this is vague and very restricted) 45

43 Tergites conspicuously golden-haired, median stripe mainly yellowish ; rostrum usually yellowish-grey above, with numerous golden hairs ; palpi less developed than in *montium* ; wing length 14–16 mm. ♂ tergite 9 with median projection very short, broad, tip rather narrowly and shallowly bifurcated ; outer claspers large, longer than broad, rounded at tips, moderately concave behind, with scattered short brown hairs except at base and tip. ♀ ovipositor small, cerci short, rather deeply keeled and broad, not obviously narrowing for about apical third, tips rounded. *Uncommon. Ireland* (*Kerry*), *Inverness* (*Aviemore*), *Yorks southwards.* 4–9 ..... **solstitialis** Westhoff.

Tergites with numerous tiny black hairs, pale hairs scanty (except on tergite 9 in **lateralis** ♂) ; rostrum usually pale grey above with contrasting blackish hairs 44

44 ♂ outer claspers large, longer than broad, rounded at tips, concave behind, with sparse short brown hairs except at tip ; tergite 9 with median projection rather short and narrow, widely and deeply bifurcated at tip. ♀ ovipositor not noticeably small. ♂♀ tergites with median stripe broadly yellowish on basal tergite, more or less greyish on succeeding tergites, and with pale yellow lateral stripes ; wing length 15–21 mm. *Frequent in hilly districts. Ireland, Scotland southwards to Derbyshire.* 5–8 ..... **montium** Egger.

♂ outer claspers small, longer than broad, rather pointed at tips, convex behind, with sparse, longish brown hairs except at base ; tergite 9 shaped as in *montium*. ♀ ovipositor noticeably small. ♂♀ colour of tergites as in *montium*, but sometimes more yellowish beyond basal tergite ; wing length 15–20 mm. *Common. Generally distributed.* 3–9 ..... **lateralis** Meigen.

45 Males 46

Females 48

46 Flagellum with basal segment about as long as scape and pedicel together ; tergite 9 with median pair of parallel, moderately long, narrow, blackish projections at tip, flanked by a pair of short, pointed, yellowish, lateral processes ; outer claspers greatly reduced, finger-like, with rather dense blackish hairs towards tip ; wing length 14–18 mm. *Frequent. Generally distributed.* 5–7
pruinosa Wiedemann ♂.

Flagellum with basal segment considerably longer than scape and pedicel together ; tergite 9 without a pair of pointed lateral processes 47

47 Tergite 9 with median projection rather long, narrow, rather widely and deeply bifurcated at tip ; outer claspers short, squarish, with sparse, shortish brown hairs except at base ; wing length 12–16 mm. *Frequent. Derbyshire southwards to Hants (New Forest).* 5–8 ..... **couckei** Tonnoir ♂.

Tergite 9 with median projection rather short and broad, not bifurcated at tip ; outer claspers long, rather narrow and strap-like after base, slightly concave behind, with sparse longish brown hairs except at base and tip ; wing length 14–17 mm. *Rare. Inverness (Aviemore), Yorks (Austwick).* 5–6, 8
coerulescens Lackschewitz ♂.

48 Tergal plate of ovipositor as wide as tergite 9 ; sternal plate slightly shining on basal part, two brightly shining reddish areas laterally on more than apical third. (Wing length and *distribution, see* ♂) ..... **pruinosa** Wiedemann ♀.

Tergal plate narrower than tergite 9 ; sternal plate entirely dull grey 49

49 Ovipositor stumpy ; cerci deeply keeled below for more than basal half, then not noticeably slender. (Wing length and *distribution, see* ♂) .... **couckei** Tonnoir ♀.

Ovipositor moderately long ; cerci shallowly keeled below for more than basal half, then noticeably slender. (Wing length and *distribution, see* ♂)
coerulescens Lackschewitz ♀.

50 R_2 present, but not reaching costa (normally) 51

R_2 present, ending in costa 53

51 Femora blackish or brownish for at least apical third, often only extreme base yellowish ; tibiae and tarsi dark brown or blackish ; scape greyish or brownish, pedicel usually yellow, flagellum dark brownish or blackish ; pale pubescence on thorax, scutellum and postnotum longish and rather abundant ; tergites often narrowly yellowish-orange on posterior margins and with grey or yellowish lateral stripe ; wing length 14–18 mm. ♂ tergite 9 incised apically for one-third to half its visible length ; inner clasper quite unarmed on dorsal edge (*in situ*). ♀ front and mid femora strongly compressed and much thickened on apical two-thirds. *Common in damp woods. Generally distributed.* 4–6
variipennis Meigen.

Femora brownish at tip only, or completely yellowish ; tibiae usually light brown or yellowish, darker-tipped, tarsi usually blackish ; scape and pedicel often entirely yellowish, flagellum with basal segment usually yellowish ; tergites usually more extensively yellowish than in *variipennis*. ♂ tergite 9 as in *variipennis*. ♀ front and mid femora not strongly compressed and not much thickened on apical two-thirds 52

52 Femora brown-tipped, otherwise yellowish ; pale pubescence on thorax, scutellum and postnotum scanty and short (at least in ♂) ; wing length 19–23 mm. ♂ inner clasper with a well-developed, stout, blunt, blackish spine on the dorsal edge (*in situ*). ♀ front and mid femora slightly compressed and somewhat thickened towards tips, usually more extensively and distinctly dark-tipped than in ♂. *Uncommon. Warwickshire* (*Coventry*), *Hereford* (*Haugh Wood*), *Gloucester* (*Bristol*), *Hants* (*New Forest and Isle of Wight*). 5 **pseudovariipennis** Czizek.

Femora completely yellowish-orange, occasionally vaguely brown-tipped in ♀ ; pale pubescence on thorax, scutellum and postnotum longish and rather abundant ; wing length 15–20 mm. ♂ inner clasper with a minute, but distinct, pointed blackish spine on the dorsal edge (*in situ*). ♀ front and mid femora not noticeably compressed and very slightly thickened. *Common. Generally distributed.* 4–6 ..... **hortulana** Meigen.

53 Wing-membrane with the whitish patch in stigmatic area extending down through discal cell to hind margin (in cell M3) ; thorax grey, with distinct dark brownish praescutal stripes, the lateral pair pale-centred and a narrow brown line between them and the median pair ; tergites yellowish, with median and lateral brownish stripes ; femora brown-tipped. ♂ tergite 9 with a deep, broad, apical incision ; sternite 8 simple. ♀ tergal plate polished, reddish, about as long as the slender, tapering cerci ; wing length 17 mm. *Rare. Hants* (*New Forest*), ♀ only. 8 **winthemi** Lackschewitz.

Whitish patch in stigmatic area not nearly reaching hind margin of wing 54

(*T. excisa* Schummel occasionally has the eyes widely spaced below, and then runs to this couplet. This mountain species is dealt with under Couplet 26.).

54 Femora entirely yellowish-orange ; thorax greyish, praescutal stripes brownish, more or less distinct ; tergites orange, often more or less extensively darkened ; rather large species ; wing length 18–23 mm. ♂ tergite 9 greatly reduced, completely hidden by 8 or at most a narrow black median projection visible ; sternite 8 simple, 9 with scarcely incurved, rather bluntly tipped, externo-lateral processes, notched below just beyond middle ; antennae rather slender, not at all serrated. ♀ ovipositor large, cerci considerably enlarged, keeled, upcurved towards tips (much less so than in *nubeculosa*), finely serrated above for about middle third, coarsely serrated below for about apical two-thirds, sternal valves rudimentary. *Rare. S.W. Ireland* (*Killarney*), *Inverness* (*Abernethy and Aviemore*), *Perthshire* (*Rannoch*), *Merioneth* (*Dolgelly*). 4–6, 8 **rubripes** Schummel.

Femora brownish or blackish at least at tip 55

55 All femora brownish or blackish for at least apical half 56

At least posterior femora brownish or blackish only towards tip 57

56 ♂ basal segment of flagellum shorter than scape and pedicel together ; hypopygium yellowish ; tergite 9 slightly downturned at posterior edge, with median and lateral apical incisions, the median incision bounded by a pair of downwardly and outwardly directed polished black teeth ; outer claspers narrow at base, moderately broadening towards tip ; inner claspers broad at base, pointed at tip ; wing length 12–15 mm. ♀ micropterous. *Rare. Scotland* (*Edinburgh*). 10. (*See Brown*, 1947) ..... **gimmerthali** Lackschewitz.

♂ basal segment of flagellum longer than scape and pedicel together ; hypopygium dark reddish ; tergite 9 downturned at posterior edge, with median and lateral apical incisions, the median incision not bounded by a pair of polished teeth ; outer claspers broad, finger-shaped, inner claspers rather narrow at base, pointed at tip. ♀ wings normal ; ♂♀ wing length 14–17 mm. *Frequent on peaty bogs. Generally distributed.* 4–6 ..... **macrocera** Zetterstedt.

57 Praescutum with very narrow dark brown median stripe, extending from anterior margin almost to posterior margin, bordered by light grey stripes ; tergites yellowish with dark brown median, and often lateral, stripes, ♀ tergites often extensively greyish ; wing length 15–20 mm. ♂ tergite 9 terminating with a pair of short, pointed, outwardly directed median projections and a pair of somewhat longer, rounded, inwardly directed lateral projections. *Frequent. Generally distributed.* 5–6 ..... **pabulina** Meigen.

Praescutum with median stripe wholly or partly light grey 58

58 Males 59

Females 63

♂

59 Basal flagellar segment as long as, or slightly longer than, scape and pedicel together.....60
Basal flagellar segment considerably shorter than scape and pedicel together 61

60 Antennae very long and slender, flagellar segments long, moderately thickened at their base and tip, whorled with unusually long hairs; hypopygium large; tergite 9 long, very narrow, truncate, with small median depression at tip and slight lateral extensions; sternite 8 long, a pair of deep, elongate-oval, membranous pits towards tip on either side of the narrow median keel; sternite 9 with pair of closely-applied whitish, membranous extensions below; wing length 15–21 mm. *Frequent. S.E. Ireland, Scotland southwards to Hants* (*Isle of Wight*). 5–7.....**unca** Wiedemann ♂.
Antennae moderately long and thick, flagellar segments, except the first, short, much clubbed at their base and moderately thickened at tip, whorled with moderately long hairs; hypopygium small; tergite 9 extremely reduced, scarcely visible apart from the pair of somewhat pointed lateral extensions; sternite 8 rather short, simple, 9 with strongly incurved externo-lateral processes, each bearing a pointed, inwardly directed tooth just before the pointed tip; wing-length 17–21 mm. *Uncommon. Scotland* (*Sutherland*) *southwards to Hants* (*New Forest*). 4–6.....**nubeculosa** Meigen ♂.

61 Basal segment of flagellum clear yellow, following segments clear yellow with brownish base, apical segments usually darker; antennae very short and slender; hypopygium small; tergite 9 short, concave, rather shortly and broadly extended at lateral corners; sternite 8 rather short, simple, 9 with conspicuous median incision at tip; wing length 18–23 mm. *Common. Generally distributed.* 5–8.....**scripta** Meigen ♂.
Basal segment of flagellum usually brownish or blackish, occasionally obscurely yellowish, following segments entirely brownish or blackish.....62

62 Antennae slender; legs rather slender, femora scarcely thickened towards tips; head round; rostrum short; hypopygium moderately large; tergite 9 rather short, with narrow, squarish, deep, median depression towards base, downturned, flattened and widely excised at tip, the excision bounded apically by a pair of small black teeth; sternite 8 long, with a pair of short, rounded, pale-haired median projections; wing length 15–16 mm. *Rare. Morayshire* (*Logie*), *Yorks* (*Austwick*). 9.....**vafra** Riedel ♂.
Antennae moderately thick; legs stoutish, femora moderately thickened towards tips; head elongate; rostrum long; hypopygium moderately large; tergite 9 short, with broad, deep median depression, hind corners extended inwardly; sternite 8 rather long, tip with short, triangular, median projection, terminating with a pair of long, fine, almost straight, parallel spines; wing length 16–19 mm. *Rare. Scotland* (*Inverness*). 6.....**bistilata** Lundstroem ♂.

♀

63 Flagellum entirely brownish or blackish.....64
Flagellum with at least first segment yellowish, usually more extensively so..65

64 Antennae slender; legs rather slender, femora not much thickened towards tips; head round; rostrum short; ovipositor small, base yellow, cerci straight, these and sternal valves pale yellow. (Wing length and *distribution*, *see* ♂) **vafra** Riedel ♀.
Antennae moderately thick; legs stoutish, femora much thickened towards tips; head elongate; rostrum long; ovipositor large, base dark reddish or black, cerci straight, these and sternal valves orange. (Wing length and *distribution*, *see* ♂).....**bistilata** Lundstroem ♀.

65 Antennae stout; ovipositor large, cerci greatly enlarged, keeled, strongly upcurved towards tips, finely serrated above for about middle third, coarsely serrated below for more than apical two-thirds; sternal valves rudimentary or almost obsolete (fig. 2*a*). (Wing length and *distribution*, *see* ♂) **nubeculosa** Meigen ♀.
Antennae slender; ovipositor of normal size.....66

66 Cerci strongly upcurved towards tips, coarsely serrated below for apical two-thirds, sternal valves rudimentary. (Wing length and *distribution*, *see* ♂) **scripta** Meigen ♀.
Cerci normal, not upcurved, sternal valves well developed (fig. 2*b*). (Wing length and *distribution*, *see* ♂).....**unca** Wiedemann ♀.

Subfamily CYLINDROTOMINAE.

KEY TO GENERA.

1 Cell M_1 present (i.e. uppermost of the three veins arising from discal cell forked) **Cylindrotoma** Macquart (p. 22).
Cell M_1 absent (three single veins arising from discal cell) 2

2 Head and thorax with deep punctures; m-cu well beyond base of discal cell; R_2 absent ..... **Triogma** Schiner (p. 22).
Head and thorax smooth; m-cu at or near base of discal cell 3

3 Head steadily and considerably narrowing behind eyes; thorax brightly shining; R_2 usually absent ..... **Diogma** Edwards (p. 22).
Head somewhat angled immediately behind eyes, then moderately narrowing; thorax dull; R_2 present ..... **Phalacrocera** Schiner (p. 22).

Genus **Cylindrotoma** Macquart.

KEY TO SPECIES.

1 Head dull yellowish, partly black above; antennal scape yellowish, flagellum black; thorax light yellowish, dull; mesonotum with three narrowly separated dull black stripes; femora dark-tipped; stigma small, usually distinct; wing-length 9–11 mm. *Frequent in woods. Generally distributed.* 5–6, 8–9 **distinctissima** Meigen.

Genus **Diogma** Edwards.

KEY TO SPECIES.

1 Head shining black above, yellowish beneath, with a black spot adjacent to each eye; antennae usually mainly yellowish, blackish towards tip of flagellum, sometimes more extensively darkened; thorax coloured as in *C. distinctissima*, but rather conspicuously shining; tip of femora not obviously darker; stigma faint; wing-length 9–10 mm. *Uncommon, mainly in woods. Generally distributed.* 7–8 ..... **glabrata** Meigen.

Genus **Triogma** Schiner.

1 Head and thorax blackish, slightly grey-dusted; antennae and palpi black; abdomen brown or yellowish-brown; legs mainly dark; wings rather smoky; wing-length 9–10 mm. *Uncommon on bogs. Generally distributed.* 5 **trisulcata** Schummel.

Genus **Phalacrocera** Schiner.

1 Head blackish; antennae and palpi black; thorax blackish, grey-dusted; pleurae partly yellowish; abdomen reddish-brown to dark brown; legs mainly dark; wings smoky; wing-length 10–14 mm. *Uncommon by mossy ponds. Generally distributed.* 4–9 ..... **replicata** Linnaeus.

Subfamily LIMONIINAE.

KEY TO TRIBES.

1 Radius three-branched (R_{2+3} simple, one submarginal cell); tibial spurs absent ..... LIMONIINI (p. 23).
Radius four-branched (R_{2+3} forked, two submarginal cells) 2

2 Tibial spurs present, even if small; cell M_1 nearly always present 3
Tibial spurs absent (but represented by thickened hairs in most **Gonomyia** sens. lat.); cell M_1 absent (except in **Crypteria** and **Neolimnophila**) ERIOPTERINI (p. 45).

3 Eyes pubescent; Sc_2 near middle of Sc ..... PEDICIINI (p. 32).
Eyes bare; Sc_2 near tip of Sc ..... HEXATOMINI (p. 36).

Tribe LIMONIINI.

KEY TO GENERA AND SUBGENERA.

1 Antennae 14-segmented; r always present (**Limonia sens. lat.**).....2
Antennae 16-segmented.....7

2 Tip of R_1 long and horizontal.....3
Tip of R_1 short and vertical (r often appearing like tip of R_1 and curving down into R_{2+3}).....4

3 No anal cross-vein.....s.g. **Limonia** Meigen **s.str.** (p. 24).
A cross-vein connecting veins 1A and 2A distally
s.g. **Discobola** Osten-Sacken (p. 24).

4 Sc reaching far beyond base of R_S; claws with several strong teeth; yellowish species.....s.g. **Metalimnobia** Matsumura (p. 23).
Sc usually ending nearly opposite base of R_S, rarely much beyond; claws with a single basal tooth.....5

5 Mouth-parts as long as head and thorax together....**Geranomyia** Haliday (p. 30).
Mouth-parts at most as long as head.....6

6 Antennae simple.....**Dicranomyia** Stephens (p. 25).
Antennae in ♂ pectinate, in ♀ with the flagellar segments slightly enlarged beneath **Rhipidia** Meigen (p. 30).

7 Sc running close to R_1 for its whole length; distal part of R_1 almost in contact with costa; R_S long and straight.....**Taphrophila** Rondani (p. 31).
Sc not unusually close to R_1; distal part of R_1 not nearly in contact with costa.....8

8 r present; m-cu far before outer end of upper basal cell.....9
r absent; m-cu not, or but little, before end of upper basal cell.....10

9 Upper branch of M forked; praescutum produced over pronotum.....
Thaumastoptera Mik (p. 31).
Lower branch of M forked (fig. 10*a*, *b*); praescutum not produced over pronotum
Orimarga Osten-Sacken (p. 31).

10 R_S very long and running close to and parallel with R_1; r–m as long as usual; rostrum short.....**Elliptera** Egger (p. 32).
R_S shorter, not running close to R_1; r–m very short or absent; rostrum longer than head.....**Helius** St. Fargeau and Serville (p. 32).

Genus **Limonia** Meigen (sens. lat.).

Subgenus **Metalimnobia** Matsumura.

KEY TO SPECIES.

1 Thorax brightly shining; praescutum with a median pair of black or brown stripes, usually flanked posteriorly by a pair of small black or brown spots; wings faintly spotted and clouded above Cu_1; cell R unspotted before middle; membrane strongly yellow-tinged; tips of femora narrowly darkened; wing-length 11–17 mm. ♂ hypopygium with style almost entire, slightly bifid at tip; parameres hairy at tip. *Frequent. Generally distributed.* 7–11
bifasciata Schrank.

Thorax hardly shining; praescutum with four dark brown or black stripes; wings strongly spotted and clouded all over, membrane not yellow-tinged....2

2 Femora with apical and subapical dark rings; wings with four large conspicuous dark brown spots anteriorly, only one near base of cell R; wing-length 11–21 mm. ♂ styles split into four; parameres very hairy at tip. *Uncommon. Hants and Essex.* 4–6, 8.....**quadrimaculata** Linnaeus.

Femora with apical dark ring only, or not at all darkened (Irish var.); wings spotted almost as in *quadrimaculata*, but less conspicuously so, and with 1–4 small spots near base of cell R; wing-length 9–15 mm. ♂ style almost as in *quadrimaculata*, but parameres quite bare. *Common. Generally distributed.* 4–9.....**quadrinotata** Meigen.

Subgenus **Discobola** Osten-Sacken.

1 Wings with a distinct ocellate pattern ; thorax light brown, slightly shining ; three darker ill-defined praescutal stripes ; femora with pre-apical dark ring ; halteres with blackish stem, extreme base and most of knob yellowish ; wing-length 7–10 mm. *Rare. Moray (Forres).* 8 (1 ♂).....**annulata** Linnaeus.

(The second European species, *caesarea* Osten-Sacken, which Edwards considered also may occur in Britain, differs from *annulata* in its darker thorax, presence of small dark spots in middle of lower basal cell, and yellow-stemmed halteres.)

Subgenus **Limonia** Meigen s.str.

KEY TO SPECIES.

1 Wings with at least a few slight clouds in basal cells.....2
Wings without clouds in cells.....5

2 Mesonotum shining black ; wings with three small dark brown spots near front margin ; abdomen with tergites 1 and 6–8 black, 2–5 yellow with posterior corners black (♂) or with narrow or broad posterior black bands (♀) ; wing-length 6–10 mm. ; apart from legs, *Rhyphus*-like in appearance. *Local. Suffolk southwards.* 4–5.....**maculipennis** Meigen.

Mesonotum brownish, with or without stripes ; wings with three or more light brown spots near front margin ; abdomen more extensively blackish, at least in ♂.....3

3 Femora with three dark rings ; praescutum with three separate and equally broad dark brown stripes, the middle one sometimes narrowly divided by a pale line ; wing-length 9–11 mm. *Very common in woods. Generally distributed.* 2–11
nubeculosa Meigen.

Femora with at most two dark rings (second faint if present) ; praescutum with dark lateral markings reduced or absent.....4

4 Femora with only the tips dark brownish ; no indication of a dark subapical ring ; praescutum undusted, ground-colour dull yellowish-brown, dark median stripe (when present) shining, lateral stripes brownish and slightly shining ; wing-length 9–11 mm. *Common. Generally distributed.* 5–7
flavipes Fabricius.

Femora with brownish tips and rather indistinct brownish subapical ring ; praescutum moderately yellow-dusted, ground-colour dark brown, dark median stripe less dusted, broad and shining, lateral markings indistinct ; wing-length 7·5–8·5 mm. *Uncommon, among broom. Generally distributed.* 5–6, 8–9
dilutior Edwards.

5 Wings with blackish or brownish dots at base of R_8, tip of Sc and over r....6
Wings with at most two indistinct dark dots.....8

6 Femora with pre-apical dark ring ; apical wing-margin clear ; thorax entirely yellowish, or praescutum with a vague narrow dark median stripe anteriorly ; wing-length 7–11 mm. *Common. Generally distributed.* 5–7
tripunctata Fabricius.

Femora with dark tip ; apical wing-margin blackened ; thorax otherwise.....7

7 Thorax yellow, praescutum with a broad, distinct, median black stripe ; abdomen black, bases of segments 3–6 more or less yellowish ; front femora black except on basal third, or rarely black only at tip ; middle and hind femora yellow with black tips ; wing-length 9–12 mm. *Local. Notts southwards.* 5–8
nigropunctata Schummel.

Thorax and abdomen nearly all black and all femora black at tip only ; otherwise resembles *nigropunctata. Rare. Derbyshire, Norfolk, Oxon, Surrey.* 6
masoni Edwards.

8 Sc reaching far beyond base of R_8, as usual ; femora with tips black.....9
Sc reaching only slightly beyond base of R_8 ; femora with tips pale after subapical black ring ; abdomen largely dark brown, posterior margins of segments rather broadly yellowish ; wings almost clear except for brownish stigma, which varies in intensity ; wing length 8–11 mm. *Common. Generally distributed.* 5–10.....**macrostigma** Schummel.

9 Head blackish, distinctly dusted; thorax yellow, with three broad, rather ill-defined brown stripes; wing with r quite clear; wing-length 9–11 mm. *Frequent among butter-bur. Generally distributed.* 6–8....**trivittata** Schummel.
Head yellowish, scarcely dusted; thorax yellow, with a short median brown stripe only; r distinctly clouded grey; wing-length 7–10 mm. *Uncommon Generally distributed.* 7–9.....**stigma** Meigen.

Subgenus **Dicranomyia** Stephens.

KEY TO SPECIES.

1 Sc extending far beyond base of R_5 2
Sc not, or only slightly, extending beyond base of R_5 5
2 Palpi only 2-segmented; frons silvery; wings spotted; abdomen and legs dark brown; wing-length 7–11 mm. *Locally common. Generally distributed.* 5–9
decem-maculata Loew.
Palpi 4-segmented; frons not silvery; wings unspotted apart from stigma....3
3 Eyes very narrowly separated above; thorax mainly yellowish with indistinct median brown stripe; pleurae with a broad dark longitudinal stripe; wing-length 7·5 mm. *Rare. Chester (Cotterill Clough), Cambs (Woodditton).* 7
inusta Meigen.
Eyes rather widely separated above; thorax almost all darkened; pleurae unstriped.....4
4 Wing-membrane hairy on distal half, rather smoky; discal cell closed; wing-length 6–9 mm. *Uncommon in damp woods. Generally distributed.* 6–8
fusca Meigen.
Wing-membrane bare as usual, almost clear with dark veins, stigma fairly distinct; discal cell open; wing-length 5–7 mm. *Uncommon near waterfalls. Generally distributed.* 6–7.....**aquosa** Verrall.
5 Sc_2 very close to tip of Sc; wings sparsely spotted, no spots free in cells (*cf. Rhipidia maculata* Meigen: wing-spots numerous, especially in cells).....6
Sc_2 well before tip of Sc 8
6 Frons silvery; two light brown anterior wing-spots, tip vaguely clouded; wing-length 6–9 mm. *Common, mainly on heaths and in woods. Generally distributed.* 6–9.....**dumetorum** Meigen
Frons not silvery; three anterior wing-spots, tip strongly clouded.....7
7 Thorax black; m-cu far before base of discal cell; wing-spots all rather large and distinct; legs yellow; wing-length 7–9 mm. *Uncommon among butter-bur. Generally distributed.* 5–6.....**ornata** Meigen.
Thorax orange with blackish median stripe; m-cu near base of discal cell; wing-spots smaller, one near wing-base less distinct; femora black-tipped; wing-length 6–8 mm. *Uncommon on bogs. Generally distributed.* 6–8
lucida de Meijere.
8 R and Cu_1 mainly yellow, other veins mainly brown; four or five rather large dark anterior wing-spots, and numerous small spots along Cu_1 (wing-spots occasionally reduced to a conspicuous stigma and veins R and Cu_1 almost entirely and conspicuously yellow = **var. cornubiensis** Edwards); thorax brown, heavily grey-dusted; praescutum with three blackish stripes, the middle one divided by a pale line; femora with conspicuous black tips; wing-length 6–10 mm. *Frequent by wet coastal cliffs. Ireland, Merioneth southwards* (**var. cornubiensis** *from Cornwall (St. Ives Bay) only*). 4–8.....**goritiensis** Mik.
R and Cu_1 brown like other veins, or all veins yellowish.....9
9 Wings with spots or clouds at tips of 1A and 2A.....10
No such spots or clouds.....11
10 Thorax dull from front view, brown, unstriped, rather heavily dusted; flagellum with short verticils; legs usually yellowish, femora black-tipped (or mainly blackish in a Hebridean variety); wings with dark clouds anteriorly, over cross-veins and at tip; wing-length 8–10 mm. *Common by running water. Generally distributed.* 6–9.....**didyma** Meigen.
Thorax shining from all angles, dark brown or black, scarcely dusted; verticils rather long; legs light brown, femora dark brown-tipped; wing-markings larger, darker and more clearly defined; wing-length 10 mm. (2 examples). *Rare. Inverness.* 8.....**consimilis** Zetterstedt.
11 Praescutum not entirely shining black; frons usually dull.....12
Praescutum shining black; frons silvery.....25

12 Apex of R_5 with a more or less distinct spot, except in *mitis* var. *lutea*; Sc_2 rarely beyond end of 2A.....13
Apex of R_5 unspotted; Sc_2 usually well beyond end of 2A 14

13 A distinct brown or grey spot at apex of R_5, extending into cell R and surrounding cells; often slight clouds over cross-veins, distal part of Cu_1 and base of R_5; stigma distinct, yellowish-brown; thorax light to dark brown, heavily dusted, praescutum not obviously striped; tergites mainly dark, their posterior margins usually conspicuously pale; legs very slender, femora dark-tipped; wing-length 6–9 mm. ♂ hypopygium as in fig. 8*a*. *Common "swarming" species. Generally distributed.* 3–11.....**chorea** Meigen.

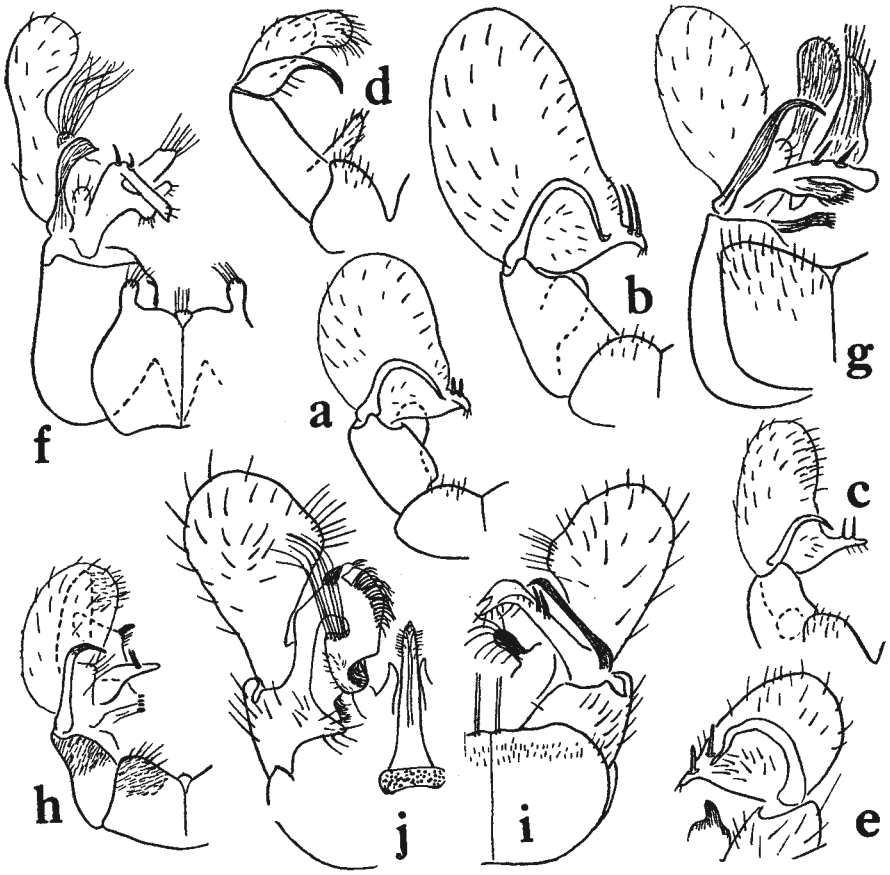

FIG. 8.—Male hypopygia (tergite, coxite, and styles) of *Dicranomyia* spp., dorsal aspect (except *j*). a. *chorea* Meigen. b. *mitis* Meigen. c. *zernyi* Lackschewitz. d. *sera* Walker. e. *ventralis* Schummel. f. *stigmatica* Meigen. g. *complicata* de Meijere. h. *danica* Kuntze. i. *halterella* Edwards. j. *halterella*, ventral aspect. (e, i and j on a slightly larger scale than the rest.)

Spot at apex of R_5 fainter, not distinctly extending into cell R; clouds faint or absent; legs usually somewhat stouter; wing-length 7–10 mm. ♂ hypopygium as in fig. 8*b*. *Common, mainly in woods. Generally distributed.* 5–9. **Typical form:** antennae dark or with only the scape vaguely pale; thorax rather

heavily brown-dusted; mesonotum darker than pleurae; praescutum not distinctly striped; stigma yellowish-brown, distinct; tergites dark, without pale hind-margins. (**var. affinis** Schummel: darker than typical form; pleurae as dark as mesonotum; praescutum with moderately shining black median stripe and often with short lateral stripes; stigma dark brown, rather conspicuous. **var. lutea** Meigen: lighter than typical form; thorax almost all yellowish, less obviously dusted; scape yellowish; abdomen mainly yellowish; wings almost completely clear, stigma faint or absent).....**mitis** Meigen.

14 Last few antennal segments rather elongate, with long verticils.....15
All flagellar segments shortly oval, with short verticils.....17

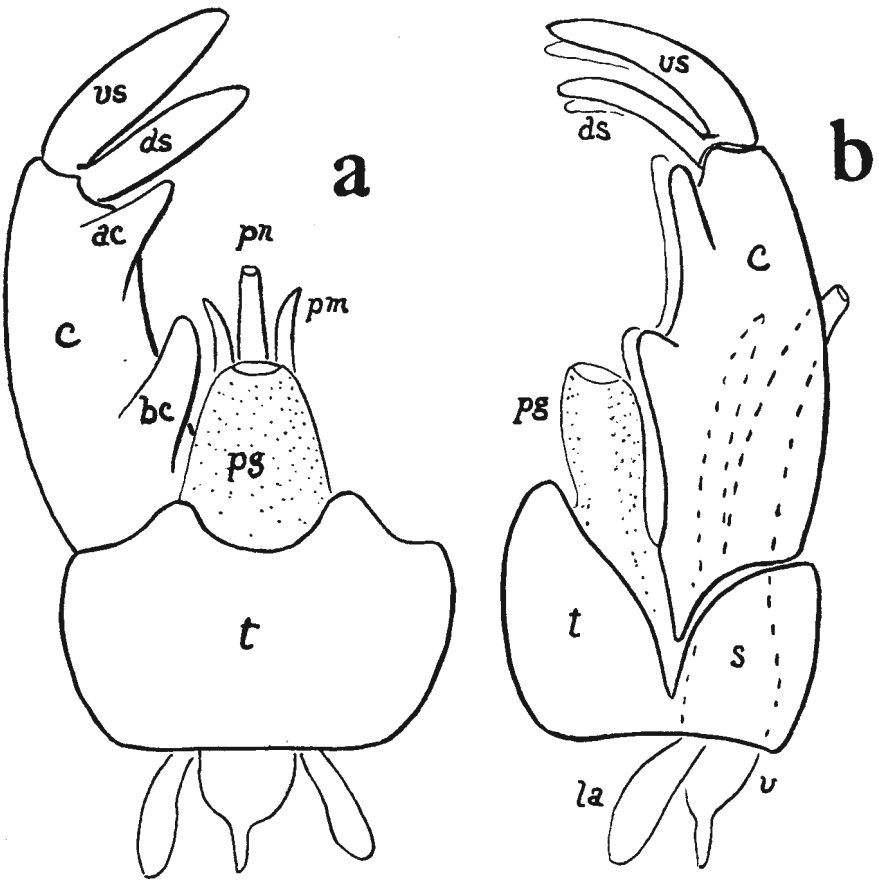

FIG. 8A.—a, b. Diagrams showing male hypopygium in LIMONIINAE. a. Hypopygium, dorsal aspect. (*t* = tergite. *c* = coxite. *ac* and *bc* = apical and basal lobes of coxite. *ds* = dorsal or inner style. *vs* = ventral or outer style. *pg* = proctiger. *pm* = paramere. *pn* = penis.) b. Hypopygium, lateral aspect. (Lettering as in **a**, also *s* = sternite. *v* = vesica. *la* = lateral apodeme.)

15 Palpi only 2-segmented; head dark brown; thorax lightish brown; mesonotum somewhat shining; praescutum with three nearly contiguous dark brown stripes; abdomen dark brown, venter and posterior margins of tergites pale; wings almost clear, stigma indistinct; wing-length 6–8 mm. ♂ hypopygium as in fig. 8*e*. *Uncommon. Generally distributed.* 8–10.....**ventralis** Schummel.

Palpi normal, 4-segmented ; wings quite clear, stigma indistinct ; wing-length 6–9 mm. 16

16 Discal cell closed ; thorax dull yellowish-brown ; praescutum with a dark brown median stripe, sometimes with indistinct brown lateral stripes ; tergites usually extensively dark brown, sometimes light brown laterally ; legs light brown. ♀ ovipositor entirely pale. *Common. Generally distributed.* 5–10 **modesta** Meigen.

Discal cell open ; thorax yellowish-brown ; praescutum with three equally distinct dark brown stripes, lightly dusted ; tergites dark brown, posterior margin pale ; legs light brown, tips of femora somewhat darkened. ♀ ovipositor shining black at base beneath (as in *sera*). *Rare. Inverness.* 8 (1 ♀) **patens** Lundstroem.

17 Scape of antennae yellow or light brown, remainder darkened ; thorax yellow, brown-dusted ; praescutum with a dull blackish median stripe, and more or less obscure dark brownish lateral stripes ; abdomen yellow, with trace of a median dorsal dark stripe ; legs light brown ; wings almost clear, narrower than usual, with less developed anal lobe ; stigma absent ; wing-length 6–9 mm. ♂ hypopygium as in fig. 8*d*. ♀ ovipositor shining black at base beneath (as in *patens*). *Frequent. Coastal marshes around Britain.* 5, 9 ..... **sera** Walker.

Antennae all dark 18

18 Thorax with yellowish ground-colour, rather heavily dusted, especially at sides ; praescutum with a rather broad, black, shining median stripe and obscure dark brown lateral stripes (a male example from Barra has the thorax entirely dark, and even the pleurae without a yellow tinge) ; abdomen yellowish ; legs yellowish-brown, tips of femora sometimes obscurely brownish ; wings almost clear, stigma light brown ; wing-length 6–8 mm. *Common. Generally distributed.* 5–11 ..... **autumnalis** Staeger.

Thorax dark 19

19 Praescutum with three blackish stripes, dusted ash-grey ; abdomen blackish ; femora light brown, anterior pair often dark-tipped, tibiae and tarsi usually dark ; wings clear, yellowish at extreme base ; stigma absent ; wing-length 7–10 mm. *Common. Notts southwards.* 5–6 ..... **sericata** Meigen.

Praescutum with at most an ill-defined median stripe 20

20 Small species with open discal cell ; Sc short, ending before base of R_8 ; praescutum brown, somewhat darkened in middle, moderately dusted ; abdomen usually dark brown ; legs yellowish-brown ; wings clear, with dark veins and faint stigma ; wing-length 4–5 mm. *Common locally. Morayshire, Yorks.* 8–9 ..... **aperta** Wahlgren.

Larger species ; discal cell normally closed ; Sc reaching base of R_8 21

21 Praescutum and abdomen uniformly dark greyish ; antennae black, last few segments rather thin, but with short verticils ; legs yellowish-brown, femora broadly darkened apically ; stigma ill-defined ; distance of Sc_2 from tip of Sc about equal to length of m-cu ; wing-length 7–8 mm. ♂ hypopygium not unusually large or complex (fig. 9*a*). *Uncommon. Generally distributed.* 6–7 **distendens** Lundstroem.

(Edwards considered that the Continental species, *zernyi* Lackschewitz, was probably a pale form of *distendens*, the male hypopygium (fig. 8*c*) appearing almost identical.)

Praescutum darkened in middle ; ♂ hypopygium large and complex 22

22 Stoutly built, coastal species ; thorax mainly dusted brownish, but with silvery dust at sides ; pleurae, scutellum and postnotum dusted silvery ; abdomen dark brown or black ; wings variable in development, normal or abbreviated ; stigma faint or conspicuous ; venation sometimes degenerate in short-winged examples, e.g. discal cell open and only three posterior cells ; legs light brown, femora in normally-winged specimens black-tipped ; wing-length 3–8 mm. ♂ hypopygium as in fig. 8*g*. *Frequent along coastal marshes. Generally distributed* 5, 7, 9 ..... **complicata** de Meijere.

Less stout, not strictly coastal species 23

23 Stigma conspicuous, black or dark brown (cf. also *mitis var. affinis* Schummel) ; rather similar to *complicata* but wings broader ; legs more yellowish ; wing length 5–6 mm. ♂ hypopygium as in fig. 8*f*. *Frequent, mainly on mountain bogs. Generally distributed.* 8–9 ..... **stigmatica** Meigen.

Stigma faint or absent 24

24 Halteres normal ; thorax brown, heavily dusted lighter brown ; pleurae, scutum, scutellum and postnotum silvery-dusted ; tergites black, venter yellow ; legs light brown ; stigma faint ; wing-length 5–6 mm. ♂ hypopygium as in fig. 8*h*. *Rare. Somerset* (*Shapwick*). 7 ..... **danica** Kuntze.
Halteres unusually long and thin ; thorax brown ; pleurae, postnotum and sides of thorax silvery-dusted ; tergites black, venter mainly yellow, somewhat darkened towards tip ; legs light brown ; stigma barely perceptible (type only examined) ; wing length 7 mm. ♂ hypopygium as in fig. 8*j*, *i*. *Rare. Scotland.* 9 ..... **halterella** Edwards.

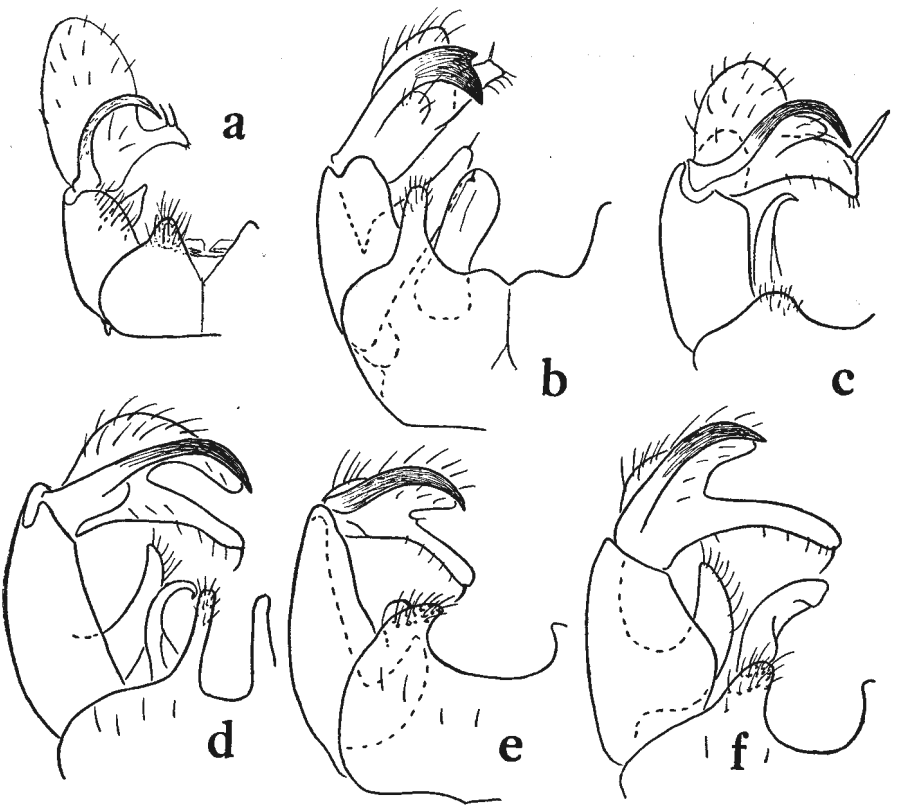

FIG. 9.—Male hypopygia of *Dicranomyia* spp., dorsal aspect. a. *distendens* Lundstroem. b. *occidua* Edwards. c. *rufiventris* Strobl. d. *stylifera* Lackschewitz. e. *morio* Fabricius. f. *caledonica* Edwards. (*a* to a rather smaller scale than the rest.)

25 Abdomen light reddish-yellow ; antennae entirely black ; scutum and pleurae partly, scutellum and postnotum entirely, silvery-dusted ; legs light brown ; no distinct stigma ; wing length 5–7 mm. ♂ hypopygium as in fig. 9*c*. *Uncommon. Argyll, Inverness.* 8 ..... **rufiventris** Strobl.
Abdomen largely black 26
26 Abdominal sternites yellow, at least posteriorly ; coxae yellow, at least apically 27
Abdomen all black ; coxae blackish, hind pair sometimes brownish 28

27 R_5 less than half as long as R_{2+3}; wings clear, stigma distinct; pronotum, middle of scutum, scutellum and most of pleurae finely silvery-dusted, but pteropleura and lower part of sternopleura shining, undusted; sternites yellow on posterior margins only; front femora mainly black, yellow only at base, mid and hind femora mainly yellow, darkened at tips only; tibiae and tarsi somewhat darkened; wing length 5–7 mm. ♂ hypopygium as in fig. 9*e*. *Frequent on marshes. Generally distributed.* 4–5, 8–9 ..... **morio** Fabricius.

R_5 normally more than half as long, sometimes quite as long, as R_{2+3}; wings slightly brown-tinged, stigma indistinct; otherwise differing from *morio*: antennae with terminal segments somewhat longer; pteropleura silvery-dusted; sternites mainly yellow, tergites often yellow along posterior margins, occasionally more extensively so; front femora less dark; wing-length 5–6 mm. ♂ hypopygium as in fig. 9*b*. *Common on rushy bogs. Sutherland, Perth, Yorks, Hereford.* 6–7 ..... **occidua** Edwards.

28 Processes of tergite 9 of ♂ moderately developed; stigma indistinct; silvery-dusting of thorax as in *occidua*; femora darkened as in *morio*; wing-length 5–7 mm. ♂ hypopygium as in fig. 9*f*. *Locally common on rushy bogs. Scotland.* 6 **caledonica** Edwards.

Processes of tergite 9 of ♂ very long; otherwise closely resembles *caledonica*. ♂ hypopygium as in fig. 9*d*. *Uncommon on marshes. Perthshire.* 6 **stylifera** Lackschewitz.

Subgenus **Geranomyia** Haliday.

KEY TO SPECIES.

1 Mainly brownish species; thorax ranging in colour from light yellowish-brown to blackish-brown with yellowish shoulders; praescutum not distinctly striped; pleurae yellowish-brown to blackish-brown, without contrasting black markings; abdomen yellowish-brown, light or dark brown, with broad, continuously black side-margins; legs uniformly yellow or light brown; wing-length 7–9 mm. *Frequent on rocky coasts around Britain.* 6–9 ..... **unicolor** Haliday.

Smaller, mainly yellow species; thorax mainly yellow; praescutum with three or four brown stripes (the median stripe sometimes divided along centre), and also an elongate black marking on the side-margin; pleurae mainly yellow, with a sharply-defined black spot just below that on side-margin of thorax; abdomen mainly yellow, side-margins broadly and continuously brownish or blackish; legs yellow, femora distinctly brown-tipped; wing-length 5–7 mm. *Locally common. Dorset (Chesil Beach).* 6, 8 ..... **bezzii** Alexander.

Subgenus **Rhipidia** Meigen.

KEY TO SPECIES.

1 Wings with variable number of small grey spots in cells, and with larger and slightly darker spots and clouds at middle of Sc, at each end of R_5, stigma, tip of 2A and cross-veins; thorax brown, heavily grey-dusted except on the broad dark brown median praescutal stripe; tergites mainly light brown, hind-margins more or less darkened, side-margins of segments continuously dark brown; legs yellowish brown, front femora with tip blackish, mid and hind femora with dark pre-apical ring; wing-length 6–9 mm. ♂ antennae bipectinate, segments 4–11 each with two processes beneath at base; on 5–10 these processes are both long, outer as long as or slightly longer than inner; 11 has outer processes reduced, and 12 has a single short process. ♀ antennae simple. *Common. Generally distributed.* 5–10 ..... **maculata** Meigen.

Wings without any small spots in cells 2

2 Front femora darkened at tip only as in *maculata*; wings with four light brownish spots along costa, at middle and end of Sc, base of R_5 and stigma; cross-veins and outer end of R_5 clouded; two cross-veins between Sc and R as in *maculata*; thorax, abdomen and legs as in *maculata*; wing-length 6–9 mm. ♂ antennae bipectinate as in *maculata*, but outer pectinations shorter than inner; segments 11 and 12 with a single process, which is longer than in *maculata*; 13 also somewhat produced beneath. ♀ antennae unipectinate, processes quite long on segments 4–11, present also on 12 and 13. *Uncommon around rotten logs. Cambs, Herts, Hants.* 6–7 ..... **ctenophora** Loew.

Front femora mainly blackish, yellowish for less than basal half; wings as in *ctenophora* except that spot at middle of Sc and cross-vein at centre of this spot are lacking; thorax and abdomen as in *ctenophora*; wing-length 7–9 mm. ♂ antennae unipectinate, each of segments 4–12 bearing a single mid-ventral process at base, those on 4, 11 and 12 very short. ♀ antennae without definite pectinations, segments 4–10 somewhat produced beneath. *Uncommon around rotten logs. Hunts, Herts, Hants.* 4–7.....**uniseriata** Schiner.

Genus **Taphrophila** Rondani.

KEY TO SPECIES.

1 Thorax variable in colour, light reddish to rather dark grey; praescutum with or without a brown median stripe and indistinct lateral stripes; abdomen dark brown or black; legs uniformly light brown; wings strongly milky; wing-length 6–8 mm. *Common by running water. Generally distributed.* 6–9 **vitripennis** Meigen.

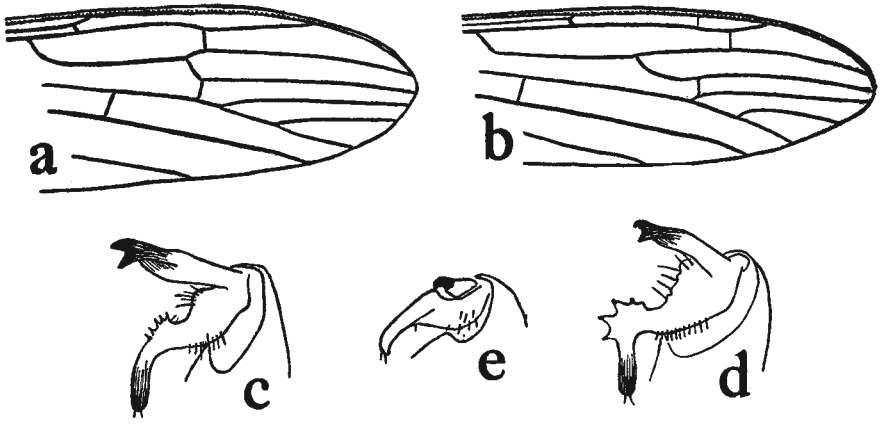

FIG. 10.—a, b. Wing-venation of *Orimarga* spp. a. *virgo* Zetterstedt. b. *attenuata* Walker. c–e. Styles of male hypopygia of *Helius* spp. c. *longirostris* Meigen. d. *flavus* Walker. e. *pallirostris* Edwards.

Genus **Thaumastoptera** Mik.

KEY TO SPECIES.

1 Body uniformly pale yellow, including genitalia; legs very pale yellow, tips of femora and tibiae narrowly black; wing-veins mainly pale, base of R_s, and cross-veins, darker; wing-length 5–6 mm. *Frequent by boggy springs. Yorks southwards.* 6–7.....**calceata** Mik.

Genus **Orimarga** Osten-Sacken.

KEY TO SPECIES.

1 Thorax usually with yellow or light brown ground-colour, rarely dark brown, moderately grey-dusted; praescutum sometimes with an indistinct blackish median stripe; abdomen brown or black; legs pale yellow, tips of femora occasionally brownish; wings milky; tip of R_1 twice to four times as long as r; r–m only about its own length distant from fork of R_s and before the first fork of M (fig. 10*a*); wing-length 7–8·5 mm. *Uncommon. Sutherland, Yorks, Dorset, Devon.* 6–8.....**virgo** Zetterstedt.

Thorax with black ground-colour, almost completely obscured by heavy silvery dust; praescutum unstriped; abdomen dark brown or black; legs reddish-brown, tips of femora sometimes darker; wings milky, narrower than in *virgo*; tip of R_1 less than twice as long as r; r–m several times its length beyond fork of R_s and at or beyond first fork of M (fig. 10*b*); wing-length 6–7 mm. *Uncommon. Generally distributed.* 6–7.....**attenuata** Walker.

Genus **Elliptera** Schiner.

KEY TO SPECIES.

1 Blackish species ; antennal segments moniliform ; mesonotum somewhat shining, unstriped ; wings clear, stigma absent, veins dark ; wing-length 6·5–7·5 mm. *Yorks* (*Pateley Bridge*). 6. (*Pupal skins only taken by Edwards ; adult not yet taken in Britain*) ..... **omissa** Egger.

Genus **Helius** St. Fargeau and Serville.

KEY TO SPECIES.

1 Stigma practically absent ; thorax mainly or entirely yellowish-brown ; praescutum sometimes with a dark area in middle anteriorly ; abdomen mainly yellow, some dark markings usually present ; legs yellow ; wing-length 7–9 mm. ♂ styles as in fig. 10*d*. *Frequent by weedy ponds and bogs. Yorks southwards.* 6–7 **flavus** Walker.

Stigma present 2

2 Antennae with flagellar segments 2–4 not much longer than broad ; thorax brownish ; praescutum with three dark brown stripes, the middle one running the whole length, lateral ones often ill-defined ; legs light brown, often more or less darkened after base of femora ; stigma elongate, light grey ; wing-length 7–9 mm. ♂ styles as in fig. 10*c*. *Frequent by weedy ponds and bogs. Generally distributed.* 6–8 ..... **longirostris** Meigen.

Flagellar segments 2–4 about twice as long as broad ; thorax light brown ; praescutum with three distinct black stripes ; legs light brown, femora dark-tipped ; stigma shortly oval, dark brown, rather conspicuous ; wing-length 9–11 mm. ♂ styles as in fig. 10*e*. *Uncommon by weedy ponds and bogs. Hereford southwards.* 5–6 ..... **pallirostris** Edwards.

Tribe PEDICIINI.

KEY TO GENERA AND SUBGENERA.

1 Wing-membrane hairy ..... **Ula** Haliday (p. 36).
Wing-membrane bare 2

2 Second submarginal cell with base pointed and nearly always distal to that of first posterior ; antennae 15–17-segmented (**Pedicia** sens. lat.) 3
Second submarginal cell with base square and level with that of first posterior ; R_5 short ; antennae 13-segmented (**Dicranota** sens. lat.) 6

3 Cord (i.e. the series of cross-veins and more or less transverse portions of veins at outer ends of basal and marginal cells) oblique ; large species with striped wings ..... **Pedicia** s.str. (p. 33).
Cord not noticeably oblique ; smaller species ; wings not striped 4

4 Fourth (penultimate) posterior cell sessile (i.e. with its base level with that of the open discal cell) ..... **Amalopis** Haliday (p. 33).
Fourth posterior cell stalked (i.e. its base much beyond base of discal cell, or of third posterior cell if discal cell is open) 5

5 Second posterior cell longer than, or about as long as, its stem (which includes upper margin of discal cell when latter is closed)
Crunobia Kolenati (p. 33).
Second posterior cell shorter (usually much shorter) than its stem
Tricyphona Zetterstedt (p. 33).

6 Two cross-veins in marginal cell 7
Only one cross-vein in marginal cell ..... **Rhaphidolabis** Osten-Sacken (p. 35).

7 Antennae of ♂ somewhat elongate ; stigma dark ..... **Dicranota** s.str. (p. 34).
Antennae short in both sexes ; stigma faint .... **Paradicranota** Alexander (p. 35).

Genus **Pedicia** Latreille.

Subgenus **Pedicia** Latreille s.str.

KEY TO SPECIES.

1 Largest British Limoniid; wings with conspicuous and continuous brown streaks extending along costa, downwards across cord and along whole of Cu_1; head and thorax light grey; praescutum with three dark grey stripes, the median one often narrowly divided; abdominal segments continuously blackish (or occasionally reddish) along middle above and below, grey laterally; legs brownish, femora black-tipped; wing length 20–24 mm.; ♀ wings usually shorter than ♂. *Locally common. Generally distributed.* 4–9 ..... **rivosa** Linnaeus.

Subgenus **Crunobia** Kolenati.

KEY TO SPECIES.

1 Light brown species; wings distinctly brown-tinged; head dark brown, grey-dusted; antennae light brown or yellow; thorax light brown; abdomen light brown, median line of tergites often vaguely darker; legs light brown, femora vaguely darkened at tips; wing-length 12–16 mm. *Frequent locally. Generally distributed.* 5–9 ..... **littoralis** Meigen.

Pale yellow species, including head and antennae; wings clear; legs pale yellow. femora conspicuously brown-tipped; wing-length 9–11 mm. *Uncommon, Generally distributed.* 6–10 ..... **straminea** Meigen.

Subgenus **Amalopis** Haliday.

KEY TO SPECIES.

1 Head dark grey, brown above; antennae (normally) 16-segmented, scape and pedicel usually partly or entirely yellowish, flagellum black; thorax with blackish ground-colour, heavily dusted grey except on the three shining praescutal stripes, middle stripe narrowly divided; tergites mainly dark or with a dark median stripe, abdomen otherwise light reddish; coxae and most of femora yellow or light brown, legs otherwise dark brown or blackish; wings rather brownish with brown spots at base of R_s and tip of R_1, cord conspicuously brownish, and sometimes small clouds at tip of R_2 and base of cell M_1; wing-length 11–15 mm. *Rather common. Generally distributed.* 4–10 **occulta** Meigen.

Subgenus **Tricyphona** Zetterstedt.

KEY TO SPECIES.

1 All coxae yellow; abdomen usually yellowish laterally, and with venter extensively reddish-yellow; ♂♀ genitalia yellow 2

All coxae dark grey, brown or black; abdomen almost all blackish, grey-dusted, at most venter with restricted pale area; ♂ genitalia black, ♀ reddish 3

2 Thorax grey; praescutum from front view with four slightly shining, lightly grey-dusted, black stripes, the median pair close together, all stripes from behind appearing dull, with median pair completely fused; tergites black, grey-dusted with pale hind-margins; femora and tibiae usually light brown, tarsi darker, legs occasionally mainly darkened; wings rather broad, anal angle well marked, hairs on veins on distal part quite obvious; wing-length 10–12 mm. ♂ hypopygium as in fig. 11*b*. *Uncommon. N.E. Scotland (Banffshire), southwards to Carnarvon, S.W. Ireland (Killarney).* 5–8 **lucidipennis** Edwards.

Praescutum with median stripes appearing separate (at least posteriorly) from all view-points; wings narrower than in *lucidipennis*, with anal angle more obtuse, hairs on veins on distal part very short and inconspicuous; wing-length 6·5–9·5 mm. ♂ hypopygium as in fig. 11*a*; otherwise resembles *lucidipennis*. *Common locally. Generally distributed.* 5–10 ..... **claripennis** Edwards.

3 Praescutum from front view with four distinct shining black stripes, the median pair narrowly divided ; legs brown, coxae grey-dusted ; antennae 16-segmented, flagellum rather swollen at base ; wings with second submarginal cell very short-stalked ; wing length 5·5–7 mm. ♂ hypopygium as in fig. 11c. *Uncommon. Generally distributed.* 6–7, 9 ..... **schummeli** Edwards.

Praescutum with three faint dark grey or brown, hardly shining stripes, the median one partly divided or entire ; second submarginal cell rather long-stalked ; flagellum more swollen than in *schummeli* 4

4 Median praescutal stripe almost entirely divided by a pale line (distinct from front view) ; femora almost uniformly dark brown, coxae sometimes lighter, legs otherwise brownish ; vein R_5 long ; wing-length 7–8 mm. ♂ hypopygium as in fig. 11*d*. *Uncommon. Inverness, Perth, Yorks, Carnarvon, Hants.* 6 **unicolor** Schummel.

Median praescutal stripe undivided (although sometimes a thin reddish-brown line is discernible) ; femora yellow towards base, apical two-thirds blackish, legs otherwise mainly blackish ; R_5 much shorter than in *unicolor* ; wing-length 5–9·5 mm. *Common. Generally distributed.* 4–11 **immaculata** Meigen.

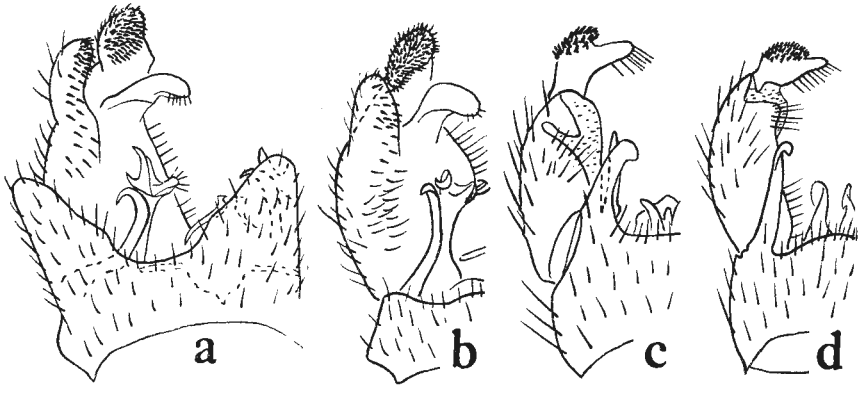

FIG. 11.—Male hypopygia of *Tricyphona* spp., dorsal aspect. a. *claripennis* Verrall. b. *lucidipennis* Edwards. c. *schummeli* Edwards. d. *unicolor* Schummel.

Genus **Dicranota** Zetterstedt.

Subgenus **Dicranota** Zetterstedt s.str..

KEY TO SPECIES.

1 r-m with a very small dark cloud, m–cu and base of R_5 unclouded ; cell M_1 short but apparently always present ; stigma dark, distinct ; wing-length 8–10 mm. ♂ hypopygium with ventral style shortly oval, hairy, much shorter than the curved dorsal style. *Uncommon. Generally distributed.* 4–5, 7–10 **bimaculata** Schummel.

Cloud over r-m larger than in *bimaculata*, small clouds or dark seams often present over m–cu and base of R_5 ; cell M_1 as often absent as present ; stigma still more distinct ; wing-length 6–9·5 mm. ♂ hypopygium (fig. 12*a*) with ventral style elongate, finger-like, with only a few short hairs, and equal in length to dorsal style, which is nearly straight. *Uncommon. Ross, Inverness, Perth, Yorks.* 6, 8–10 ..... **guerini** Zetterstedt.

Subgenus **Paradicranota** Alexander.

KEY TO SPECIES.

1 Antennae 10- or 11-segmented, segments unusually short; grey, somewhat stout-bodied species; legs and wings rather short; mesonotum less arched than usual; femora usually light brown towards base, legs otherwise black; wing-vein Cu_1 conspicuously dark; cell M_1 absent; wing-length 4–6 mm. *Rare. Cheshire* (*Goyt Valley*). 4.....**robusta** Lundstroem.
Antennae 13-segmented, segments normal; mesonotum arched as usual; Cu_1 not at all dark.....2

2 Wing-cell M_1 absent; postnotum and pleurae with a slight reddish-yellow tinge; legs mainly light brown; wing-length 7–8·5 mm. ♂ hypopygium with dorsal apical lobe of coxite small; tergite with long, blunt-tipped lateral process; parameres bent at right angles near the pointed tips. *Uncommon. Generally distributed.* 5–7, 10.....**pavida** Haliday.
M_1 present, although sometimes very short; ground-colour of thorax uniformly grey.....3

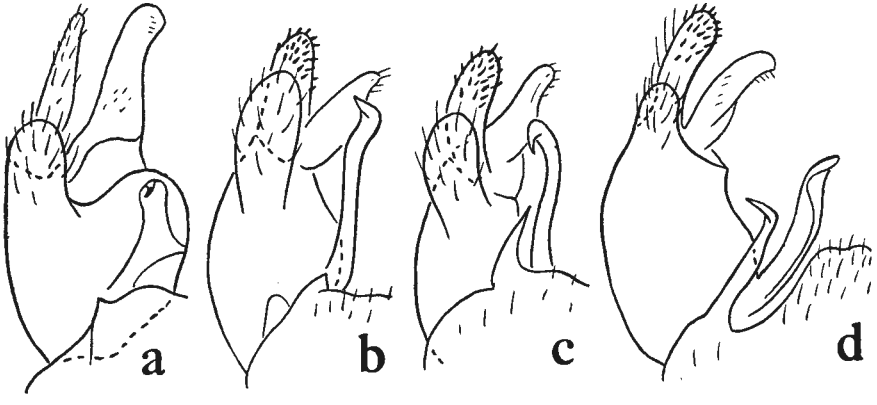

FIG. 12.—Male hypopygia of *Dicranota* spp., dorsal aspect. a. *guerini* Zetterstedt. b. *brevitarsis* Bergroth. c. *subtilis* Loew. d. *exclusa* Walker.

3 Coxae tinged reddish-yellow, femora more or less extensively light brown or yellowish, legs otherwise dark brown; wing-length 5·5–7 mm. ♂ hypopygium (fig. 12*c*) with lateral process of tergite moderately long, pointed; parameres sinuous, the pointed tips strongly recurved, inner margin with some short hairs. *Uncommon. Shropshire northwards.* 5–7, 9–10.....**subtilis** Loew.
Coxae grey, legs otherwise uniformly brownish; wing-length 5–7 mm. ♂ hypopygium (fig. 12*b*) with lateral process of tergite reduced to small triangular projection; dorsal apical lobe of coxite longer than in the other species; parameres nearly straight, only bent at tips, bare. *Uncommon. Scotland, Durham, Westmorland.* 6–7.....**brevitarsis** Bergroth.

Subgenus **Rhaphidolabis** Osten-Sacken.

KEY TO SPECIES.

1 Resembles *Paradicranota subtilis* rather closely, but lacks cross-vein r; cell M_1 present; wing-length 5–8 mm.; genitalia in both sexes reddish-yellow. ♂ hypopygium (fig. 12*d*) with middle part of tergite prominent and hairy; lateral process long, the pointed tip bent outwards. *Uncommon. Scotland and Wales.* 5–6.....**exclusa** Walker.

Genus **Ula** Haliday.

KEY TO SPECIES.

1 Head grey; antennae long and slender; scape and pedicel yellow, flagellum black, each segment with one long hair and short whitish pubescence; thorax brown; praescutum darker in middle or entirely dark, grey-dusted; abdomen brownish or black; genitalia in both sexes reddish-yellow; legs light brown; wings light grey, light brown stigma usually distinguishable, cross-veins sometimes slightly clouded brown; wing-length 6–10 mm. *Common. Generally distributed.* 5–6, 9–11 ..... **sylvatica** Meigen.

Tribe HEXATOMINI.

KEY TO GENERA AND SUBGENERA.

1 Five (rarely four) posterior cells; antennae 16-segmented 2
Only three posterior cells; antennae 6–7-segmented (♂) or 10–11-segmented (♀) **Hexatoma** Latreille (p. 37).
2 Cross-vein m–cu at base of discal cell; pronotum large; arcular cross-vein absent ..... **Dactylolabis** Osten-Sacken (p. 38).
m–cu (except in abnormal specimens) well beyond base of discal cell 3
3 Arcular cross-vein absent (fig. 13*b*) 4
Arcular cross-vein present (fig. 13*a*) 5

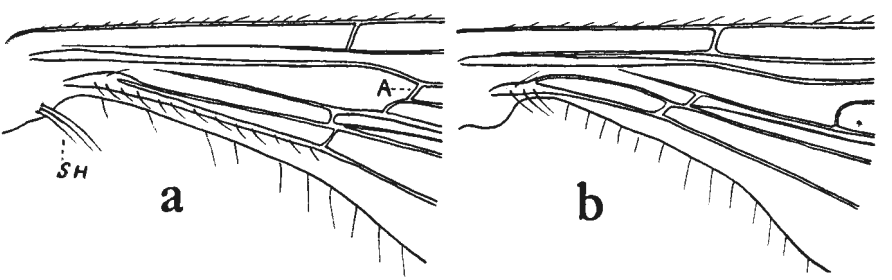

FIG. 13.—Wing-base of HEXATOMINI genera. a. *Pilaria* Sintenis, showing arcular cross-vein (= *A*) and squamal hairs (= *SH*). b. *Austrolimnophila* Alexander, showing absence of these structures.

4 An accessory cross-vein in costal cell; third antennal segment large and conical **Epiphragma** Osten-Sacken (p. 39).
No accessory cross-vein in costal cell; third antennal segment smaller, not conical **Austrolimnophila** Alexander (p. 39).
5 Wing-membrane hairy at tip; anterior pits of mesonotum removed from front margin; tibial spurs very small, sometimes absent; r normally absent **Oxydiscus** de Meijere (p. 45).
Wing-membrane bare; anterior pits of mesonotum close to front margin, sometimes indistinct; tibial spurs always obvious; r present (**Limnophila** sens. lat.) 6
6 Tip of vein R_1 short, turned up to costa at cross-vein r; head not much narrowed behind 7
Tip of R_1 longer, continued at least a short distance beyond r 8
7 No cross-vein in lower basal cell ..... **Phylidorea** Bigot (p. 39).
Cross-vein present near middle of lower basal cell **Idioptera** Macquart (p. 40).
8 Cross-vein present in lower basal cell; wings more or less spotted **Elaeophila** Rondani (p. 40).
No cross-vein in lower basal cell 9
9 Head narrowed behind (fig. 14*a*, *b*); anterior pits of mesonotum conspicuous ... 10
Head rounded behind (fig. 14*c*); wings unspotted (**Pilaria** sens. lat.) 11

10 Pronotum large; wings normally spotted
Limnophila Macquart s.str. (p. 42).
Pronotum smaller; wings (in British species) unspotted
Pseudolimnophila Alexander (p. 43).

11 Squamae with a few long hairs; humeral pits large, anterior pits small
Pilaria Sintenis s.str. (p. 43).
Squamae quite bare.....12

12 Anterior pits large, confluent, forming a shining patch on front of thorax
Pilaria Sintenis, **filata** group (p. 44).
Anterior pits small, separate.....**Pilaria** Sintenis, **nemoralis** group (p. 43).

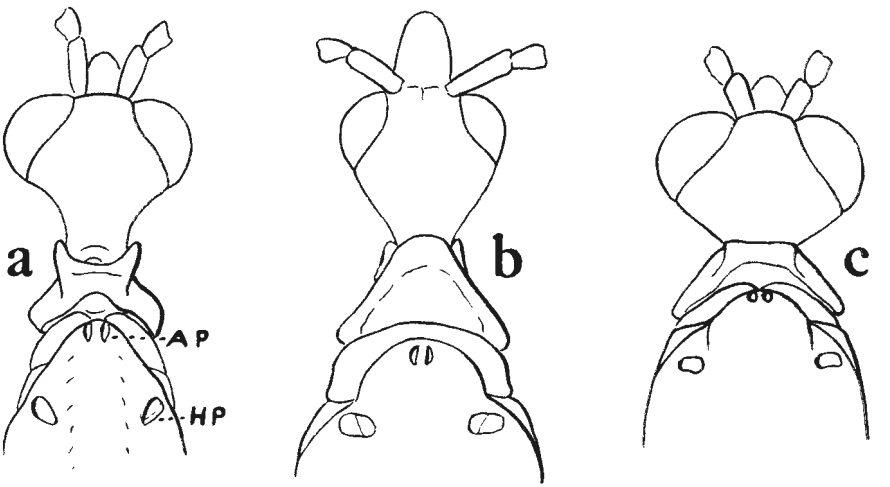

FIG. 14.—Head and anterior part of thorax of HEXATOMINI genera, dorsal aspect. a. *Pseudolimnophila* Alexander. b. *Limnophila* Macquart. c. *Pilaria* Sintenis. Note shape of head and prothorax. (*AP* = anterior pits. *HP* = humeral pits.)

Genus **Hexatoma** Latreille.

KEY TO SPECIES.

1 Thorax brown or black, dusted light brown, heavily except on the three praescutal stripes; median stripe usually divided by a narrow brown line from front view; abdomen black, shining; legs mainly brown or blackish, bases of femora light brown or reddish; $R_2 + _3$ and R_2 subequal in length, r proximal to the fork; wing-length 9–12 mm. ♂ antennae almost as long as body; flagellar segments 1–3 subequal in length, 4 somewhat shorter, 5 (last) minute. ♀ antennae scarcely as long as thorax, flagellum 8–9 segmented, last few segments very small. *Frequent on shingle of rapid streams. Yorks northwards.* 6–8
bicolor Meigen.

Resembles *bicolor*, but differs as follows: Thorax dusted grey, praescutal stripes usually more shining; abdomen dusted grey, almost dull, hind-margins of tergites sometimes indistinctly and narrowly yellowish; legs shorter and stouter; femora entirely black or dark brown; R_2 usually less than half as long as $R_2 + _3$, r far before the fork; wing-veins more strongly marked; wing-length only 6–11 mm. ♂♀ antennae shorter than thorax; in ♂ flagellar segment 1 considerably longer than 2, 3 or 4, 5 (last) minute; in ♀ flagellar segment 2 about half as long as 1, remainder together scarcely longer than second. *Frequent on shingle of rapid streams. Westmorland northwards.* 5–7
fuscipennis Curtis.

Genus **Dactylolabis** Osten-Sacken.

KEY TO SPECIES.

1 Thorax heavily grey-dusted except on the four distinct, slightly shining, praescutal stripes ; abdomen black, posterior borders of tergites narrowly yellow ; femora brown, often black-tipped ; wings conspicuously clouded, including a large cloud at base of basal cells and another over base of R_5 ; wing-length 7·5–9·5 mm. *Frequent on limestone hills. Generally distributed.* 5–6
sexmaculata Macquart.

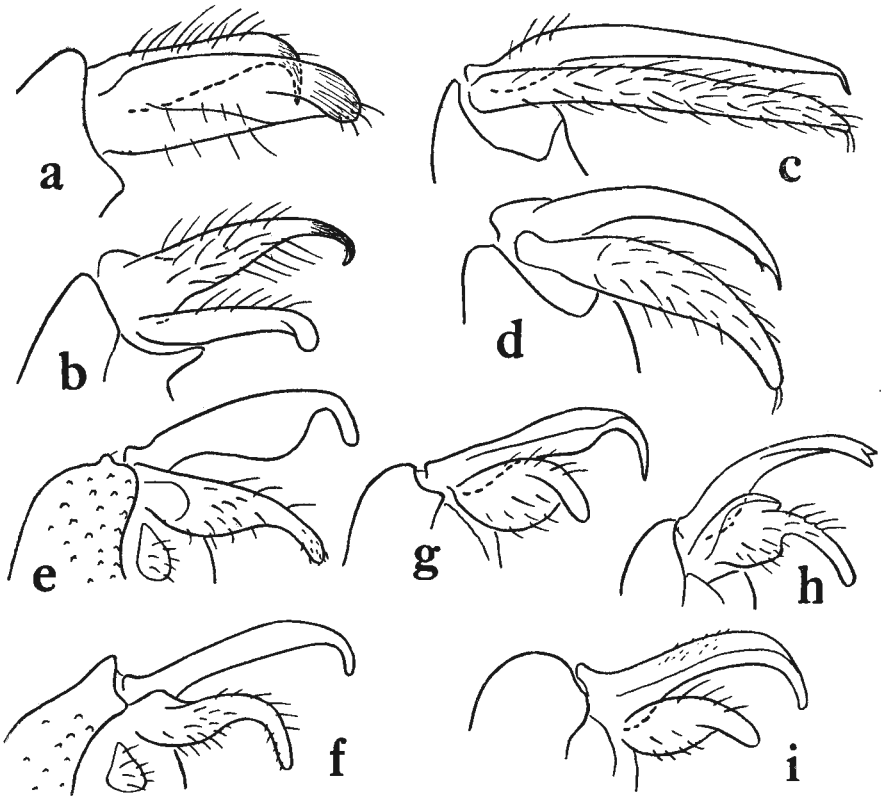

FIG. 15.—Styles, with tip of coxite, of male hypopygia of HEXATOMINI spp. a. *Epiphragma ocellaris* Linnaeus. b. *Austrolimnophila ochracea* Meigen. c. *Pseudolimnophila sepium* Verrall. d. *Pilaria discicollis* Meigen. e. *Phylidorea meigeni* Verrall. f. *Ph. phaeostigma* Schummel. g. *Ph. squalens* Zetterstedt. h. *Ph. fulvonervosa* Schummel. i. *Idioptera pulchella* Meigen.

Thorax uniformly grey-dusted without trace of praescutal stripes ; abdomen black, posterior borders of tergites rarely paler ; legs more slender than in *sexmaculata ;* femora usually dark brown, paler towards base ; wings with smaller, less conspicuous clouds, none at base of basal cells and only a small cloud over base of R_5 ; wing-length 8–10 mm. *Uncommon on wet rocks. Hereford northwards.* 5–7 ..... **transversa** Meigen.

Genus **Epiphragma** Osten-Sacken.

KEY TO SPECIES.

1 Antennae with scape and pedicel dark, base of flagellum swollen, orange, remainder dark; thorax hairy, ground-colour yellow, grey pruinose; four brown praescutal stripes, obscured by pruinosity; abdomen partly yellow, with more or less extensive brown markings; legs yellow, femora with two narrow black rings on distal half, the outer ring well before the tip, one or other of these rings sometimes very faint or absent; wings with a more or less intense ocellate pattern; wing-length 9–12 mm. ♂ styles, with tip of coxite as in fig. 15*a*. *Frequent in wet woods. Generally distributed.* 5–6 ..... **ocellaris** Linnaeus.

Genus **Austrolimnophila** Alexander.

KEY TO SPECIES.

1 Head grey; antennae dark; thorax light brown; mesonotum more or less darkened, dull; praescutal stripes obscure; abdomen light brown, narrowly darkened laterally; legs brown; wings clear, stigma faint; wing-length 8–11 mm. ♂ styles, with tip of coxite as in fig. 15*b*. *Common. Generally distributed.* 5–8 ..... **ochracea** Meigen.

Genus **Limnophila** Macquart sens. lat.

Subgenus **Phylidorea** Bigot.

KEY TO SPECIES.

1 R_5 short, subequal in length to R_{2+3}, or at most less than twice as long; antennae (except in **heterogyna**) alike in both sexes, not or scarcely longer than head and thorax together; wings unmarked except for stigma 2

R_5 long, at least twice as long as R_{2+3}; ♂ antennae longer than in ♀, fully half as long as wing; wings with slight clouds on cross-veins and base of R_5 9

2 Larger species; wings of ♀ normal 3

Small, grey-brown species; ♂ antennae black, much longer than head and thorax together, ♀ paler and much shorter; legs brown, femora in ♂ darkened except at base; wings narrow, clear, without stigma, rather short in ♀; wing-length, ♂ 5–6 mm., ♀ 4 mm. *Rare. Shropshire.* 8 ..... **heterogyna** Bergroth.

3 Wings with distinct stigma; abdomen extensively darkened (except in **lineola**) 4

Stigma scarcely indicated; body mainly yellowish 7

4 Thorax black 5

Thorax partly yellowish 6

5 Mesonotum sparsely grey-brown dusted, obviously shining; antennae black or dark brown, first few flagellar segments very shortly oval; coxae yellow, femora more or less yellow towards base, legs otherwise brown or black; wing-length 8–12 mm. ♂ styles, with tip of coxite as in 15*e*. *Common on heaths and moors. Generally distributed.* 5–9 ..... **meigeni** Verrall.

Mesonotum uniformly grey-brown dusted, hardly shining; antennae slightly longer than in *meigeni*, flagellum light brown, its basal segments rather elongate oval; legs and wing length as in *meigeni*. ♂ styles, with tip of coxite as in fig. 15*f*. *Frequent. Scotland.* 5–8 ..... **phaeostigma** Schummel.

6 Wings pellucid; thorax orange-yellow, sparsely grey-brown dusted, obviously shining; praescutum with a broad, ill-defined, moderately shining, blackish median stripe, usually fading well before suture, no lateral stripes; femora mainly black or dark brown, legs otherwise mainly light brown; wing-length 12–14 mm. *Common. Hereford southwards.* 5–6 ..... **dispar** Meigen.

Wings tinged brownish-yellow; thorax with light brown ground-colour, heavily dusted grey-brown, hardly shining; praescutum with a broad median stripe as in *dispar*, but stripe extends back almost to suture, a pair of shorter lateral stripes sometimes present; legs brown, tips of femora vaguely darker; wing-length 10–14 mm. *Uncommon. Generally distributed.* 5–9 ..... **lineola** Meigen.

7 Thorax with a dark median line, indicated at least anteriorly ; antennal scape and pedicel usually somewhat darkened.....8
Thorax entirely ochreous, shining ; scape and pedicel usually yellow ; abdomen brownish-orange, segments 8 and 9 in ♂ black (but coxites yellow as usual) ; legs light brown, extreme tips of femora and tibiae usually black, also last few tarsal segments ; wing-length 6·5–10 mm. *Common. Generally distributed.* 4–9.....**ferruginea** Meigen.

8 Discal cell closed as usual ; thorax orange-yellow, shining, with a narrow, dark, median line from pronotum almost to suture ; abdomen yellow, sometimes darker above, segments 8 and 9 not blackened in either sex ; legs light brown, tips of femora often vaguely and broadly darkened ; wing-length 9–11 mm. ♂ styles, with tip of coxite, as in fig. 15*h*. *Common. Generally distributed.* 5–8 **fulvonervosa** Schummel.
Discal cell open ; otherwise differs from *fulvonervosa* as follows : smaller ; dark median line of thorax narrower and fainter, sometimes hardly distinguishable ; tips of femora rarely darkened ; wing-length 7·5–9·5 mm. *Frequent. Generally distributed.* 6–7.....**aperta** Verrall.

9 Head yellow, somewhat obscured by grey dust from hind view ; antennae with at least first three segments yellow, remainder darker, faintly ringed ; thorax orange-yellow, shining ; abdomen orange-yellow, with black lateral markings, except segment 9, which is black ; legs yellow, tips of femora rather broadly, and of tibiae narrowly, black ; wing length 7 mm. *Uncommon. Carnarvon northwards.* 6–7.....**glabricula** Meigen.
Head and thorax black, heavily dusted brown-grey ; antennae entirely dark....10

10 Abdomen black and slender in both sexes ; legs brown, coxae and bases of femora yellow ; wings normally grey ; wing-length 5–8 mm. ♂ antennae with long verticils, basal flagellar segment as long as scape and pedicel together, only slightly broadening in middle ; styles, with tip of coxite, as in fig. 15*g*. *Common on peat bogs. Generally distributed.* 5–8.....**squalens** Zetterstedt.
Abdomen in ♂ mainly orange, segment 8 black and lateral margins of segments often darkened, in ♀ all black and unusually broad and stout ; legs stouter than in *squalens*, especially in ♀ ; wings normally brownish ; wing-length 6–8 mm. ♂ antennae with short verticils, basal flagellar segment shorter than scape and pedicel together, considerably broadening in middle. *Uncommon. Yorks, Dorset, Hants.* 6–9.....**abdominalis** Staeger.

Subgenus **Idioptera** Macquart.

KEY TO SPECIES.

1 Femora and tibiae mainly yellow, broadly black apically ; thorax heavily silvery-grey pruinose, sometimes with brownish median dusting ; abdomen yellow, unbanded, narrowly black laterally ; wing bands conspicuous, dark brown, usually lighter around cross-veins ; cell M_1 short, occasionally absent. ♂ antennae slender, two-thirds as long as wing, dark, narrowly pale at joints ; wing-length 8–9 mm. ♀ wings normal (as in ♂). *Frequent. Westmorland, Yorks, Cheshire.* 5–7.....**fasciata** Linnaeus.
Legs black, except bases of femora ; thorax ash-grey pruinose, extensively brown-dusted, with an ill-defined dark median stripe ; wing-markings variable, less intense and more uniformly tinted than in *fasciata*. ♂ antennae less slender than in *fasciata*, barely half as long as wing, all dark ; abdomen yellow, posterior and lateral margins of segments darkened ; wing-cell M_1 longer ; wing-length 6–8 mm. ; styles, with tip of coxite, as in fig. 15*i*. ♀ wings functionless, half length of abdomen ; abdomen mainly blackish. *Locally common. Generally distributed.* 5–8.....**pulchella** Meigen.

Subgenus **Elaeophila** Rondani.

KEY TO SPECIES.

1 Halteres entirely yellow ; antennae slightly longer than head and thorax together, entirely dark, basal flagellar segments elongate-oval ; thorax and abdomen uniformly dark brown ; legs brown ; wings slightly smoky, without conspicuous spots or clouds, only small faint clouds present at base of R_s, tip of Sc and below stigma, and occasionally a darker cloud in middle of R_s ; wing length

5–8 mm. ♂ styles as in fig. 16*g*. *Frequent on peat bogs. Generally distributed.* 4–6 ..... **trimaculata** Meigen.

Knob of halteres largely blackish; antennae shorter than thorax; wings with conspicuous spots or clouds, at least along anterior border 2

2 Femora light or dark brown, often gradually darkened from base to tip; antennae entirely dark; thorax dark, pruinose; praescutum with a pair of more or less distinct median brown stripes only; abdomen blackish; wings narrow, with seven dark evenly spaced costal spots and slight clouds over cross-veins and tips of all veins, sometimes other faint clouds present; wing length 7 mm. ♂ styles as in fig. 16*e*; aedeagus as in fig. 16*h*. *Uncommon by streams. Westmorland southwards.* 5–6 ..... **verralli** Bergroth.

Femora yellow, conspicuously dark brown at extreme tips; base of flagellum yellow, antennae otherwise dark; thorax dark; praescutum with variable brown markings, typically a pair of median stripes with a pair of smaller stripes adjacent to them posteriorly, and other adjacent marks on each side at middle; abdomen more or less translucent brownish 3

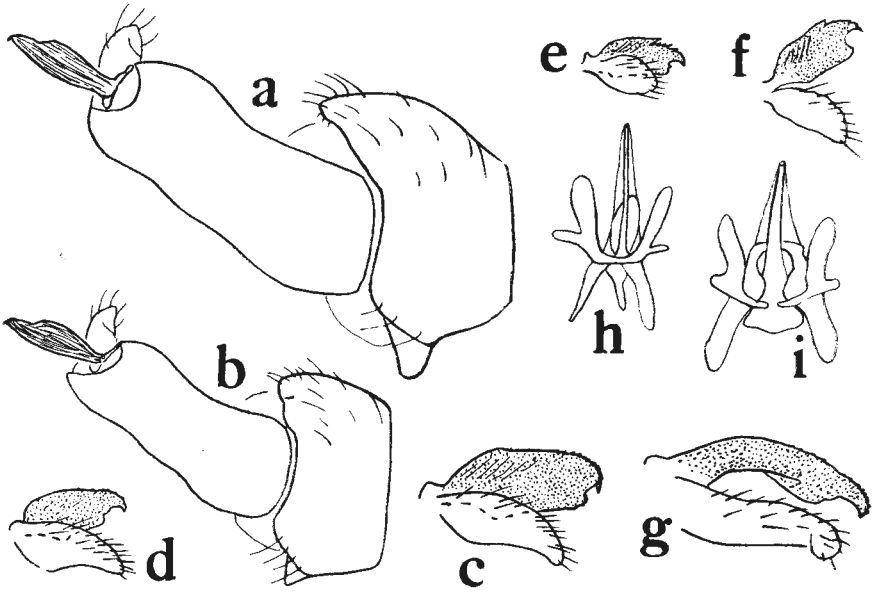

FIG. 16.—a, b. Male hypopygia of *Elaeophila* spp., lateral aspect. a. *maculata* Meigen. b. *submarmorata* Verrall. c–g. Styles of *Elaeophila* spp. c. *maculata* Meigen. d. *mundata* Loew. e. *verralli* Bergroth. f. *apicata* Loew. g. *trimaculata* Zetterstedt. h, i. Aedeagus of *Elaeophila* spp. h. *verralli* Bergroth. i. *apicata* Loew.

3 Head light grey with two dark brown stripes behind eyes, also often a dark spot in middle of frons; wings with third and fourth costal spots widely separated, no small dots along veins, markings at wing-tips distinctive, the sixth and seventh costal spots joined below in cells R_3 and R_5, leaving a small pale area at extreme tip of R_{4+5}; wing length 7–8 mm. ♂ styles as in fig. 16*f*; aedeagus as in fig. 16*i*. *Common by streams. Generally distributed.* 6–9 ..... **apicata** Loew.

Head uniformly dark grey, or at most a median brown area present 4

4 ♂ hypopygium (fig. 16*a*, *c*) with tergite rather prominent, squared off in middle; sternite with a conspicuous lip-like projection in middle beneath; coxite with a small group of spinules at inner root; outer style very broad, with only five teeth on distal margin and a small terminal tooth; penis very short, not extend-

ing beyond spinules of coxite ; wings broadened in middle (♂ only), so that hind-margin is almost angled near tip of vein 2A. ♂♀ **Typical form :** wing-membrane heavily spotted and dotted with dark brown, usually with many small dots along courses of veins ; the seven main costal spots not all equidistant, fourth much nearer to fifth than to third ; R4 + 5 with a number of dark dots, never uniformly dark-bordered ; cross-vein in lower basal cell only narrowly dark-bordered, even in the darkest specimens. **var. decora :** wings more extensively dark. **var. aegle :** wings much paler than in typical form ; wing-length (all forms) 9–11 mm. *Common by streams. Generally distributed.* 5–9 ..... **maculata** Meigen.

♂ hypopygium with tergite more truncate than in *maculata*, also sternite with the lip-like projection much less pronounced ; ventral piece of aedeagus somewhat differently shaped ; other genital characters as in *maculata ;* wing-length 6–9 mm. 5

5 Wings streaked, with or without spots 6
Wings spotted, without streaks 7

6 Wings both spotted and streaked. *Local. S. Devon.* 6
submarmorata Verrall **var. bistriata** Edwards.
Wings streaked rather than spotted. *Local. Devon.* 5–6
submarmorata var. suffumata Edwards.

7 Only five small wing-spots ; costal cell and wing-tip quite unspotted. *Frequent. Generally distributed.* 5–6 ..... **submarmorata var. pentasticta** Edwards.
Wings with more numerous spots ; costal cell spotted 8

8 No distinct spots apart from seven in costal area ; wing-membrane almost entirely dark grey. *Rare. Devon.* 5. (1 ♂) .... **submarmorata var. eatoni** Edwards.
Spots generally distributed over wing ; membrane not noticeably grey 9

9 First costal wing spot (over humeral cross-vein) small ; other wing-spots reduced, restricted. *Frequent. Yorks southwards.* 5–6
submarmorata var. oligosticta Edwards.
First costal wing-spot large ; other wing-spots not noticeably reduced or restricted 10

10 Courses of veins (including R_{4+5}) with numerous small dots. ♂ hypopygium as in fig. 16*b*. *Common by streams. Generally distributed.* 4–8
submarmorata Verrall. **Typical form.**
R_{4+5} uniformly dark-margined, or clear except at base ; scarcely any small dots along courses of veins. ♂ styles as in fig. 16*d*. *Uncommon. Generally distributed.* 6–9 ..... **mundata** Loew.
(It seems probable that *mundata*, considered distinct by Edwards, should be regarded as a variety of *submarmorata*. The hypopygia do not appreciably differ.)

Subgenus **Limnophila** Macquart s.str.

KEY TO SPECIES.

1 Coxae grey, femora yellow on basal half, then gradually darkening to the broadly blackish tips, legs otherwise dark brown or black ; thorax and abdomen heavily grey or blue-grey pruinose ; praescutum with four dark brown stripes, lateral pair shortened, median pair either running the whole length or shortened and sometimes with a fine dark line between them ; wings normally with numerous small spots and dots along veins and in cells, some larger ones towards costa ; in dark specimens the spots are larger, more numerous, and may fuse to extend over entire wing, in others they are reduced in number, or even (rarely) absent, leaving the wing clear ; wing-length 10–13 mm. *Frequent. Generally distributed.* 3–5 ..... **punctata** Schrank.
Legs, including coxae, mainly yellow, femora with rather narrow, sharply defined, blackish tips, tibiae narrowly blackish at base and tip, last few tarsal segments darkened ; thorax heavily blue-grey pruinose ; praescutum with a light brown median stripe, sometimes shortened, and some scattered light brown dots ; abdomen reddish-yellow ; wings narrower than in *punctata*, markings similar, but blotch below stigma more oblique ; sometimes the entire wing is suffused with brown, without definite markings ; wing-length 9–12 mm. *Uncommon. Yorks southwards.* 5–7 ..... **pictipennis** Meigen.

Subgenus **Pseudolimnophila** Alexander.

KEY TO SPECIES.

1 Thorax dark grey; praescutum with three distinct dark brown stripes, middle one sometimes divided; pleurae grey; abdomen blackish above, more or less reddish-yellow below; legs light or dark brown, tips of femora and tibiae vaguely darkened; R_{2+3} rather long, forking at, or close to, r; wing-length 8·5–10 mm. *Frequent. Generally distributed.* 5–7 ..... **lucorum** Meigen.

Thorax dark brown above, lower part, including pleurae, light reddish-brown; praescutal stripes not clearly defined; legs light brown, last few tarsal segments usually darkened; R_{2+3} short, forking well before the cross-vein; wing-length 8·5–10 mm. ♂ styles, with tip of coxite, as in fig. 15*c*. *Uncommon. S.W. Ireland, Carnarvon southwards.* 6, 8 ..... **sepium** Verrall.

Subgenus **Pilaria** Sintenis.

(1) **Pilaria,** s.str.

KEY TO SPECIES.

1 Antennae with verticils not unusually long, scarcely twice length of segments; thorax dark brown, dusted yellowish-brown, shoulders paler, pleurae more or less blackish; four indistinct praescutal stripes; abdomen reddish-yellow, often extensively darkened; legs light brown, femora narrowly and abruptly black-tipped; tips of tibiae and last few tarsal segments often darkened; wings brown-tinged, stigma, cross-veins and base of R_S with slight dark clouds; cell M_1 present; wing-length 9–11 mm. *Uncommon. Generally distributed.* 6–7 ..... **scutellata** Staeger.

Antennae with very long verticils, four or more times as long as segments 2

2 Cell M_1 absent; thorax uniformly dark brown or blackish, lightly dusted reddish-brown; pleurae largely ochreous, with a broad black stripe from neck to base of abdomen; abdomen black; legs brown; wings slightly brownish, unmarked; wing-length 6–8 mm. *Uncommon. Scotland, Norfolk, Shropshire.* 7–8 **meridiana** Staeger.

M_1 present; larger species 3

3 Thorax (including pleurae) entirely yellow, dorsum at most reddish-yellow; abdomen brown, darker markings usually restricted to a blackish median line; legs brown; wings scarcely darkened, apart from the dark-grey stigma; wing-length 9–10 mm. *Rare. Hants, Sussex.* 6–7 ..... **fuscipennis** Meigen.

Thorax uniformly dark brown or black above, shoulders and pleurae reddish-yellow; abdomen extensively blackish above, usually paler beneath; legs brown, femora sometimes gradually darkening from base to tip; wings brown-tinged, stigma scarcely darker; wing-length 10–12 mm. ♂ styles, with tips of coxites, as in fig. 15*d*. *Common by ponds and marshes. Generally distributed.* 6–8 ..... **discicollis** Meigen.

(2) **Pilaria, nemoralis** group.

KEY TO SPECIES.

1 Wing-cell M_1 about equal in length to its stem; stigma brown, conspicuous; slight brown seams along cord and at base of R_S; thorax light grey; four brown or dark grey praescutal stripes, more or less obscured by dusting; abdomen brown above, usually paler beneath; legs light brown; wing-length 7–9 mm. *Frequent. Generally distributed.* 5–10 ..... **adjuncta** Walker.

M_1 usually about half as long as its stem, or shorter or even absent; stigma faintly darkened; wing-membrane clear; praescutal stripes and legs as in *adjuncta* 2

2 Antennae yellowish at base; thorax light grey, heavily dusted; abdomen brown or brownish-ochreous 3

Antennae entirely dark brown or blackish; thorax and abdomen usually somewhat darkened 4

3 Upper of the two veinlets closing discal cell somewhat curved; wing-length 6–8 mm. *Common. Cambridgeshire southwards.* 5–8
nemoralis Meigen. **Typical form.**
Both veinlets closing discal cell quite straight; smaller form; wing-length 4·5–6 mm. *Uncommon. Yorks, Herts.* 7–9
nemoralis var. minuscula Edwards.

4 Discal cell as usual about twice as long as broad, the cross-vein meeting it well beyond base; wing-length 7–9 mm. *Frequent, mainly in hilly districts. Scotland, Carnarvon, Cambs.* 5–9 ..... **nemoralis var. separata** Walker.
Discal cell small, hardly longer than broad, the cross-vein meeting it at, or close to, base; wing-length 8–9 mm. *Uncommon. Scotland.* 5, 7–8
nemoralis var. quadrata Edwards.

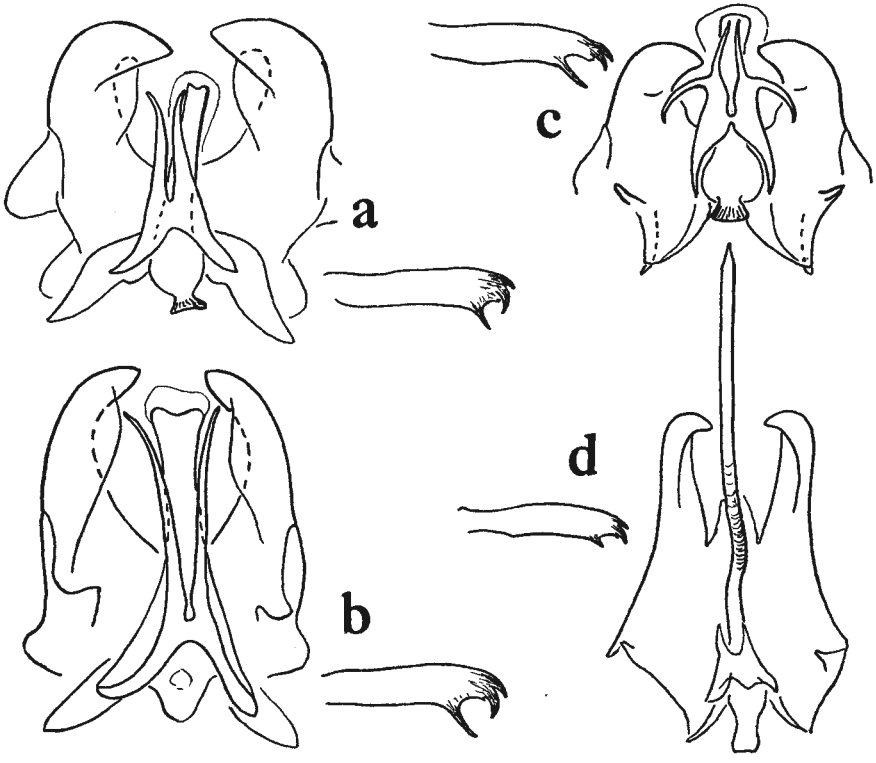

FIG. 17.—Aedeagus (ventral aspect) and outer style of male hypopygia of *Oxydiscus* spp. a. *senilis* Haliday. b. *fusculus* Loew. c. *ecalcaratus* Edwards. d. *nielseni* Kuntze.

(3) **Pilaria, filata** group.

KEY TO SPECIES.

1 Cell M_1 at most half as long as its stem, usually shorter and often absent; thorax heavily grey-dusted; praescutum with three obscurely darker stripes; abdomen dark brown or black; coxae and bases of femora brown, legs otherwise black; wings slightly dark grey-tinged; small species; wing-length 5–6·5 mm. *Frequent on bogs. Generally distributed.* 5–7 ..... **filata** Walker.

M_1 about as long as its stem, or even longer; thorax brownish, lightly dusted grey or reddish-brown; praescutum with at most an ill-defined darker median stripe; abdomen usually lighter than in *filata*; coxae and bases of femora yellow, legs otherwise brown; wings slightly yellow-tinged; larger species; wing-length 7–9 mm. *Uncommon. Scotland (Morayshire) southwards to Bedford.* 6–7 ..... **batava** Edwards.

Genus **Oxydiscus** de Meijere.

KEY TO SPECIES.

1 Wings hairy only at extreme tip, narrower than in the other species, without obvious anal angle; vein 2A shorter, ending before level of base of R_S; cell M_1 very short, sometimes absent; both anal veins bare; thorax light reddish-brown; three more or less obvious dark praescutal stripes; abdomen light brown to black; genitalia yellow (both sexes); legs light brown; tibial spurs 0·1–1; wing length 3·5–4 mm. ♂ aedeagus and outer style as in fig. 17*d*. *Uncommon. Generally distributed.* 8–9 ..... **nielseni** Kuntze.

Wings hairy on distal third; 2A reaching beyond level of base of R_S; both anal veins setose 2

2 Dark species; thorax, including scutellum, dark brown; praescutum sometimes with traces of a pair of blackish median stripes; pronotum dark anteriorly, dull yellow posteriorly; upper part of pleurae with a broad, ill-defined, dark brown transverse stripe, and lower part of sternopleurae with a large dark brown patch; abdomen dark brown or black, paler beneath; genitalia reddish-brown (both sexes); legs light brown; tibial spurs 0·1–1; wings somewhat smoky; cell M_1 usually as long as its stem, or longer or shorter, but always present; wing length 5–6 mm. ♂ aedeagus and outer style as in fig. 17*a*. *Frequent. Generally distributed.* 5–9 ..... **senilis** Haliday.

Less dark species; scutellum pale, pronotum mainly so; abdomen as in *senilis*; genitalia conspicuously paler than abdomen (both sexes); legs usually paler than in *senilis*; wings usually almost clear 3

3 Tibial spurs 0·1–1; thorax uniformly light reddish-brown; upper part of pleurae with an indistinct stripe only, sternopleurae almost entirely yellow; cell M_1 as in *senilis*; wing length 4–5 mm. ♂ aedeagus and outer style as in fig. 17*b*. *Uncommon. S.E. Ireland. Scotland, Yorks, Sussex, Cornwall.* 7–9 **fusculus** Loew.

Tibial spurs absent 4

4 Thorax uniformly brown; praescutum without trace of darker stripes; upper part of pleurae with a fairly obvious dark stripe, but spot on lower part of sternopleurae not well marked; cell M_1 rather short, but present (only two specimens examined); wing length 5 mm. ♂ aedeagus and outer style as in fig. 17*c*. *Rare. Denbighshire.* 6 ..... **ecalcaratus** Edwards.

Thorax paler than in *ecalcaratus*; praescutum always with traces of four darker stripes; upper dark stripe of pleurae distinct but narrower than in the other species, spot on lower part of sternopleurae fairly distinct; cell M_1 extremely short, absent in one specimen (ten examined); wing-length 4–6 mm. *Frequent locally in damp woods. Cambs, Dorset, Devon.* 8 ..... **dalei** Edwards.

Tribe **ERIOPTERINI.**

KEY TO GENERA AND SUBGENERA.

1 Five posterior cells (cell M_1 present) 2

Four posterior cells (M_1 absent) 4

2 Antennae normal; wing-membrane hairy at tip [**Oxydiscus, tribe** HEXATOMINI] (p. 45).

Antennae with first few segments of flagellum fused into a large conical segment; wing-membrane bare (CLADURARIA) 3

3 R_{2+3} and R_2 subequal in length; meron small (fig. 18*a*) **Neolimnophila** Alexander (p. 48).

R_{2+3} much less than half as long as R_2; meron large (fig. 18*b*) **Crypteria** Bergroth (p. 48).

4 Middle and hind coxae close together, meron small (except in *Rhabdomastix*); wing-membrane without macrotrichia, veins not conspicuously hairy; anterior pits of praescutum near front margin or absent.....5
Middle and hind coxae rather widely separated, meron large (fig. 18*e*); anterior pits of praescutum placed rather far back (except in *Scleroprocta*, which has the wing-membrane hairy); r always present (ERIOPTERARIA).....11
5 Radial fork long, r present; anterior pits absent.....6
Radial fork short, r absent; anterior pits present near front margin.....7
6 r–m well beyond fork of R_S; r close to tip of R_1.....**Lipsothrix** Loew (p. 48).
r–m at fork of R_S; r far before tip of R_1
Gnophomyia Osten-Sacken (p. 49).
7 Mid and hind coxae close together, meron small (fig. 18*c*); ax considerably before base of Cu (in this latter feature *Gonomyia* differs from all other ERIOPTERINI and resembles the PEDICIINI (see fig. 21*a–c*) (**Gonomyia** sens. lat.).....8
Mid and hind coxae separated, meron large (fig. 18*d*); ax only slightly before base of Cu.....**Rhabdomastix** Skuse (p. 52).

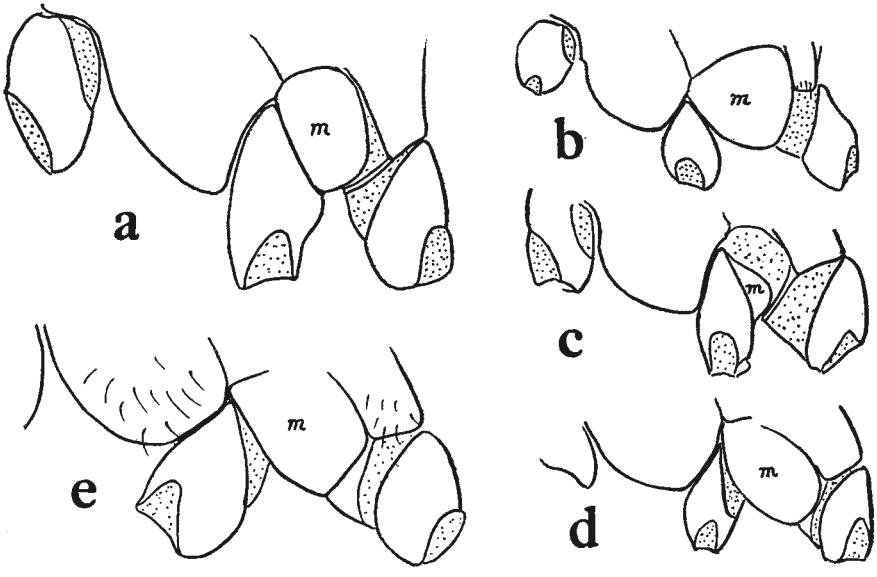

FIG. 18.—Lower part of pleurae, with middle and hind coxae, of ERIOPTERINI genera, to show size of meron (= *m*). Membranous areas stippled. a. *Neolimnophila* Alexander. b. *Crypteria* Bergroth. c. *Gonomyia* Meigen. d. *Rhabdomastix* Skuse. e. *Erioptera* Meigen.

8 Lower basal cell much shorter than upper; discal cell open
Idiocera Dale (p. 49).
Basal cells of equal length.....9
9 R_2 moderately long, almost continuing direction of R_{2+3}; discal cell open or closed.....**Elliptéroides** Becker (p. 49).
R_2 shorter, at an angle with R_{2+3}; discal cell closed.....10
10 R_2 oblique, R_S moderately long.....**Gonomyia** Meigen **s.str.** (p. 50).
R_2 very short and vertical, R_S very short.....**Lipophleps** Bergroth (p. 50).
11 R_S ending in second submarginal cell (normally); m–cu beyond middle of wing (usually well beyond).....12
R_S ending in first submarginal cell; m–cu near or some distance before middle of wing; veins with long dense hair.....22
12 Wing-membrane bare.....13
Wing-membrane hairy (**Ormosia sens. lat.**).....20

13 R_{2+3} long, r well before the fork (**Cheilotrichia sens. lat.**).....14
R_{2+3} short, r on R_2 beyond the fork (**Erioptera sens. lat.**).....16
14 R_2 very short, straight, divergent from R_3.....**Gonempeda** Alexander (p. 53).
R_2 longer, looping parallel with R_3.....15
15 Pteropleura with hairs; pale yellow species....**Cheilotrichia** Rossi **s.str.** (p. 54).
Pteropleura bare; grey species.....**Platytoma** Lioy (p. 54).
16 2A long and sinuous.....17
2A short and nearly straight.....18
17 Veins usually obviously hairy; discal cell usually open
Erioptera Meigen (p. 54).
Veins nearly bare; discal cell closed (except occasionally in **S. stictica** Meigen); 2A more strongly sinuous.....**Symplecta** Meigen (p. 56).
18 Veins very hairy; ♂ hypopygium inverted.....**Ilisia** Rondani (p. 57).
Veins less hairy; ♂ hypopygium not inverted.....19
19 Last three antennal segments not noticeably smaller
Psiloconopa Zetterstedt (p. 57).
Last three antennal segments rather abruptly smaller
Trimicra Osten-Sacken (p. 57).

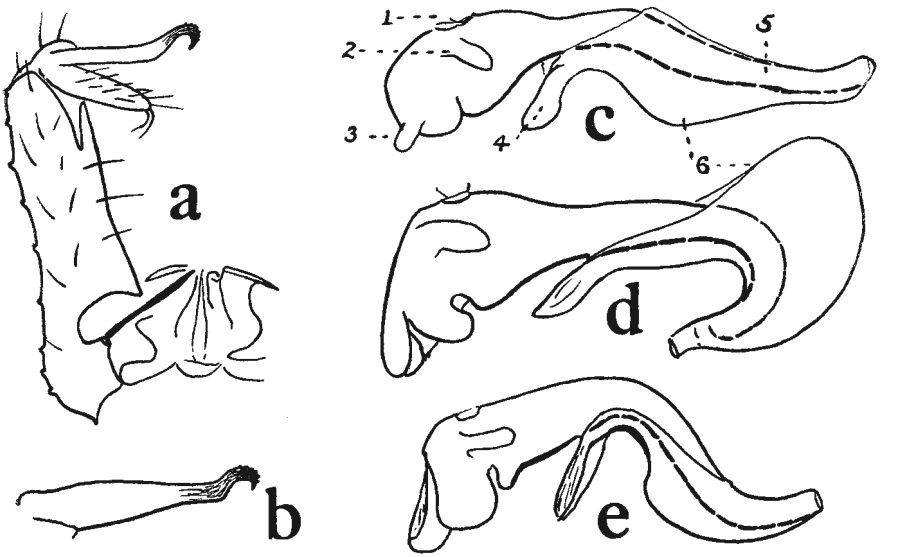

FIG. 19.—a. Male hypopygium of *Neolimnophila carteri* Tonnoir, dorsal aspect. b. Outer style of male hypopygium of *N. placida* Meigen. c–e. Aedeagus of *Lipsothrix* spp., lateral aspect, parameres and lateral apodemes of vesica removed. c. *ecucullata* Edwards. d. *errans* Walker. e. *remota* Walker. (1 = aperture of entry of vas deferens to vesica. 2 = base of lateral apodeme. 3 = median apodeme of vesica. 4 = point of attachment of ninth sternite. 5 = ejaculatory duct. 6 = penis sheath.)

20 2A long and sinuous, as in *Erioptera*.....**Rhypholophus** Kolenati (p. 61).
2A shorter and nearly straight.....21
21 Postnotum bare; discal cell present, closed.....**Scleroprocta** Edwards (p. 60).
Postnotum with soft hairs; discal cell usually absent (confluent with third posterior).....**Ormosia** Rondani **s.str.** (p. 58).
22 Postnotum and wing-membrane bare.....**Molophilus** Curtis (p. 61).
Postnotum with patches of long hairs; wing-membrane hairy; whole body very densely hairy..*Tasiocera* Skuse subgenus **Dasymolophilus** Tonnoir (p. 66).

Genus **Neolimnophila** Alexander.

KEY TO SPECIES.

1 Praescutum unstriped; thorax dark brown, heavily grey-dusted; abdomen yellowish-brown; legs light brown; veins towards wing-tips with obvious short hairs; r on R_2, usually well beyond fork; wing-length 7–9 mm. ♂ hypopygium as in fig. 19*a*. *Frequent. Shropshire northwards.* 5–7
carteri Tonnoir.

Praescutum with a pair of distinct dark brown median stripes (sometimes fused) and at least traces of a lateral pair; veins towards wing-tips with very short and inconspicuous hairs; r at or scarcely beyond fork, or on R_{2+3} before fork; otherwise resembles *carteri*. ♂ outer style as in fig. 19*b*. *Uncommon. Yorks, Notts, Hereford, Herts.* 7–9 ..... **placida** Meigen.

Genus **Crypteria** Bergroth.

KEY TO SPECIES.

1 Thorax uniformly brown or dark grey; pleurae and venter often reddish-yellow; legs brown; wings (fig. 20) clear; wing-length 5–6·5 mm. *Frequent. Herts northwards.* 8–10 ..... **limnophiloides** Bergroth.

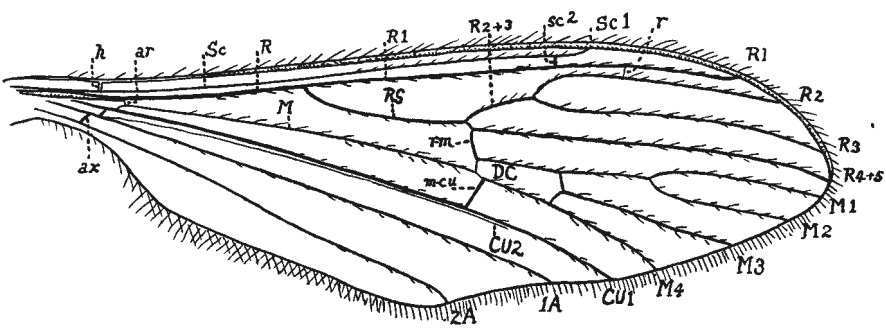

FIG. 20.—Wing of *Crypteria limnophiloides* Bergroth, showing notation of veins.

Genus **Lipsothrix** Loew.

KEY TO SPECIES.

1 Femora entirely yellow; body pale yellow, including genitalia (♂♀); antennae and halteres yellow; tips of tibiae somewhat darkened; tarsi usually darkened; wings clear; wing-length 8–10 mm. ♂ base of sternite 8 usually darkened; aedeagus as in fig. 19*e*. *Common locally. Generally distributed.* 5–7
remota Walker.

At least tips of femora black 2

2 Wings entirely clear; thorax entirely yellow; vein 2A hairy at tip 3

Wings with distinct stigma 4

3 Tergites with trace of median dark stripe, sternites often darkened at sides; body, antennae, halteres and genitalia (♂♀) pale yellow; tips of tibiae narrowly black; wing length 8–10 mm. ♂ distal part of sternite 7 and whole of 8 black; aedeagus as in fig. 19*d*. *Uncommon. Scotland, Wales.* 6–7, 10
errans Walker.

Abdomen entirely pale yellow (or with sternite 8 only slightly darkened in ♂); vein 2A more strongly curved down at tip than in *errans*; otherwise resembles *errans*; wing length 9 mm. ♂ aedeagus as in fig. 19*c*. *Rare. Sutherland.* 7 (1 ♂) ..... **ecucullata** Edwards.

4 ♂ only (♀ unknown). Stigma black, conspicuous; vein 2A bare; antennae entirely dark; thorax with yellow ground-colour, slightly shining; praescutum with very broad median and short, rather broad, lateral blackish stripes, confluent posteriorly; tergites 1 and 2 mainly black, 3–6 with black posterior bands, 7 and 8 and hypopygium black; cross-veins slightly clouded; wing-length 9 mm. *Rare. Lancs.* 6.....**nigristigma** Edwards ♂.

Stigma grey; 2A hairy; antennae more or less extensively pale at base; thorax brightly shining; praescutum with a broad median dark stripe, less distinct or even absent in ♀; abdomen in ♂ mainly black above, mainly yellow below, in ♀ mainly yellow above and below; wing-length 7–8·5 mm. ♂ antennae fully twice as long as thorax (in other species only about the same length). *Common locally. Hants, Devon.* 6–7.....**nervosa** Edwards.

Genus **Gnophomyia** Osten-Sacken.

KEY TO SPECIES.

1 Body black, slightly shining; antennae and palpi black; legs dark brown or black, bases of femora paler; wings clear, veins black; halteres with clear yellow knob, stem mainly brown; wing-length 6–9 mm. *Frequent around rotten tree-trunks. Yorks southwards.* 5–7.....**lugubris** Zetterstedt.

Genus **Gonomyia** Meigen sens. lat.

Subgenus **Ellipteroides** Becker.

KEY TO SPECIES.

1 Thorax shining black; posterior pronotal angles yellow, a narrow bright yellow stripe on notopleural suture and a broader one on lower part of pleurae; abdomen and legs entirely black, somewhat shining; wings slightly brown-tinged; R_{2+3} and R_2 subequal in length; discal cell absent; wing-length 7 mm. *Uncommon. Cambridgeshire southwards.* 6.....**lateralis** Macquart.

Thorax dull blackish-brown with pale yellow scutellum; yellow markings of pleurae duller than in *lateralis*; abdomen black; coxae, trochanters and bases of femora yellowish-brown, legs otherwise light brown; wings clear; R_2 more than half as long again as R_{2+3}; discal cell present; wing-length 7–8·5 mm. *Rare. Hereford (Woolhope and Haugh Wood).* 7–8
alboscutellata von Roser.

Subgenus **Idiocera** Dale.

KEY TO SPECIES.

1 Wings clear, stigma light brown; R_3 hardly upcurved at tip; thorax light grey; praescutum with a pair of brownish-grey median stripes; pleurae mainly black, more or less heavily grey-dusted, with whitish stripes above and at middle; scutellum pale yellow with dark median line; abdomen black or dark grey above, usually dark grey beneath, posterior margins of segments narrowly whitish; coxae more or less whitish, tips of femora and tibiae vagely darkened, legs otherwise light brown; wing-length 7 mm. *Rare. Dumbarton, Glamorgan.* 7. (♀ only).....**connexa** Loew.

Wings with obvious dark spots and clouds, or with less obvious dark clouds only (**bradleyi**); R_3 strongly upcurved at tip; praescutal median stripes dark brown, conspicuous, often a lateral pair present; thorax, pleurae and abdomen almost as in *connexa*.....2

2 Costal cell with numerous small spots; tip of vein 2A with a large spot; four praescutal stripes; scutellum brown or dark grey, with a pale median line; coxae whitish, tips of femora and tibiae more or less distinctly darkened, legs otherwise yellow or light brown; wing-length 6·5–7·5 mm. *Rare. Dorset, Cornwall.* 6.....**sexguttata** Dale.

Costal cell unspotted before stigma; tip of 2A unspotted; a distinct median pair of praescutal stripes only; scutellum uniformly brown or grey above, sometimes narrowly yellowish behind.....3

3 R_5 almost right-angled at base, R_3 almost so at tip; wing-markings, including stigma, dark brown, conspicuous; coxae more or less whitish, all femora with an obvious dark pre-apical ring, legs otherwise yellow or light brown; wing-length 6–7·5 mm. *Rare. Westmorland, Yorks, Worcester, Hereford.* 6–8
punctata Edwards.

R_5 only obtusely angled at base; R_3 evenly upcurved at tip; wing-markings, including stigma, light brown, inconspicuous; legs as in *punctata*, but femora vaguely and broadly darker at tips; wing-length 6 mm. *Rare. Worcester (Wyre Forest).* 7. (1 ♂).....**bradleyi** Edwards.

Subgenus **Gonomyia** Meigen s.str.

KEY TO SPECIES.

1 Third antennal segment yellow, remainder black; thorax dull grey-brown above; scutellum lighter and slightly shining; pleurae entirely yellow; abdomen dark above; wing length 6 mm. ♂ hypopygium (part) as in fig. 22*e*. *Rare. Devon (Slapton).* 8. (1 ♂).....**bifida** Tonnoir.

Antennae all black; scutellum mainly yellow.....2

2 Scutellum almost dull (from above); thorax dull grey-brown above; pleurae with dark markings.....3

Scutellum shining (from all angles); thorax more extensively yellow, even the grey parts somewhat yellow-tinged; abdomen with more extensive yellow lateral markings than in other species, and venter entirely orange-yellow; proboscis yellow.....6

3 Proboscis darkened above; abdomen dark above, narrowly yellow laterally, greyish-yellow beneath; legs light to dark brown; wing-length 5·5–7 mm. ♂ hypopygium (part) as in fig. 22*g*. *Frequent. Shropshire northwards.* 5–7, 9
simplex Tonnoir.

Proboscis entirely yellow; abdomen as in *simplex*, but venter usually clear yellow; legs as in *simplex*.....4

4 Pleural markings usually light brown or reddish-brown; wing-length 5–6·5 mm. ♂ outer style with a small blackened area on inner side, smoothly rounded, not tooth-like; hypopygium (part) as in fig. 22*a*. *Frequent. Shropshire southwards.* 5–8.....**tenella** Meigen.

Pleural markings often dark brown or blackish. ♂ outer style with blackened area on inner side tooth-like.....5

5 Wing-length 5·5–7 mm. ♂ inner style with one strong and long black curved tooth only; hypopygium (part) as in fig. 22*c*. *Common. Generally distributed.* 5–8.....**dentata** de Meijere.

Wing-length 5–6·5 mm. ♂ inner style with two teeth, both usually black, but the smaller (inner) tooth sometimes pale; hypopygium (part) as in fig. 22*d*. *Uncommon. Yorks, Carnarvon, Merioneth, Hants.* 6, 8.....**conoviensis** Barnes.

6 Discal cell shorter; wing-length 5·5–7 mm. ♂ penis short; outer style small, without blackening on inner side; inner style forming a broad, pointed, curved blade; hypopygium (part) as in fig. 22*b*. *Frequent. Generally distributed.* 6–8
lucidula de Meijere.

Discal cell longer (than in average *lucidula*); species even more yellowish than *lucidula*; head with a yellow area above antennae and extensively yellow behind; wing-length 6·5–8 mm. ♂ penis very long, tubular; outer style long, inner margin not blackened; inner style with blunt black process in middle of outer margin; hypopygium (part) as in fig. 22*f*. *Frequent near streams. Yorks southwards.* 6–7.....**recta** Tonnoir.

Subgenus **Lipophleps** Bergroth.

KEY TO SPECIES.

1 Thorax dark brown above; pronotum and notopleural suture whitish; pleurae with a broad whitish-grey stripe below middle; abdomen dark brown (rarely yellowish) above, paler beneath; legs yellow or light brown; wings clear; wing-length 5 mm. *Uncommon. Yorks southwards.* 6–7, 9
abbreviata Loew.

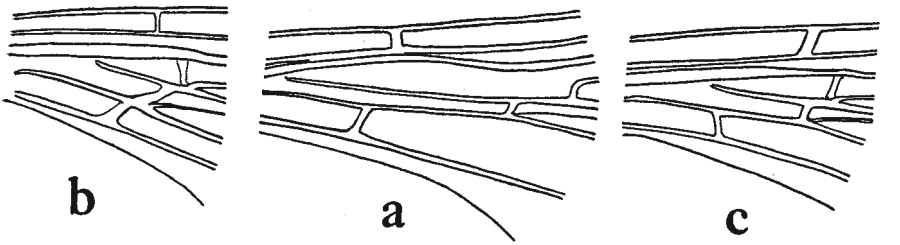

FIG. 21.—Wing-base, showing relative positions of the basal cross-veins and vein-connections in *Gonomyia* Meigen (a), and, for comparison, *Erioptera* Meigen (b) and *Tricyphona* Zetterstedt (c). Note retracted axillary cross-vein in *a* and *c*.

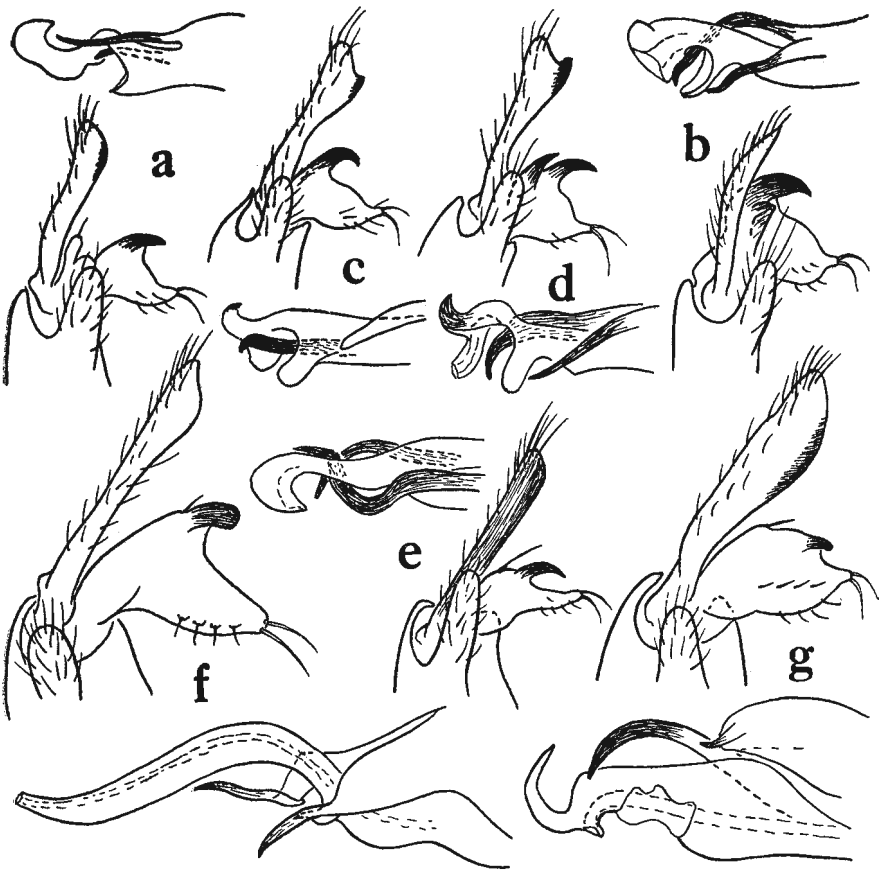

FIG. 22.—Styles, with tip of coxite, dorsal aspect, of male hypopygia of *Gonomyia* s.str.; and tip of aedeagus, lateral aspect (all same scale). a. *tenella* Meigen. b. *lucidula* de Meijere. c. *dentata* de Meijere. d. *conoviensis* Barnes. e. *bifida* Tonnoir. f. *recta* Tonnoir. g. *simplex* Tonnoir.

Genus **Rhabdomastix** Skuse.

KEY TO SPECIES.

1 R_2 longer and markedly oblique ; Sc_2 absent ; thorax dark brown, sometimes paler towards sides, grey-dusted ; scutellum reddish-yellow ; posterior pronotal lobes ochreous ; abdomen black ; legs brown, femora often darker towards tips ; wings rather broad, clear, nearly all veins on outer part of wing bearing numerous distinct macrotrichia, including R_2 and R_3 ; wing-length 5·5–7·5 mm. ♂ antennae with all flagellar segments except last with long, dense, outstanding pale pubescence ; paramere and outer style of hypopygium as in fig. 23*d, f*. *Rare*. *Yorks* (*Mulgrave Woods*). 8 ..... **inclinata** Edwards.

R_2 very short and vertical (normally) ; Sc_2 present ; R_{2+3} with few macrotrichia, or none ; antennae with some short pubescence, or apparently none (both sexes) 2

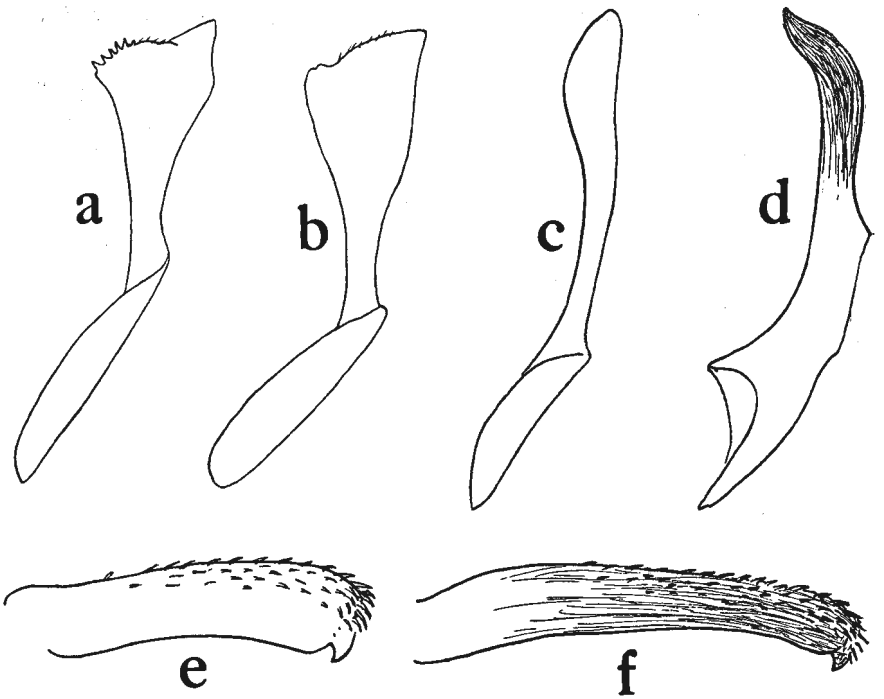

FIG. 23.—Parameres and outer styles of male hypopygia of *Rhabdomastix* spp., all same scale. a. *hilaris* Edwards var. b, e. *hilaris* typical. c. *parva* Siebke. d, f. *inclinata* Edwards.

2 Sc_2 at tip of Sc ; small dark species ; antennae with all flagellar segments rather shortly oval, apparently without pubescence ; head grey ; thorax dark brown, grey-dusted ; abdomen black ; legs stoutish, brown or black, trochanters and extreme bases of femora often pale ; wings rather narrow, grey, veins dark ; wing-length 4–5 mm. ♂ paramere of hypopygium as in fig. 23*c*. *Uncommon*. *Generally distributed*. 5–6 ..... **parva** Siebke.

Sc_2 well before tip of Sc ; larger, extensively yellow species ; first few flagellar segments rather short, rounded, shortly pubescent, remainder more slender, almost cylindrical, without obvious pubescence ; head yellow or yellowish-grey, with more or less distinct brown median stripe ; thorax mainly yellow ; praescutum with three brown stripes, grey-dusted, the median stripe more distinct

and blackish anteriorly; pronotum dark in middle above, otherwise yellow; abdomen yellowish-brown; legs slender, light brown, tips of femora sometimes obscurely darkened; wings rather broad, clear, veins mainly pale; wing-length 7–9 mm. ♂ hypopygium with parameres pale, clubbed, not distinctly spinulose on distal margin; paramere and outer style as in fig. 23*b*, *e*. *Uncommon*. *Inverness*, *Perth*. 7. ♂ **var.** 1: Head mainly grey; R_2 longer and oblique; parameres with their outer distal margin spinulose (fig. 23*a*). *Inverness* (*Aviemore*). 1 example. ♂ **var.** 2: Head entirely grey (perhaps discoloured) R_2 normal; parameres as in **var.** 1. *Inverness* (*Aviemore*). 1 example

hilaris Edwards.

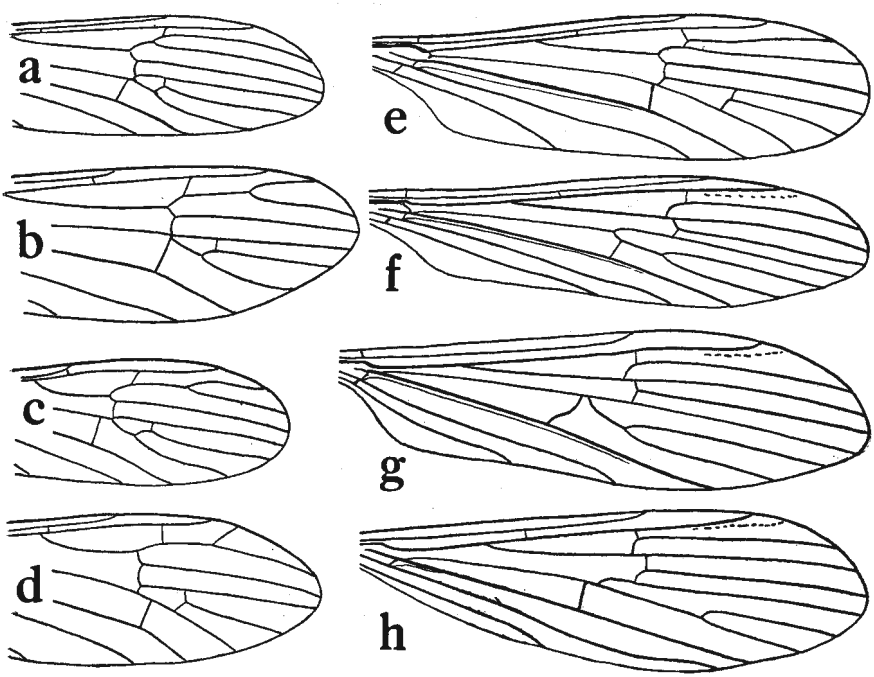

FIG. 24.—Wing-venation of ERIOPTERINI spp. a. *Ilisia areolata* Siebke. b. *Platytoma cinerascens* Meigen, abnormal specimen with closed discal cell. c. *Cheilotrichia imbuta* Meigen. d. *Gonempeda flava* Schummel. e. *Psiloconopa pusilla* Schiner. f. *Molophilus obscurus* Meigen. g. *M. pusillus* Edwards. h. *Tasiocera murina* Meigen. (*a–d* to slightly smaller scale than *e–h*.)

Genus **Cheilotrichia** Rossi sens. lat.

Subgenus **Gonempeda** Alexander.

KEY TO SPECIES.

1 Pale yellow, including head, thorax, abdomen, legs, halteres and wing-veins; palpi and antennae (except scape) somewhat darkened; wing-length 5 mm.; wing-venation as in fig. 24*d*. ♂ hypopygial appendages black. *Common*. *Generally distributed*. 6–7 ..... **flava** Schummel.

Subgenus **Cheilotrichia** Rossi s.str.

KEY TO SPECIES.

1 Pale yellow, including head, thorax, abdomen, halteres and wing-veins; palpi and scape only of antennae somewhat darkened; legs mainly pale yellow, tips of front and mid femora, bases of front and mid tibiae, and extreme tips of all tibiae and tarsal segments black; wing-length 4–4·5 mm.; wing-venation as in fig. 24*c*. ♂ hypopygial appendages black. *Common. Generally distributed.* 6–7 ..... **imbuta** Meigen.

Subgenus **Platytoma** Lioy.

KEY TO SPECIES.

1 Head dark grey; antennae and palpi black; thorax dark grey, posterior pronotal angles ochreous; scutellum and pleurae reddish-brown, grey-dusted; abdomen dark or reddish-brown above, paler beneath; halteres yellow; legs brown; wings clear, veins greyish; wing-length 5–7 mm.; discal cell absent (except abnormally (fig. 24*b*)). ♂ hypopygium reddish-yellow (fig. 26*e*). *Common. Generally distributed.* 5–10 ..... **cinerascens** Meigen.

(*P. affinis* and *P. neglecta*, two East European species, may occur in Britain; their chief, or sole, distinction from *P. cinerascens* is in the shape of the male styles (fig. 26*f*, *g*).)

Genus **Erioptera** Meigen.

Subgenus **Erioptera** Meigen s.str.

KEY TO SPECIES.

1 Praescutum unstriped, or (at least from front view) with a broad more or less shining dark brown stripe, practically occupying space between rows of dorsocentral hairs; yellow or brownish species; wing-veins conspicuously hairy .. 2

Praescutum with (from all angles) a narrow more or less shining dark brown stripe, occupying only about one-third of space between rows of dorsocentral hairs; wing-veins only slightly hairy; grey species 13

2 Yellow species; abdomen, wings and halteres yellow 3

Darker species; at least abdomen or halteres (or both) darkened 7

3 Body and wings rather pale yellow 4

Body and wings brownish-yellow; antennae (except scape) and palpi dark brown; eyes rather small, widely separated above and shortly in contact below; legs light brown; wing length 7–9 mm. ♂ styles, with tip of coxite as in fig. 25*d*. *Uncommon. Yorks, Herts.* 6 ..... **squalida** Loew.

4 Palpi light to dark brown; eyes normal 5

Palpi black; eyes large (especially in ♂), broadly in contact below; antennae usually somewhat darkened after first few segments; legs yellow or light brown; wing length 6–9 mm. ♂ styles, with tip of coxite, as in fig. 25*e*. *Frequent. Generally distributed.* 6–8 ..... **divisa** Walker.

5 ♂ hypopygium with outer style broadly expanded apically, the expanded portion blackened to a variable extent; inner style with black tooth (variable in size) before tip; styles, with tip of coxite as in fig. 25*a*. ♂♀ entirely pale yellow, apart from more or less darkened antennal flagellum and black eyes and palpi; eyes rather small, widely separated above and scarcely in contact below; wing-length 6–8 mm. *Common. Generally distributed.* 6–8

flavescens Linnaeus.

♂ outer style not expanded apically, narrow, strap-like 6

6 ♂ inner style more curved than in *flavescens*, the black tooth nearer middle and much longer; styles, with tip of coxite as in fig. 25*b*. ♂♀ closely resemble *flavescens*; wing length 6–8 mm. *Uncommon. Cambs. Herts, Hants.* 6–7

meijerei Edwards.

♂ inner style with a black hump near the rounded tip; styles, with tip of coxite as in fig. 25*c*. ♂♀ similar to *flavescens*, but body a duller yellow, and basal segments of antennal flagellum (especially in ♂) shorter and stouter, distal segments with longer hair; wing length 5–8 mm. *Uncommon. Yorks, Dorset.* 7–8

nielseni de Meijere.

7 Wings broadly and conspicuously dark brown towards costa on distal half; head dark above; antennae yellow; palpi black; thorax, abdomen and legs yellow; halteres brownish; wing length 5 mm. ♂ styles, with tip of coxite as in fig. 25*i*. *Rare. Dorset* (*Glanville's Wootton*). 6 ..... **limbata** Loew.
Wings uniformly grey or slightly brownish 8

8 Thorax extensively yellowish, or yellow at least towards sides and on pleurae 9
Thorax mainly or all dark, pleurae sometimes partly light brown 11

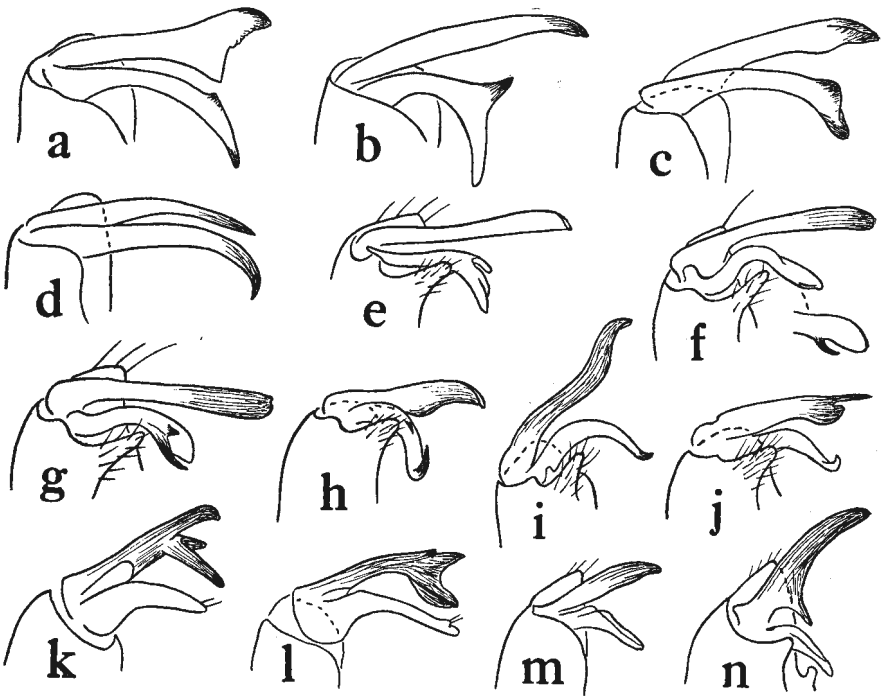

FIG. 25.—Styles, with tip of coxite (all same scale) of male hypopygia of *Erioptera* Meigen. a. *flavescens* Linnaeus. b. *meijerei* Edwards. c. *nielseni* de Meijere. d. *squalida* Loew. e. *divisa* Walker. f. *fusculenta* Edwards. g. *fuscipennis* Meigen. h. *lutea* Meigen. i. *limbata* Loew. j. *sordida* Zetterstedt. k. *griseipennis* Meigen. l. *nigripalpis* Goetghebuer. m. *diuturna* Walker. n. *trivialis* Meigen.

9 Halteres with black knob; head mainly dark above; antennae with scape (and often pedicel) yellow, rest dark; palpi black; eyes small; mesonotum extensively dark brown in middle; abdomen dark brown with yellow tip; legs light brown, tips of femora often darkened; wing-hair grey; wing length 5–7·5 mm. ♂ styles, with tip of coxite as in fig. 25*h*. *Common. Generally distributed.* 5–10 ..... **lutea** Meigen **var. taenionota** Meigen.
(Typical *lutea*, not yet taken in Britain, has the thorax and abdomen entirely yellow.)
Halteres pale, or only vaguely darkened 10

10 ♂ hypopygium with outer style divided into three divergent arms from near middle, more or less blackened; inner style pale, with a few small hairs at tip; styles, with tip of coxite as in fig. 25*k*. ♂♀ head yellowish-grey; antennae with scape yellow, rest dark; palpi black; eyes rather small, widely separated above;

thorax yellowish-brown, indistinctly darkened above ; abdomen brown, tip pale ; legs brown ; wing-hair grey ; halteres yellow or only vaguely darkened ; wing length 5–6·5 mm. *Common. Generally distributed.* 5–7
griseipennis Meigen.

♂ outer style much less deeply divided than in *griseipennis*, one of the three lobes replaced by a small tooth ; ♂ styles, with tip of coxite, as in fig. 25*l*. ♂♀ resemble *griseipennis*, but sometimes paler. *Uncommon. Derbyshire, Berks.* 5–6
nigripalpis Goetghebuer.

11 Shoulder with a yellow spot, thorax otherwise blackish-grey, lightly brown-dusted ; head dark, with whitish border to eyes ; antennae and palpi dark brown or black ; praescutum with a vague broad shining median stripe ; pleurae partly yellow, lightly grey-dusted ; abdomen black or dark brown ; coxae yellow, femora yellow towards base, more or less broadly darkened at tip ; legs otherwise yellow or light brown ; halteres with dark knob ; wings only slightly darkened ; wing-length 4–6 mm. ♂ eyes large, broadly contiguous below ; styles, with tip of coxite, as in fig. 25*f*. *Frequent. Yorks southwards.* 6–8 ..... **fusculenta** Edwards.

Thorax entirely blackish-grey, without yellow markings 12

12 Wings distinctly brownish ; praescutum with a vague broad shining median stripe ; head, antennae, palpi, abdomen and halteres as in *fusculenta* ; pleurae blackish, grey-dusted ; coxae dark, trochanters and base of femora yellow, legs otherwise dark brown ; wing-length 4–6 mm. ♂ eyes as in *fusculenta* ; styles, with tip of coxite, as in fig. 25*g*. *Common. Generally distributed.* 5–9
fuscipennis Meigen.

Wings broader and paler than in *fuscipennis* ; mesonotum without trace of a shining median stripe ; halteres yellow ; otherwise closely resembles *fuscipennis* ; wing-length 6 mm. ♂ eyes rather large ; styles, with tip of coxite as in fig. 25*j*. *Rare. Inverness* (*Nethy Bridge*). 6. (1 ♂) .. **sordida** Zetterstedt.
(*riedeli* Lackschewitz, *teste* Lackschewitz 1940.)

13 Discal cell closed (normally) ; head light grey ; antennae and palpi black ; thorax, including pleurae, light grey, shoulders sometimes yellow ; praescutum with a distinct narrow dark brown median stripe ; abdomen dark grey ; legs light or dark brown, femora usually darkened apically ; halteres yellow ; wing-length 6–7 mm. ♂ styles, with tip of coxite, as in fig. 25*n*. *Common. Generally distributed.* 4–10 ..... **trivialis** Meigen.

Discal cell open ; closely resembles *trivialis*, but slightly smaller ; wings somewhat narrower and hairs on veins shorter ; knob of halteres often darkened ; legs sometimes mainly blackish. ♂ styles, with tip of coxite, as in fig. 25*m*. *Frequent. Scotland* (*Arran*) *southwards to Isle of Wight.* 8–10
diuturna Walker.

Subgenus **Symplecta** Meigen.

Key to Species.

1 An extra cross-vein in cell R_2 ; tip of vein 2A moderately to strongly sinuous 2

No extra cross-vein in cell R_2 ; tip of vein 2A less sinuous ; Sc_2 only slightly beyond base of R_s ; head light grey, with a dark median stripe ; antennae and palpi black ; thorax grey, usually yellow at sides ; praescutum with three narrow black stripes, median one usually more distinct and extending back over postnotum ; abdomen black, continuously yellow laterally and broadly so at posterior corners of tergites ; legs light brown, femora broadly darkened preapically ; wings usually with distinct small spots and clouds on cross-veins, tips of Sc, R_1 and 2A, and below base of R_s ; second posterior cell at least slightly longer than third ; wing-length 3–8 mm. (salt-marsh specimens are often brachypterous with degenerate venation, and in normally winged examples the discal cell may be open or distorted). ♂ styles large ; outer style with two black lobes at right angles ; inner style a large black hook. *Common on marshy coasts. Generally distributed.* 4–9, 11 ..... **stictica** Meigen.

2 Third posterior cell much longer than second ; tip of 2A strongly sinuous ; Sc_2 considerably beyond base of R_s ; also differs from *stictica* as follows ; Praescutal median stripe only extending from front margin nearly to suture ; head without a dark median stripe ; legs darker ; wing-length 5–8·5 mm. ♂ styles small. *Frequent. Generally distributed.* 3–4, 7–9 ..... **hybrida** Meigen.

♀ only (♂ unknown). Second and third posterior cells equal in length; tip of 2A moderately sinuous; Sc_2 only slightly beyond base of R_5; also differs from *hybrida* as follows: scutellum and humeral angles clearly yellowish; spot over base of R_5 larger and more sharply defined, almost confluent with the small spot over Sc_2; wing length 6–7 mm. *Rare. Ross* (*Dingwall*). 8
scotica Edwards ♀.

Subgenus **Trimicra** Osten-Sacken.

KEY TO SPECIES.

1 Head brown with dark median stripe; antennae and palpi black; thorax dark brown; praescutum with blackish median stripe and sometimes indications of lateral stripes; pleurae partly yellow; abdomen black, lateral margins of tergites broadly yellow; legs brown, femora swollen apically and with traces of a dark preapical ring; wings more or less smoky; cross-veins often with dark clouds; size very variable; wing-length 6–11 mm. ♂ large examples have the front and hind tibiae and thickened ends of hind femora clothed with long, dense, soft hair; hypopygium large, yellow. *Common locally. Yorks southwards to Hants.* 5–9 ..... **pilipes** Fabricius.

Subgenus **Psiloconopa** Zetterstedt.

KEY TO SPECIES.

1 Thorax brightly shining, black; scutellum, pronotal angles and upper part of pleurae yellow; head, including antennae and palpi, black; abdomen shining black, posterior margins of segments yellow; legs black, basal third of front femora and most of mid and hind femora yellow; wings slightly yellow; discal cell present; wing-length 4·5–5·5 mm. *Rare. Inverness* (*Aviemore*). 6. (2 ♂) ..... **meigeni** Zetterstedt.
Thorax dull brown or grey 2
2 Legs entirely black; head grey; antennae and palpi black; thorax, including pleurae, entirely grey; praescutum with a median pair of dark brown stripes, often more distinct in middle; abdomen black, with rather long yellow pubescence; wings darkened at middle and below the brown stigma; discal cell confluent with second posterior; wing-length 6–7 mm. *Rare. Inverness, Hereford.* 5–8 ..... **melampodia** Loew.
Legs yellow; very small species; head black behind, grey on frons; antennae and palpi black; thorax dull brown; praescutum with a pair of faint dark median stripes, confluent in front; abdomen dull brown, posterior margins of segments narrowly pale; tips of femora somewhat thickened and broadly black, tips of tibiae faintly darkened; wings grey, with indications of three darker spots along costa and another over Sc_2; discal cell usually closed, but sometimes confluent with second posterior (fig. 24*e*); wing-length 4 mm. *Rare. Hereford.* 5–7 ..... **pusilla** Schiner.

Subgenus **Ilisia** Rondani.

KEY TO SPECIES.

1 Wings with numerous dark spots 2
Wings clear, unspotted 3
2 Wing spots with more or less obviously paler centres; scape dark, antennae otherwise yellow; palpi black; thorax light brown; abdomen yellowish-brown, continuously black laterally; legs yellow, all femora with a dark brown preapical ring, and front pair only with another before middle; wing-length 6–8 mm. ♂ hypopygium as in fig. 26*a*. *Common. Generally distributed.* 5–10
maculata Meigen.
Wing-spots uniformly dark (i.e. without paler centres), this being particularly noticeable with the spots over Sc_2 and r–m, which are smaller and more widely separated than in *maculata*; antennae, palpi, body, legs and wing-length as in *maculata*. ♂ hypopygium as in fig. 26*b*. *Scotland* (*Kincardine*) *southwards to Hants.* 5–9 ..... **occoecata** Edwards.

3 Antennae dark, flagellar segments shortly oval with short, scanty pubescence; palpi black; body light brown, mesonotum and abdominal tergites more or less darkened; praescutum with traces of two short narrow brown stripes posteriorly, continued over scutum, which has an additional median stripe; postnotum bare; legs light brown; discal cell very small (fig. 24*a*); wing-length 5–6 mm. ♂ hypopygium as in fig. 26*c*. *Rare. Glasgow, Staffs, Oxford.* 5–6 ..... **areolata** Siebke.

Antennae longer than in *areolata*, dark, flagellar segments more elongate oval, and with longer and denser pubescence; legs darker; postnotum with a few hairs; discal cell larger; otherwise resembles *areolata*. ♂ hypopygium as in fig. 26*d*. *Uncommon. Scotland* (*Morayshire*) *southwards to Cheshire.* 5–6, 8–9 **vicina** Tonnoir.

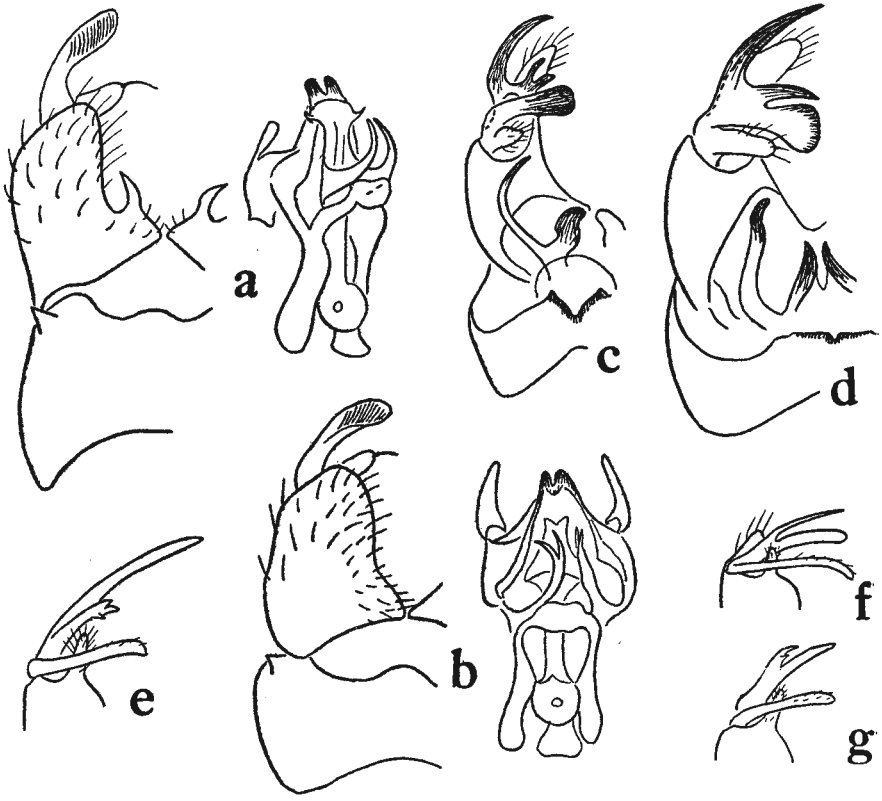

FIG. 26.—a–d. Male hypopygia of *Ilisia* spp. a, b. Sternite, coxite and styles, ventral aspect, with aedeagus shown separately. c, d. Hypopygium, dorsal aspect. a. *maculata* Meigen. b. *occoecata* Edwards. c. *areolata* Siebke. d. *vicina* Tonnoir. e–g. Styles, with tip of coxite, dorsal aspect, of male hypopygia of *Platytoma* spp. e. *cinerascens* Meigen. f. *affinis* Lackschewitz. g. *neglecta* Lackschewitz (after Lackschewitz, 1927).

Genus **Ormosia** Rondani.

Subgenus **Ormosia** Rondani s.str.

KEY TO SPECIES.

1 Thorax with dark greyish ground-colour, sometimes slightly reddish-tinged; legs brown or partly black 2

Thorax with yellowish or light brownish ground-colour, at least in part; legs entirely or mainly light brown or yellow.....7

2 Praescutum with a narrow median brown stripe (from all viewpoints); abdomen black; wings with clearer membrane and darker veins than in other species; stigma distinct, cross veins narrowly clouded; cell M_1 variable in length, often only slightly longer than its stem, usually much wider at base than in other species; wing length 4·5–6 mm. ♂ tergite 9 small, without hair-tuft; styles, with tip of coxite as in fig. 27*c*. *Common. Generally distributed.* 4–5
lineata Macquart.

Praescutum unstriped (viewed from front).....3

3 Hairs on hind tibiae and tarsi practically all black. ♂ antennae somewhat longer than head and thorax together; flagellar segments pear-shaped, moderately swollen at base, the narrow terminal portion shorter than the stouter part.....4

Hairs on hind tarsi mainly or all whitish. ♂ antennae fully twice as long as thorax; flagellar segments much swollen (rather less so in *albitibia*), with narrow necks which are about as long as the basal portion.....5

4 ♂ tergite 9 with a conspicuous tuft of long yellow hairs at distal end of broad portion, beyond the tuft a long, narrow projecting portion which is deeply split into two, and reaches to the tip of the yellow hairs; styles, with tip of coxite, as in fig. 27*f*. ♂♀ thorax sometimes slightly reddish tinged; stigma ill-defined, inconspicuous, the darkened area usually filling whole of outer marginal cell; no darkening over cross-veins; cell M_1 usually at least twice as long as its stem; wing-length 4·5–6 mm. *Common. Generally distributed.* 5–9
nodulosa Macquart.

♂ tergite 9 smaller than in *nodulosa*, without hair-tuft, terminal projection short; styles, with tip of coxite, as in fig. 27*e*. ♂♀ thorax, wings and wing length as in *nodulosa*. *Frequent. Generally distributed.* 5–6.....**depilata** Edwards.

5 Hairs on distal part of hind tibiae and on last three tarsal segments blackish; thorax dark ash-grey, never reddish-tinged; cell M_1 usually about half as long again as its stem; stigma rather more distinct than in two preceding species, but hardly extending beyond tip of R_1 and always leaving a clear area at tip of outer marginal cell; wing-length 4–6 mm. ♂ tergite 9 small, without hair-tuft, or terminal projection; styles, with tip of coxite, as in fig. 27*a*. *Common. Generally distributed.* 5–6, 8–10.....**hederae** Curtis.

Hairs on hind tarsi all whitish or pale.....6

6 Hairs at tip of hind tibiae dark; thorax less ashy-grey than in *hederae*; stigma more resembling that of *nodulosa*; wing-length 5·5–6·5 mm. ♂ tergite 9 with a long, slender terminal portion and tuft of yellow hairs, differing from *nodulosa* in the yellow hairs being on the slender terminal portion of the tergite; styles, with tip of coxite, as in fig. 27*b*. *Uncommon. Inverness southwards to Cheshire.* 5–6.....**aciculata** Edwards

Hairs on hind tibiae all pale; larger autumn species; mesonotum dark brownish-grey, sides of praescutum with slight ochreous tinge; pleurae dark grey; wings as in *nodulosa*; wing-length 5–7 mm. ♂ tergite 9 with patch of long yellow hairs much more diffuse than in *nodulosa*, slender terminal portion pubescent only; styles, with tip of coxite, as in fig. 27*g*. *Frequent. Generally distributed.* 8–9.....**albitibia** Edwards.

7 Pleurae dark in middle, remainder of thorax mainly light brown, but mesonotum darker except at sides; abdomen black; wings as in *nodulosa*; wing-length 5–6 mm. ♂ antennae as long as whole body, flagellar segments much swollen, with narrow necks which are about as long as the basal portion; tergite 9 without conspicuous hair-tuft; styles, with tip of coxite, as in fig. 27*d*. *Uncommon. Yorks, Oxford, Gloucester, Herts.* 9.....**bicornis** de Meijere

Pleurae all yellow.....8

8 Abdomen dark brown; larger species; thorax almost entirely yellowish-brown, mesonotum somewhat darkened in middle; wings as broad and densely hairy as usual; venation as in *nodulosa*; wing-length 5–6·5 mm. ♂ antennae and tergite 9 as in *bicornis*; styles, with tip of coxite, as in fig. 27*i*. *Uncommon on moorlands. Scotland, Durham, Denbigh.* 6–9.....**similis** Staeger.

Abdomen yellow ; very small species ; thorax entirely yellow ; wings narrower and paler than in the other species, hairs on membrane finer and less dense ; wing-length 4 mm. ♂ antennae somewhat longer than head and thorax together, flagellar segments almost cylindrical, only slightly widened at middle ; tergite 9 without hair-tuft ; styles, with tip of coxite, as in fig. 27*h*. *Uncommon on moorlands and in mountainous areas. Scotland (Sutherland) southwards to Shropshire.* 6–8 ..... **pseudosimilis** Lundstroem.

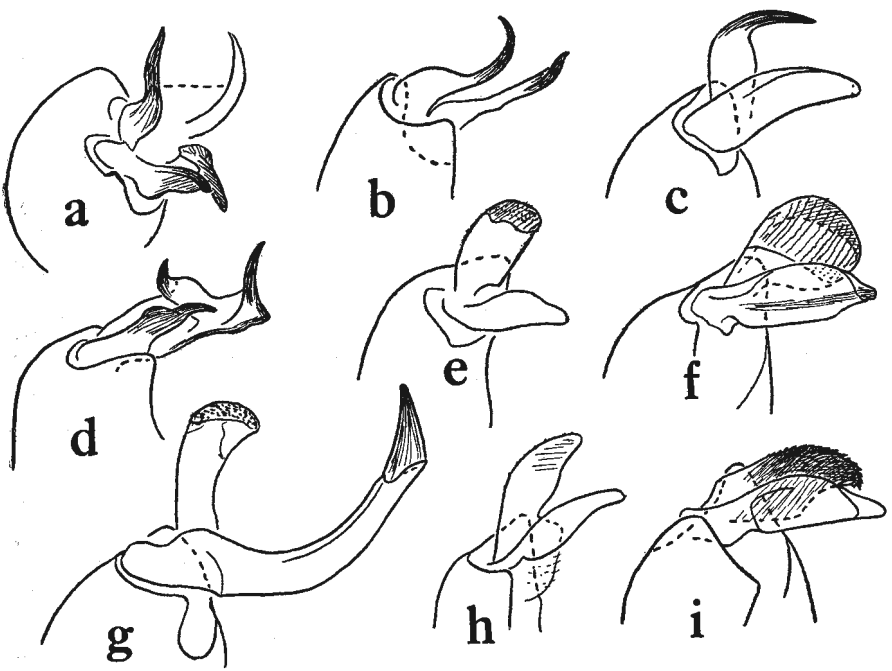

FIG. 27.—Styles, with tip of coxite, dorsal aspect, of male hypopygia of *Ormosia* s.str. a. *hederae* Curtis. b. *aciculata* Edwards. c. *lineata* Macquart. d. *bicornis* de Meijere. e. *depilata* Edwards. f. *nodulosa* Macquart. g. *albitibia* Edwards. h. *pseudosimilis* Lundstroem. i. *similis* Staeger.

Subgenus **Scleroprocta** Edwards.

KEY TO SPECIES.

1 Legs uniformly light brown, only tips of femora and tibiae narrowly and faintly darkened ; mesonotum brownish-grey ; praescutum with at least a median dark stripe faintly indicated ; wings greyish, stigma inconspicuous ; m–cu well before base of discal cell, which is rather short ; wing-length 6–7 mm. *Rare. Derbyshire, Flintshire.* 6 ..... **sororcula** Zetterstedt.

Legs partly blackish, only coxae, trochanters, basal third of front femora, basal half of mid femora and basal two-thirds of hind femora light brown ; mesonotum dark-grey ; praescutum quite unstriped ; wings clearer than in *sororcula*, stigma more distinct ; m–cu just at base of discal cell, which is somewhat longer than in *sororcula* ; wing-length 7–8 mm. *Uncommon. Scotland, Yorks, Merioneth, Devon.* 5–6 ..... **danica** Nielsen.

Subgenus **Rhypholophus** Kolenati.

KEY TO SPECIES.

1 Praescutum unstriped, or with only a short median stripe extending back to anterior pits; legs yellowish-brown, tips of femora distinctly darkened; abdomen brown; wing-hairs mainly yellowish, wings thus appearing slightly paler than in the other species; wing-length 7·5–8·5 mm. *Uncommon. Inverness, Yorks, Shropshire, Hereford, Herts.* 8–9
haemorrhoidalis Zetterstedt.

Praescutum with a pair of brown median stripes, between them sometimes a short brown anterior stripe, all stripes occasionally faint; legs brown, tips of femora not, or only vaguely, darkened; abdomen brown.....2

2 Median pair of praescutal stripes diverging slightly in front, no short brown stripe between them; wings mottled, due to patches of dark hair; stigma and a patch over tip of R_2 dark, between them a conspicuous patch of whitish hair; dark areas over cross-veins and in middle of upper basal cell; wing-length 5·5–7·5 mm. *Frequent. Scotland (Morayshire) southwards to Surrey.* 8–9
varia Meigen.

Median pair of praescutal stripes diverging rather widely in front, a short anterior brown stripe present between them; wings much less mottled than in *varia*; no dark area in upper basal cell; dark area over tip of R_2 less obvious; wing length 6–8·5 mm. *Frequent. Generally distributed.* 8–10
bifurcata Goetghebuer.

Genus **Molophilus** Curtis.

KEY TO SPECIES.

1 Body all black, including scutellum and hypopygium, at most posterior pronotal angles and extreme wing-base yellowish; antennae dark.....2

Body not all black, at least scutellum and hypopygium partly yellow.....5

2 Flightless, wings abbreviated (♂♀); thorax shining; pronotum usually all black; abdomen black haired; legs rather stout, black, with black hairs; halteres with whitish knob; wing length 2 mm. ♂ coxite and styles as in fig. 28*a*. *Abundant in peaty areas. Generally distributed.* 5–6.....**ater** Meigen.

Wings fully developed; posterior pronotal angles usually pale yellow.....3

3 Legs all dark brown or black, slender; thorax slightly shining, mesonotum lightly grey-dusted; abdomen yellow-haired; halteres yellow; wing-length 3·5–4 mm. ♂ coxite and styles as in fig. 28*b*. ♀ tergite 9 not obviously dusted, shining. *Locally common. Dumbarton, Hants, Somerset, Devon.* 4–5
niger Goetghebuer.

Legs not all dark brown or black.....4

4 Trochanters and bases of femora yellowish, coxae brown, legs otherwise black or brown; thorax grey-dusted, scarcely shining; abdomen yellow-haired; legs slender; halteres pale yellow; wing length 5 mm. ♂ coxite and styles as in fig. 28*d*. ♀ tergite 9 obviously whitish-dusted, slightly shining. *Uncommon. S.W. Ireland, Brecon.* 5.....**czizeki** Lackschewitz.
(Two similar European species, which may occur in Britain, are *maurus* Lackschewitz and *pullus* Lackschewitz; ♂ coxite and styles of *maurus* as in fig. 28*c*.)

Legs mainly light brown, femora hardly darker even at tips; thorax brown-dusted (viewed from front), scarcely shining; abdomen pale-haired; legs not noticeably slender; halteres yellow, knob sometimes darkened; wing-length 3–4 mm. ♂ coxite and styles as in fig. 28*e*. ♀ tergite 9 not obviously dusted, shining. *Rare. S.W. Ireland, Inverness, Norfolk, Cambs, Hunts.* 5, 7
bihamatus de Meijere.

5 Thorax mainly black, grey-dusted, quite dull; scutellum yellow, at least posteriorly; head dark grey; posterior pronotal angles yellow, sometimes also a small yellow area on each side of praescutum in front and a variable yellow area on pleurae; antennae entirely dark; abdomen black; legs rather stout, mainly black; wings rather dark, yellow at base; wing-length 3–4 mm.; wing-venation as in fig. 24*f*. ♂ coxite and styles as in fig. 29*a*. ♀ tergite 9 brown or

black, whitish-dusted, slightly shining or dull. *Common. Generally distributed.* 5–9 ..... **obscurus** Meigen.

(Three other European species, *scutellatus* Goetghebuer, *oldenbergi* Lackschewitz and *rothschildi* Edwards, have similar colouring, but are larger, and the ♂ hypopygia are completely different; ♂ coxite and styles of *rothschildi* as in fig. 29*f*.)

Thorax mainly or entirely light brown or yellow. ♀ tergite 9 yellowish 6

6 Pleurae yellow with a brown stripe (sometimes faint) from neck to base of abdomen; head mainly yellow; thorax dull, light brown; pronotum yellow; antennal flagellum brown, scape and pedicel yellow; abdomen usually darker than thorax; legs slender, light brown, tarsi more or less darkened; wings rather pale; wing length 4–5 mm. ♂ hypopygium pale; coxite and styles as in fig. 29*g*. ♀ tergite 9 moderately broad and bulbous; cerci strongly curved, narrower than usual. *Uncommon. N.W. Ireland, Scotland, Cambs, Devon.* 5–6, 9 ..... **pleuralis** de Meijere.

Pleurae quite unstriped, pale 7

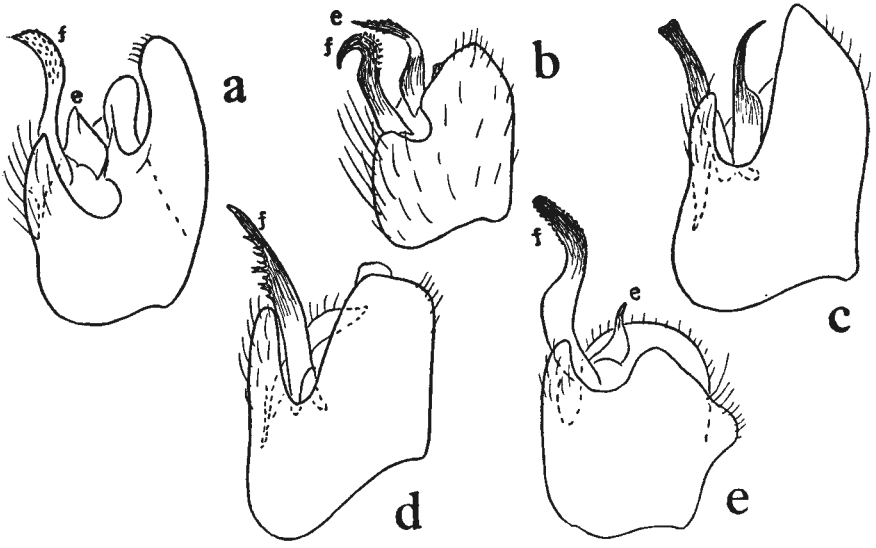

FIG. 28.—Coxite and styles, lateral aspect, of male hypopygia of *Molophilus* (black species). a. *ater* Meigen. b. *niger* Goetghebuer. c. *maurus* Lackschewitz. d. *czizeki* Lackschewitz. e. *bihamatus* de Meijere. (See fig. 29 for explanation of parts.)

7 Vein 2A ending before m–cu; head brown; antennae all dark; thorax uniformly brownish-yellow; abdomen scarcely darker than thorax; legs light brown, tarsi slightly darker; wings dark-haired, fringe unusually long; venation differing from other species in cross-vein r being nearer to base of R_2, m–cu before or at most scarcely beyond fork of M, and 2A shorter and straighter (fig. 24*g*); tergite 9 narrow, not at all bulbous; cerci moderately curved; wing-length 3–5 mm. ♂ unknown. *Rare. Ayrshire* (*Dreghorn*). 5 **pusillus** Edwards ♀.

2A ending below or beyond m–cu 8

8 Thorax light brown; head usually dark grey; abdomen darkened 9

Thorax almost uniformly yellow or light yellowish-brown 14

9 Antennae uniformly brown, base not obviously paler or reddish 10

Antennae with scape, and often pedicel, obviously paler than flagellar segments, or reddish; head brown or greyish-brown; thorax dull, light brown, shoulders and

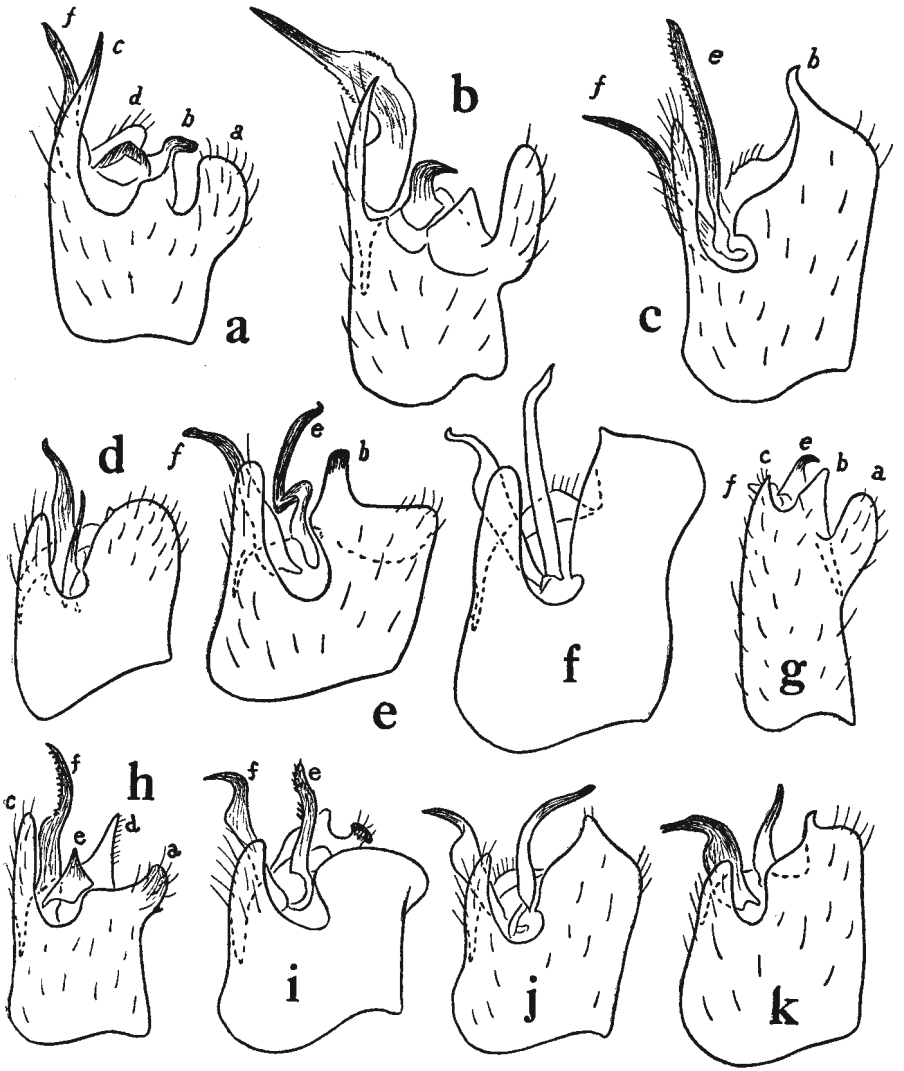

FIG. 29.—Coxite and styles, lateral aspect, of male hypopygia of *Molophilus* (brownish and brownish-yellow species). a. *obscurus* Meigen. b. *griseus* Meigen. c. *corniger* de Meijere. d. *undulatus* Tonnoir. e. *serpentiger* Edwards. f. *rothschildi* Edwards. g. *pleuralis* de Meijere. h. *occultus* de Meijere. i. *propinquus* Egger. j. *curvatus* Tonnoir. k. *bifidus* Goetghebuer. (Explanation of parts: *a* and *b* = outer and inner sternal (actually dorsal) lobes of the coxite. *c* and *d* = outer and inner tergal or anal (actually ventral) lobes. *e* and *f* = the two styles.)

scutellum yellow ; abdomen brown ; legs long and rather slender, light brown, femora often more or less extensively darkened towards tips ; wings dark-haired, not obviously paler at base ; size rather variable, average wing-length 5–6 mm., range 3–7 mm. ♂ hypopygium light brown ; coxite and styles as in fig. 29*b*. ♀ tergite 9 narrow, slightly bulbous ; cerci strongly curved, narrower than usual. *Common. Generally distributed.* 5–9 ..... **griseus** Meigen.

10 ♂ hypopygium with style *e* much shorter than *f* 11
♂ style *e* at least as long as *f* 12

11 ♂ style *e* very shortly triangular ; coxite and styles as in fig. 29*h*. ♀ tergite 9 rather broad and bulbous ; cerci moderately curved. ♂♀ head blackish-grey ; thorax dull, light brown, shoulders and scutellum rather obscurely yellow ; abdomen dark brown ; legs of moderate length and thickness, usually mainly brown, but sometimes extensively darkened ; wings dark-haired, paler at base ; wing-length 5 mm. *Common. Generally distributed.* 5–8 .... **occultus** de Meijere.
(Another European species, *pieltaini* Edwards, has a somewhat similar ♂ hypopygium, but differs obviously in its entirely yellow coloration ; ♂ coxite and styles as in fig. 30*g*.)
♂ style *e* short and slender ; coxite and styles as in fig. 29*d* ; closely resemble *occultus*. *Rare. Morayshire, Yorks* (2 ♂). 8 ..... **undulatus** Tonnoir.

12 ♂ style *e* covered with fine spicules, about as long as *f* ; coxite and styles as in fig. 29*i* ; closely resembles *occultus*. *Uncommon. Scotland southwards to Hants.* 5–7 ..... **propinquus** Egger.
♂ style *e* smooth 13

13 ♂ styles *e* and *f* with blackened tips, *e* longer than *f*, *f* not bifid ; coxite and styles as in fig. 29*j*. ♀ tergite 9 broad and bulbous, not longer than wide. ♂♀ closely resemble **occultus**. *Uncommon. Arran, Westmorland, Lancs, Denbigh, Hants.* 5–6 ..... **curvatus** Tonnoir.
♂ style *e* not blackened at tip, *e* and *f* subequal in length, *f* bifid at tip ; coxite and styles as in fig. 29*k*. ♀ tergite 9 as in *curvatus*. ♂♀ closely resemble *occultus*, but legs less frequently darkened. *Common. Shropshire southwards.* 5–8 **bifidus** Goetghebuer.

14 Head and wing-hair mainly or entirely grey ; antennal flagellum usually dark or only indistinctly pale at base, scape more or less pale. ♀ tergite 9 short, scarcely longer than broad (*ochrescens* ♀ not seen) 15
Head and wing-hair mainly or entirely yellow ; flagellum usually more or less extensively pale towards base, scape pale. ♀ tergite 9 rather long, much longer than broad 19

15 ♂ style *e* vestigial, *f* long, curved apically and blunt-tipped, smooth, black ; coxite and styles as in fig. 30*c* ; abdomen yellow, sometimes slightly darker than thorax ; legs brown, tips of femora and tibiae and entire tarsi often darkened ; wing-length 4–5 mm. *Uncommon. Scotland* (*Argyll*) *southwards to Suffolk.* 6, 8–9 **ochrescens** Edwards.
♂ styles *e* and *f* long 16

16 ♂ style *e* sinuous or wavy 17
♂ style *e* straight or almost so 18

17 ♂ style *e* with a strong double bend, very long, black, smooth, *f* long, black, blunt-tipped ; coxite and styles as in fig. 29*e*. ♂♀ abdomen brown, sometimes lighter in ♀ ; legs slender, colour as in *ochrescens* ; wing-length 5 mm. *Common. Generally distributed.* 5–6, 8–9 ..... **serpentiger** Edwards.
♂ style *e* wavy, rather long and stout, black, *f* with extreme tip bent at right angles ; coxite and styles as in fig. 30*f*. ♂♀ thorax and abdomen uniformly orange-yellow ; legs rather stout, colour as in *ochrescens* ; wing length 5–6 mm. *Locally common. Scotland* (*Cromarty*) *southwards to Bucks.* 5–9 **flavus** Goetghebuer.

18 ♂ style *e* remarkably long, straight, black, with fine spicules along one side, *e* about as long as *f* ; coxite and styles as in fig. 29*c*. ♂♀ closely resemble *serpentiger*. *Rare. Morayshire, Yorks, Hertford.* 7–8 ..... **corniger** de Meijere.
♂ style *e* rather long, pointed, smooth, *f* somewhat longer and stouter ; coxite and styles as in fig. 30*e*. ♂♀ abdomen not much darker than thorax ; legs as in *flavus* ; wing-length 5–6 mm. *Common. Generally distributed.* 5–9 **cinereifrons** de Meijere.

19 ♂ lobe *a* large, *b* forming a strong and rather long pointed black hook, *c* longer than *f*, sickle-shaped, *e* rudimentary, *f* with a tuft of fine short hairs at tip; coxite and styles as in fig. 30*a*. ♂♀ antennal flagellum with at least basal half pale yellow; thorax and abdomen uniformly pale yellow; legs yellow or light brown, more or less darkened; wing-length 5–6 mm. *Common. Generally distributed.* 6–7 ..... **ochraceus** Meigen.

♂ lobe *a* very small, or not clearly distinguishable 20

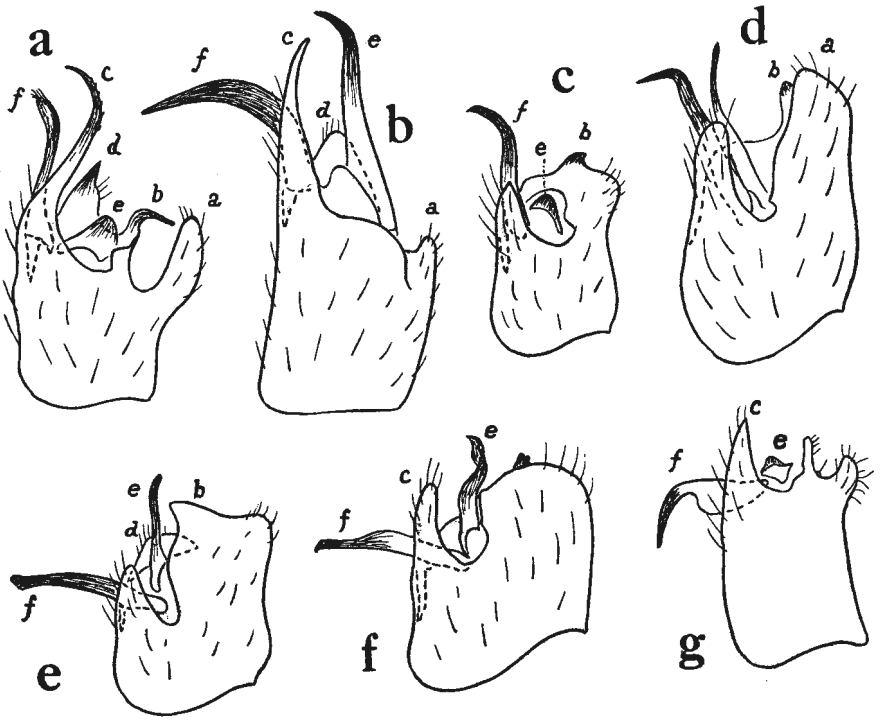

FIG. 30.—Coxite and styles, lateral aspect, of male hypopygia of *Molophilus* (yellow species). a. *ochraceus* Meigen. b. *appendiculatus* Staeger. c. *ochrescens* Edwards. d. *medius* de Meijere. e. *cinereifrons* de Meijere. f. *flavus* Goetghebuer. g. *pieltaini* Edwards. (See fig. 29 for explanation of parts.)

20 ♂ lobe *a* very small, *b* absent, *c* very long and finely pointed, hardly darkened even at tip, *e* and *f* rather longer than *c*, curved, *e* blackened on distal quarter, *f* black; coxite and styles as in fig. 30*b*. ♂♀ closely resemble *ochraceus*, but antennae sometimes rather less extensively yellowish at base. *Common. S.W. Ireland; generally distributed in England and Wales; no Scottish records.* 5–9 ..... **appendiculatus** Staeger.

♂ lobe *a* not clearly distinguishable, *b* small and black, *c* moderately long, *e* very slender, straight, *f* rather longer, right-angled at tip, *e* and *f* blackened at tips; coxite and styles as in fig. 30*d*. ♂♀ closely resemble *appendiculatus*, but femora less obviously darkened towards tips. *Common. Scotland (Inverness) southwards to Herts.* 5–9 ..... **medius** de Meijere.

Genus **Tasiocera** Skuse.

Subgenus **Dasymolophilus** Tonnoir.

KEY TO SPECIES.

1 Small, extremely hairy species ; antennae brown ; head and thorax dark brown or black ; abdomen black ; legs dark brown ; halteres black, clear white towards base ; wing length 2·5–3·5 mm. ; wing-venation as in fig. 24*h*. *Common. Generally distributed.* 5–7 ..... **murina** Meigen.

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