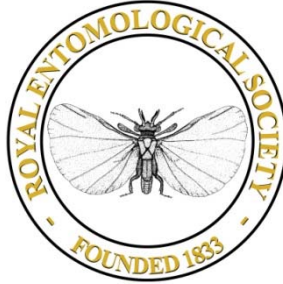


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## HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS

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# HANDBOOKS FOR THE IDENTIFICATION OF BRITISH INSECTS



HEMIPTERA  
CICADOMORPHA  
(excluding Deltocephalinae and Typhlocybinae)

By  
WALTER J. LE QUESNE

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# HEMIPTERA

## (CICADOMORPHA)

(excluding Deltocephalinae and Typhlocybinae)

By WALTER J. LE QUESNE

THE Auchenorrhyncha are generally regarded as being divided into two series, the Cicadomorpha and the Fulgoromorpha : this *Handbook* covers all the Cicadomorpha with the exception of the two subfamilies Deltocephalinae and Typhlocybinae, which will be treated separately. The present part deals with 80 species, divided between 4 families.

### GENERAL ADULT CHARACTERISTICS

In the British species the cells of the fore wings can be hyaline or coriaceous, sometimes with puncturation. The nomenclature used for the veins and cells of the fore wing is as in figure 2. A key to the parts shown in figures 1-6, together with some shown in subsequent illustrations, is given below, the number in brackets indicating the relevant figure.

- |  |  |
|--|--|
| <i>A1</i> , first anal vein (2)                                  | <i>M</i> , median vein (2)                       |
| <i>A2</i> , second anal vein (2)                                 | <i>MA</i> , median apical cell (2)               |
| <i>ABS</i> , aedeagus basal support (180)                        | <i>MB</i> , median band (171)                    |
| <i>AC</i> , anteclypeus (3)                                      | <i>MC</i> , median cell (2)                      |
| <i>AE</i> , aedeagus (penis) (180)                               | <i>MCo</i> , median coxa (13)                    |
| <i>AN</i> , antenna (3)  | <i>mcu</i> , subapical m-cu crossvein (2)        |
| <i>AP</i> , appendix (2)   | <i>MF</i> , median femur (13)                    |
| <i>AT</i> , anal tube (tenth abdominal segment of male) (4, 180) | <i>OC</i> , ocellus (3, 171)                     |
| <i>CCS</i> , corio-claval suture (2)                             | <i>P</i> , pronotum (1)                          |
| <i>CE</i> , compound eye (1, 3)                                  | <i>PA</i> , paramere (180)                       |
| <i>Cu</i> , cubital vein (2)                                     | <i>PES</i> , prothoracic episternite (208)       |
| <i>CuC</i> , cubital cell (2)                                    | <i>PL</i> , palette (1, 3)                       |
| <i>DCB</i> , discoidal cross-band (171)                          | <i>POS</i> , postocellar spot (171)              |
| <i>DS</i> , discoidal spot (171)                                 | <i>PV</i> , peripheric vein (2, 79)              |
| <i>EA</i> , external apical cell (2)                             | <i>R</i> , radial vein (2)                       |
| <i>ESA</i> , external subapical cell (2)                         | <i>RC</i> , radial cell (2)                      |
| <i>FC</i> , frontoclypeus (3)                                    | <i>Sc</i> , subcosta (2)                         |
| <i>G</i> , gena (3)  | <i>ScC</i> , subcostal cell (2)                  |
| <i>GP</i> , gonoplac (ovipositor sheath) (6)                     | <i>SEA</i> , subexternal apical cell (2)         |
| <i>GPL</i> , genital plate (4, 5)                                | <i>SIA</i> , subinternal apical cell (2)         |
| <i>GS</i> , genital segment (male) (4)                           | <i>ST</i> , scutellum (1)                        |
| <i>IA</i> , internal apical cell (2)                             | <i>TH</i> , thyridium (3, 171)                   |
| <i>IM</i> , inner margin (of wing) (2)                           | <i>VA</i> , valve (5)                            |
| <i>IOB</i> , interocellar band (171)                             | <i>VE</i> , vertex (1)                           |
| <i>ISA</i> , internal subapical cell (2)                         | <i>VI</i> , sixth abdominal segment (6)          |
| <i>IX</i> , ninth abdominal segment (6)                          | <i>VII</i> , seventh abdominal segment (5, 6)    |
| <i>L</i> , lorum (3)   | <i>VIII</i> , eighth abdominal segment (4, 5, 6) |
|  | <i>XI</i> , eleventh abdominal segment (180)     |

Figure 171 shows the markings of the face and figure 180 the internal male genitalia, which often provide valuable specific characters. In the

female, the form of the seventh abdominal sternum and the length of the gonoplac are often important.

#### GENERAL LARVAL CHARACTERISTICS

The larvae of Cicadids and Cercopids are specialised for their modes of life as discussed under these families. The larval stages of Membracids and Cicadellids, on the other hand, occupy similar habitats to the adults and thus resemble them more closely, often, in particular, in characters relating to the form of the head, antennae and legs. The Cicadellids have not however been well enough studied to enable a key to be drawn up for the recognition of their larvae.

#### CLASSIFICATION AND NOMENCLATURE

There is much difference of opinion as to the extent of the family Cicadellidae, which is here used in its widest sense. The nomenclature used is based on Le Quesne's check-list (1964b). Sufficient synonymy is given to correlate with the check lists of Kloet & Hincks (1945) and China (1950, 1951) and with Edwards' *Hemiptera-Homoptera of the British Islands* (1894-96).

#### MOUNTING

Some notes are given on this subject in the *Handbook on Fulgoromorpha* (Le Quesne, 1960).

#### EXPLANATION OF KEYS

It should be emphasized that, except where otherwise stated, the keys refer only to adult forms of the insects occurring in Britain. The monthly records refer to the adult state. My remarks under the same heading in the *Fulgoromorpha Handbook* (1960) also apply.

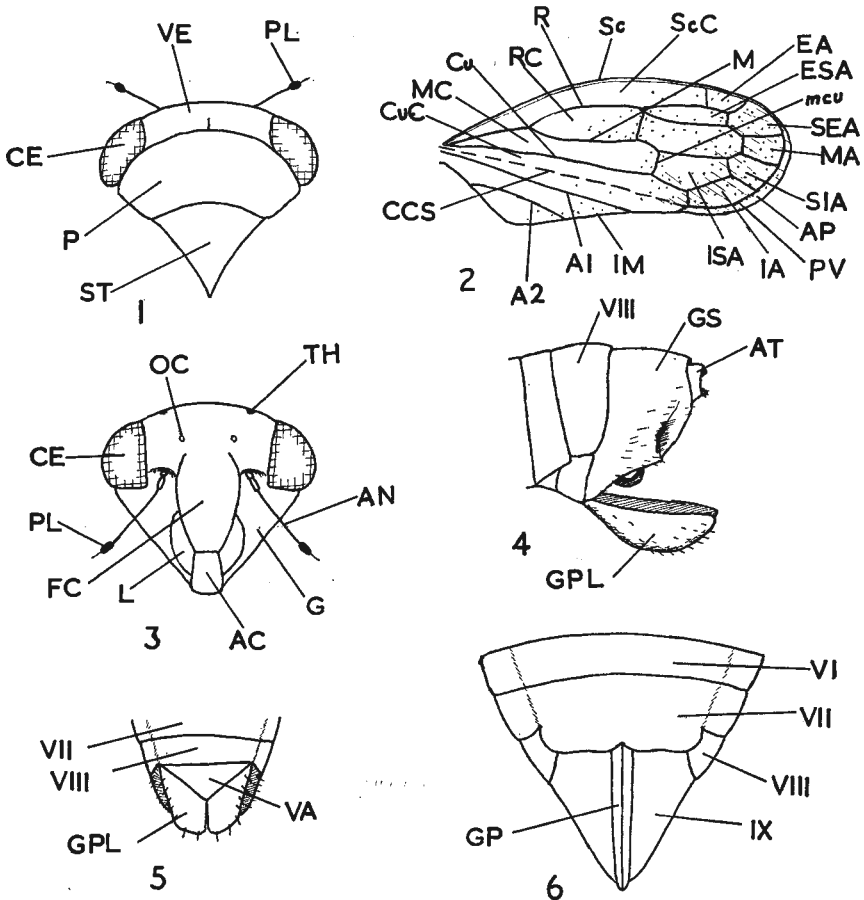
#### ACKNOWLEDGMENTS

I wish to thank the Trustees of the British Museum (Nat. Hist.), the Director of the Royal Scottish Museum and the Hope Professor of Entomology at Oxford for allowing me to study the respective collections in their charge. I am especially grateful to Dr. M. A. Salmon, who collaborated with me over part of this *Handbook*. Mr. G. E. Woodroffe has tested the keys to a large extent and has made very valuable suggestions; Mr. J. H. Flint, Mr. A. A. Allen, Mr. J. D. Collins and Mr. M. Ackland have also tried out parts of the keys and made useful contributions. Besides these, I must thank Dr. W. E. China, the late Mr. H. W. Daltry, Dr. C. D. Day, Dr. G. H. L. Dicker, Dr. J. Dlabola, Colonel C. A. W. Duffield, the late Mr. P. Harwood, Mr. W. R. B. Hynd, Mr. D. Leston, Dr. R. Linnavuori, Dr. F. Ossianilsson, Professor H. Ribaut, Mr. A. R. Waterston and Dr. W. Wagner, all of whom have given me assistance or lent me specimens.

The drawing of *Cercopis vulnerata* was kindly made by Miss Cynthia Watson; the rest of the drawings are my own.

SEPARATION OF CICADOMORPHA AND FULGOROMORPHA

- 1 Postclypeus distinct from frons and with upper margin below compound eyes so that frons is situated on face. Median coxae elongate, mobile, with bases widely separated (except Tettigometridae). Tegulae present over base of fore wing (sometimes hidden under pronotum). Fore wing with two anal veins united in apical part. Hind wing without peripheric vein. Antennae with base directly beneath compound eyes (except Tettigometridae, where base below level of eyes and between them and two basal segments of antennae together nearly as long as width of eye).....FULGOROMORPHA
- Postclypeus and frons not distinct from each other, with upper margin of frontoclypeus between or above level of compound eyes. Median coxae short, fixed, with bases set close together (fig. 13). Tegulae not present over base of fore



FIGS. 1, 3.—*Idiocerus confusus* : (1) vertex, pronotum and scutellum ; (3) face.  
 FIG. 2.—*Pediopsis tiliae*, fore wing.  
 FIGS. 4, 6.—*Aphrodes albifrons* : (4) male, apex of abdomen, side view ; (6) female, apex of abdomen, ventral view.  
 FIG. 5.—*Turrutus socialis*, male, apex of abdomen, ventral view.

(For explanation of lettering throughout, see p. 1)

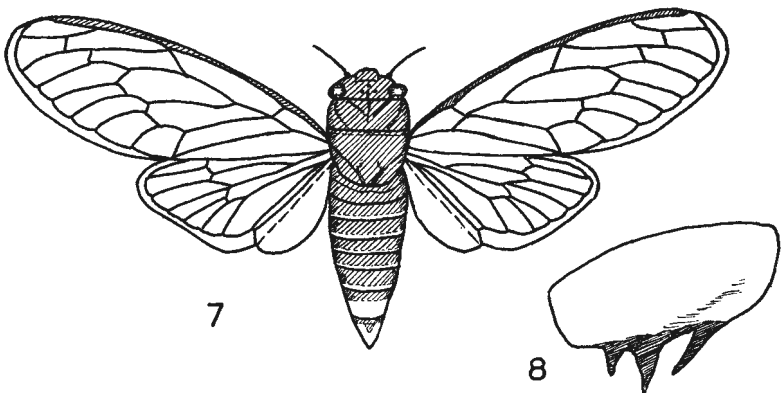
wings. Fore wing with two anal veins distinct at apex (sometimes united for short distance in middle). Hind wing with peripheric vein, at least uniting apices of anal and cubital veins (figs. 79, 149, etc.). Antennae with base between compound eyes (figs. 9, 75, 85, etc.) (except Jassinæ, Macropsinæ and Idiocerinae, where base of antennae at or below level of lower margin of eyes and length of two basal segments of antennae together much less than half width of eye—figs. 77, 148, etc.).....CICADOMORPHA

## KEYS TO FAMILIES OF CICADOMORPHA

- 1 Fore wing hyaline, 18–24 mm. long (fig. 7). Three ocelli present on vertex (fig. 21). Anterior femora with strong spines (fig. 8).....CICADIDAE (p. 4)
- Fore wing not more than 15 mm. long, usually not clearly hyaline. Two (or no) ocelli present on vertex or face. Anterior femora unarmed or with weak hair-like spines.....2
- 2 Pronotum developed into long projection posteriorly covering the scutellum (figs. 68, 70, etc.). Anterior part of pronotum and vertex vertical (fig. 70). (Fore wing with peripheric vein distinct in apical half (fig. 70))
  - Pronotum not developed into posterior projection. Scutellum exposed. Anterior part of pronotum and vertex horizontal or inclined, not vertical.....3
  - 3 Posterior tibiae cylindrical, without keels, with one or more stout fixed spines, but no mobile ones (fig. 18). Distinct plate present on vertex (figs. 12, 14, etc.). (Fore wings horny, with puncturation).....CERCOPIIDAE (p. 5)
  - Posterior tibiae distinctly keeled, bearing a row of mobile spines along keel or keels, some of which may be mounted on enlarged bases (fig. 84) (poorly developed but present in *Ulopa*—fig. 76). No distinct plate present on vertex. (Fore wing more or less membranous, mainly or wholly without puncturation, except in *Ulopa*).....(= JASSIDAE) CICADELLIDAE (p. 15)

## Family CICADIDAE

Members of this family of large and conspicuous species have been popularly recognised in warmer countries for a very long time on account of their drumming "song". In Britain, however, we have only one very local representative. The larvae are subterranean, with the anterior legs modified into strong claws for digging (fig. 20): the larval state usually lasts several years, but little seems to be known about the life-history of the British species.



FIGS. 7, 8.—*Cicadetta montana* : (7) body and wings ; (8) anterior femur.

Genus *Cicadetta* Kolenati

(= *Melampsalta* Kolenati)

This large genus is represented in all the principal geographic regions. We have one species in Britain.

Face black, densely pilose at sides, postclypeus strongly convex, marked with thin pale transverse lines. Fore body black, with short pilosity. Fore and hind wings hyaline, with veins black-brown: area between costa and subcostal vein orange-brown in basal half. Abdomen black above, narrowly orange-brown along posterior margin of each tergum. Length of body: ♂, 15-16 mm.; ♀, 21-22 mm. Length of fore wing: ♂, 19-20 mm.; ♀, 24-25 mm.

*montana* (Scopoli)

Very local and erratic in its appearance, sometimes found in numbers. England: New Forest, Hants; near Haslemere, Surrey (one old record). v-vii. Europe, Siberia, Syria.

## Family CERCOPIDAE

Members of this family are often called "frog-hoppers" and are well known for the "cuckoo-spit" secretion with which the larvae of many of the species surround themselves. There are two subfamilies, the Cercopinae and Aphrophorinae; the former contains one European genus, *Cercopis*, which is represented in Britain, while the latter includes five genera from Europe, three of which are represented in this country.

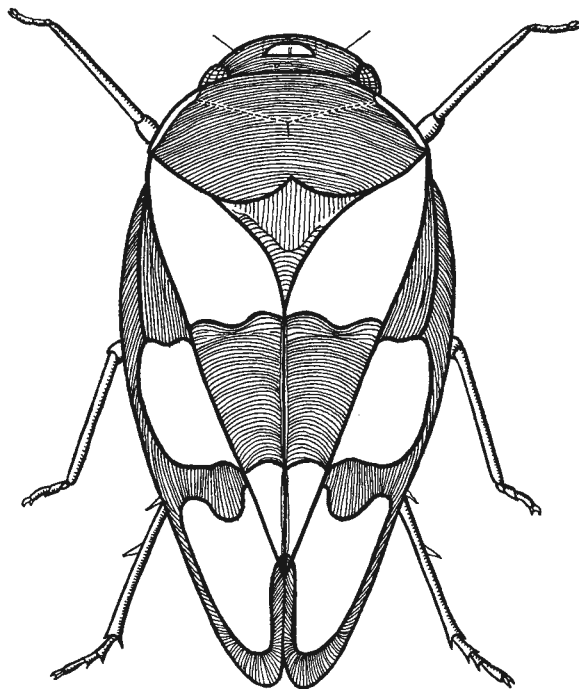
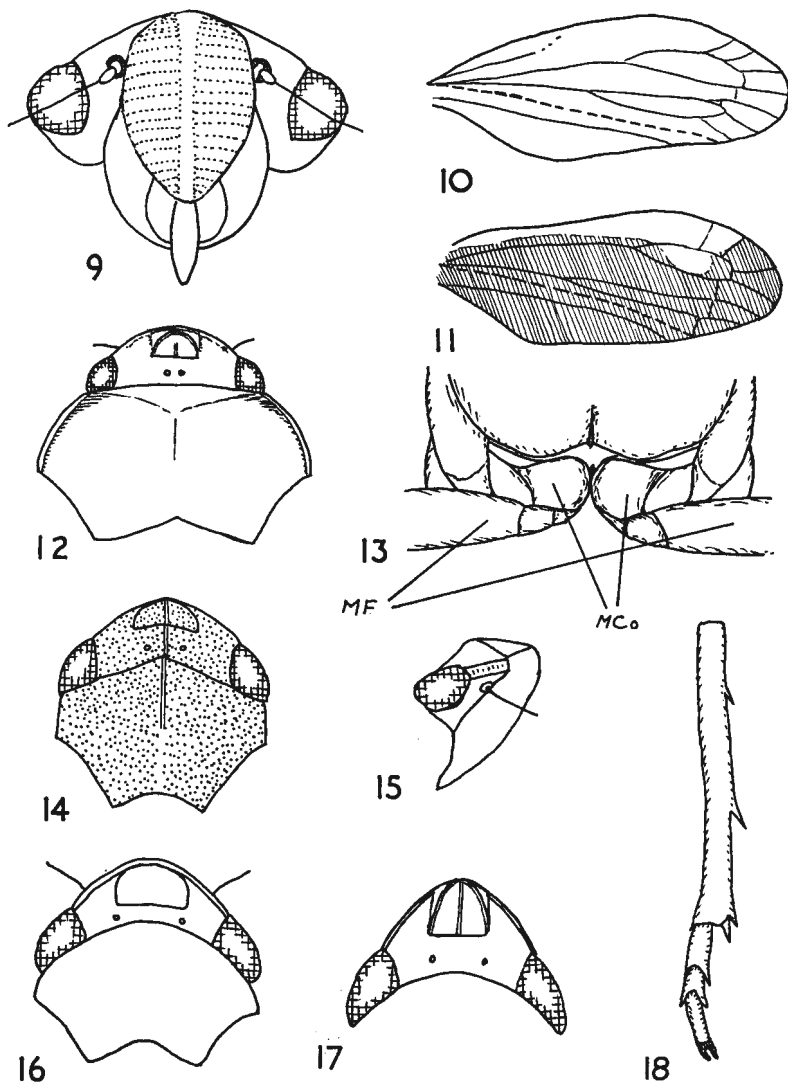


FIG. 8A.—*Cercopis vulnerata* Illiger.





FIGS. 9, 13, 14, 18.—*Aphrophora alni*: (9) face; (13) part of underside of thorax; (14) vertex and pronotum; (18) posterior tibia and tarsus.

FIGS. 10, 15, 16.—*Philaenus spumarius*: (10) fore wing; (15) head, side view; (16) vertex and pronotum.

FIGS. 11, 17.—*Neophilaenus lineatus*: (11) fore wing; (17) female, vertex.

FIG. 12.—*Cercopis vulnerata*, vertex and pronotum.

## KEY TO GENERA

- 1 Anterior margin of pronotum straight (fig. 12). Fore wings black with dark red markings (fig. 19).....**Cercopis** Fabricius (p. 7)
- Anterior margin of pronotum produced between eyes (figs. 14, 16). Fore wings variously coloured, but not black and red.....2
- 2 Pronotum without median keel (fig. 16). Transition between vertex and face on either side of frontoclypeus consisting of a furrow between parallel keels (fig. 15). Overall length less than 6.5 mm.....3
- Pronotum with median keel anteriorly (fig. 14). Transition between vertex and face and either side of frontoclypeus not consisting of a furrow between parallel keels. Overall length at least 8 mm.....**Aphrophora** Germar (p. 8)
- 3 Basal two-thirds of costa of fore wings almost straight and approximately parallel to inner margin (fig. 11). Length of upper margin of frontoclypeus less than its distance from eye along anterior margin of vertex. Plate of vertex with median keel, shorter or longer than broad (figs. 17, 61 etc.) . . **Neophilaenus** Haupt (p. 12)
- Basal two-thirds of costa of fore wings distinctly convex in relationship to a line parallel with inner margin (fig. 10). Length of upper margin of frontoclypeus as great as or greater than its distance from eye along anterior margin or vertex. Plate of vertex broader than long, without median keel (fig. 16)  
**Philaenus** Stål (p. 11)

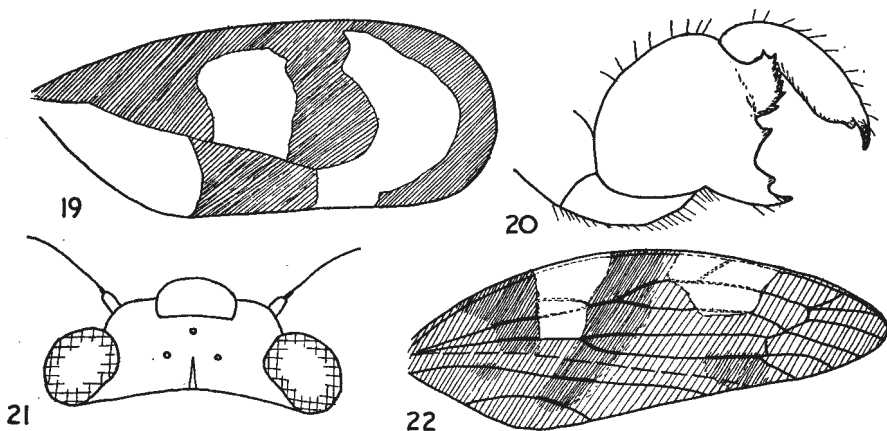


FIG. 19.—*Cercopis vulnerata*, fore wing.

FIGS. 20, 21.—*Cicadetta montana*: (20) larva, anterior leg (21) imago, vertex.

FIG. 22.—*Aphrophoraalni*, fore wing.

Genus *Cercopis* Fabricius

This characteristic genus has seven European species, only one of which occurs in Britain. The larva is gregarious, living underground in a mass of solidified froth (*cf.* China, 1925).

Face, vertex, pronotum and scutellum shining black, with fine pale pilosity; frontoclypeus strongly convex; ocelli reddish, near posterior margin of vertex; pronotum with fine puncturation. Fore wings with red and black pattern as in fig. 19, with fine puncturation and fine pale pilosity. Hind wings translucent, smoky brown, with fine pilosity. Abdomen blackish above, terga narrowly reddish posteriorly. Overall length: ♂♀, 9.5–10.5 mm.

**vulnerata** Illiger

Usually in or near woods. Widespread in England, though somewhat local. Scotland: Paisley, Renfrews. iv–vii (viii?). C. and S. Europe.

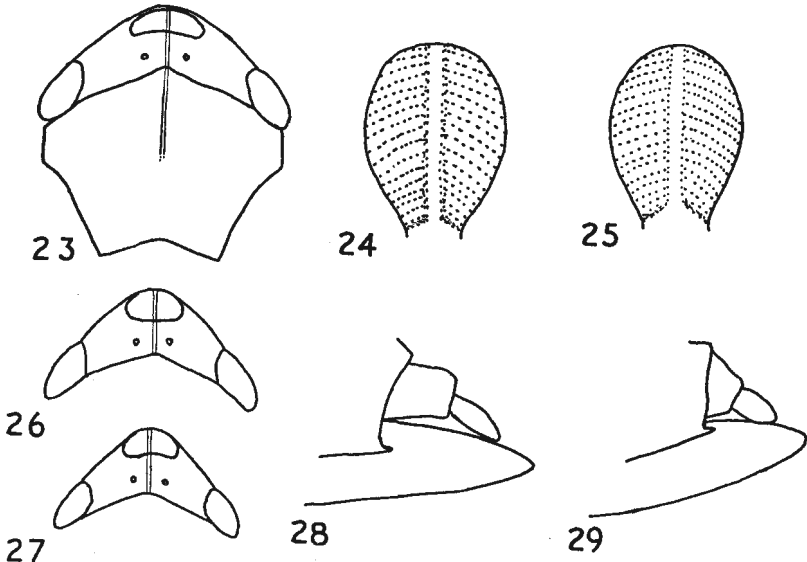
Genus *Aphrophora* Germar

This genus consists of large and characteristic species; in Britain we have four out of the six described from Europe. A considerable number of species, however, have been described from China and Japan.

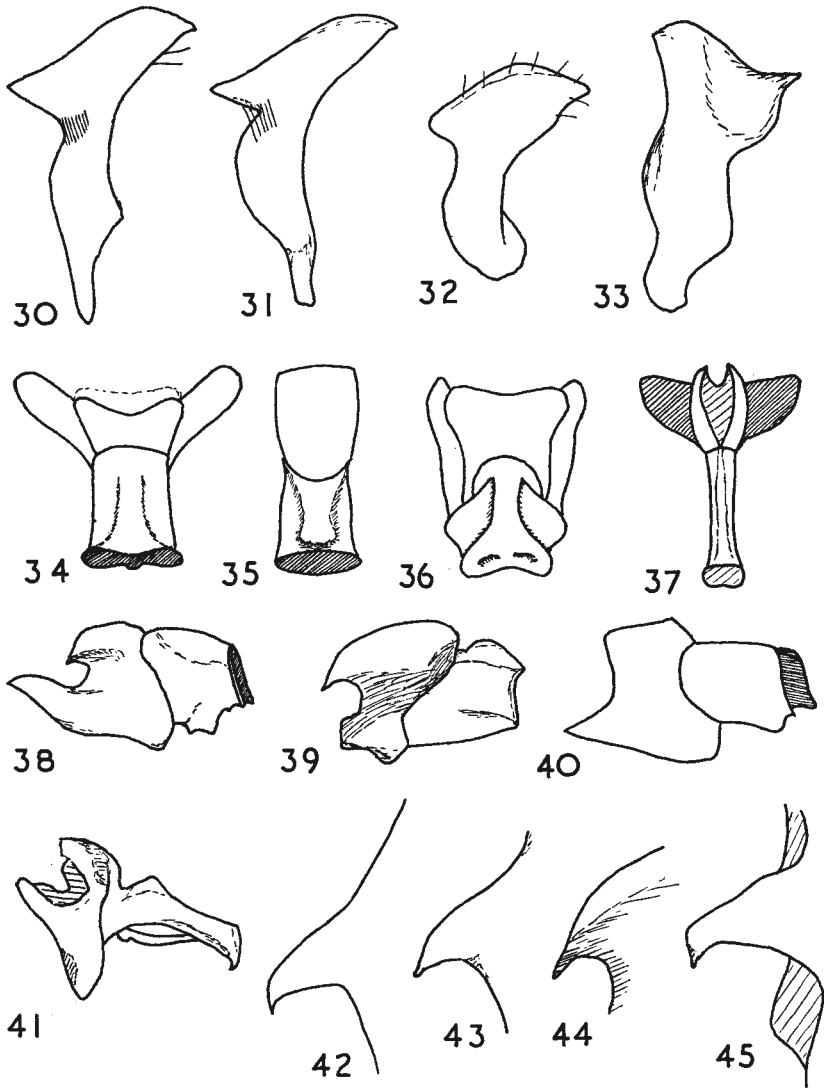
In all the British species the postclypeus is strongly convex and has straight rows of puncturation on either side of a smooth paler median band, besides series of curved rows of puncturation on either side of the band, with paler streaks between these (figs. 24, 25). The fore body and fore wings are covered by setigerous puncturation, which is black on pronotum (except for pale raised median line anteriorly) and on centre of scutellum.

## KEY TO SPECIES

- 1 Vertex shorter, ratio of its length to breadth (including eyes) 0.24-0.31, its length medially about one and a half times as great as length next to eye, thus making anterior angle more obtuse; plate of vertex more than twice as broad as long (figs. 14, 23)..... 2
- Vertex longer, ratio of its length to breadth (including eyes) 0.31-0.37, its length medially about twice as great as length next to eye, anterior angle thus rather sharper; plate of vertex about twice as broad as long (figs. 26, 27)..... 3
- 2 Fore wings brownish, usually with two distinct white patches along costal margin and tendency to form around these three darker bands with included veins blackish (fig. 22), sometimes dark brown with one pale patch present along costal margin; puncturation unpigmented in white patches, otherwise black. Smaller and narrower; width of pronotum 2.65-3.05 mm.; ratio of length of pronotum to that of vertex 2.1-2.35. Overall length: ♂♀, 9.1-10.2 mm. (Median band of postclypeus margined with single row of puncturation on either side (fig. 9). Vertex with pale raised median line, otherwise with strong black puncturation. In male, aedeagus narrow (figs. 37, 41), paramere excised apically



Figs. 23-29.—*Aphrophora* spp.: (23) *major*, vertex and pronotum; (24) *forneri*, frontoclypeus; (25) *salicina*, frontoclypeus; (26) *forneri*, vertex; (27) *salicina*, vertex; (28) *forneri*, female, apex of abdomen, side view; (29) *salicina*, female, apex of abdomen, side view.



FIGS. 30-45.—*Aphrophora* spp., male genitalia: 30-33, parameres: (30) *forneri*; (31) *salicina*; (32) *major*; (33) *alni*: 34-37, aedeagi from above: (34) *forneri*; (35) *salicina*; (36) *major*; (37) *alni*: 38-41, aedeagi from side: (38) *forneri*; (39) *salicina*; (40) *major*; (41) *alni*: 42-45, projections of side of genital segment: (42) *forneri*; (43) *salicina*; (44) *major*; (45) *alni*.

(fig. 33), projection of side of genital segment as in fig. 45. In female, part of gonoplac projecting in side view beyond apical abdominal segment about one and a half times as long as broad)

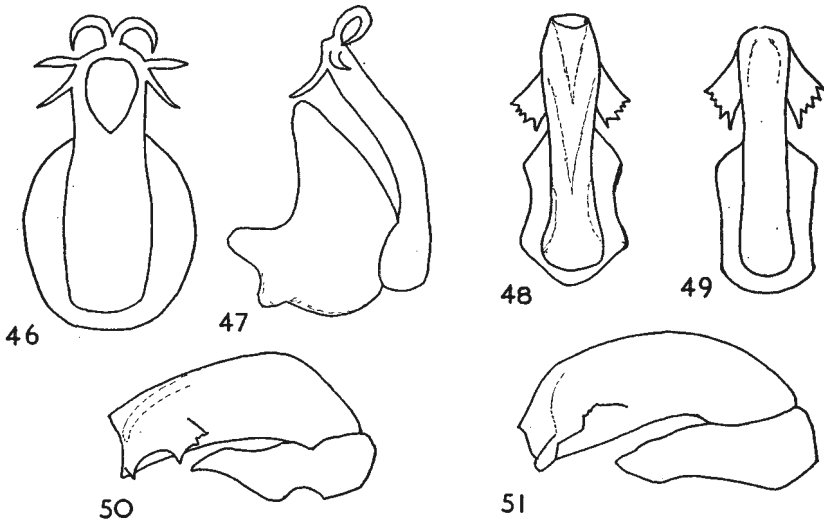
(= *spumaria* : auctt. nec (Linnaeus)) **alni** (Fallén)

Widely distributed on a considerable variety of trees and bushes. England. Wales. Scotland. Ireland. v-x. Palaearctic Region.

- Fore wings uniformly brown, at most with one or two indistinctly darker patches ; puncturation black throughout. Larger and broader : width of pronotum, 3.15-3.5 mm., ratio of length of pronotum to that of vertex, 2.45-2.8 ; overall length, ♂♀, 10.6-12.0 mm. (Median band of postclypeus margined with irregular double row of puncturation on either side (as in fig. 24). Vertex with pale raised median line, puncturation mainly rather weak, only blackish and strong near ocelli. In male, aedeagus as in figs. 36, 40 ; paramere as in fig. 32 ; projection of side of genital segment as in fig. 44)

(= *myricae* Edwards) **major** Uhler

Locally common on *Myrica* gale (sweet-gale). England : Staffs., Norfolk, Cambs., Hunts., Surrey, Hants. Ireland : Co. Wicklow. viii-x. France. Germany. Austria. Hungary. Russia. Japan.



FIGS. 46, 47.—*Philaenus spumarius*, aedeagus : (46) from behind ; (47) side view. FIGS. 48, 50.—*Neophilaenus lineatus*, aedeagus : (48) from behind ; (50) side view. FIGS. 49, 51.—*N. longiceps*, aedeagus : (49) from behind ; (51) side view.

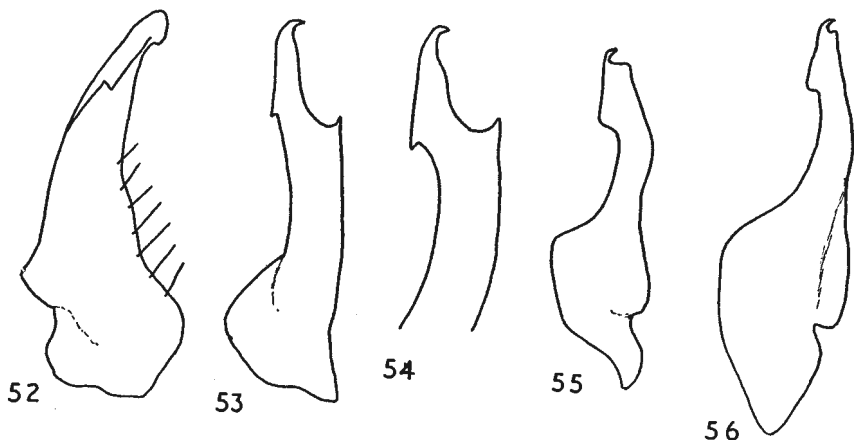
- 3 Fore wings unicolorous greenish-yellow with black setigerous puncturation. Frontoclypeus with median band margined on either side with a single row of black puncturation, especially distinct in lower half (fig. 25). In female, part of gonoplac projecting in side view beyond apical abdominal segment rather less than one and a half times as long as wide (fig. 29). (Anterior margin of vertex between eye and plate almost straight. Vertex with raised smooth posterior margin and central line, otherwise with fine, not blackened puncturation. Veins of fore wing pale anteriorly, rather darker in apical third. In male, aedeagus as in figs. 35, 39 ; paramere as in fig. 31 ; projection of side margin of genital segment rather variable, e.g. as in fig. 43. Overall length : ♂♀, 8.6-10.3 mm.) . . . . . (= *salicis* (DeGeer)) **salicina** (Goeze)  
On *Salix* spp., sometimes common. England : Southern counties ; Selby, Yorks. Wales : Kidwelly, Carmar. Ireland : Co. Galway. v-xi. Europe, Siberia.

- Fore wings orange-yellow in basal third, followed by somewhat indistinct dark brown transverse band, posteriorly brownish, with black setigerous puncturation throughout. Postclypeus with median band margined on either side with irregular double row of black puncturation (fig. 24). In female, part of gonoploc projecting beyond apical abdominal segment nearly twice as long as wide (fig. 28). (Anterior margin of vertex between eye and plate often more or less convex. Vertex with raised smooth median line, otherwise with fine, not blackened puncturation. In male, aedeagus as in figs. 34, 38; paramere as in fig. 30; projection of side margin of genital segment rather variable, e.g. as in fig. 42. Overall length: ♂♀, 9.7-11.4 mm.) . . . . . (= *maculata* Edwards) **forneri** Haupt  
*On Salix spp., local. S. & C. England, as far N. as Staffs. and Cambs. vi-ix. Germany. Czechoslovakia.*

### Genus *Philaenus* Stål

This is the common and widespread "cuckoo-spit" insect of the countryside and garden, the larva surrounding itself with froth on a wide variety of plants. The adult of the one western European species shows a wide range of colour-patterns, many of the forms being named (cf. Haupt, 1935; Salmon, 1954a). Wagner (1955) has shown that the spines of the aedeagus of the species vary in form, exhibiting a cline from the North to the South of Europe: examination of British specimens should also show variation dependant on the latitude of the locality.

Frontoclypeus strongly convex, pale with dark transverse streaks more or less developed, sometimes only two or three present near upper margin; in dark specimens broad dark median band present; two basal segments of antennae pale, globular base of filament dark. Fore body and fore wings very variable in colour, sometimes uniformly straw-coloured, but often with black-brown mottling or streaks, rarely wholly black-brown. In male, paramere as in fig. 52; aedeagus (Southern English specimens) as in figs. 46, 47. Overall length: ♂♀, 5.8-6.7 mm. . . . . (= *leucophthalmus* (Linnaeus)) **spumarius** (Linnaeus)  
*Abundant on a wide variety of trees and low plants. England. Wales. Scotland. Ireland. vi-xi. Palaearctic and Nearctic regions.*



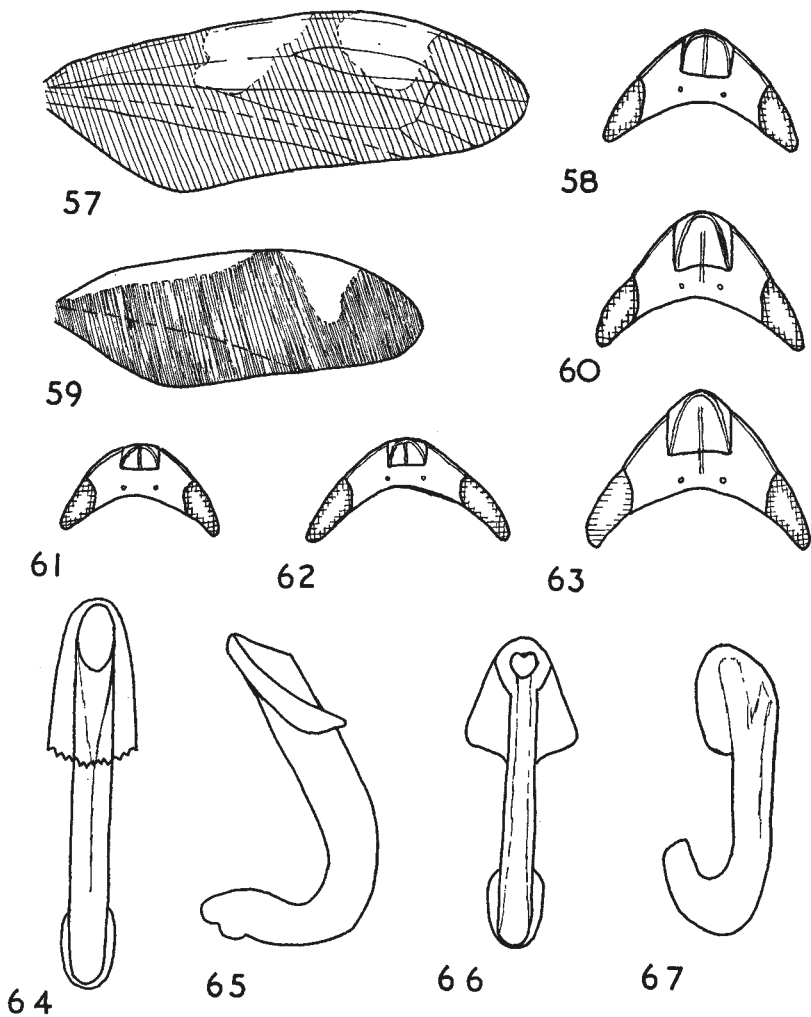
FIGS. 52-56.—Parameres: (52) *Philaenus spumarius*; (53) *Neophilaenus lineatus*: (54) *N. longiceps*; (55) *N. exclamationis*; (56) *N. campestris*.

Genus *Neophilaenus* Haupt(=*Philaenus* : auctt. partim)

This genus contains nine European species, four of which occur in Britain. I am here regarding *longiceps* as distinct from *lineatus*, but it has been suggested (Duffield, 1957) that the former may be a salt-marsh form of the latter. In all four species, the fore body and fore wing are finely pilose. The larvae of this genus are found on grasses or rushes. The ecology of two species under moorland conditions has been described by Whittaker (in press).

## KEY TO SPECIES

- 1 Fore wings lighter or darker brown with an unbroken whitish streak along costa (fig. 11), not always obvious when ground colour pale and rarely absent when colour dark. Vertex relatively longer and more pointed apically (figs. 17, 58, 60, 63) : ratio of its length to that of width between eyes greater than 0.60 in males and greater than 0.65 in females. In male, aedeagus broad in side view (figs. 50, 51) and with lamelliform projections with their apices detached from stem of aedeagus (figs. 48, 49) ; paramere with a broad concavity towards apex (figs. 53, 54).....2
- Fore wings either with two whitish patches (fig. 57) or a clearly separated whitish streak and patch along costa (fig. 59). Vertex relatively short and more rounded apically (figs. 61, 62) ; ratio of its length to that of width between eyes less than 0.60. In male, aedeagus narrower in side view (figs. 65, 67) and with lamelliform projections attached along all their length to stem of aedeagus (figs. 64, 66) ; paramere with a narrow concavity just before apex (figs. 55, 56).....3
- 2 Vertex and its plate more elongate ; length of plate roughly equal to its width at base, distinctly more than half length of vertex (figs. 60, 63) ; length of vertex next to eye about half of its median length in male, rather less in female. In male, aedeagus in side view broadest near apex (fig. 51). Larger ; overall length : ♂, 5.9 mm. ; ♀, 6.4-6.8 mm. (Genae pale ; lorae and antennary cavities black ; frontoclypeus light brown with median band and narrow transverse lines black in upper and lower parts ; furrow between face and vertex pale, narrowly dark edged. Fore body reddish-brown ; scutellum darker apically. Fore wings greyish-brown, except for pale costal band and small blackish streak at apex of inner margin. Paramere as in fig. 54).....*longiceps* (Puton)  
*Very local in salt-marshes. England : Benfleet, Essex ; Nagden Marshes, Kent. vi. France. N. Africa.*
- Vertex and its plate rather less elongate ; length of plate distinctly less than its width at base, about half or only slightly more than half that of vertex (figs. 17, 58) ; length of vertex next to eye distinctly more than half its median length in male, about half or slightly more than half in female. In male, aedeagus in side view narrowest towards base, more nearly parallel-sided for much of its length (fig. 50). Smaller ; overall length : ♂, 4.8-5.4 mm. ; ♀, 5.3-6.5 mm. (Genae pale ; lorae and antennary cavities black ; frontoclypeus light brown with median band and narrow transverse lines black in upper and lower parts ; furrow between face and vertex pale, narrowly dark edged. Fore body light or darker brown ; scutellum sometimes rather darker apically. Fore wings light brown or blackish-brown, sometimes paler towards apex, almost always with pale costal band ; small black streak usually present at apex of inner margin. Paramere as in fig. 53).....*lineatus* (Linnaeus)  
*Common on grasses : the dark forms only occur in certain populations on Molinia caerulea Moench. England. Scotland. Wales. Ireland. vi-vi. Palaearctic and Nearctic Regions.*
- 3 Pale markings of fore wings consisting of two whitish spots along costa (fig. 57). Larger ; overall length : ♂, 5.0-5.3 mm. ; ♀, 5.4-5.7 mm. In male, laminate projections of aedeagus with serrate lower margin (fig. 64). (Genae light brownish ; lorae same colour or rarely somewhat darker ; dark mark present in antennary cavity ; frontoclypeus brown with lighter transverse lines on either side ; furrow between face and vertex pale, narrowly dark edged. Fore body red-



FIGS. 57-67.—*Neophilaenus* spp.: (57) *campestris*, fore wing; (58) *lineatus*, male, vertex; (59) *exclamationis*, fore wing; (60) *longiceps*, male, vertex; (61) *exclamationis*, male, vertex; (62) *campestris*, male, vertex; (63) *longiceps*, female, vertex; (64) *campestris*, aedeagus from behind; (65) the same, side view; (66) *exclamationis*, aedeagus from behind; (67) the same, side view.



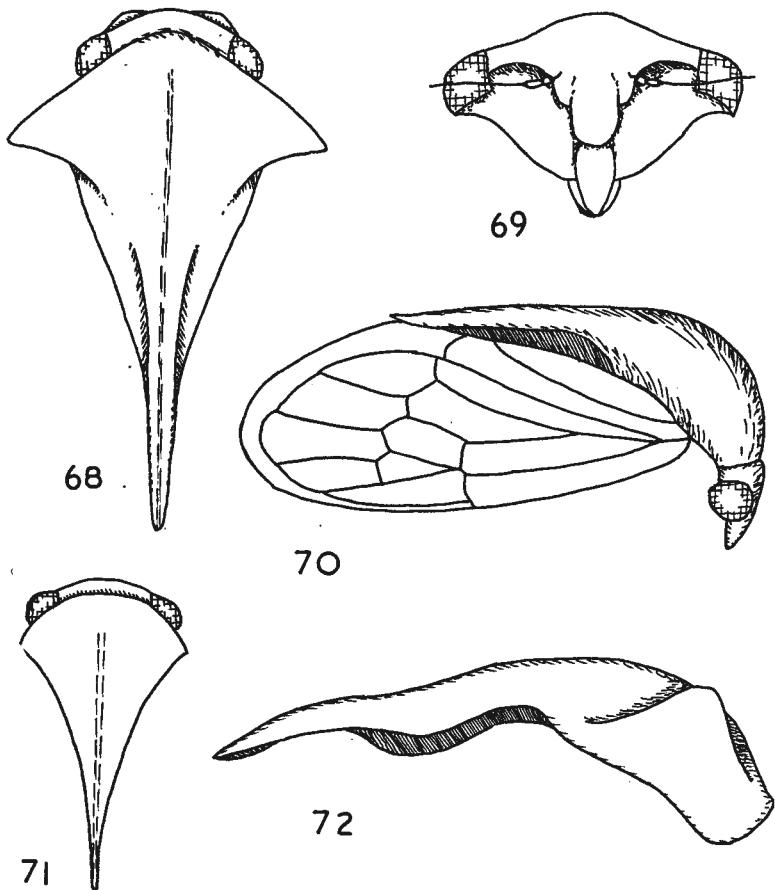
brown; in male, plate of vertex often darker; in female, dark median longitudinal band often present throughout. Fore wings light brown with two pale patches, sometimes broadly pale apically; lighter marblings sometimes present on clavus; small blackish streak often present at apex of inner margin. Paramere as in fig. 56).....**campestris** (Fallén)

Locally present on grasses. England, as far N. as Yorks. Ireland. *vi-ix* Europe to Turkestan. N. Africa.

- Pale markings of fore wings consisting of a pale streak and a pale spot along costa (fig. 59). Smaller: overall length: ♂, 3.7-4.4 mm.; ♀, 3.8-4.6 mm. In male, laminate projections of aedeagus with smooth lower margin (fig. 66). (Genae pale; lorae usually dark; antennary cavities dark; frontoclypeus dark brown with lighter transverse lines on either side. Fore body chestnut brown, with plate of vertex often somewhat darker. Fore wings chestnut brown; pale streak and spot along costa rather variable in extent; blackish streak usually present at apex near inner margin. Paramere as in fig. 55)

**exclamationis** (Thunberg)

Locally common on short grasses, often on calcareous hillsides or on acid soils over gritstone hillsides. England. Wales. Scotland. *vi-x*. Europe. Siberia. N. Africa.



FIGS. 68, 69, 72.—*Centrotus cornutus*: (68) vertex and pronotum; (69) head from beneath; (72) pronotum, side view.

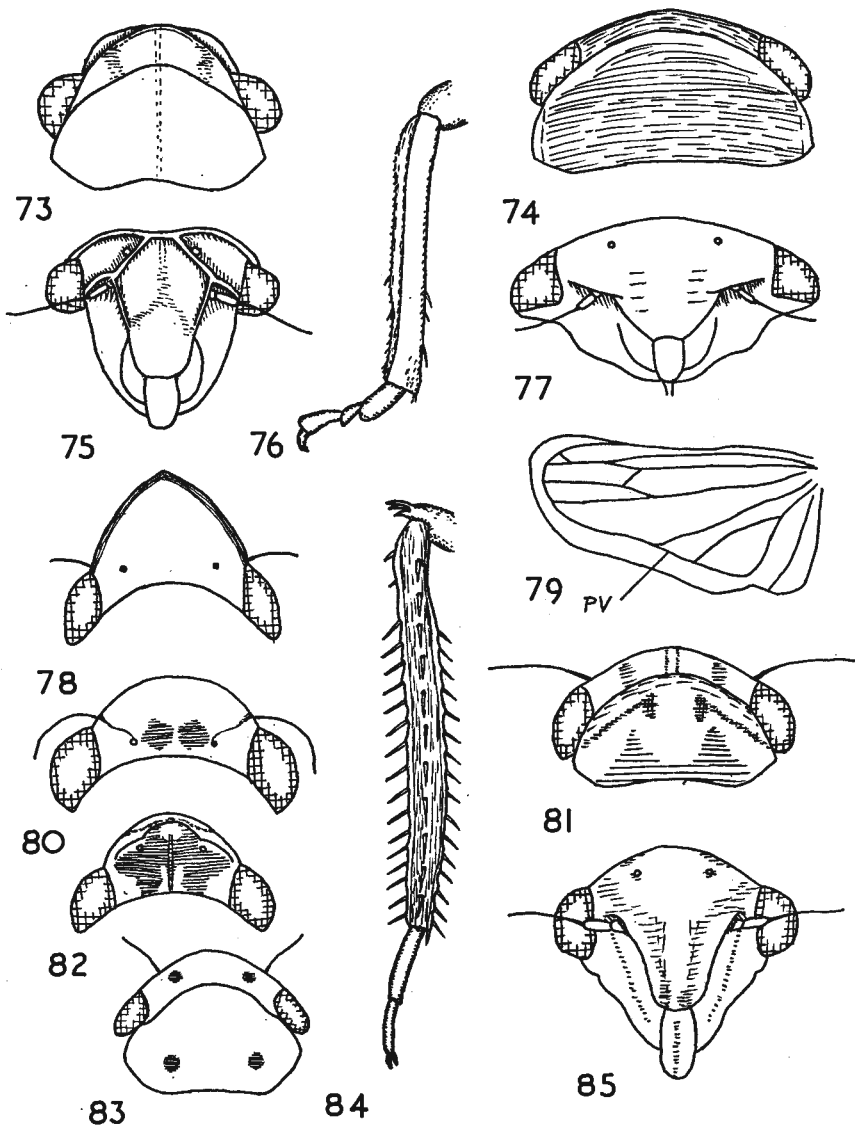
FIGS. 70, 71.—*Gargara genistae*: (70) head, pronotum and fore wing, side view; (71) vertex and pronotum.



## KEY TO SUBFAMILIES

- 1 Posterior tibiae strongly flattened (fig. 104). Pronotum with laminar projections (figs. 102, 103). Overall length 13–18 mm. (Spines of posterior tibiae rather weak and few in number. Fore wings with strong puncturation in basal two-thirds, rather weak and scattered apically).....LEDRINAE (p. 20)
- Posterior tibiae not or less distinctly flattened (figs. 76, 84). Pronotum without projections. Overall length less than 13 mm.....2
- 2 Apex of posterior femora without spines, posterior tibiae with poorly developed spines (fig. 76). Fore wings rather horny, with distinct puncturation throughout (fig. 107).....ULOPINAE (p. 18)
- Posterior tibiae and apex of femora with strongly developed spines (fig. 84). Fore wings without distinct puncturation or with it only at base.....3
- 3 Macropterous, with three veins of corium of fore wing not forked or linked by cross-veins in basal two-thirds (fig. 251). (Overall length less than 5.5 mm.)  
(= CICADELLINAE auctt.) TYPHLOCYBINAЕ
- Macropterous or brachypterous; if fore wings longer than abdomen, veins of corium with at least one fork and one cross-vein in basal two-thirds (figs. 108, 120, etc.).....4
- 4 Two strongly developed keels on vertex forming X with keels of face (figs. 73, 75); vertex without median keel... (= PAROPIINAE) MEGOPHTHALMINAE (p. 18)
- Keels of vertex, if present, not forming X with keels of face but including median keel.....5
- 5 Vertex encompassing eyes in front, more than twice as long as pronotum (fig. 248)  
(= HECALINAE auctt.) EUPELICINAE (p. 53)
- Vertex not recurved in front of eyes to encompass them, less than twice as long as pronotum .....6
- 6 Ocelli on vertex or transition between vertex and face.....7
- Ocelli definitely on face.....10
- 7 Front of vertex with keel formed in three arcs just in front of ocelli (fig. 82). (Ocelli on vertex, nearer anterior margin than posterior one).....EVACANTHINAE (p. 22)
- Vertex without triarcuate keel.....8
- 8 Ocelli on vertex, approximately level with anterior margin of eyes, nearer posterior margin than anterior margin (figs. 78, 80).. (= TETTIGELLINAE) CICADELLINAE (p. 21)
- Ocelli on vertex, considerably in front of eyes or on passage between vertex and face (figs. 245, 249, etc.).....9
- 9 Ocelli clearly on vertex, just behind anterior margin<sup>1</sup>; vertex more or less sharply differentiated from face (figs. 245, 247). In macropters, peripheral vein of hind wings only extending to median vein (fig. 246). Genital plates of male narrow, curved upwards apically (fig. 4)... (= ACOEPHALINAE) APHRODINAE (p. 53)
- Ocelli on transition between vertex and face (fig. 249); two latter sometimes broadly rounded into each other. In macropters, peripheral vein of hind wings complete (fig. 250). Genital plates of male flat, more or less triangular (fig. 5)  
(= EUSCELLINAE) DELTOCEPHALINAE
- 10 Face with well-defined frontal suture from antenna almost to ocellus (figs. 152, 133, etc.). Membrane of fore wings wide (fig. 151) (less distinctly so in *Idiocerus decimusquartus*: fig. 120).....IDIOCERINAE (p. 23)
- Frontal suture above antennal ridge of face not distinct or not reaching more than halfway from antenna to ocellus. Membrane of fore wings narrow (figs. 147, 259 etc.).....11
- 11 Ridge above antennae well-developed, extending from eye to frontoclypeus, at slight angle to horizontal (fig. 77). Sides of pronotum about as long as or longer than posterior margin of eye, strongly carinated (fig. 74). Apex of anterior and median femora with two spines.....JASSINAE (p. 32)
- Ridge above antennae either at considerable angle with horizontal (fig. 148) or not reaching eye and weak (fig. 85). Sides of pronotum much shorter than posterior margin of eye, not carinated (figs. 81, 83, 150, 153, 156). Apex of anterior and median femora without spines.....12

<sup>1</sup> The position of the ocellus can best be judged when the head is in side view; in particular, the Deltocephaline genus *Paramesus* could easily be mistaken for one of the Aphrodinae if the head is examined from above.



FIGS. 73, 75.—*Megophthalmus scanicus* : (73) vertex and pronotum ; (75) face.  
 FIGS. 74, 77, 84.—*Iassus lanio* : (74) vertex and pronotum ; (77) face ; (84) posterior tibia and tarsus.  
 FIG. 76.—*Ulopa reticulata*, posterior tibia and tarsus.  
 FIG. 78.—*Graphocephala coccinea*, vertex.  
 FIGS. 79, 81, 85.—*Agallia consobrina* : (79) hind wing ; (81) vertex and pronotum ; (85) face.  
 FIG. 80.—*Cicadella viridis*, vertex.  
 FIG. 82.—*Evacanthus interruptus*, vertex.  
 FIG. 83.—*Austroagallia sinuata*, vertex and pronotum.

- 12 Ridge above antennae well-defined and prominent, reaching eye without considerable change in direction (fig. 148). Always macropterous, with peripheric vein of hind wing terminating at subcostal vein (fig. 149). . . . . MACROPSINAE (p. 34)
- Ridge above antennae weakly defined, not reaching eye (fig. 85). Either brachypterous or with peripheric vein of hind wing terminating along costal margin (fig. 79). . . . . AGALLIINAE (p. 49)

### Subfamily ULOPINAE

This group is probably the most primitive of the Cicadellidae: the subfamily is here regarded in the same sense as the tribe Ulopini in Evans' paper (1947). Only one genus occurs in Western Europe.

### Genus *Ulopa* Fallén

Out of six species recorded from Europe, two occur in Britain. They are normally flightless, with strongly convex fore wings and are to be found near ground-level; however, one macropterous *U. trivialis* has been reported (Duffield, 1963b). The posterior legs are similar to the other pairs and not modified for jumping. Ocelli are absent.

#### KEY TO SPECIES

- 1 Anterior margin of vertex with a rather variable depression or flattening (fig. 86). Fore wings in both sexes grey-brown with two transverse whitish bands and sometimes also a third at extreme base; veins brown or black-brown, whitish in areas of transverse bands (fig. 107). (Postclypeus strongly convex; face orange-brown; vertex with fine puncturation, brownish with two darker patches medially; pale raised median line present posteriorly. Pronotum whitish, with coarse dark puncturation, often with broad red-brown transverse streak, with two darker depressed areas towards lateral margins. Scutellum brownish, often darker at anterior angles, with strong transverse impression. Fore wings with coarse puncturation; hind wings absent. In male, aedeagus as in figs. 89, 93; apex of paramere as in fig. 91. Overall length: 3.3–3.7 mm.)

*reticulata* (Fabricius)

*Common under Erica and Calluna (heather). England. Wales. Scotland. Ireland. i–xi. Europe. N. Africa.*

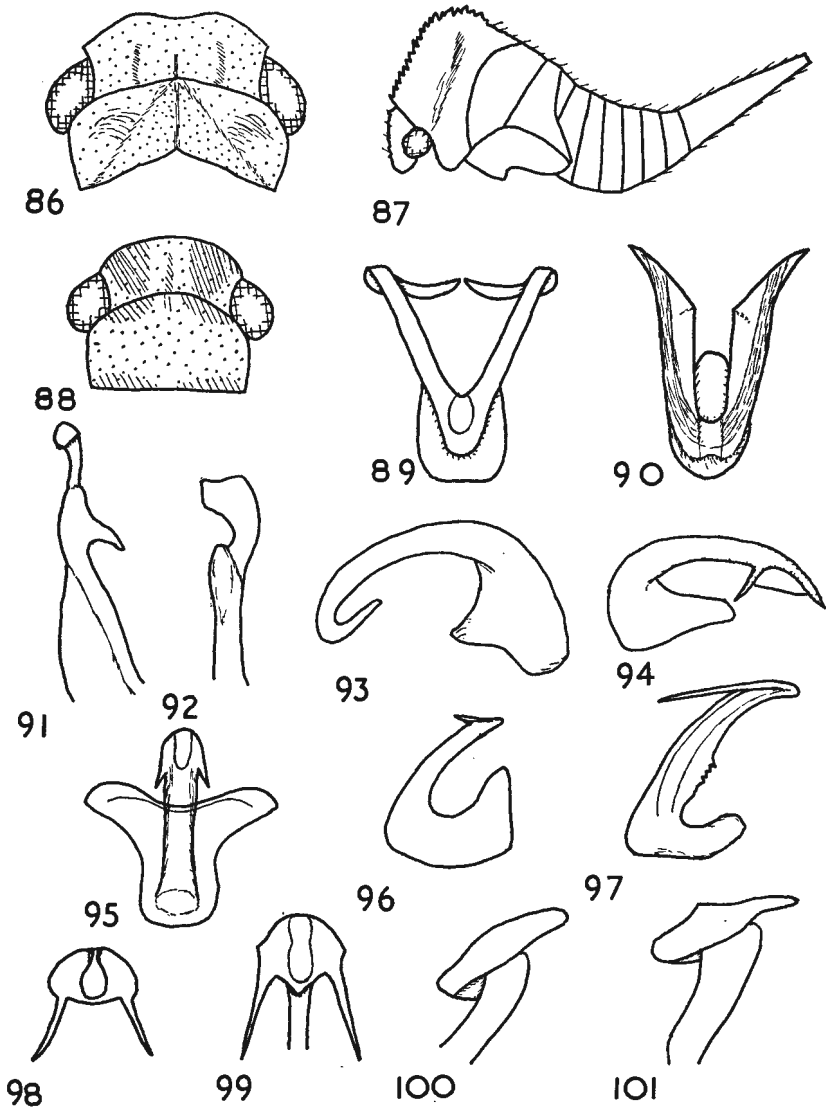
- Anterior margin of vertex convex throughout (fig. 88). Fore wings of male yellowish white with dark streak in clavus roughly parallel to inner margin and narrower dark streaks along radial and cubital veins; in female, fore wings dull straw-coloured, unicolorous except for some darker mottling along some of the veins; in macropterous female, veins darker brown. (In male, face yellow-brown with two triangular blackish patches above base of antennae; vertex yellowish, with two large blackish patches; pronotum yellowish, with blackish markings anteriorly and posteriorly; scutellum yellowish with anterior corners blackish; aedeagus as in figs. 90, 94; apex of paramere as in fig. 92. In female, face and fore body brownish with puncturation rather darker except, in brachypters, for pronotum medially and posteriorly, where coarse puncturation is unicolorous; fore wing of brachypters with coarse puncturation, unicolorous with adjacent areas; in macropter, puncturation weaker or absent in median and cubital cells and in apical half of fore wing. Overall length: ♂, 2.5–2.9 mm.; brachypterous ♀, 3.1–3.4 mm.; macropterous ♀, 3.6 mm.) . . . . . *trivialis* Germar

*Very local, on calcareous hillsides and in sandy coastal localities, probably associated with Echium. Kent, Surrey, Sussex, Dorset. iv, vi, viii–x. C. and S. Europe. Caucasus.*

### Subfamily MEGOPHTHALMINAE

(= PAROPINAE)

This group, regarded as a tribe of the Ulopinæ by Evans (1947), has two European genera, only one of which is represented in Britain.



FIGS. 86, 89, 91, 93.—*Ulopa reticulata* : (86) vertex and pronotum ; (89) aedeagus from behind ; (91) apex of paramere ; (93) aedeagus, side view.  
 FIGS. 88, 90, 92, 94.—*U. trivialis* : (88) vertex and pronotum ; (90) aedeagus from behind ; (92) apex of paramere ; (94) aedeagus, side view.  
 FIG. 87.—*Gargara genistae*, larva, side view.  
 FIGS. 95, 96, 100.—*Megophthalmus scanicus* : (95) aedeagus from behind ; (96) the same, side view ; (100) apex of paramere.  
 FIGS. 97, 98, 99, 101.—*M. scabripennis* : (97) aedeagus, side view ; (98) apex of aedeagus, from behind ; (99) the same, another specimen ; (101) apex of paramere.

Genus *Megophthalmus* Curtis(= *Paropia* Germar)

There are two closely allied European species, both of which occur in Britain. The difference in texture of the cells of the fore wings of the two species is difficult to appreciate unless specimens of each are compared.

## KEY TO SPECIES

- 1 In male, aedeagus with spine-like projections near apex shorter, not as long as distance between their base and apex of aedeagus (figs. 95, 96); paramere with outer margin smoothly curved (fig. 100). Cells of fore wing with surface irregularly rugose, not regularly tuberculate. Length of hind wings variable, often at least three-quarters length of fore wings or more and reaching to or beyond apex of corio-clavate suture of latter. (In male, face yellow-brown, broadly marked with black-brown between keels; vertex and pronotum yellow-brown with black-brown median lines and patches on either side; pronotum with coarse puncturation; scutellum black. Fore wings uniformly pale brownish. In female, fore body and fore wings more or less uniformly light brown. Overall length: ♂, 3.0–3.5 mm.; ♀, 3.6–4.1 mm.).....*scanicus* (Fallén)  
*Among grass roots, also on bushes. England. Wales. Scotland. Ireland. i, vi-x. N. and C. Europe.*
- In male, aedeagus with spine-like projections near apex longer, their length greater than distance between their base and apex of aedeagus (figs. 97, 98, 99); paramere with sharply angulated outer margin (fig. 101). Cells of fore wing with surface closely and regularly tuberculate. Hind wings about half as long as fore wings, not reaching apex of corio-clavate suture of latter. (Males usually as in *scanicus*, but dark markings of face and fore body less well developed. Females unicolorous, or with some black-brown mottlings on fore body and fore wings. Overall length: ♂, 2.5–3.2 mm.; ♀, 3.3–3.7 mm.).....*scabripennis* Edwards  
*Among grasses, often in sandy places. England, as far N. as Lancs. and Yorks. Wales. v-x. France. Italy. Yugoslavia. Bulgaria.*

## Subfamily LEDRINAE

There is only one European genus and species in this group, which has many more representatives in the other continents.

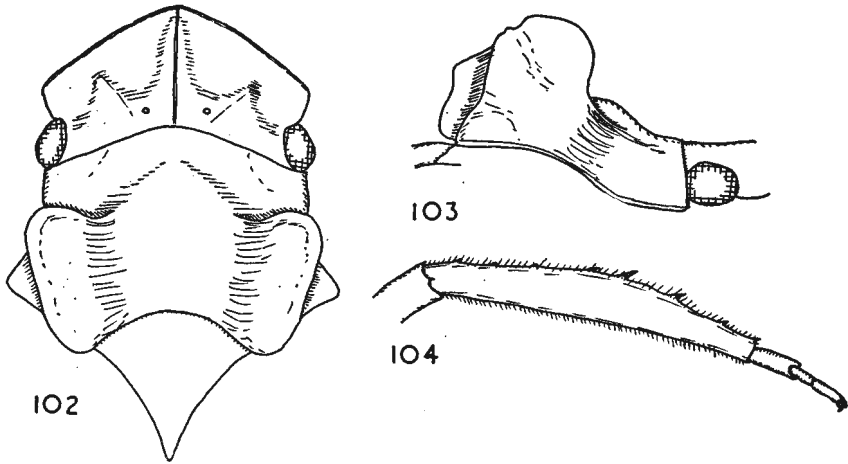
Genus *Ledra* Fabricius(= *Tetigonia* Geoffroy nomen invalidum)

This genus has only one European species: this is unmistakable, having a very flattened appearance and a mottled colour-pattern. Thus, though the largest British Cicadellid, it is far from conspicuous on the lichen-covered branches of trees on which it is found.

Face light brownish, very flattened, with concave depressions anteriorly; antennae short, set in depressions. Fore body light brown with dark setigerous puncturation. Vertex obtuse angled anteriorly; ocelli on vertex towards posterior margin; eyes rather small, vertex partially encompassing eyes in front. Posterior part of pronotum and laminar projections rather darker. Scutellum transversely depressed anteriorly, convex posteriorly. Veins of fore wings yellowish or greenish with brownish mottlings, with a considerable number of supernumeraries in apical half; cells basally opaque, mottled yellowish and brownish, apically hyaline. Abdomen above light brownish, with darker frecklings and indistinct darker transverse bands. Legs light brown with darker frecklings

*aurita* (Linnaeus)

*In woods, especially on oak. S. & C. England, as far N. as Herefords. and Norfolk. v-ix. Europe. Caucasus.*



FIGS. 102-104.—*Ledra aurita* : (102) vertex, pronotum and scutellum ; (103) pronotum, side view : (104) posterior tibia and tarsus.

### Subfamily CICADELLINAE

(= TETTIGELLINAE, = TETTIGONIELLINAE)

This subfamily occurs almost universally, especially in tropical America, but is very poorly represented in Europe. In Britain we have only two species belonging to two genera, one of which is a recent introduction.

#### KEY TO GENERA

- 1 Vertex acute-angled anteriorly (fig. 78). Fore wings green, streaked with red ; abdomen red above.....*Graphocephala* Van Duzee
- Vertex broadly rounded anteriorly (fig. 80). Fore wings largely green or purplish-brown, not marked with red ; abdomen blackish.....*Cicadella* Latreille

### Genus *Cicadella* Latreille

(= *Tettigella* China and Fennah, = *Tettigoniella* : auctt. nec Jacobi)

This genus has only one European species, which is of Holarctic distribution. The definition of the genus *Cicadella* has caused some difficulty and many authors have in the past twenty years or so regarded it as synonymous with *Eupteryx* (subfamily Typhlocybinae). A recent decision of the International Commission (1963) has confirmed the usage here adopted.

Frontoelypeus and anteclypeus strongly convex, light brown, yellowish at sides; frontoelypeus with yellowish longitudinal median band and transverse lines; genae yellowish, with narrow black band next to frontoelypeus and anteclypeus; antennae rather long. Vertex broadly rounded anteriorly, brownish anteriorly and greenish yellow posteriorly with two large dark patches medially and a small dark spot over the base of each antenna. Pronotum yellowish anteriorly, dark green posteriorly. Scutellum light greenish. Fore wings varying between bright green and purplish black, usually greenish in females and purplish in males; costa narrowly and apex rather more broadly hyaline or smoky greyish; inner margin sometimes also lighter. Hind wings rather smoky. Legs yellowish. In male, aedeagus complex, as in fig. 115. Overall length: ♂, 6.0-6.7 mm.; ♀, 7.5-8.4 mm.....*viridis* (Linnaeus)

On grasses in marshy places, common. England. Wales. Scotland. Ireland. vii-x. Palaearctic and Nearctic regions.



Genus *Graphocephala* Van Duzee

One species of this American genus has been introduced into Britain, where it has spread fairly widely.

Face pale yellowish with indistinct brownish transverse lines, narrowly black at upper margin. Vertex yellowish, narrowly black along anterior margin; ocelli darker. Pronotum narrowly green anteriorly, broadly bright green posteriorly with a yellowish or reddish transverse band anteriorly and two similarly coloured spots medially. Scutellum orange red. Fore wings dark green with two longitudinal red bands, one in clavus and one along cubital vein, obsolescent basally; costal margin narrowly yellowish, apical margin narrowly marked with black; membrane greyish. Hind wings smoky greyish. Abdomen red above. In male, aedeagus as in fig. 114. Overall length: ♂, 8.4–8.7 mm.; ♀, 8.5–9.4 mm.

*coccinea* (Forster)

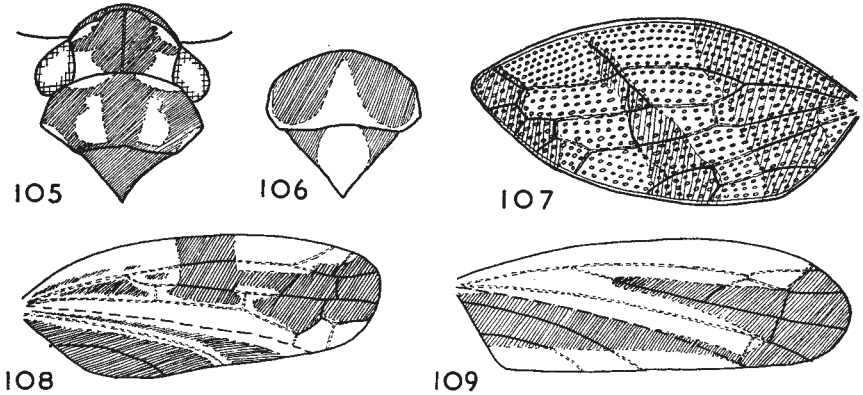
*Introduced species, which has spread quite widely, especially on rhododendrons. S. and C. England, as far N. as Cheshire. vi-x. N. America.*

## Subfamily EVACANTHINAE

This group, regarded as part of the Aphrodinae by Evans (1947) and as part of the Cicadellinae (Tettigellinae) by many authors, contains two European genera, one of which occurs in Britain.

Genus *Evacanthus* Lepeletier and Serville

There are two European species, both of which occur in Britain.



FIGS. 105, 108.—*Evacanthus acuminatus*: (105) vertex, pronotum and scutellum; (108) fore wing.  
 FIGS. 106, 109.—*E. interruptus*: (106) pronotum and scutellum; (109) fore wing.  
 FIG. 107.—*Ulopa reticulata*, fore wing.

## KEY TO SPECIES

- 1 Fore wings bright yellow and black (black markings rarely absent), inner margin with more or less broad yellow band (fig. 109). Pronotum black, often with broad pale longitudinal median band, at least posteriorly (fig. 106). Scutellum pale, often darker in anterior corners. (Face light yellowish, frontoclypeus often with thin dark transverse lines at sides. Vertex black with small yellowish patches anterior to ocelli and in posterior corners next to eyes; other pale markings variable, longitudinal median band sometimes present. In male,

fore wings usually longer than abdomen; in female, usually distinctly shorter than abdomen. Abdomen black above, often with dorsal longitudinal yellow band. In male, aedeagus as in figs. 112, 113; paramere as in fig. 116; appendage of genital segment as in fig. 119. Overall length: ♂, 5.3-5.8 mm.; ♀, 6.3-6.5 mm.)..... **interruptus** (Linnaeus)

*On grasses, also on bushes, common. England. Wales. Scotland. Ireland. vi-x. Palaearctic Region.*

- Fore wings greyish with dark brown or black patches, inner margin dark, except often narrowly on raised edge (fig. 108). Pronotum and scutellum blackish, often with lighter patches on either side of black median longitudinal band (fig. 105). (Face light brownish, frontoclypeus with thin dark transverse bands at sides, sometimes united to form large blackish area. Vertex black with variable light brownish markings. In male, fore wings roughly as long as abdomen; in female, fore wings shorter than abdomen. In male, aedeagus as in figs. 110, 111; paramere as in fig. 117; appendage of genital segment as in fig. 118. Overall length: ♂, 5.1-5.6 mm.; ♀, 5.5-6.8 mm.)... **acuminatus** (Fabricius)

*On grasses, also on bushes. England, as far N. as Yorks. Wales. Ireland. vi-ix. Europe. Siberia. Caucasus. N. America.*

### Subfamily IDIOCERINAE

This characteristic subfamily is represented in all the principal geographical regions of the world. In Europe the single genus *Idiocerus* occurs. This forms part of the Bythoscopidae of Edwards (1896).

### Genus *Idiocerus* Lewis

This genus is represented by over 50 species in the Palaearctic region, of which 18 are found in Britain. These are relatively large species, between 4 and 7 mm. long, with a broad vertex, smoothly rounded anteriorly. Nearly all the species occur on *Salix* or *Populus*, many being restricted to one species or group of species of these trees; however, *I. vittifrons* occurs on maple. It should be noted that the coloration in certain species is fugitive and changes after death. This phenomenon and other biological details have been described by Allen (1964).

In many, but not all, of the species of this genus, the male has the antennae broadened near the apex into a flat plate-like structure, generally referred to as the "palette".

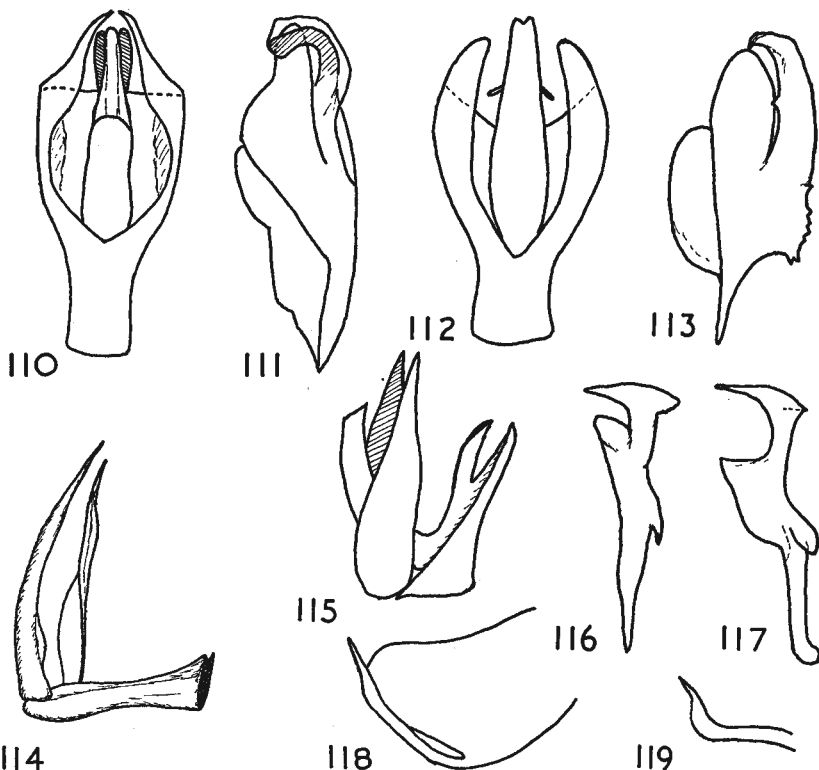
The non-British species, *I. ustulatus* (Mulsant and Rey), occurs in the Channel Isles.

#### KEY TO SPECIES

- 1 Pronotum and vertex with coarse transverse striations (fig. 132). Cells of fore wings wrinkled, with glabrous points near the veins (fig. 120). (In male, antennae without distinct palette; lower part of face strongly pilose, rather more markedly so in male; interocellar distance about twice that from ocellus to base of corresponding antenna; vertex slightly longer at sides than medially. In male, fore body dirty white or yellow, more or less mottled with brown; in female, fore body rust brown. Pronotum almost two and a half times as broad as long, its width in ♂ 1.9-2.1 mm., in ♀ 2.3 mm. Scutellum of male with two black triangles basally and sometimes also central marking; in female, with only very slightly darker brown basal triangles. Pattern of fore wings variable: in male, veins dirty white or yellow, often with brown or blackish markings, the latter sometimes roughly in form of letters IH and HI; in female, fore wings usually brownish with a few white spots, veins concolorous. Abdomen mainly blackish above. In female, gonoplac projecting beyond apical abdominal segment by approximately its own width. Overall length: ♂, 6.0-6.3 mm.; ♀, 6.8-7.0 mm.)..... (= *scurra* (Germar)) **decimusquartus** (Schrank)

Local on *Populus nigra* L. and *italica* Moench. (black and Lombardy poplar).  
 England : Oxon., Herts., Middlesex, Essex, Kent, Surrey, Sussex. viii-x (female  
 known to hibernate on Continent). C. and S. Europe. Caucasus. Turkestan.  
 N. Africa. N. America.

- Pronotum without distinct transverse striations, finely shagreened. Cells of fore wings not distinctly wrinkled nor with glabrous points near veins.....2  
 2 Bases of external and subexternal apical cells of fore wing level or nearly so (fig. 151); in males, distinct tubercles along costal margin. (In male, antennae with distinct oval palette. Lower part of face pilose, pilosity considerably longer in male (fig. 152); interocellar distance about twice that from ocellus to base of corresponding antenna; vertex somewhat longer at sides than medially. Vertex pale orange anteriorly with some blackish spots, grey-brown posteriorly. Scutellum yellowish-brown with two black triangles basally and sometimes horseshoe-shaped mark medially. In male, costal region of fore wings usually more or less marked bright orange-brown with a conspicuous



FIGS. 110, 111, 117, 118.—*Evacanthus acuminatus*, male genitalia: (110) aedeagus from behind; (111) the same, side view; (117) paramere; (118) genital segment, side view.

FIGS. 112, 113, 116, 119.—*E. interruptus*, male genitalia: (112) aedeagus from behind; (113) the same, side view; (116) paramere; (119) appendage of side of genital segment.

FIG. 114.—*Graphocephala coccinea*, aedeagus, side view.

FIG. 115.—*Cicadella viridis*, aedeagus, side view.

orange-yellow patch towards apex; veins of corium broadly dark medially and narrowly apically, separated by pale section; anal veins brown, except first anal vein apically white. In female, veins of fore wing mainly brown, with a few pale patches; costa sometimes yellowish. Abdomen mainly black above. Overall length: ♂, 6.2-6.5 mm.; ♀, 6.5-6.9 mm.)

(= *adustus* (Herrich-Schaeffer)) **stigmatalis** Lewis

Common on *Salix*, especially *S. alba* L. (white willow) and *S. fragilis* L. (crack willow). England. Scotland. vii-x. Europe. N. Africa.

- Base of external apical cell considerably nearer base of fore wing than is base of subexternal apical cell (figs. 121-129); male without distinct tubercles along costal margin (sometimes vaguely indicated in *similis*).....3
- 3 External subapical cell of fore wing broadened posteriorly, reaching costa (figs. 122, 124) (boundary vein of cell at apex often difficult to see in male). In male, fore wing with costal area broadly swollen in middle (fig. 122), and with two large roughly triangular black-brown patches with their bases along costal margin, one in middle and extending into brown streak reaching inner angle, and one towards apex, covering apex of external subapical cell. (In male, antennae with distinct oval palette. Lower part of face pilose, distinctly so in male, very short in female; vertex longer at sides than medially. Vertex light brown. Pronotum light brown with dark spots anteriorly, tending to form inverted V in middle, posteriorly mainly dark brown with pale central patch. Scutellum brownish with two black triangles basally and a roundish black spot on a stalk towards apex. Costal margin of fore wing extended downwards in basal half. In female, veins of fore wings mainly dark brown with a few white patches, cells only faintly tinged brownish. Abdomen mainly black above. Overall length: ♂, 5.0-5.4 mm.; ♀, 5.3-5.8 mm.)

(= *varius*: (Germar) nec (Fabricius)—see Le Quesne, 1964) **similis** Kirschbaum

Common locally on *Salix*, especially *S. purpurea* L. (according to Edwards on *S. triandra* L.). England: Yorks., Norfolk, Cambs., Oxon., Bucks., Herts., Essex, Middlesex, Berks., Hants. vii, viii. France. C. Europe.

- External subapical cell either roughly parallel-sided or rather convex-sided and narrowing somewhat apically, not reaching costa or not separated from external apical cell. In male, fore wing with costal area not so distinctly swollen in middle and without two black-brown patches as above.....4
- 4 Genae apically with more or less sharp point, detached from anteclypeus, sometimes not very obviously in female (figs. 135, 138). Male without palette on antennae..5
- Genae apically rounded, contiguous with anteclypeus. Male with palette on antennae (very narrow and easily overlooked in *rutilans*).....8
- 5 Fore wing light brownish in basal two-thirds without any unpigmented spots or patches, except for patch at apex of first anal vein. (Face and vertex uniformly yellowish, with some brownish mottlings; thyridia black in male, pale in female. Scutellum yellowish, with or without two black triangles basally and two black dots medially. Fore wings apically rather cloudy hyaline: veins darker brown than cells, except sometimes for pale patch at apex of first anal vein and short pale patches near apex of both cubital and median veins. In male, abdomen largely blackish above). (= *aurulentus* Kirschbaum) **cupreus** Kirschbaum<sup>2</sup>  
On Lombardy poplar (*P. italica* Moench.). One male from Cossey, Norfolk. The female overwinters as the adult in France. W. Europe.
- Fore wing either with red-brown transverse band or basal two-thirds brownish with some hyaline patches, including some along cubital vein. (In weakly pigmented specimens, these may not be very obvious).....6
- 6 Fore wing with well-defined red-brown transverse band extending across its entire width, usually forming rather narrow brown patch in otherwise pale subcostal cell (fig. 128), sometimes only represented in this cell by a brown line along raised costal margin. In female, posterior margin of seventh abdominal sternum projecting medially, rather weakly bilobate (fig. 142). (Thyridia pale in both sexes. In female, face pale yellowish below level of antennae, above this mainly chestnut brown with pair of pale spots just outside ocelli, vertex mainly dark brown; in male, face and vertex entirely light yellowish. Pronotum

<sup>2</sup> This definition does not include the specimen described by Edwards (1896: 262) as *cupreus*: I have not seen this example but I have taken similar ones and suspect that they are in fact over-wintered *vitreus*.

brownish, more or less distinctly marked with three longitudinal pale streaks. Scutellum yellowish, with black triangles at base in males and brownish ones in females. Fore wings more or less suffused red-brown at base, especially at inner angle, apically tinged grey-brown with dark veins. In female, gonoplae projecting beyond apical abdominal segment by about its own width. Overall length : ♂, 4.7-5.0 mm. ; ♀, 5.1-5.6 mm.).....**tremulae** (Estlund)

*Local, on aspen* (*Populus tremula* L.) or *white poplar* (*P. alba* L.). *England, as far N. as Yorks. Wales. vii-xi. N. and C. Europe.*

- Fore wings with less well defined transverse band, either not reaching costa or extending along most of length of subcostal cell (fig. 129). Posterior margin of seventh abdominal sternum of female usually almost straight. (Thyridia dark in females, pale or dark in males).....7

- 7 Basal part of seta of antenna dark. Thyridia of male pale. Colour of fore wings usually more red-brownish, especially in overwintered females. (In male, face and vertex yellowish ; in female, mainly brownish, sometimes with paler markings and sometimes dark margined towards eyes. Pronotum grey-brown, sometimes with pale median longitudinal streak. Scutellum with black triangles basally and paired dots medially in male, brownish with two more or less darker basal triangles in female. Fore wing with rather distinct hyaline spot enclosing *m-cu* cross-vein, another at apex of first anal vein and a hyaline streak at or near apices of corio-clavial suture, cubital and median veins (fig. 129). Overall length : ♂, 4.7-5.1 mm. ; ♀, 5.0-5.6 mm.).....**vitreus** (Fabricius)

*Locally common on poplars, especially P. nigra* L., and *italica Moench.*, sometimes on *sallows*. *England, as far N. as Yorks. and Lancs. vi-x. N. and C. Europe.*

- Basal part of seta of antenna pale. Thyridia of male dark. Colour of fore wings usually more grey-brownish, paler. (Face and vertex yellowish in male ; mainly brownish, often with paler markings in female. Pronotum more or less dark grey-brown, sometimes with pale median longitudinal streak. In male, scutellum with black or brown pair of triangles basally, more or less well defined, and paired dots medially ; in female, more or less uniform brownish. Fore wings with hyaline patches as in *vitreus*, but sometimes tending to spread rather further. Overall length : ♂, 4.4-4.9 mm. ; ♀, 5.1-5.5 mm.)

(= *cognatus* Fieber) **distinguendus** Kirschbaum

*On white poplar* (*P. alba* L.) and *grey poplar* (*P. canescens* Sm.), *locally common, also rarely on aspen* (*P. tremula* L.). *England, as far N. as Yorks. and Lancs. iv, viii-x. France. C. Europe. N. America.*

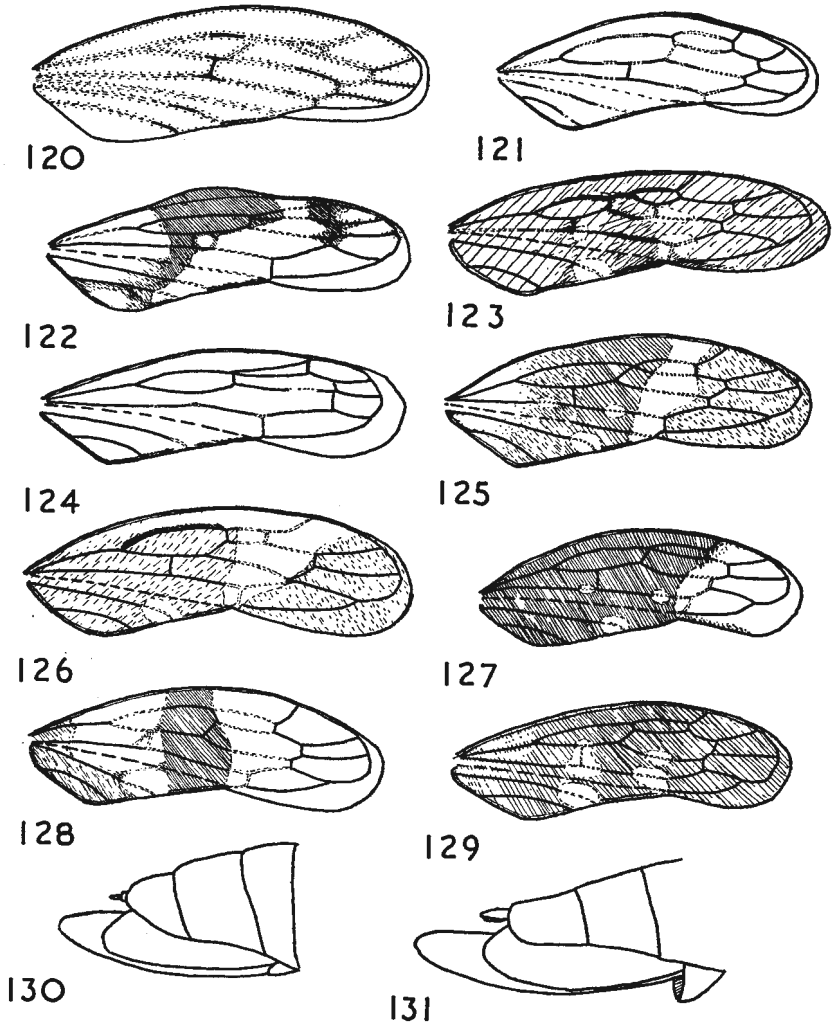
- 8 Side margins of frontoclypeus below antennae almost parallel or weakly convergent in upper part, suddenly bending inwards in middle (fig. 136) ; frontoclypeus thus much broader a short distance above anteclypeus and almost as broad as long. In male, face and frontoclypeus with broad black median longitudinal streak. (In female, face with some brownish mottlings in region of ocelli and upper part of frontoclypeus. In male, palette of antennae well-developed. Thyridia black. Vertex and pronotum with brownish or black-brown mottlings, but without very distinct markings. Scutellum with two black triangles at base, median impression with thin V-shaped dark mark. Veins of fore wing with alternate pale and brown or black-brown patches. In female, part of gonoplae projecting beyond apical abdominal segment about as long as broad. Overall length : 5.0-5.8 mm.)

(= *tibialis* Fieber, = *heydeni* : auctt. nec Kirschbaum—see Le Quesne, 1964a) **vittifrons** Kirschbaum

*On maple, local. England : Glos., Kent, Berks., Hants., Dorset. viii-xii. C. and S. Europe.*

- Side margins of frontoclypeus more strongly convergent below antennae, without sharp change of direction in middle ; frontoclypeus considerably longer than broad (except in *herrichi*) ; dark markings of face not comprising broad black median longitudinal streak.....9
- 9 All veins of corium of fore wing with alternate blackish and white patches (fig. 121) 10
- Veins of corium of fore wing without whitish patches except, in some species, along cubital vein and one near junction of median vein with apical cells.....11

- 10 Gonae with pale pubescence, long and dense in male, shorter and more scattered in female (fig. 139). Larger and broader: overall length: ♂, 6.0-6.2 mm.; ♀, 6.4 mm. Distance of ocellus from base of corresponding antenna almost equal to half distance between ocelli. Face with well-developed triangular black spot against eye and a smaller one (sometimes fused into it) below. (Frontoclypeus with series of small black marks, lateral series often being more or less fused together. In male, palette of antennae well-developed. Thyridia black. Vertex and pronotum grey-brown, latter with a number of black dots anteriorly. Scutellum brown with three black triangles at base, median one with horseshoe-shaped mark at apex with a black dot at either side. Fore wings light brown with veins, costa and inner margin with alternate pale and black-brown patches. In female, part of gonoplac projecting beyond apical abdominal segment hardly as long as broad).....**herrichi** Kirschbaum  
*On Salix alba L. (white willow), scarce. England: Eaton, Caister by Norwich and Stratton Strawless, Norfolk. viii, ix. Europe. Turkestan.*
- Gonae apparently glabrous in both sexes. Shorter and narrower: overall length, ♂♀, 4.8-5.2 mm. Distance of ocellus from corresponding antenna usually distinctly more than half distance between ocelli. Face usually with a single small dark spot against eye (fig. 137). (In male, antennae with oval palette. Face and vertex light orange-brown: lower part of postclypeus with pair of brownish vertical bands, sometimes other dark marks present as well as that against eye. Thyridia black. Pronotum more or less evenly dark at sides with broad pale longitudinal central band. Scutellum with two black triangles basally, pair of black dots medially and pair of smaller triangles towards apex. Fore wings pale grey-brown, veins with concolorous or yellowish patches, marbled with dark brown. Abdomen largely dark above. In female, gonoplac projecting beyond apical abdominal segment by about one and a quarter times its own width).....**poecilus** (Herrich-Schaeffer)  
*On Populus nigra L. and italica Moench. (black and Lombardy poplar), local. England: Cossey and Wacton, Norfolk; Goring, Oxon.; Latimer, Bucks.; Mortimer, Berks. vii-ix. Europe. Siberia.*
- 11 Cubital vein with two or more whitish patches medially, sometimes not very obvious if ground colour is pale.....12
- Cubital vein concolorous, except sometimes for whitish patch near junction with apical cells or becoming somewhat paler towards base.....14
- 12 Fore wings uniformly red-brown in basal three-fifths, except for white spot at apex of first anal vein and two or three white spots along cubital vein; hyaline or faintly greyish in apical part beyond the rather sharp boundary (fig. 127). In male, palette of antennae very narrow, 6 to 8 times as long as broad. In female, head and pronotum narrower; breadth of head 1.6-1.75 mm.; breadth of pronotum 1.45-1.55 mm.; ratio of breadth of pronotum to its length 2.1-2.3. (Interocellar distance one and a quarter to one and a half times distance of ocellus from corresponding antenna (fig. 140). Face pale orange-brown, upper part darker marbled; thyridia black. Vertex pale orange-brown, darker marbled. Pronotum largely grey-brown, anteriorly narrowly coloured as vertex. Scutellum brownish, more or less marbled darker. In female, gonoplac projecting beyond apical abdominal segment by about one and a quarter times its width. Overall length: ♂♀, 4.9-5.3 mm.).....**rutilans** Kirschbaum  
*On sallows (Salix caprea L. and cinerea L.), local. England: Glos., Bucks., Kent, Surrey, Berks., Dorset. iv-ix, xi. France. Germany. Italy.*
- Fore wings sometimes with red-brown markings in basal half, but if so wing partly paler basally (fig. 125) or ground colour nearly uniform light brown throughout. In male, palette of antennae oval, three to four times as long as broad, blackish. In female, head and pronotum broader; breadth of head at least 1.95 mm.; breadth of pronotum at least 1.7 mm.; ratio of breadth of pronotum to its length 2.3-2.7 in *elegans* or 2.1-2.3 in *lituratus*.....13
- 13 Ocelli about equally close to or rather closer to each other than to base of corresponding antenna (fig. 141). Fore wing with broad red-brown transverse band medially and narrow hyaline transverse band posterior to it, apically light grey-brown (fig. 125). Usually smaller: overall length: ♂, 5.2-5.5 mm.; ♀, 5.5-5.8 mm. (Face pale orange-yellow; in male usually with brownish longitudinal streak on frontoclypeus; in female with darker mottlings in upper



Figs. 120-129.—Fore wings of *Idiocerus* spp.: (120) *decimusquartus*; (121) *poecilus*; (122) *similis*, male; (123) *lituratus*, male; (124) *similis*, female; (125) *elegans*; (126) *laminatus*; (127) *rutilans*; (128) *tremulae*; (129) *vitreus*.

Figs. 130, 131.—*Idiocerus* spp., female, apex of abdomen, side view: (130) *fulgidus*; (131) *confusus*.

part: vertex with dark spot medially, definite in male, more irregular and towards junction with face in female. Pronotum brownish, with rather variable mottling. Scutellum similarly coloured, with two triangles basally, black in male and brown in female. In female, gonoplac projecting beyond apical abdominal segment by about its own width). (= *viduatus* Edwards) *elegans* Flor

On *Salix*, especially *S. caprea* L., *S. cinerea* L. and *S. purpurea* L., local. *England. Wales. Scotland. vi-x. Europe. N. Africa.*

- Ocelli considerably more distant from each other than from base of corresponding antenna (fig. 133). Fore wing light brown with white markings, but without distinct hyaline band extending to costa on apical part of wing (fig. 123). Usually larger: overall length; ♂, 5.35–6.1 mm.; ♀, 6.0–6.7 mm. (Face yellowish, sometimes tinged with orange, sometimes with greyish patch between thyridia. Thyridia black. Pronotum mainly grey-brown, with yellowish mottlings. Scutellum with two black triangles basally, two black dots medially and often horseshoe-shaped marking towards apex. Costal margin of fore wing in basal half extending downwards outside subcostal vein. In male, fore wing with veins largely dark brown, dark pigment extended in patches in middle of median and cubital veins, with distinct pale patches on either side of these and at apex of first anal vein: dark marks present at apex of clavus. In female, fore wing with light brown veins, without particularly darker patches, but usually with whitish patches in corresponding positions to those in male. Abdomen blackish above. In female, gonoplac projecting beyond apical abdominal segment by about its own width).....*lituratus* (Fallén)

On *Salix caprea* L., *cinerea* L., *repens* L. (*sallows and dwarf willow*) and *fragilis* (*crack willow*): common. *England. Wales. Scotland. Ireland (teste Halbert). vi-xi. Europe. Transcaucasia.*

- 14 Fore wing milky white, tinged pale greyish or greenish, sometimes slightly suffused grey-brown towards inner margin, but never with red-brown: alternatively (var. *fuscocoeruleus* Edwards), face, fore body, legs and anterior part of fore wing purplish-grey. Thyridia black or grey in male, pale in female. (Face and vertex yellowish. Pronotum dirty yellowish tending more or less towards grey, sometimes with paired short dark streaks anteriorly. Scutellum dirty yellowish, in male sometimes with two dark basal triangles and a pair of dark dots medially. In male, fore wings pale greyish, sometimes tinged greenish basally and along costa, with brownish patches along inner margin and apically; hyaline spot usually present at apex of first anal vein; veins mainly pale except for variable darkening towards apex of wing. In female, fore wing uniformly pale greyish brown, often with darker streak along inner margin towards apex of clavus. In male, genital plates convex beneath. In female, gonoplac extending beyond apical abdominal segment by about its own width. Overall length: ♂, 5.4–5.9 mm.; ♀, 6.4–6.7 mm.).....*albicans* Kirschbaum

On *white and grey poplar* (*P. alba* L. and *canescens* Sm.), *England, as far N. as Yorks. Wales: Holyhead, Anglesey (teste Dale). Ireland (teste Halbert). vii-ix. Europe. Turkestan.*

- Fore wing either partly greenish, more or less suffused with red-brown towards inner margin or entirely red-brown except for some hyaline markings. Thyridia pale in male.....15

- 15 Males .....16
- Females .....19

- 16 Ventral margin of genital plates convex or straight towards apex (figs. 144, 146) . . 17
- Ventral margin of genital plates distinctly concave towards apex (figs. 143, 145) . . 18

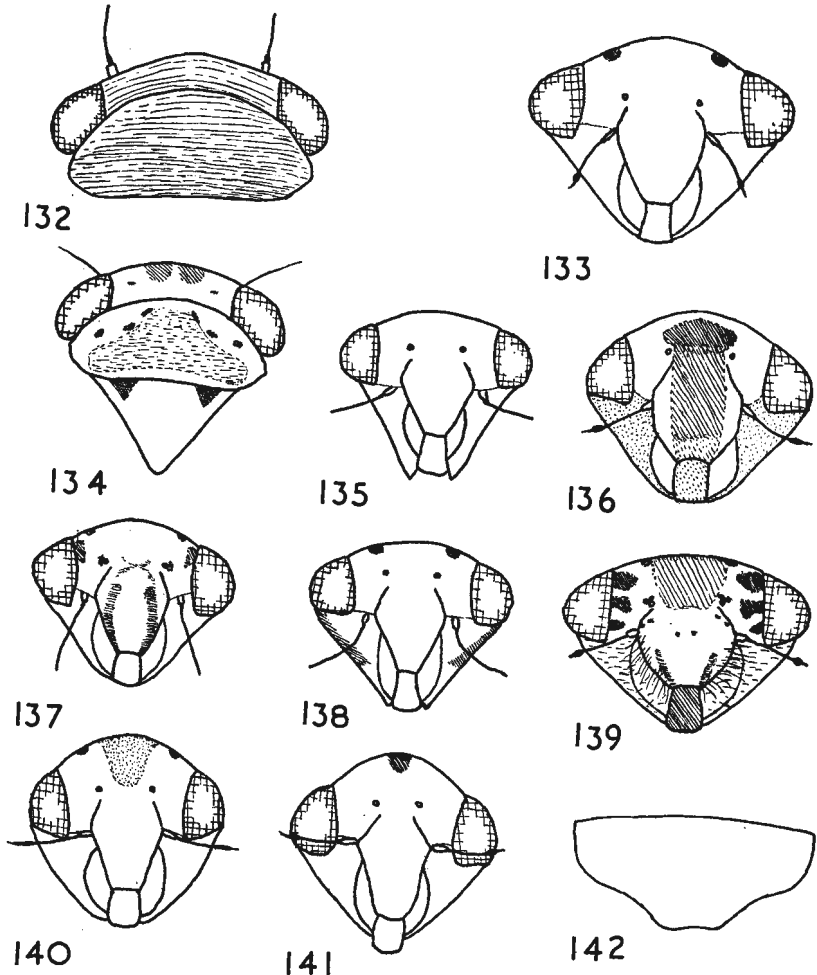
- 17 Costal margin of fore wing usually more or less greenish. Scutellum usually without distinct black triangles at base. Genital plates with apical half of ventral margin distinctly convex, fairly broadly black at apex (fig. 146). (Interocellar distance about one and a half times distance from ocellus to base of corresponding antenna. Face, green or yellowish; genae brownish. Vertex, pronotum and scutellum green or yellowish green. Basal half of fore wing more or less distinctly light reddish-brown, narrowly pale at apex of first anal vein; towards costa fore wing unpigmented, hyaline. Legs pale brownish or greenish. Abdomen black above, more or less widely greenish at sides. Overall length: 5.3–5.9 mm.)

**confusus** Flor

On *Salix*, especially *cinerea* L. and *caprea* L. (*sallows*). *England. Wales. Scotland. Ireland. vi-x. Europe. Siberia.*



- Fore wing more or less widely red-brown, not greenish on costal margin. Scutellum with pair of distinct black triangles basally, and sometimes also two black median dots. Genital plates with ventral margin almost straight for much of their length, usually narrowly black at apex (fig. 144). (Interocellar distance about one and a half times distance from ocellus to base of corresponding antenna. Face yellowish, sometimes with broad orange-red median stripe. Vertex, pronotum and scutellum brownish, pronotum usually with a few blackish marks anteriorly, scutellum marked as above. Fore wing often paler towards costa; roundish hyaline spot present at apex of first anal vein, edge of inner margin dark from this spot to apex of clavus. Abdomen black above, sometimes



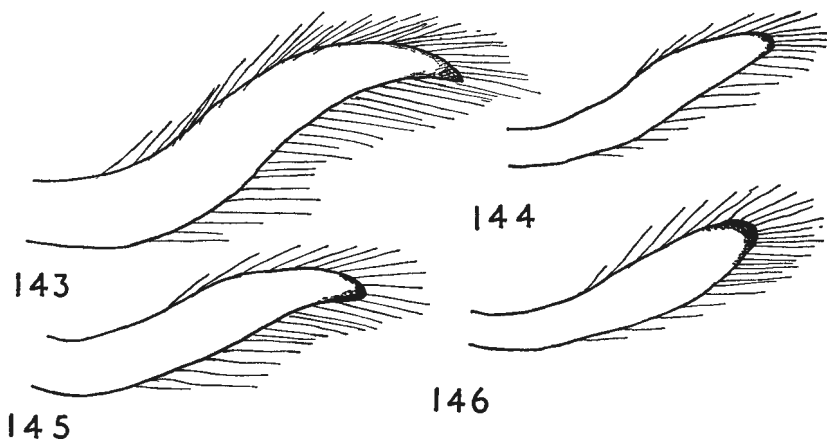
Figs. 132-142.—*Idiocerus* spp.: (132) *decimusquartus*, vertex and pronotum; (133) *lituratus*, male, face; (134) *populi*, vertex, pronotum and scutellum; (135) *tremulae*, male, face; (136) *vittifrons*, male, face; (137) *poecilus*, female, face; (138) *vitreus*, female, face; (139) *herrichi*, male, face; (140) *rutilans*, male, face; (141) *elegans*, male, face; (142) *tremulae*, female, seventh abdominal sternum.

narrowly orange-brown basally. Legs pale brown or bright orange. Overall length 5.0-5.5 mm.).....**populi** (Linnaeus)

On *Populus*, especially *P. tremula* L. (*aspen*). England. Scotland. vii-x. Europe. Siberia. N. America.

- 18 Fore wing brown, with a distinct transverse hyaline band just above base of apical cells, extending to costal margin (fig. 126); costa dark brown. Genital plates with ventral margin very strongly concave towards apex (fig. 143). (Interocellar distance about one and a half times distance from ocellus to base of corresponding antenna. Face yellowish or pale brownish, sometimes with orange patches. Vertex and pronotum pale brownish, latter often darker posteriorly. Scutellum yellow-brown, with two dark basal triangles and often with dark median patch. Basal two-thirds of fore wings red-brownish, with roundish hyaline spot at apex of first anal vein; apical part of wing grey-brown. Abdomen black above, narrowly orange-brown at base. Genital plates rather broadly dark apically. Overall length 5.8-6.0 mm.).....**laminatus** Flor

On *Populus*, especially *P. tremula* L. (*aspen*) and *canescens* Sm. (*grey poplar*). England. Scotland. vi-x. Europe.



FIGS. 143-146.—Genital plates of male *Idiocerus* spp.; (143) *laminatus*; (144) *populi*; (145) *fulgidus*; (146) *confusus*.

- Fore wings light brownish, without distinct transverse hyaline band; costa pale, usually greenish. Genital plates with ventral margin less strongly concave towards apex (fig. 145). (Interocellar distance about one and a half times distance from ocellus to base of corresponding antenna. Face greenish or yellowish, sometimes with orange suffusions. Vertex and anterior part of pronotum greenish or yellowish; pronotum posteriorly grey-brown. Scutellum greenish or yellowish with two more or less well developed dark triangles at base and sometimes two dark dots medially. Fore wings with apex of anal vein usually narrowly hyaline. Abdomen black above, narrowly pale brownish at base, sometimes pale brownish at sides. Overall length 5.7-6.0 mm.)

**fulgidus** (Fabricius)

On *Populus nigra* L. and *italica* Moench. (*black and Lombardy poplars*); occasionally on *P. tremula* L. (*aspen*). England. Scotland. vi-x. Europe. Siberia.

- 19 Fore wing brown with a more or less distinct transverse white band just above base of apical cell (fig. 126); dark arcuate patch present along middle of radial vein; other veins in middle of fore wing often darkened. (Face light brownish, often reddish or rarely green in life, often with a greyish semicircular patch at upper

- limit; thyridia brownish. Vertex, pronotum and scutellum light brown; latter with two black triangles basally and often median marking. Fore wing red-brownish in basal two-thirds, with roundish hyaline spot at apex of first anal vein; apical part of wing grey-brown. Abdomen black, more or less pale brown or reddish at sides and sometimes narrowly at apex of each segment. Gonoplac projecting beyond apical abdominal segment by about its own length. Overall length 6.1-6.5 mm.).....**laminatus** Flor  
[See couplet 18]
- Fore wing without distinct whitish patch towards apical region; veins without dark patches.....20
- 20 Gonoplac projecting beyond apical abdominal segment by about one and a half times its own width (fig. 131). (Face, vertex, pronotum and scutellum uniform green, after death becoming yellowish or brownish; semicircular mark sometimes present at upper limit of face; pronotum sometimes posteriorly greyish-brown; thyridia pale. Fore wing with costa more or less greenish, inwardly more or less widely tinged red-brown, especially towards anal angle; apex of first anal vein usually narrowly pale. Abdomen often more or less widely blackish above, green at sides, sometimes uniformly green, turning light brown after death. Overall length 6.1-6.5 mm.).....**confusus** Flor  
[See couplet 17]
- Gonoplac projecting beyond apical abdominal segment by about its own length or rather less (fig. 130).....21
- 21 Pronotum reddish-brown, often with several dark spots anteriorly (fig. 134). Scutellum with two triangular black spots basally.....22
- Pronotum yellowish or greenish, without dark spots. Scutellum without blackish spots. (Face green, after death becoming yellowish or brownish, sometimes with greyish semicircular patch at upper limit; thyridia pale. Vertex, pronotum and scutellum greenish or yellowish, latter sometimes with two slightly darker triangles basally. Fore wing often with costa greenish, inwardly more or less widely tinged red-brown; apex of first anal vein usually narrowly pale. Abdomen green, after death becoming light yellowish or brownish, often with small dark patch medially. Overall length 6.3-6.8 mm.).....**fulgidus** (Fabricius)  
[See couplet 18]
- 22 Larger: overall length 6.0-6.7 mm. Thyridia black.....**lituratus** (Fallén)  
[See couplet 13]
- Smaller: overall length 4.9-6.0 mm. Thyridia pale or dark brownish. (Face and vertex green or pinkish, after death becoming yellowish or brownish, former sometimes with greyish semicircular spot at upper limit. Fore wing tinged red-brownish, often bright green, after death becoming paler, towards costa; roundish hyaline spot present at apex of first anal vein. Abdomen largely or wholly black above).....**populi** (Linnaeus)  
[See couplet 17]

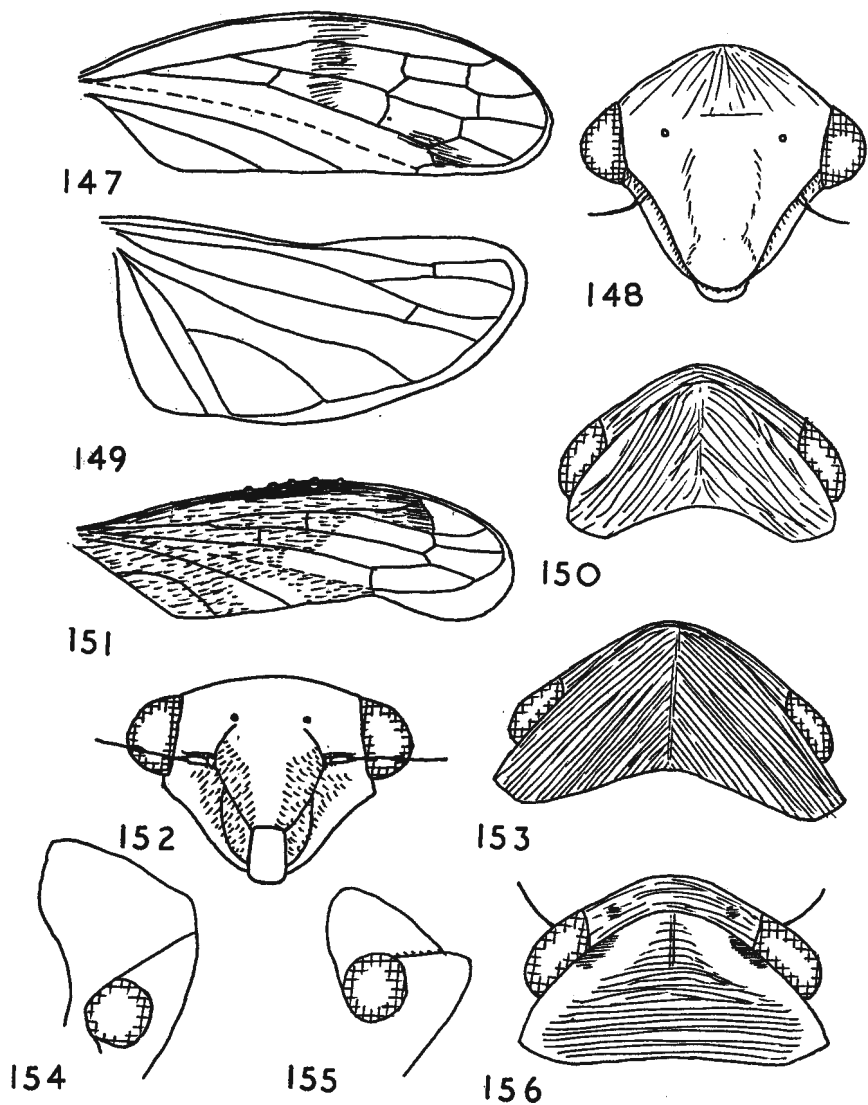
#### Subfamily JASSINAE

Evans (1947) regards this subfamily as consisting of seven tribes, three of which are represented in Europe and only one in Britain. Ribaut's (1952) definition is narrower, containing only one of the three groups from Europe recognised by Evans; fortunately, both British species are referable to this particular group and thus their higher taxonomy is not in doubt. These species form part of the Bythoscopidae of Edwards (1894).

The Jassinæ in the narrower sense (Jassin of Evans) contains two European genera, both of which are represented in Britain.

#### KEY TO GENERA

- 1 Fore wing with fine black setigerous dots. Overall length 4.0-5.0 mm.  
**Batracomorphus** Lewis
- Fore wing without black dots. Overall length 7.0-8.1 mm.  
**Iassus** Fabricius



FIGS. 147-150, 155.—*Macropsis cerea* : (147) fore wing ; (148) face ; (149) hind wing ; (150) vertex and pronotum ; (155) upper part of head and pronotum, side view.  
 FIGS. 151, 152.—*Idiocerus stigmaticalis*, male : (151) fore wing ; (152) face.  
 FIGS. 153, 154.—*Pediopsis tiliae* : (153) vertex and pronotum ; (154) upper part of head and pronotum, side view.  
 FIG. 156.—*Oncopsis flavicollis*, vertex and pronotum.

Genus *Batracomorphus* Lewis

There are two European species, one of which occurs in Britain.

Face, vertex, pronotum and scutellum green or yellow-green, sometimes sprinkled with fine black dots. Width of frontoclypeus at level of ridge above antennae about half of distance between eyes and about equal to distance between ocelli. Head (including eyes) narrower than pronotum; sides of pronotum about as long as eye. Fore wings green or yellow-green; veins concolorous or slightly darker; peripheric vein not clearly separated from edge of wing at apex. Abdomen greenish or yellowish. In female, gonoplac projecting very little beyond apical abdominal segment. Overall length: ♂, 4.0-4.4 mm.; ♀, 4.8-5.0 mm.

*irroratus* Lewis

On *Helianthemum* (*rockrose*), locally common on calcareous hillsides. England, as far N. as *S. Yorks.* and *Derbys.* vii, viii, x. C. and S. Europe.

Genus *Iassus* Fabricius

(= *Jassus* Fallén, = *Bythoscopus* Germar)

There are two European species, one of which occurs in Britain.

Face yellowish, often with brown mottlings; width of frontoclypeus at level of ridge above antennae about one-quarter of distance between eyes and much less than distance between ocelli. Vertex, pronotum and scutellum yellowish or greenish, heavily mottled with brown. Head (including eyes) about as wide as pronotum; sides of pronotum shorter than eye. Fore wing green or brown; veins usually somewhat darker; peripheric vein clearly separated from edge of wing at apex. Abdomen greenish or brownish. In female, gonoplac not projecting beyond apical abdominal segment. Overall length: ♂, 7.0-7.3 mm.; ♀, 7.7-8.1 mm.

*lanio* (Linnaeus)

Common in woods, usually on oak. England. Wales. Scotland. Ireland. vii-x. Europe.

## Subfamily MACROPSINAE

This subfamily occurs in all the principal geographic regions: it forms part of the *Bythoscopidae* of Edwards (1894). Ribaut (1952) recognises five genera from France, four of which occur in Britain.

## KEY TO GENERA

- 1 Striations of pronotum roughly parallel to its posterior margin, at least posteriorly (fig. 156). Anterior margin of pronotum medially approximately level with anterior margin of eyes.....*Oncopsis* Burmeister (p. 35)
- Striations of pronotum oblique in relationship to its posterior margin, even in posterior part (figs. 150, 153) (rather weakly oblique in *Hephathus*—fig. 241). Anterior margin of pronotum extending forwards considerably in front of anterior margin of eyes.....2
- 2 Vertex hardly visible in centre, on lower level than front of pronotum (figs. 153, 154).....*Pediopsis* Burmeister (p. 40)
- Vertex narrow, but distinct in centre, at higher level than front of pronotum (figs. 150, 155).....3
- 3 Fore wing 2.2-2.8 mm. long, with cells milky hyaline and veins brown, at least in apical part. Striations of pronotum rather weakly oblique in relation to its posterior margin (fig. 241) (direction rather variable from one specimen to another). Face in side view uniformly curved throughout (fig. 242). Male genital segment without appendage emanating from ventral margin...*Hephathus* Ribaut (p. 40)
- Fore wing at least 2.9 mm. long, with cells not milky hyaline, more or less tinged green or brown, at least near veins. Striations of pronotum more strongly oblique in relation to its posterior margin (figs. 150, 206, etc.). Face in side view somewhat flattened in middle, sharply curved towards upper margin (figs. 239, 208). Male genital segment with appendage emanating from ventral margin, bent upwards and terminating in a point apically (fig. 252)

*Macropsis* Lewis (p. 42)

Genus *Oncopsis* Burmeister

(= *Bythoscopus* : auctt. nec Germar)

Some of the problems of this genus have been discussed by Wagner (1949) and Le Quesne (1961b); the latter showed that *O. subangulata* is probably a distinct species from *flavicollis* and this view is supported by Halkka (1959), who has shown chromosomal differences between them. *O. avellanae* Edwards is here regarded as an ecological form of *carpini* Sahlberg. On this basis, we have in Britain five out of the seven Western European species.

It has been found more convenient to provide separate keys for the males and females.

KEY TO SPECIES

(Males)

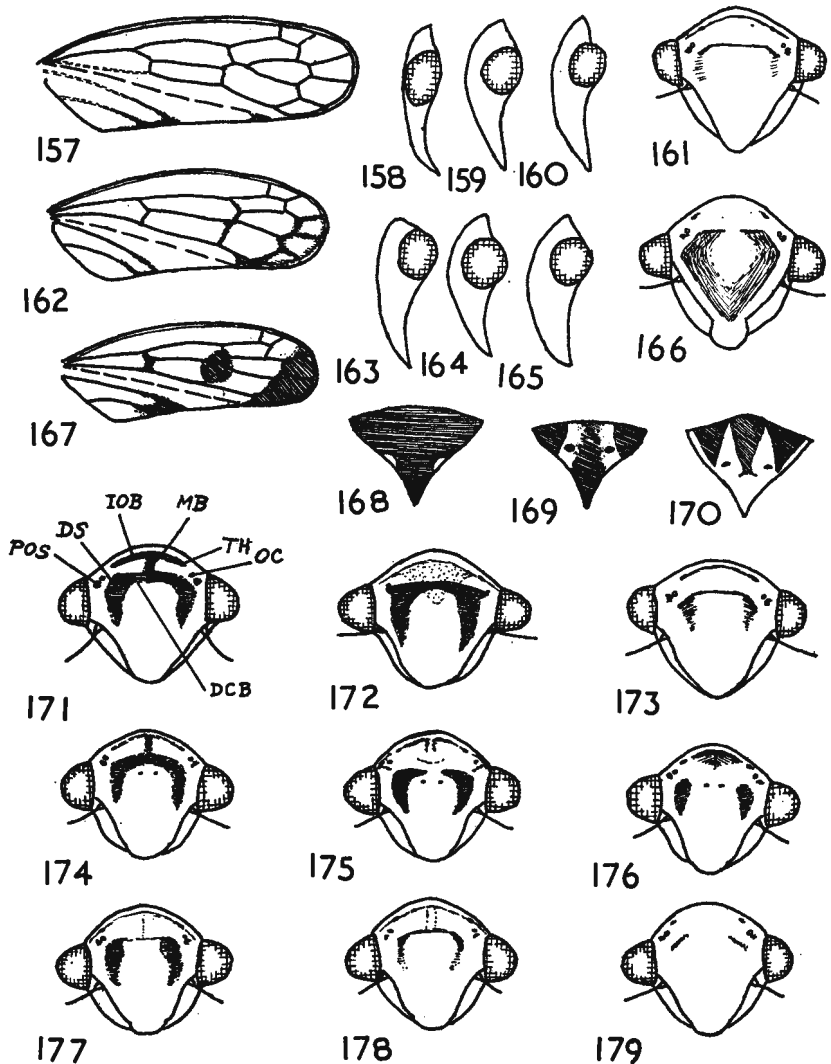
- 1 Length of fore wing 3.4–3.6 mm.; a more or less rounded brown spot on *m-cu* cross-vein (fig. 167). (Face yellow-brown, with black thyridia and dark interocular band reaching eyes; discoidal cross-band more or less strongly marked, discoidal spots usually light brownish or absent; postocellar spots often present; median band absent. On vertex, narrow light brown band usually present posterior to interocular band. Pronotum grey-brown with blackish dots along striations. Scutellum chestnut-brown, often with darker basal triangles and sometimes darker longitudinal median streak or suffused darker apically. Fore wing slightly smoky hyaline with veins and corio-claval suture narrowly black-brown, usually with some dark suffusion around margins of apical cells, at apex of corio-claval suture and along inner margin between apices of first and second apical veins. Legs brownish with a dark line along outer margin of tibiae. Outer surface of aedeagus convex (fig. 199); paramere narrow at apex, without distinct lamella (fig. 181); aedeagus basal supports similar to those of *flavicollis* (figs. 196–198). Overall length 3.9–4.4 mm.)

(= *rufuscula* (Fieber) *tristis* (Zetterstedt)

On *Betula* (birch). England. Wales. Scotland. Ireland. *vi-ix*. Europe. Siberia.

- Length of fore wing greater than 3.6 mm.; *m-cu* cross-vein normally narrowly or not at all bordered darker (figs. 157, 162).....2
- 2 Scutellum usually largely black or blackish, with bright yellow spots along sides towards apex; a broad dark patch almost always present towards the apex between the yellow markings (figs. 168, 169). Veins of fore wing nigger-brown to black, cells hyaline except often for a dark brownish suffusion in the apical cells (at least near veins), on either side of *m-cu* cross-vein and at apex of clavus. Inner margin of clavus dark between anal veins, often clear yellow along rest of length. (Aedeagus with outer surface concave in middle (fig. 200), paramere as in figs. 187, 188. On *Betula* (birch)).....3
- Scutellum often largely pale (fig. 170), usually so at apex, which is sometimes narrowly blackish. Veins of fore wing dark or light brown, cells sometimes uniformly pale brown. Rarely any darker suffusion in apical cells, round *m-cu* cross-vein or at apex of clavus. Inner margin of clavus dark or pale between anal veins and nearly always whitish or greyish along rest of length. (On trees other than *Betula*).....4
- 3 Branches of aedeagus basal supports short, subequal, distance between their apices subequal to their length (figs. 192–195). Raised margin of fore wing not yellow at anal angle. (Face dirty yellowish; thyridia and postocellar spots black; interocular line more or less strongly marked; median line rarely present; discoidal cross-band often present; discoidal spots, if present, usually narrow (fig. 161) or represented by a light brownish area. Pronotum grey-brown or black-brown with two suboval brown or black patches along anterior margin and posterior margin narrowly dirty yellowish. Overall length 4.8–5.2 mm.)

(= *fortior* Wagner) *subangulata* (Sahlberg)



FIGS. 157, 158, 163.—*Oncopsis alni*: (157) male, fore wing; (158) profile of head, male; (163) the same, female.

FIGS. 159, 162, 164, 168, 169, 171-173.—*O. flavicollis*: (159) profile of head, male; (162) male, fore wing; (164) profile of head, female; (168, 169) males, scutellum (two specimens); (171, 172, 173) males, face (three specimens).

FIGS. 160, 165, 170, 174-176.—*O. carpini*: (160) profile of head, male; (165) the same, female; (170) male, scutellum; (174, 175, 176) males, face (three specimens).

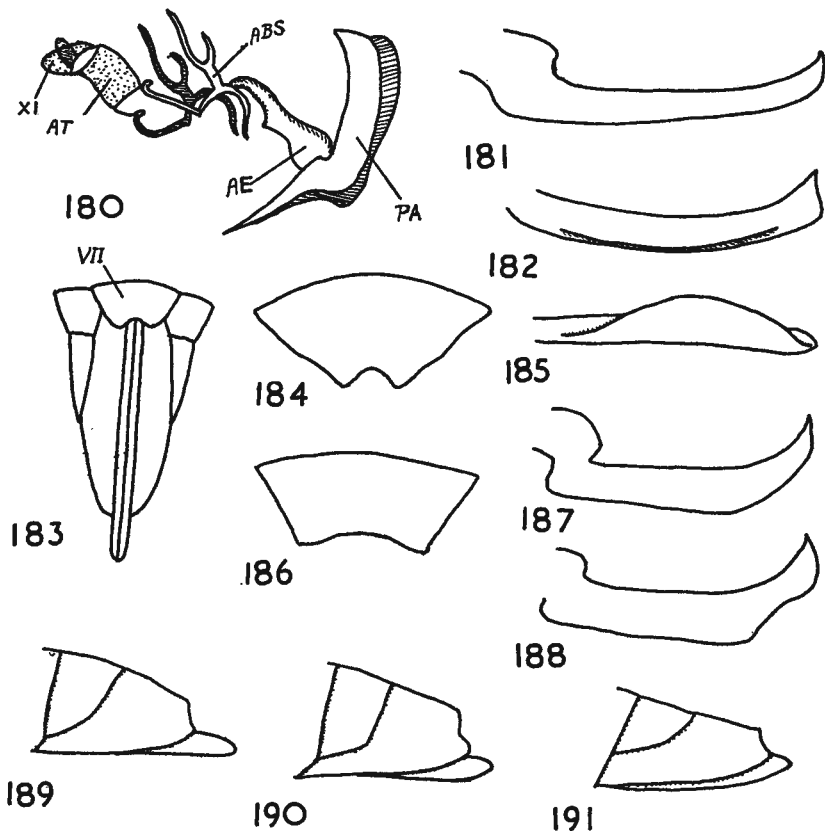
FIGS. 161, 166.—*O. subangulata*: (161) face, male; (166) face, female.

FIG. 167.—*O. tristis*, male, fore wing.

FIGS. 177-179.—*O. carpini avellanae*, males, face (three specimens).

On *Betula pendula* Roth. (= *verrucosa* Ehrh., = *alba*: auctt.), local, often together with next species. England: *Whizall Moss, Salop.*; *Stoke Common, Bucks.*; *Wytham, Berks.*; *Cadnam, Hants. vi-viii.* France. Germany. Czechoslovakia. Austria. Scandinavia.

- Branches of aedeagus basal supports differing considerably in length; distance between their apices about one-third length of longer branch (figs. 196-198). Raised margin of fore wing usually yellowish at anal angle, colour developing some weeks after becoming adult. (Face dirty yellow, sometimes tinged brownish or greenish with variable black markings; interocular band and discoidal cross-band usually present; median band fairly often present; discoidal spots and postocellar spots often present (figs. 171-173). Face in side view convex (fig. 159). Pronotum yellowish with two suboval black patches along anterior



FIGS. 180, 184, 187, 188, 191.—*Oncopsis flavicollis*: (180) male, internal genitalia; (184) female, seventh abdominal sternum; (187, 188) parameres, side view (two specimens); (191) female, apex of abdomen, side view.

FIGS. 181, 183.—*O. tristis*: (181) paramere; (183) female, apex of abdomen, ventral view.

FIGS. 182, 185, 186.—*O. alni*: (182) paramere, side view; (185) the same, ventral view; (186) female, seventh abdominal sternum.

FIG. 189.—*O. carpini*, female, apex of abdomen, side view.

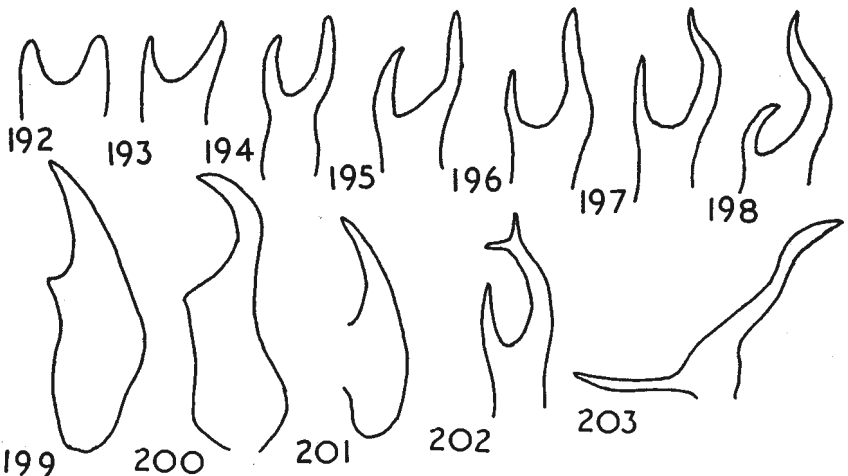
FIG. 190.—*O. subangulata*, female, apex of abdomen, side view.



margin; striations marked black-brown to variable extent, especially posteriorly, sometimes forming definite median longitudinal band and patch on either side. Legs pale brown with black line on outer edge of tibia and tarsus black apically. Overall length 4.4–5.4 mm.).....*flavicollis* (Linnaeus)

On *Betula*, generally common. England. Wales. Scotland. Ireland. *vi-ix*. Europe. Siberia. N. Africa.

- 4 Anal veins of fore wing heavily marked with black-brown on apical portion only, inner margin of clavus between them also marked black-brown (fig. 157). Face in side view flatter (fig. 158). Width of pronotum 1.6–1.7 mm. (Face yellow-brown; thyridia and postocellar spots blackish, interocular line more or less strongly marked; discoidal spots usually represented by narrow blackish streaks; discoidal cross-band and median band usually absent. Pronotum light brown with blackish dots along striations; two suboval dark spots along anterior margin. Scutellum chestnut brown with two more or less darker brown triangles basally and two darker impressed dots medially. Cells of fore wing cloudy hyaline, mainly light brownish; veins dark brown, lighter towards base of wing. Outer surface of aedeagus convex (fig. 201). Paramere broad at apex, with distinct lamella on outer edge (figs. 182, 185)).....*alni* (Schrank)  
On *Alnus* (*alder*). England. Wales. Scotland. Ireland. *vi-ix*. Europe. Siberia.
- Anal veins of fore wing often brownish, but, if so, uniformly for most of their length; inner margin of clavus between them dark brown or pale. Face in side view rather more convex (fig. 160). Width of pronotum 1.35–1.6 mm. (Genitalia as in *flavicollis*).....5
- 5 Interocular band of face not normally reaching beyond thyridia; median band almost always present; two brownish dots present just below level of discoidal cross-band (whether latter present or not) (figs. 174–176). Inner margin of clavus of fore wing often completely pale. (Face yellowish, with thyridia, postocellar spots and discoidal spots blackish. Pronotum yellow anteriorly with two black suboval spots along anterior margin, posteriorly grey-green, heavily marked with black-brown dots along striations; posterior margin narrowly pale. Scutellum either yellowish with two or three dark triangles basally and a pair of median spots or blackish with yellow streaks at sides reaching



FIGS. 192–195.—*Oncopsis subangulata*, aedeagus basal supports: (192, 193) left and right appendages of one specimen; (194, 195) the same, another specimen.

FIGS. 196–198, 202, 203.—*O. flavicollis*, aedeagus basal supports: (196, 197, 198) three normal specimens; (202, 203) two aberrant specimens.

FIGS. 199–201.—*Oncopsis* spp., aedeagi: (199) *tristis*; (200) *flavicollis*; (201) *alni*.

or almost reaching apex. Fore wing either hyaline with dark brown veins or with cells pale brown and veins slightly darker brown; raised margin of fore wing at anal angle whitish or pale yellowish. Overall length 4.4-5.1 mm.)

(= *carpinicola* Edwards) **carpini** (Sahlberg)

*On Carpinus (hornbeam). England: Glos., Herts., Bucks., Essex, Kent, Sussex, Berks., Dorset. vi-viii. France. Germany. Sweden.*

- Interocular band of face, if present, reaching from eye to eye; median band absent or indistinct; brown dots normally absent between discoidal spots (figs. 177-179). Inner margin of clavus of fore wing nearly always marked with dark brown between anal veins. (Face dirty yellowish or light brownish; thyridia, postocellar spots and discoidal spots (or linear marks) blackish. Pronotum yellowish or brownish anteriorly with two black or brown suboval spots along anterior margin, posteriorly grey-brown with darker dots along striations. Scutellum brown or yellowish, sometimes with two basal triangles, a median streak basally and two median dots darker. Fore wing either hyaline with dark brown veins or with cells pale brown and veins slightly darker brown; raised margin of fore wing at anal angle whitish. Overall length 4.6-5.3 mm.)

**carpini** (Sahlberg) form **avellanae** Edwards

*On Corylus avellana L. (hazel). England, as far N. as Staffs. Wales: Carmar. Scotland: Perth. vi-viii.*

(Females)

- 1 Length of gonoplac visible in ventral aspect less than 1.3 mm. (fig. 183). Length of fore wing 3.3-3.7 mm. (Face chestnut brown, thyridia black; other markings absent or interocular and discoidal cross-band somewhat darker. Vertex, pronotum and scutellum chestnut brown, pronotum often with darker dots along striations towards posterior margin. Fore wings uniform chestnut brown or brown with hyaline patches. Gonoplac extending beyond apex of abdomen by approximately its own width. Overall length 3.8-4.3 mm.)

**tristis** (Zetterstedt)

- Length of gonoplac visible in ventral aspect greater than 1.3 mm. Length of fore wing not less than 3.9 mm. .... 2

- 2 Posterior margin of seventh abdominal sternum with a shallow incision in middle, much less deep than wide (fig. 186). Face in side view comparatively flat (fig. 163). (Face either light brown, often with two yellowish patches between black thyridia, or dirty yellowish; blackish postocellar spots and narrow streaks representing discoidal spots also present. Pronotum brown with blackish dots along striations. Scutellum brown; two darker brown or blackish basal triangles and two dark median dots sometimes present. Fore wing more or less widely brownish, veins concolorous or darker; narrow black-brown areas present at apex of corio-claval suture, at apices of anal veins and along inner margin between latter. Gonoplac in side view projecting beyond apical abdominal segment by 0.29-0.36 mm. Overall length 5.5-5.9 mm.) .... **alni** (Schränk)

- Posterior margin of seventh abdominal sternum with a small incision in middle, about as long as wide (fig. 184). Face in side view more convex (figs. 164, 165) .. 3

- 3 Discoidal spots of face coalescing to form rust-brown, roughly heart-shaped area, more or less narrowly bordered darker (fig. 166). Cells of fore wing completely hyaline, raised margin of fore wing at anal angle dirty whitish, not yellow. (Face dirty yellow-brown; thyridia and postocellar spots black or dark brown. Pronotum grey-brown, narrowly margined dirty yellowish and with two suboval more or less dark brown patches along anterior margin. Scutellum chestnut brown with two darker impressed dots medially and a linear transverse impression just posteriorly; often two small yellowish patches along side margins immediately posterior to latter. Veins of fore wing dark brown; small dark patches present at apex of corio-claval suture and along inner margin between apices of first and second anal veins. Gonoplac in side view projecting beyond apical abdominal segment by 0.24-0.30 mm. (fig. 190). Overall length 5.0-5.5 mm.)

**subangulata** (Sahlberg)

- Either coloration of face or that of fore wing not as above. .... 4
- 4 Gonoplac longer, in side view projecting beyond apical abdominal segment by not less than 0.30 mm., and with lower margin straighter (fig. 189). (Scutellum either uniform brown or yellowish with two brown basal triangles and two

- brown median dots. Veins of fore wing chestnut brown to dirty greenish yellow; rarely completely hyaline in all cells, but some hyaline areas often present; except in uniformly brown fore wing, raised margin at anal angle whitish, sometimes tinged yellowish. Black line not present on outer edge of posterior tibiae).....5
- Gonoplac shorter, in side view not projecting beyond apical abdominal segment by more than 0.28 mm., and with lower margin more rounded (fig. 191). (Overall length 4.8-5.5 mm. Very variable in colour; the following four basic forms are recognisable, but intermediates also occur.
- (i) Upper part of face, fore body and patch around anal angle of fore wing clear yellow-green; lower part of face chestnut brown, often in form of heart-shaped patch. Rest of fore wing chestnut brown, uniformly or with some hyaline patches. No black lines on tibiae.
  - (ii) Face yellowish with black discoidal spots, subocellar spots and thyridia; dirty greenish patch present between thyridia. Pronotum dirty greenish with dark dots in striations. Scutellum yellow-brown or brown with two dark median dots and two brown basal triangles. Fore wing yellowish around anal angle, otherwise hyaline with dark brown veins. Black lines present outwardly on posterior tibiae.
  - (iii) Face yellowish with more or less dark brownish discoidal spots, narrowly blackish towards upper margin; thyridia black. Fore body and basal half of fore wing entirely yellow-green; fore wing apically hyaline with yellow-green veins. No black lines on tibiae.
  - (iv) Uniformly chestnut brown, sometimes with darker discoidal spots on face. No black lines on tibiae).....*flavicollis* (Linnaeus)
- 5 On hazel (*Corylus*). (Face brown or dirty yellowish, thyridia brown or black; postocellar spots present or absent; discoidal spots absent or brownish, sometimes with a blackish streak along upper margin, never completely black; discoidal cross-band and median line absent. Pronotum yellowish or brownish, sometimes broadly darker medially. Overall length 5.1-5.6 mm.)
- carpini* (Sahlberg) form *avellanae* Edwards
- On hornbeam (*Carpinus*). (Face yellowish; thyridia black; postocellar spot dark; black or brown discoidal spot sometimes present. Discoidal cross-band and median line absent. Pronotum yellowish or brownish, sometimes greenish grey posteriorly. Overall length 4.9-5.5 mm.).....*carpini* (Sahlberg)

### Genus *Pediopsis* Burmeister

This genus as recognised by Edwards (1896) and other earlier writers contained a number of species, but all the European forms except one have now been transferred to *Macropsis* or other genera. The one European species now recognised occurs in Britain.

Face, vertex and pronotum greenish-yellow. Scutellum brown, sometimes with greenish-yellow suffusion towards apex, sometimes with two darker brown triangles basally. Fore wings of male with irregular pattern of black-brown dots, usually tending to be denser towards apex (fig. 2); in female, fore wings mainly light brown with a tendency to form two hyaline areas medially, pattern not usually formed of distinct dots. In female, gonoplac projecting beyond apical abdominal segment by about half its own width. Overall length: ♂, 5.0-5.3 mm.; ♀, 5.2-5.8 mm.).....*tillae* (Germar)

On *Tilia* (*lime*). England: *Glos., Bucks., Kent, Surrey, Berks., Hants., Dorset. vi-ix. Europe. Algeria.*

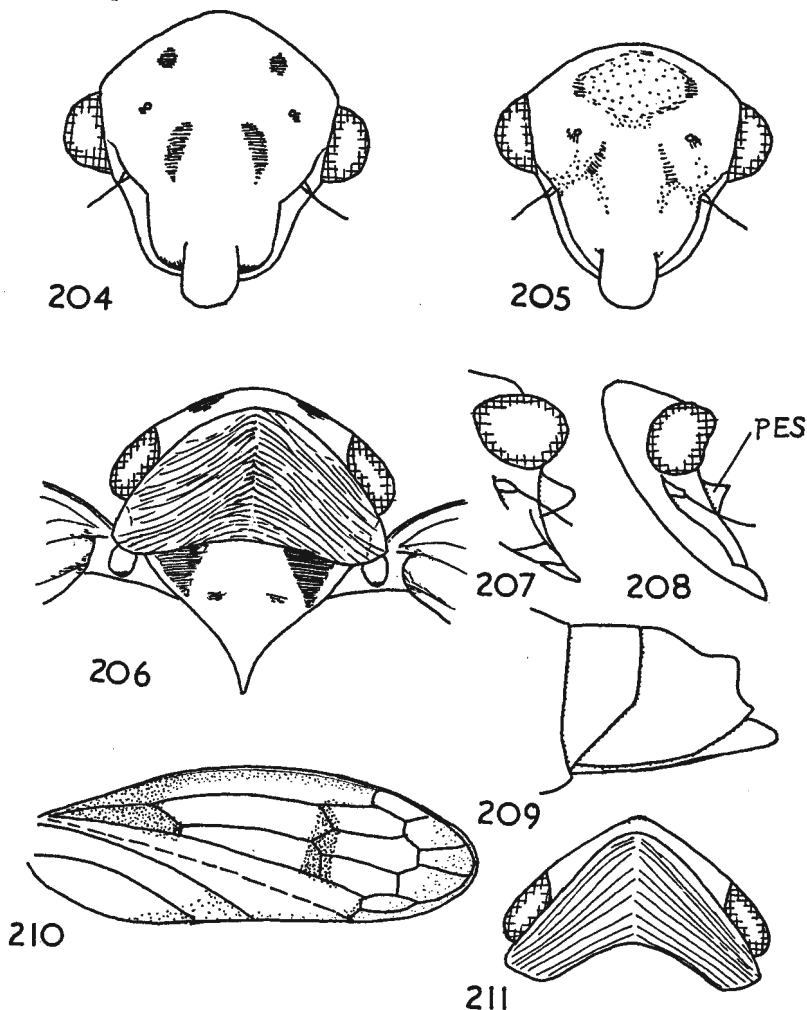
### Genus *Hephathus* Ribaut

This genus, separated from *Macropsis* by Ribaut (1952), contains two European species, one of which occurs in Britain.

Face with oblique striations in upper part, black or black-brown with variable yellowish brown areas, particularly an oval patch towards lower margin of frontoclypeus and often a roughly square area between ocelli and upper margin of face. Vertex yellowish-brown posteriorly, anteriorly more or less extensively black-

brown, at least at sides. Pronotum yellowish-brown, usually with two narrow black-brown patches along anterior margin, often with extensive dark area medially. Scutellum yellowish-brown with two black triangles basally, often with other dark markings medially, sometimes filling whole area between them. Legs pale, anterior femora dark basally, a black dot at base of each tibia. In male, aedeagus as in fig. 243; apex of paramere as in fig. 244. In female, gonoplac projecting beyond apical abdominal segment by about its own width. Overall length: ♂, 2.8-3.2 mm.; ♀, 3.0-3.5 mm...*nanus* (Herrich-Schaeffer)

In short grass in dry places. England: Box Hill, Shere and Albury, Surrey; Seaford, Sussex; Hillside, Kent; Freshwater, Isle of Wight. vii, viii. C. and S. Europe.



Figs. 204-211.—*Macropsis* spp.: (204) *fuscula*, face; (205) *scutellata*, face; (206) *scotti*, vertex, pronotum and scutellum; (207) *prasina*, posterior part of head, side view; (208) *mendax*, head, side view; (209) *mendax*, female, apex of abdomen, side view; (210) *fuscinervis*, fore wing; (211) *fuscinervis*, vertex and pronotum.

Genus *Macropsis* Lewis

The members of this genus were previously included in *Pediopsis*. There are about thirty Palaearctic species and a number of Nearctic ones. Some of the species can only be separated with difficulty; Edwards (1919a) gave a key and in the light of works by Wagner (1950) and Ribaut (1952), the British species have been reviewed again (Le Quesne 1961a).

## KEY TO SPECIES

- 1 Veins of fore wing dark brown, sometimes paler towards apex, narrowly bordered with same colour; cells in middle of corium largely or wholly colourless, hyaline 2
- Veins of fore wing paler brown or green; if veins brown, cells also uniform brown, often concolorous with veins.....5
- 2 Vertex more or less sharply angled anteriorly (fig. 211). Brown transverse patch present covering *m-cu* and adjacent veins of fore wing (fig. 210). (Face light brownish, with blackish apical spot, thyridia and discoidal spots; latter sometimes absent in female. Pronotum grey-brown with two more or less extensive blackish patches along anterior margin. Scutellum brownish, normally with two basal triangles and two median dots blackish; these markings sometimes confluent. Fore wing with base, subcostal cell, apical cells and anal cells more or less brownish. Overall length: ♂, 4.4-5.0 mm.; ♀, 5.2-5.7 mm.)

*fuscinervis* (Boheman)

*On aspen* (*Populus tremula* L.). *England, S. of line from Wash to Bristol Channel. vi-ix. Europe.*

Vertex smoothly rounded or bluntly and obtusely angled anteriorly (fig. 206). No brown transverse patch present covering *m-cu* and adjacent cross-veins of fore wing.....3

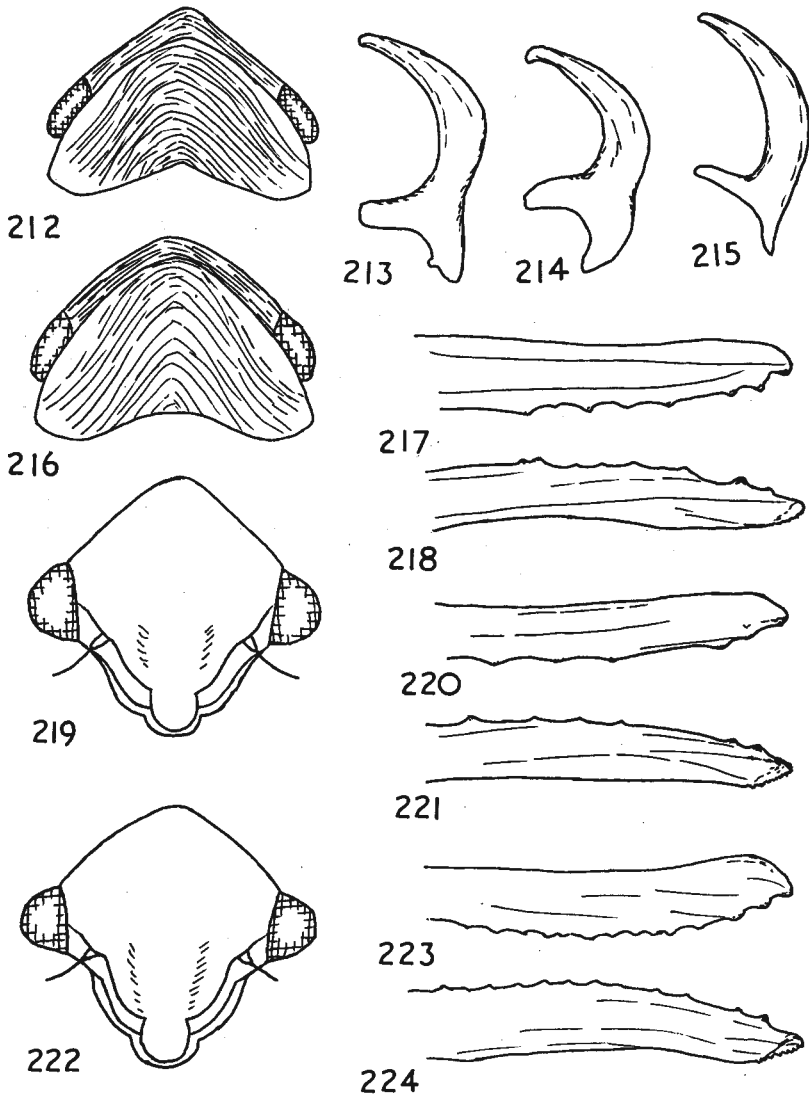
- 3 Outer margins of lorae distinctly divergent, directed towards base of antennae (fig. 205). Black lines on inner and under sides of posterior tibiae widely interrupted or weakened in middle. Ridge above base of antennae usually rather darker marked. (Face and vertex yellowish, often suffused brownish; in male, darker patch often present between thyridia; large thyridial spots, smaller discoidal spots (often consisting of two separate linear streaks) and postocellar spots blackish; median spot usually indistinct. Pronotum yellow-brown, more or less darkly marked with black-brown. Scutellum yellowish with two black basal triangles and two more or less dark median dots. Fore wing with cells hyaline or faintly brownish; inner margin of clavus black-brown. Overall length: ♂, 4.4-4.6 mm.; ♀, 5.2-5.5 mm.)

(=*tibialis* (Scott)) *scutellata* (Boheman)

*On nettles* (*Urtica*). *England, as far N. as Yorks. Ireland (teste Halbert). vii-x. W. Europe.*

- Outer margins of lorae much less divergent, directed more or less towards ocelli (fig. 204). Black lines on inner and under sides of posterior tibiae, if present, continuous. Ridge above base of antennae not normally darker marked. ....4
- 4 Inner margin of clavus of fore wing whitish. Dark markings of face more extensive; lorae often blackish apically; in male, markings usually comprising roundish median spot, latter sometimes confluent with discoidal spots; in female, discoidal spots as large, or nearly so, as thyridial spots. In male, scutellum often with dark median streak. (Face and vertex yellowish, with discoidal spots, two dots between them, postocellar spots (sometimes absent in female) and thyridial spots dark; in female, median spot absent or vaguely indicated as two parallel streaks. Pronotum yellow-brown, often with variable black-brown spots anteriorly; in male, two brownish patches also present posteriorly. Scutellum yellowish or brownish, with two black triangles basally and two median dots; latter sometimes fused into median streak in male. Fore wings with cells often tinged light brownish; in male, veins dark brown throughout; in female, veins dark brown in basal half, lighter apically. Overall length: ♂, 4.2-4.5 mm.; ♀, 4.6-5.1 mm.). (=*nassatus* (Germar), = *rubi* (Boheman)) *fuscula* (Zetterstedt)

*On bramble* (*Rubus*) and *loganberry*. *England, as far N. as Yorks. Wales: Caerns., Pembs. Ireland (teste Halbert). vi-x. Europe.*



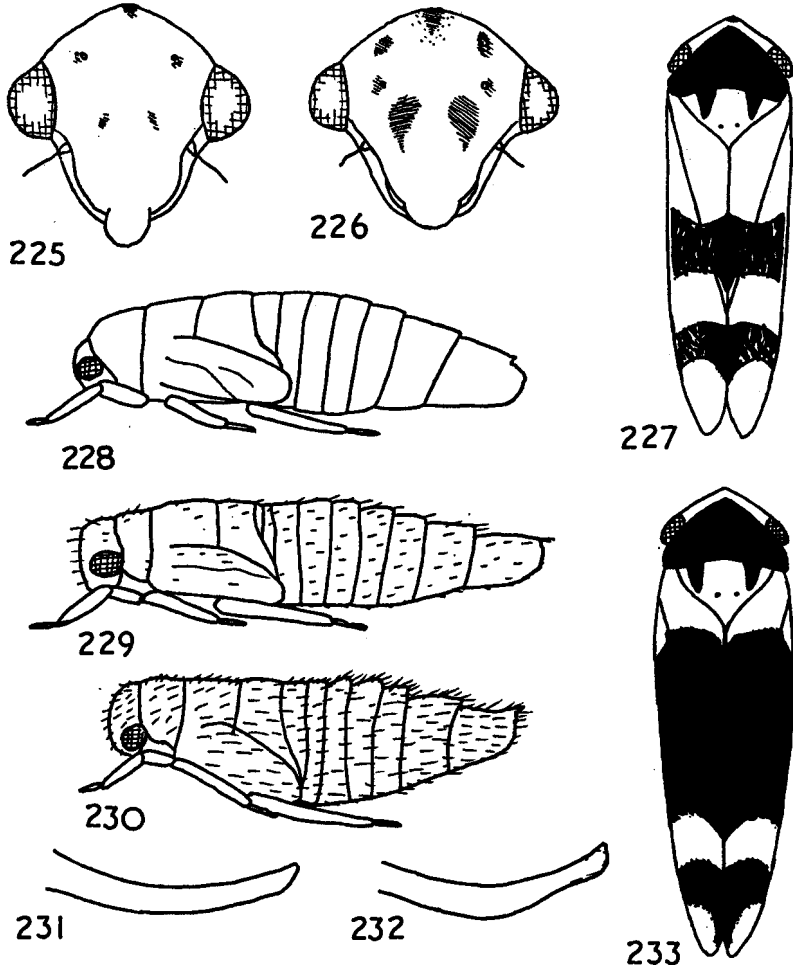
FIGS. 212, 215, 223, 224.—*Macropsis marginata*: (212) vertex and pronotum; (215) aedeagus, side view; (223) right second gonapophysis; (224) left second gonapophysis.

FIGS. 213, 217, 218, 222.—*M. prasina*: (213) aedeagus, side view; (217) right second gonapophysis; (218) left second gonapophysis; (222) face.

FIGS. 214, 216, 219–221.—*M. albae*: (214) aedeagus, side view; (216) vertex and pronotum; (219) face; (220) right second gonapophysis; (221) left second gonapophysis.

- Inner margin of clavus of fore wing brownish or blackish. Dark markings of face less extensive; lorae not blackish apically; in male, median spot either absent or consisting of two parallel streaks up to apex of face; in female, discoidal spots distinctly smaller than thyridial spots. In male, scutellum without dark median streak. (Face and vertex with large thyridial spots, smaller discoidal spots and usually two dots between latter dark. Pronotum yellowish, more or less widely suffused black-brown, in male often mainly black-brown. Scutellum yellowish with two dark triangles basally and often in male (rarely in female) two dark median dots. Fore wing with apical cells often suffused brownish, others hyaline except sometimes near veins. Overall length: ♂, 4.5-4.9 mm.; ♀, 4.7-5.5 mm.)..... (= *scutellata*: auctt. nec (Boheman)) **scotti** Edwards  
*On bramble* (Rubus). *England, as far N. as Yorks. Wales: Denbighs, Caerns. Ireland. vii-x. Europe. Transcaucasia. N. Africa.*
- 5 Veins of fore wing entirely green, at least in basal half.....6  
 - Veins of fore wing not entirely green in basal half.....10
- 6 Prothoracic episternite with sharply angled apex (fig. 208). In female, gonoplac projecting beyond apex of abdomen by about its own width (fig. 209). (Face without dark spots; profile of face smoothly curved throughout (fig. 208). Face, fore body and abdomen light green. Veins of fore wing green basally, pale yellowish apically, cells cloudy hyaline; second anal vein divergent from first anal vein, meeting marginal edge of wing at point between one-third and one-half of distance from base of wing to anal angle (fig. 240))  
 (some) **mendax** (Fieber)
- [See couplet 14]
- Prothoracic episternite rounded at apex (fig. 207). In females, gonoplac longer (fig. 235).....7
- 7 Females. Width of fore wing 1.49-1.61 mm.; ratio of its width to its length usually 0.34-0.36. Width of head 1.60-1.65 mm. (Face greenish or brownish, unicolorous or with thyridia and discoidal spots dark brown or blackish. In some specimens, vertex, pronotum and scutellum almost unicolorous greenish and fore wings with veins greenish basally, becoming paler towards apex, and cells cloudy hyaline, often tinged red-brown. In other examples, vertex, pronotum and scutellum brownish or olivaceous; pronotum with two blackish suboval patches along anterior margin and more or less widely darker posteriorly; scutellum with two dark basal triangles; fore wing with veins brownish or greenish, cells light brownish, sometimes with rather indefinite darker patches or rarely dark brown in basal half of wing. Overall length 5.0-5.7 mm.)  
 (= *distincta* (Scott), = *decorata* Edwards) **infuscata** (Sahlberg)  
*On Salix caprea L. (sallow). England: Herefords., Oxon., Middlesex, Kent, Surrey, Berks., Dorset, Somerset. vi-ix. France. Germany. Czechoslovakia. Scandinavia.*
- Males or females. Width of fore wing less than 1.45 mm.; ratio of its width to its length in females 0.31-0.34. Width of head less than 1.55 mm.....8
- 8 The two sides of anterior margin of vertex straight or slightly concave, making rather sharp angle with each other at vertex (fig. 212). Black spot on posterior tibiae absent in females, present or absent in males. In male, blackish spot present on side of prothorax just above prothoracic episternite; absent in female. In male, apex of paramere not concavely emarginate beneath (fig. 231). Larva glabrous (fig. 228). (Face and fore body green, more or less suffused yellowish, or rarely brownish-yellow; in males, scutellum with two more or less distinct brownish basal triangles. Fore wings with veins green or rarely brownish or yellowish; cells milky hyaline. In male, aedeagus as in fig. 215. In female, left second gonopophysis with series of small teeth along upper margin reaching three large ones at apex (fig. 224). Overall length: ♂, 4.3-4.9 mm.; ♀, 5.0-5.4 mm.)..... **marginata** (Herrich-Schaeffer)  
*On purple osier* (Salix purpurea L.). *England, as far N. as Northumberland. vi-viii, x. Europe.*
- The two sides of anterior margin of vertex convex, making more broadly rounded angle with each other at apex (fig. 216). Strong black spot at base of posterior tibiae always present. Blackish spot not present on side of pronotum in either sex. In male, apex of paramere concavely emarginate (fig. 232). Larva more or less hairy (figs. 229, 230).....9

- 9 In male, aedeagus distinctly narrowed towards base (fig. 213). In female, length of gonoplac visible in ventral view 1.55–1.8 mm.; left second gonapophysis with series of small teeth along upper margin reaching three large ones at apex (fig. 218). Veins of fore wing usually rather darker green. Side margin of head against prothoracic episternite usually sharply angled (fig. 222). Larva uniformly covered with long white hairs, including wing-pads (fig. 230). (Face and fore body green, more or less suffused yellowish; in males, scutellum often with two more or less distinct brownish basal triangles. Fore wing with veins sometimes yellowish apically; cells more or less hyaline. Overall length: ♂, 4.3–4.7 mm.; ♀, 4.5–5.1 mm.)... (= *virescens*: Lewis nec (Fabricius) *prasina* (Boheman))  
*On salwos* (*Salix caprea* L. and *cinerea* L.), local. England: as far N. as Yorks. (? Ireland). vi-ix. Germany. Czechoslovakia. Scandinavia.



Figs. 225–233.—*Macropsis* spp.: (225) *graminea*, male, face; (226) *impura*, male, face; (227) *cerea* var. *harrisoni*, male; (228) *marginata*, last instar larva; (229) *albae*, last instar larva; (230) *prasina*, last instar larva; (231) *marginata*, apex of paramere; (232) *prasina*, apex of paramere; (233) *cerea* var. *harrisoni*, female.



- In male, aedeagus not appreciably narrowed towards base (fig. 214). In female, length of gonoplac visible in ventral view 1.4-1.55 mm.; left second gonapophysis with distinct gap between series of small teeth along upper margin and three large ones at apex (fig. 221). Veins of fore wing usually rather lighter green. Side margin of head against prothoracic episternite usually smoothly curved or bluntly angled (fig. 219). Larva with long white hairs on face and several rows along abdomen, but wing-pads with only a few much shorter hairs (fig. 229). (Face and fore body green, more or less suffused yellowish; in male, black spot sometimes present at apex of vertex; scutellum with basal triangles yellowish, not always distinct. Fore wing with veins almost colourless apically; cells more or less hyaline. Overall length: ♂, 4.2-4.5 mm.; ♀, 4.8-5.3 mm.)

albae Wagner

On *Salix alba* L. (white willow), local. England: Suffolk, Herefords., Bucks., Herts. vii-ix. France. Germany.

- 10 Males ..... 11  
 — Females ..... 16  
 11 Face with blackish spots (figs. 225, 226). Prothoracic episternite rounded at apex (as in fig. 207)..... 12  
 — Face without distinct blackish spots. Prothoracic episternite with sharply angled apex (fig. 208)..... 14  
 12 Veins of fore wing usually rather darker than cells. Scutellum yellowish, usually more or less tinged with green and with two dark basal triangles. (Face yellowish or light greenish, almost always with a black apical spot, sometimes with thyridia and small discoidal spots blackish (fig. 225). Vertex light brownish, sometimes greenish tinged. Pronotum light or dark brownish, sometimes greenish tinged, rarely with two dark suboval spots along anterior margin. Cells of fore wing tinged light brownish. Overall length 4.2-4.7 mm.)

(= *populi* Edwards) **graminea** (Fabricius)

On *Populus nigra* L. and *italica* Moench. (black and Lombardy poplars). England: Oxon., Bucks., Herts., Kent, Mildenhall (Suffolk or Wilts.). vii-ix. France. Germany. Czechoslovakia.

- Veins of fore wing concolorous with cells. Scutellum brownish, not tinged with green ..... 13  
 13 Fore wing unmarked, 2.8-3.4 mm. long. (Face yellowish or light brownish; thyridia, postocellar spots, discoidal spots and often apical spot blackish (fig. 226). Vertex and anterior part of pronotum light brownish, latter with two blackish suboval spots along anterior margin and posteriorly more or less widely greyish. Scutellum light brownish with two blackish basal triangles. Overall length 3.6-4.2 mm.)..... **impura** (Boheman)  
 On dwarf willow (*Salix repens* L.). England. Wales. Scotland. Ireland. vi-x. Europe.

- Fore wing more than 3.5 mm. in length, often with indefinite darker patches. (Face yellowish or light brown; thyridia and discoidal spots blackish. Vertex and pronotum light brown, latter often with two black suboval patches along anterior margin and often darker posteriorly. Scutellum light brown with two blackish basal triangles. Length of paramere (cf. fig. 234), 0.74-0.77 mm.; length of aedeagus (cf. fig. 236), 0.35-0.38 mm. Overall length 4.7-5.2 mm.)

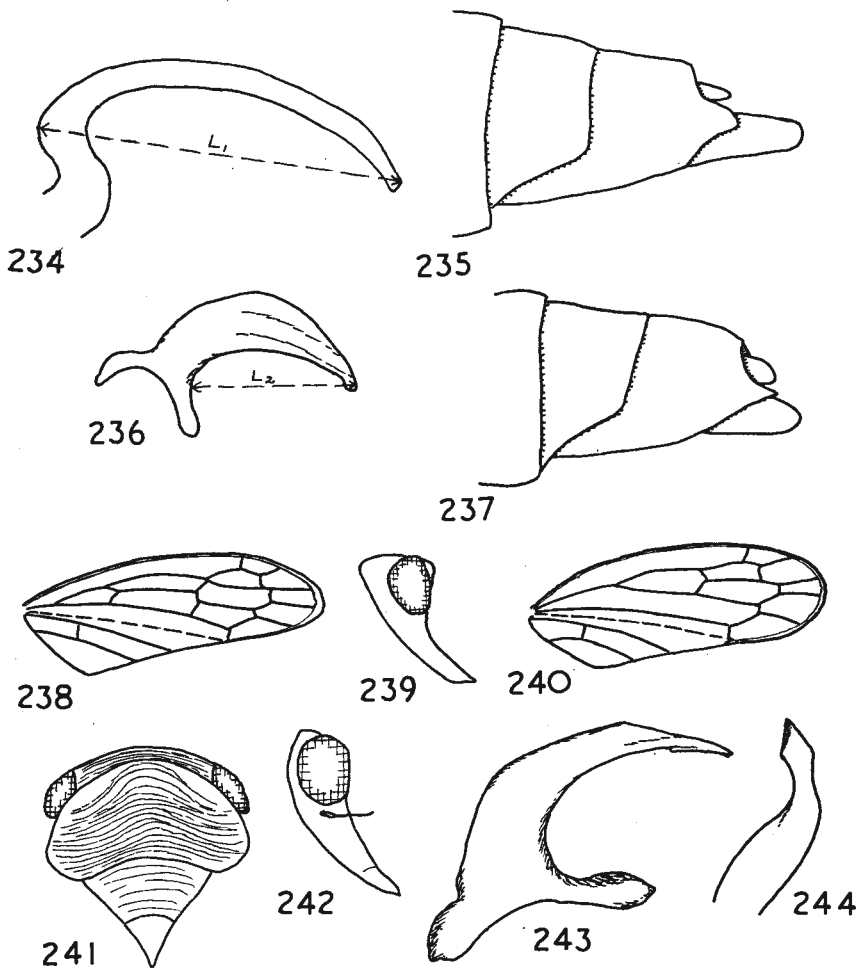
**infuscata** (Sahlberg)

[See couplet 7]

- 14 Profile of face smoothly curved throughout (fig. 208). Second anal vein of fore wing basally divergent from first anal vein, meeting raised margin of wing at point between one-third and one-half of distance from base of wing to anal angle (fig. 240). (Face brown, often indistinctly marbled darker, fore body light brown; black spot present on side of pronotum just above prothoracic episternite; scutellum with two rather darker brown triangles basally; abdomen yellow-brown, banded blackish. Fore wing uniformly brown, veins usually somewhat darker than cells. (Alternatively, coloured as in couplet 6). Overall length: ♂, 4.2-4.5 mm.; ♀, 4.6-5.0 mm.)

(= *ulmi* (Scott), = *glandacea*: auctt. partim nec (Fieber)) **mendax** (Fieber)

On elm (*Ulmus*). England, S. of line from Wash to Bristol Channel. vii-x. C. and S. Europe.



FIGS. 234-236.—*Macropsis infuscata*: (234) male, paramere; (235) female, apex of abdomen, side view; (236) male, aedeagus.

FIG. 237.—*M. cerea*, female, apex of abdomen, side view.

FIGS. 238, 239.—*M. glandacea*: (238) fore wing; (239) head, side view.

FIG. 240.—*M. mendax*, fore wing.

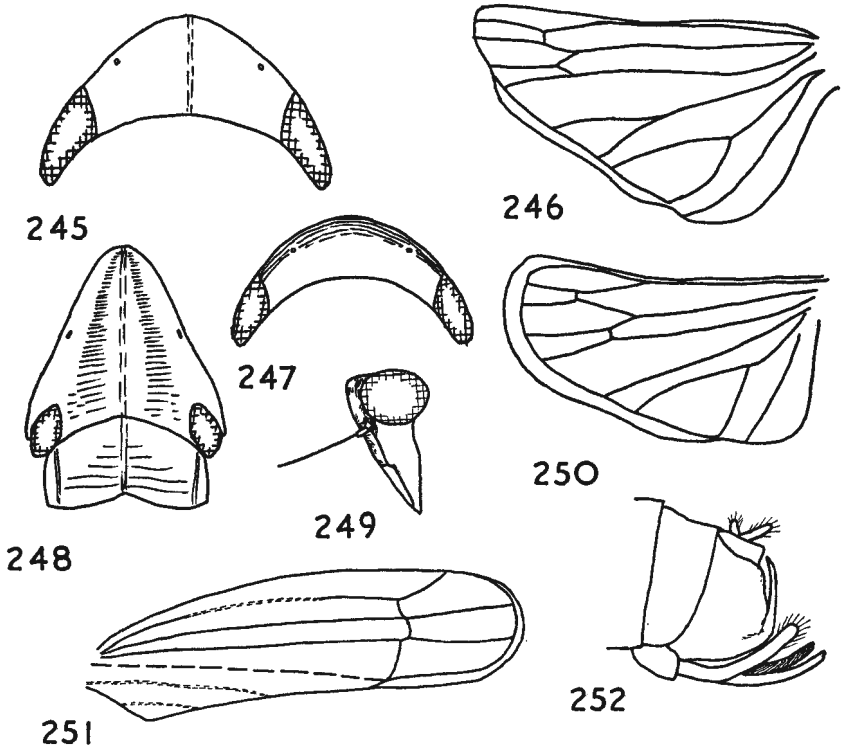
FIGS. 241-244.—*Hephathus nanus*: (241) vertex, pronotum and scutellum; (242) head, side view; (243) aedeagus, side view; (244) apex of paramere.

( $L_1$ , length of paramere;  $L_2$ , length of aedeagus).

- Profile of face with sharp change of direction in anteclypeus (fig. 239). Second anal vein of fore wing basally parallel to first anal vein or slightly convergent, meeting raised margin of wing at point much closer to base of wing than to anal angle (fig. 238) ..... 15
- 15 Fore wing with veins often somewhat darker than cells, without dark patch medially. (Fore body and cells of fore wing uniform light brown; scutellum with two more or less darker brown basal triangles; black spot present on prothoracic episternite and on side of prothorax above this. Black dot present at base of posterior tibia. Overall length : ♂, 4.5 mm.; ♀, 4.9 mm.)

**glandacea** (Fieber) *sensu* Ribaut

- *On elm* (*Ulmus*), rare. *England* : Lee and Lewisham, Kent. *viii*. *C. Europe*.
- Fore wing with veins pale, not darker than cells; in male, dark patch sometimes present medially; in female, more or less well defined darker brown transverse band nearly always present (fig. 147). (Face brown, in male with more or less dark greyish patch towards upper margin, rarely present in female; discoidal spots and thyridia often slightly darker brown than ground colour. Prothoracic episternite brown, inwardly blackish in male and sometimes in female; black spot present on prothorax immediately above it. Vertex and pronotum anteriorly light brown; pronotum in male normally blackish-brown, in female sometimes



FIGS. 245, 246.—*Aphrodes bicinctus* : (245) vertex ; (246) female, hind wing.  
 FIG. 247.—*Stroggylocephalus agrestis*, vertex, showing striations.  
 FIG. 248.—*Eupelax cuspidata*, female, vertex and pronotum.  
 FIG. 249.—*Paramesus nervosus*, head, side view.  
 FIG. 250.—*Euscelis plebejus*, male, hind wing.  
 FIG. 251.—*Alebra albostrigella*, fore wing.  
 FIG. 252.—*Macropsis marginata*, male, apex of abdomen, side view.

- grey-brown posteriorly or in both sexes rarely (var. *harrisoni* : figs. 227, 233) uniformly black. Scutellum light brown with two basal triangles and often two median dots somewhat darker brown. Fore wing in male rarely (var. *harrisoni* : fig. 227) with a distinct dark band from inner margin of clavus to radius and another right across fore wing near apex. Overall length : ♂, 4.2-4.6 mm. ; ♀, 4.4-5.3 mm.) . . . . . *cerca* (Germar)
- On Salix caprea* L., *cinerea* L. (*sallows*) or *purpurea* L. (*purple osier*). *England. Wales. Scotland* : *Dumoon, Argylls. Ireland. vi-iz. Europe.*
- 16 Gonoplac projecting beyond apical abdominal segment by about one and a half times its own width (fig. 235) . . . . . 7
- Gonoplac projecting beyond apical abdominal segment by approximately its own width or less (fig. 237) . . . . . 17
- 17 Pronotum and scutellum green or yellow-green. Costa of fore wing more or less green. (Face greenish, more or less variegated with red-brown, usually with a black apical spot : thyridia sometimes blackish. Vertex and pronotum greenish, more or less variegated with red-brown ; pronotum rarely with two dark suboval spots along anterior margin. Scutellum yellowish-green with two more or less well defined brown basal triangles. Fore wing mainly red-brown, usually rather broadly darker around veins ; inner margin sometimes narrowly greenish. Overall length 4.2-4.7 mm.) . . . . . *graminea* (Fabricius)
- [*See couplet 12*]
- Pronotum, scutellum and fore wing brownish or black, not mixed with green . . . 18
- 18 Fore wing 3.2-3.7 mm. long, without darker markings ; veins not darker than adjacent parts of cells. Black markings present on face. (Coloration as in male—see couplet 13. Overall length 3.9-4.4 mm.) . . . . . *impura* (Boheman)
- [*See couplet 13*]
- Fore wing more than 3.7 mm. long, usually either with more or less well defined darker brown transverse band medially or with veins somewhat darker than cells. Blackish markings usually absent on face . . . . . 14

### Subfamily AGALLIINAE

This subfamily occurs in all the principal geographical regions, though the single Australian species may be a recent introduction. Three genera have been recognised in Europe, all of which have British representatives, but one of them, *Anaceratagallia* Zakhvatkin, may not be of full generic value and for convenience I am here considering it as part of *Agallia*.

#### KEY TO GENERA

- 1 Posterior margin of vertex strongly sinuate behind eyes (fig. 83). Pronotum pale with two round black spots towards posterior margin, otherwise without distinct markings (fig. 83). (Aedeagus asymmetrical) . . . . . *Austroagallia* Evans
- Posterior margin of vertex not sinuate or very gently sinuate behind eyes (fig. 81). Pronotum not marked with round black spots only, sometimes with two black patches along anterior margin. (Aedeagus symmetrical) . . . *Agallia* Curtis

### Genus *Austroagallia* Evans

(= *Peragallia* Ribaut, = *Agallia* : auctt. partim)

Two species are recognised in France, one of which reaches the extreme South of England. The above synonymy follows Le Quesne (1964a).

Face yellowish, with six brown lines, sometimes indistinct, two parallel median ones in upper part, two directed from their lower margin towards antennae and two curved lines parallel to sides in lower part of frontoclypeus (fig. 253) ; distance between ocelli about equal to that between ocellus and base of corresponding antenna. Vertex yellowish with two large round black spots and two parallel median brown lines, latter sometimes indistinct. Pronotum yellowish, with two round black spots, sometimes suffused brownish anteriorly. Scutellum yellowish, often with pair of black points along base. Fore wings pale yellow-brown with veins of corium darker : clavus with veins pale, and darker brown streaks between them. Hind wings rather milky. Abdomen black, sometimes

yellowish between apical terga. In male, aedeagus as in figs. 254, 255 ; appendages of anal tube as in fig. 257. Overall length : ♂, 2.6-3.1 mm. ; ♀, 2.9-3.8 mm. .... *sinuata* (Mulsant and Rey)

Single British record from *Parietaria* ; in Channel Isles on sand-dunes. England ; Lizard, Cornwall. C. and S. Europe. Turkestan.

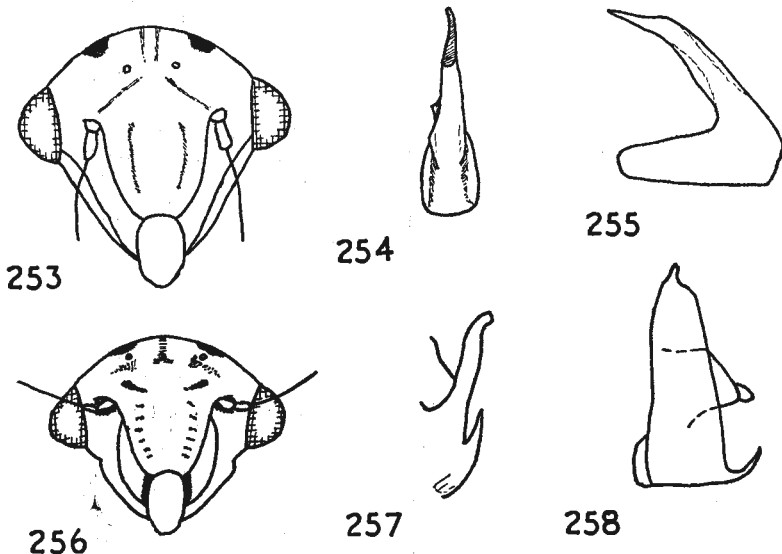
### Genus *Agallia* Curtis

Ribaut (1952) recognizes eight species from France, which he divides into three groups based on the genitalia ; one of these corresponds to Zakhvatkin's *Anaceratagallia* (1946). It seems possible that we may have to regard all three of Ribaut's groups as separate genera, but for convenience I am here retaining all five British species of the complex in the *Agallia* genus. The females of the species which I have attempted to place in the key in couplets 6 and 7 are very difficult to separate with certainty.

The "collier anal" of Ribaut (1952) seems to me to be a modified male tenth abdominal segment and I am thus calling it the "anal tube".

#### KEY TO SPECIES

- 1 Pronotum shagreened, not striolate. Scutellum with black triangles at base remote from side margins (fig. 266). (Face yellowish, with some brownish mottlings and two parallel lines medially in upper part of frontoclypeus ; distance between ocelli nearly twice that between ocellus and base of corresponding antenna (fig. 85). Vertex with two large black spots and two more or less distinct brown median lines (fig. 81). Pronotum yellowish, sometimes with two small black dots anteriorly and with brownish markings tending to form a narrow median triangle and two broader triangles at sides, their bases approaching each other towards posterior margin. Scutellum yellow, sometimes mottled brownish ; median transverse scar and two dots anterior to it sometimes blackish. Fore wings yellowish with veins of corium black-brown in apical half ; cells in middle of corium often broadly dark-edged ; veins of clavus and those of basal part of



Figs. 253-255, 257.—*Austroagallia sinuata* : (253) face ; (254) aedeagus from behind ; (255) aedeagus, side view ; (257) appendages of anal tube, postero-lateral view. Figs. 256, 258.—*Agallia brachyptera* : (256) face ; (258) anal tube.

corium whitish, with more or less developed brownish streaks between. Abdomen blackish, often paler posteriorly in female. In male, aedeagus from side as in fig. 264; anal tube with large hook-like appendages on lower margin (fig. 265). Overall length: ♂, 3.4-3.7 mm.; ♀, 3.4-4.0 mm.)

(= *puncticeps* (Germar)) **consobrina** Curtis

*Common among low plants. England. Wales. Scotland. vi, iv, v, vii-xi. Most of Europe.*

- Pronotum transversely striolate, not shagreened. Scutellum with black markings at base against side margins.....2

- 2 **Brachypterous** (macropter once reported from Germany) with fore wings less than half as long as abdomen; fore wings with veins and corio-claval suture pale throughout, dark streaks present between veins (fig. 262). (Head yellow-brown with large blackish spots across junction of vertex with face; face with median streak, rather large spots between ocelli and antennae and curved lines parallel to sides in lower part of frontoclypeus black or black-brown (fig. 256). Pronotum light brownish with four large blackish spots transversely in two pairs, sometimes also small longitudinal median dash (fig. 263). Scutellum brownish, unmarked except for black corners basally. Abdomen light brownish with a narrow dark brown band towards apex of each tergum. In male, aedeagus as in fig. 261; anal tube with stout spine-like projection on lower margin (fig. 258). Overall length: ♂, 2.3-2.8 mm.; ♀, 2.6-3.4 mm.).....**brachyptera** (Boheman)

*Local, in marshy places, also on cliffs. England: Bridlington and Scarborough, Yorks.: Wicken Fen, Cambs. Ireland: Co. Cork, Co. Galway. vi, viii. Europe. Algeria.*

- Fore wings reaching apex of abdomen or beyond, with first anal vein and corio-claval suture brown posteriorly (fig. 259). (In females and lightly marked males, face pale brown with two round black spots at transition with vertex and occasionally triangular black spots between these and eyes, some black dots on lower part of frontoclypeus and some brownish streaks; in darker male, face with extensive more or less confluent black markings, especially on lower part. Vertex with black or brown, sometimes double, median streak. Pronotum brownish, with two black spots or patches anteriorly, often black median line and spots posteriorly, these sometimes joined to form extensive patches (fig. 260). Scutellum with black triangles in each corner at base, sometimes with other black markings, occasionally almost wholly black. Veins of fore wings largely brownish or black-brown and often with dark streaks along inner margin. Anal tube terminating in two appendages).....3

- 3 Males .....4  
- Females .....6

- 4 Appendages of anal tube ending apically in two angular projections at acute angles to each other, resembling tail of fish (fig. 271). Aedeagus with stem narrow and with sharp beak-like projection apically, with rows of minute teeth along outer margin (fig. 270). (Overall length 2.7-3.1 mm.)

(= *venosa*: Ribaut nec (Fallén)) **ribauti** Ossiannilsson

*On grass in dry places. England: Suffolk, Bucks., Herts., Essex, Kent, Surrey, Berks., Devon. Wales: Caerns. iii, iv, vii-x. Most of Europe.*

- Appendages of anal tube apically ending in a single angular projection (figs. 268, 272). Aedeagus with stem broader and with apex broadly rounded, with or without minute teeth on outer margin (figs. 267, 269).....5

- 5 Stem of aedeagus very broad, with numerous fine teeth on outer margin (fig. 269). Appendages of anal tube very finely tuberculate (fig. 272). (Overall length 2.9-3.2 mm.).....(= *aspera* Ribaut) **venosa** (Fallén)

*On grass in dry places. England. Wales. Scotland: Inverness-shire; Morays.; Rhum. (? Ireland). iii, v, vii-xi. Most of Europe.*

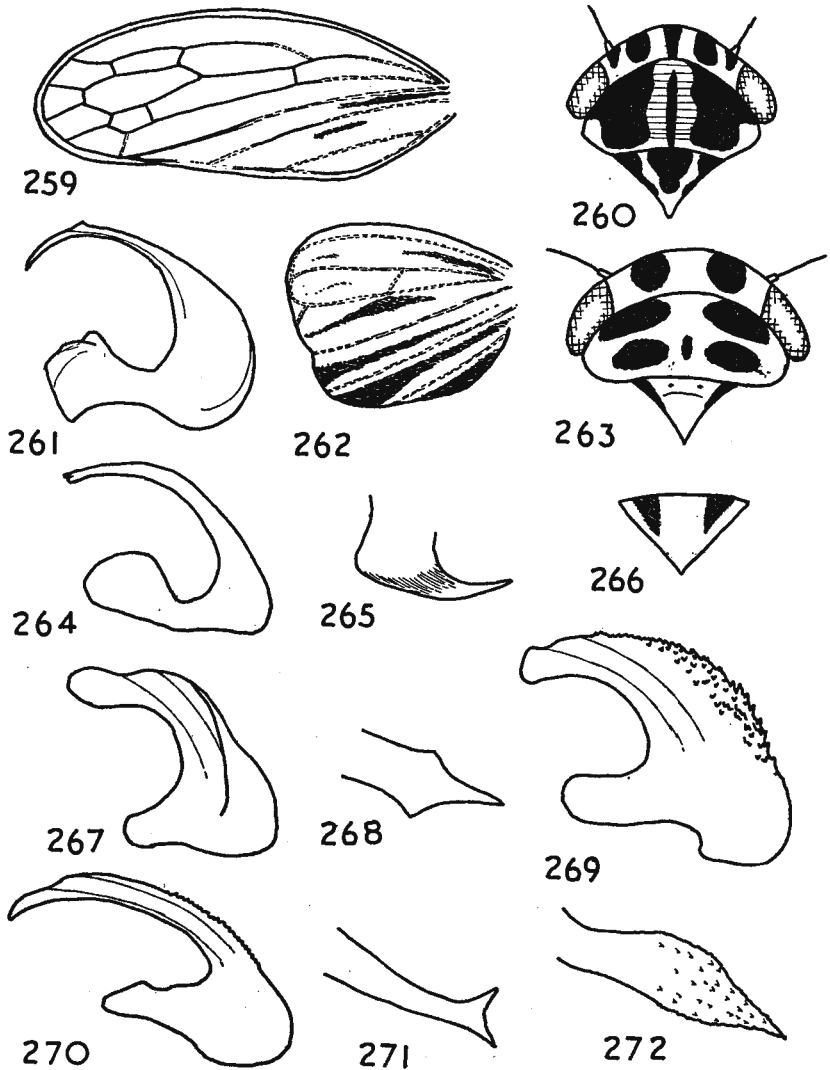
- Stem of aedeagus moderately broad, smooth on outer margin and with arcuate crest on each side (fig. 267). Appendages of anal tube smooth (fig. 268). (Overall length 2.6-2.9 mm.).....**laevis** Ribaut

*On sand-dunes. England: Lancs., Somerset, Devon. Wales: Carns., Pems. Scotland. viii, ix. France. Italy. Morocco.*

- 6 Cells of fore wings with coarse tubercles very closely packed together, giving matt effect; veins less prominent, more flattened. (Overall length 2.8-3.4 mm.)

**ribauti** Ossiannilsson

[See couplet 4]



FIGS. 259-272.—*Agallia* spp.: (259) *ribauti*, fore wing; (260) *venosa*, vertex, pronotum and scutellum; (261) *brachyptera*, aedeagus, side view; (262) the same, fore wing; (263) the same, vertex, pronotum and scutellum; (264) *consobrina*, aedeagus, side view; (265) the same, male, appendage of anal tube; (266) the same, scutellum; (267) *laevis*, aedeagus, side view; (268) the same, male, appendage of anal tube; (269) *venosa*, aedeagus, side view; (270) *ribauti*, aedeagus, side view; (271) the same, male, appendage of anal tube; (272) *venosa*, appendage of anal tube.

- Cells of fore wings with finer tubercles less closely packed together, appearing shiny: veins more prominent, sharper.....7
- 7 Seventh abdominal sternum heavily sclerotised towards apical margin, usually darkened. (Overall length 3.1-3.4 mm.).....*venosa* (Fallén)  
[See couplet 5]
- Apical margin of seventh abdominal sternum not more heavily sclerotised than basal part, not darkened. (Overall length 2.8-3.3 mm.).....*laevis* Ribaut  
[See couplet 5]

### Subfamily EUPELICINAE

(= *HECALINAE* auctt.)

The exact relationships of the striking genus *Eupelix* are rather obscure, and whereas Ribaut (1952) regards it as the sole French representative of the subfamily Eupelicinae, Evans (1947) considers that the Eupelicini form a tribe of the Hecalinae. However, Ribaut (1952) and Linnavuori (1959) regard the Hecalini as a tribe within the Deltocephalinae.

### Genus *Eupelix* Germar

This genus was formerly considered to contain three European species, all occurring in Britain, separable by the shape of the head and male and female genital characters (*cf.* Edwards, 1919*b*). Nowadays, European authors regard this as a single plastic species, though Ossianilsson (1946) regards two of the forms as ecologically distinct in Sweden. I have noted that late summer specimens often have a longer vertex than the spring ones and thus feel that seasonal variation may contribute to the problem.

Face elongate, with sharp median keel; frontoclypeus elongate, genae with rather sharp oblique angles at sides; antennary cavities narrowly blackish. Fore body straw-coloured, with more or less developed dark brown markings, particularly on vertex. Vertex distinctly broader than pronotum, with sharp median keel above, depressed on either side of it, with ocelli near side margins; in males, usually convex-sided, ratio of length to breadth 0.56-0.67; in females, straighter-sided (*fig.* 248), ratio of length to breadth 0.69-0.96. Pronotum rather oblong, with median keel and two side keels; its posterior margin with weak, broad incision. Fore wings straw-coloured, with cells wrinkled, translucent, rarely with broken transverse dark brown band, veins light brown. Abdomen with black longitudinal stripes. Overall length: ♂, 5.6-5.8 mm.; ♀, 5.6-7.2 mm.

(= *depressa* (Fabricius), = *producta* (Germar)) *cuspidata* (Fabricius)

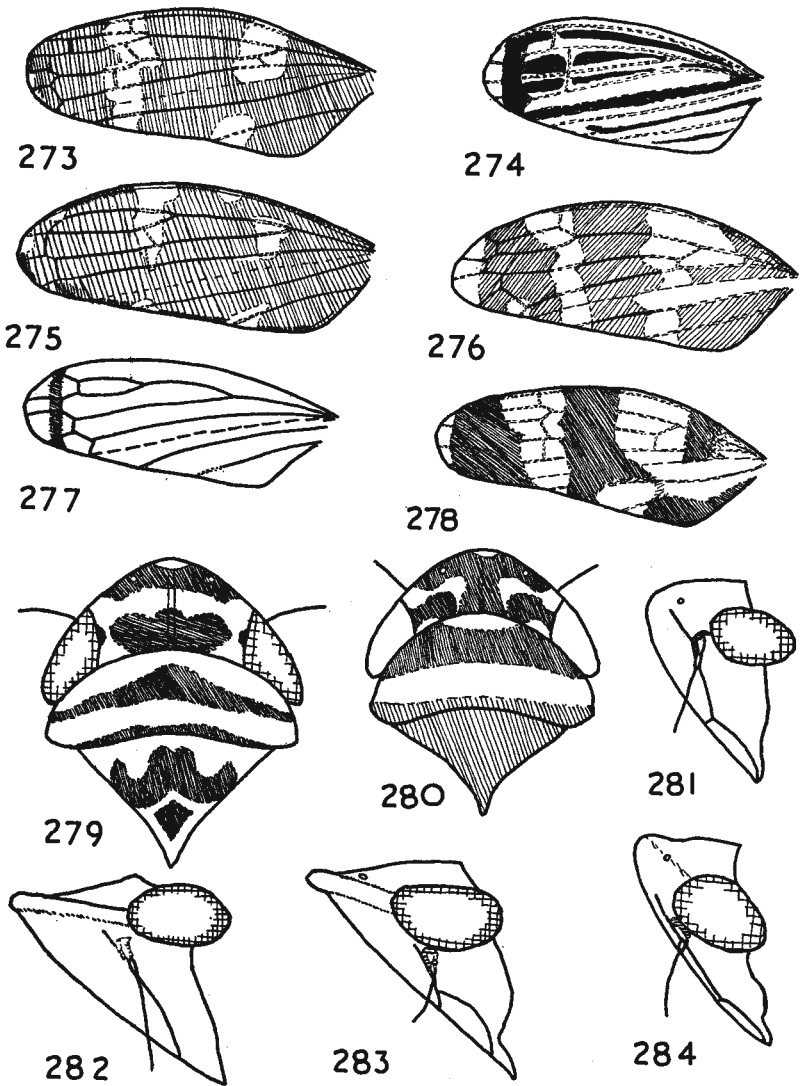
On grasses, dry places. England. Scotland. Wales. Ireland. *iii, v-ix.* Europe. Caucasus. Turkestan. North Africa.

### Subfamily APHRODINAE

(= *ACOEPHALINAE*)

This subfamily, bearing one or the other of the above names, has been recognised by most authors for at least seventy years, but there has been some uncertainty as to which genera it should comprise. Edwards (1895) included eight British genera, only three of which were allocated to this subfamily by Evans (1947), while four were included in China's (1950) check-list. However, Ribaut (1952) only allots to it two French genera, both occurring in Britain, and I am here defining the subfamily in the same way, referring *Doratura* (included by Evans) and *Rhytistylus* and *Paramesus* (included by China) to the Deltocephalinae.





FIGS. 273-278.—*Aphrodes* spp., fore wings: (273) *bifasciatus*, form *tricinctus*, male; (274) *flavostrigatus*, male; (275) *trifasciatus*, female; (276) *albifrons*, male; (277) *histrionicus*, male; (278) *fuscofasciatus*, male.  
 FIGS. 279, 280.—*Aphrodes* spp., male, vertex, pronotum and scutellum: (279) *flavostrigatus*; (280) *histrionicus*.  
 FIGS. 281-284.—*Aphrodes* spp., head in side view: (281) *flavostrigatus*, female; (282) *trifasciatus*, male; (283) *bifasciatus*, male; (284) *albifrons*, female.

## KEY TO GENERA

- 1 Vertex without median keel, transversely striated anteriorly (fig. 247)  
**Stroggylocephalus** Flor (p. 61)  
 - Vertex with median keel, not transversely striated (fig. 245)  
**Aphrodes** Curtis (p. 55)

Genus **Aphrodes** Curtis

(= *Acucephalus* Germar, = *Acocephalus* Burmeister)

This genus contains a number of closely allied species, the differences between which have been clarified by Wagner (1937) and Ribaut (1952); the British species have been discussed by Duffield (1963a) and Le Quesne (1964a). Three widespread species, *bicinctus*, *bifasciatus* and *albifrons*, exhibit considerable variation and tend to give forms with distinct ecological habitats. Females of several species cannot be recognised with certainty.

## KEY TO SPECIES

- 1 Anterior margin of vertex sharply defined, rounded at least as narrowly as anterior tibia (figs. 282, 283).....2  
 - Anterior margin of vertex broadly rounded, less sharply so than anterior tibia (figs. 281, 284).....5  
 2 Cells of fore wings wrinkled, not distinctly tuberculate. Overall length: ♂, 5.0-6.5 mm.; ♀, 5.9-7.8 mm. Frontoclypeus vertically wrinkled, at least medially. In male, fore wing without white transverse bands.....3  
 - Cells of fore wings finely tuberculate. Overall length: ♂, at most 5.0 mm.; ♀, usually less than 5.9 mm. Frontoclypeus smooth or finely punctured, without vertical wrinkles. In male, fore wing dark with whitish transverse bands (fig. 273).....4  
 3 In male, vertex, pronotum and scutellum pale ochreous brown or greenish-yellow, boldly marked with chestnut brown or black-brown, tending to leave pale transverse band on vertex and pronotum; thyridia near posterior margin of vertex dark; fore wings light brownish, usually with veins, especially first anal vein, pale or yellow-green. In female, fore body and fore wings usually straw-coloured or brownish, often with darker mottlings throughout or short dark streaks on the fore wings; fore body rarely uniformly chestnut brown. (In male, face yellowish, finely mottled with chestnut-brown; antennary cavities sometimes with round black spot; aedeagus as in figs. 285, 286, but distance between two pairs of spines somewhat variable<sup>3</sup>)

(= *nervosus* (Schrank)) **bicinctus** (Schrank)

Common on grasses: forms differing in size and colour are associated with different habitats. England. Wales. Scotland. Ireland. vi-x. Palaearctic and Nearctic regions.

- In male and female, fore body greyish-brown, sometimes finely dotted darker, without distinct transverse band on vertex or pronotum; thyridia near posterior margin of vertex usually pale. Fore wings grey or light brownish, sometimes finely mottled, but not with a regular pattern; in female, sometimes with a few very short darker streaks. (Overall length: ♂, 5.7-6.0 mm.; ♀, 6.5-7.4 mm.)

**bicinctus** (Schrank) **aestuarinus** (Edwards)

In saltings, on *Suaeda fruticosa* Forsk. England: Norfolk, Suffolk, Essex, Sussex, Hants., Dorset. vii-ix. Germany.

- 4 In male, aedeagus broader in side view, with three pairs of spines, all roughly of same size and remote from the apex (figs. 287, 288). In female, markings of fore

<sup>3</sup> The form *diminutus* Ribaut is said to differ from typical *bicinctus* in both the distance between these spines on the aedeagus and the overall size of the insect; its true significance needs further investigation. Duffield (1963a) appears to have confused *diminutus* and *bicinctus* sensu Ribaut.

A record of *Aphrodes carinatus* (Stål) from Hertfordshire (Salmon, 1954b) almost certainly refers to *bicinctus*.

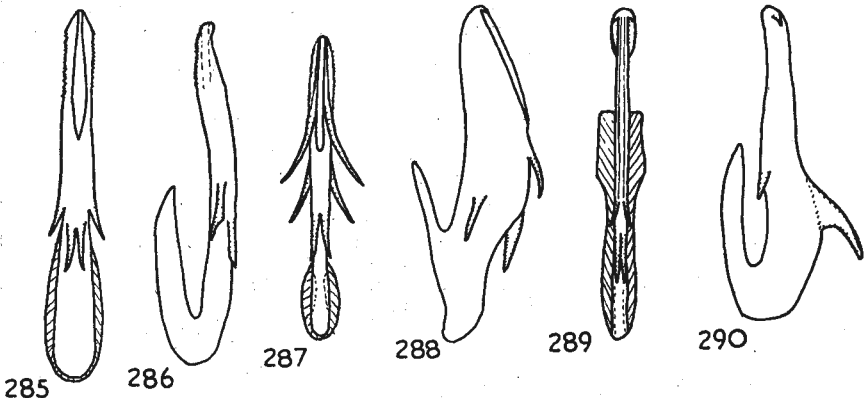
wings rather variable, but if consisting of white spots, these are not very distinct. (In male, face light yellow-brown, darker towards upper margin and sometimes narrowly dark at lower margin ; vertex black-brown, with some paler mottlings towards anterior margin and with posterior margin narrowly pale ; pronotum transversely wrinkled, dark brown anteriorly, whitish posteriorly, sometimes narrowly dark along posterior margin ; scutellum black-brown, somewhat paler posteriorly ; fore wings dark brown with two more or less broad whitish bands, sometimes entire and sometimes broken, apex sometimes also narrowly whitish (fig. 273). In female, face yellow-brown with darker mottlings ; vertex, pronotum and scutellum light brown, with darker brown mottlings ; fore wings light brownish or greyish, more or less darker marked, sometimes with regular darker markings along margins and veins. Hind wings extending to about three-quarters of length of abdomen. Overall length : ♂, 3.8-5.0 mm. ; ♀, 5.1-5.7 mm.)

(= *tricinctus* (Curtis)) **bifasciatus** (Linnaeus)

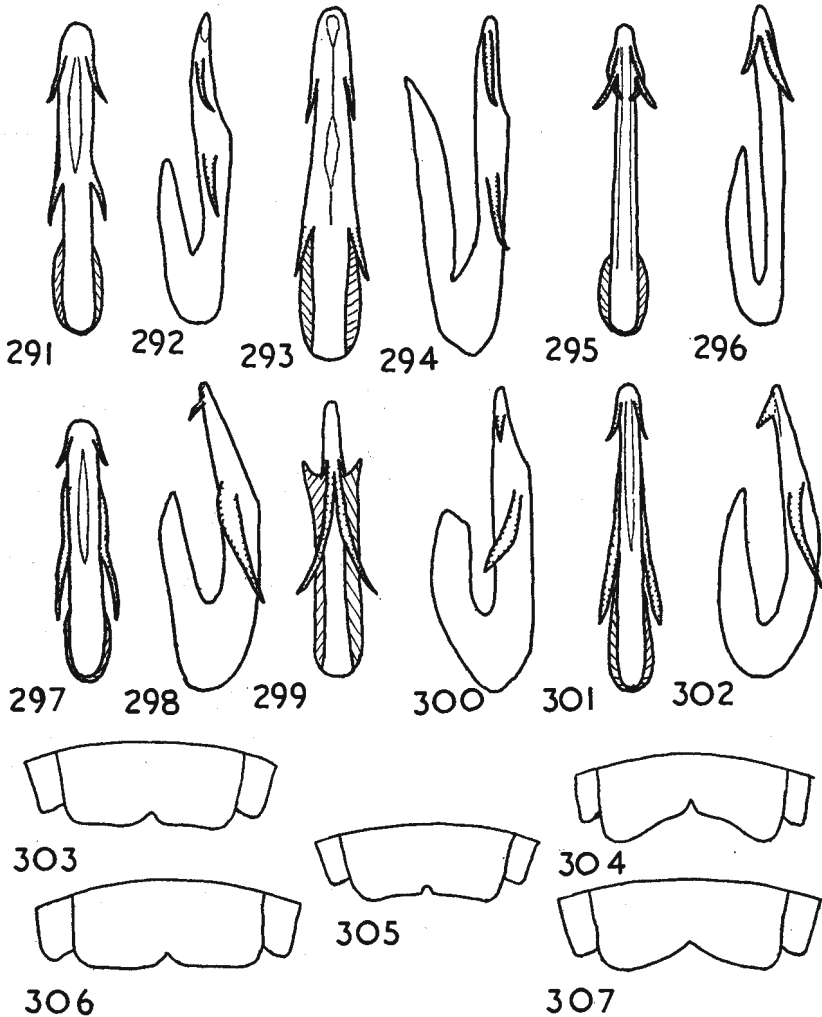
*Typical bifasciatus* (anterior white band of fore wing complete) often on dry hillsides : specimens with broken anterior white band (*tricinctus* ; Duffield's major) usually in marshy habitats. England. Wales. Scotland. Ireland (teste Halbert). vi-ix. Europe. Caucasus. Siberia.

- In male, aedeagus narrower in side view, with a very short pair of spines near apex and two pairs remote from apex, one of these being much larger than the other (figs. 289, 290). In female, fore wings dark brown with distinct whitish spots tending to form two transverse bands ; veins darker brown between whitish spots (fig. 275). (In male, face light brown, antennary cavities broadly blackish. Vertex black-brown, with a few pale dots anteriorly, obliquely wrinkled ; pronotum black-brown anteriorly, creamy white posteriorly, transversely wrinkled ; scutellum black-brown ; fore wings black-brown with two transverse creamy white bands, either intact or interrupted, and often apex creamy white. In female, face brown with darker median patch on frontoclypeus ; vertex, pronotum and scutellum brown, the two former with darker patches. Overall length : ♂, 3.6-3.9 mm. ; ♀, 4.9-5.0 mm.)..... **trifasciatus** (Geoffroy)
- On heaths. England : Yorks., Staffs., Derbys., Notts., Worcs. vii, viii. N. and C. Europe.

- 5 Males ..... 6
- Females ..... 12
- 6 Fore wings with veins mainly dark, cells unpigmented between them, except for narrow transverse band just before apex (fig. 277). Pronotum with broad transverse yellowish band, black-brown anteriorly and also posteriorly (fig. 280).



Figs. 285, 286.—*Aphrodes bicinctus*, aedeagus : (285) from behind ; (286) side view.  
 Figs. 287, 288.—*A. bifasciatus*, aedeagus : (287) from behind ; (288) side view.  
 Figs. 289, 290.—*A. trifasciatus*, aedeagus : (289) from behind ; (290) side view.



FIGS. 291, 292.—*Aphrodes albifrons*, aedeagus: (291) from behind; (292) side view.  
 FIGS. 293, 294.—*A. limicola*, aedeagus: (293) from behind; (294) side view.  
 FIGS. 295, 296.—*A. fuscofasciatus*, aedeagus: (295) from behind; (296) side view.  
 FIGS. 297, 298.—*A. albiger*, aedeagus: (297) from behind; (298) side view.  
 FIGS. 299, 300.—*A. histrionicus*, aedeagus: (299) from behind; (300) side view.  
 FIGS. 301, 302.—*A. flavostriatus*, aedeagus: (301) from behind; (302) side view.  
 FIGS. 303-307.—*Aphrodes* spp., female abdominal sterna: (303) *albiger*; (304) *fuscofasciatus*; (305) *histrionicus*; (306) *flavostriatus*; (307) *albifrons*.

- (Frontoclypeus and anteclypeus chestnut brown, former with alternate blackish and yellow patches at upper margin; lorae yellowish with brown patches; antennary cavities broadly blackish; vertex yellow with black markings as in fig. 280. Scutellum black-brown. Aedeagus as in figs. 299, 300. Overall length: 3.0-3.6 mm.).....**histrionicus** (Fabricius)  
*On grasses. England. Wales. Scotland. Ireland (teste Halbert). vi-ix. N. and C. Europe. Caucasus.*
- Fore wings with cells pigmented at least in part, pattern usually consisting of transverse bands or longitudinal streaks. If pronotum has pale transverse band, distinct dark bands not present both anteriorly and posteriorly.....7
- 7 Fore wings with veins pale, cells with dark longitudinal streaks and a single, rarely broken, transverse dark band at apex (fig. 274). (Face yellow-brown with a few more or less distinct darker spots. Vertex yellow-brown, with variable but always distinct black markings consisting essentially of two transverse bars and sometimes a longitudinal median line (fig. 279). Pronotum with an irregular black transverse band at or a little before the middle. Scutellum brown with variable black pattern (e.g. as in fig. 279). Aedeagus as in figs. 301, 302. Overall length: 3.3-3.6 mm.).....**flavostriatus** (Donovan)  
*On grasses in damp places. England. Wales. Scotland. Ireland. vii-x. N. and C. Europe. Siberia. N. America.*
- Fore wings with transverse bands or with veins mainly concolorous with or darker than cells.....8
- 8 Fore wings white, translucent, with three distinct black-brown transverse bands, the basal one broken and the apical one without a pale spot on the inner margin just beyond the apex of the corio-claval suture (fig. 278). Pronotum whitish, posteriorly, light red-brown anteriorly. Aedeagus with two pairs of spines near apex (figs. 295, 296). (Face light brown, antennary cavity dark; vertex brownish, usually darker anteriorly. Scutellum uniformly brownish. Overall length: 3.2-3.8 mm.).....**fuscofasciatus** (Goeze)  
*On grass near ground level in dry places. England, S. of line from Wash to Bristol Channel. Wales: Holyhead (teste Dale). vii-ix. Europe. Tunisia. N. America.*
- Fore wings with or without brown transverse bands; bands, if distinct, rarely black-brown and often with a white spot along inner margin just beyond apex of corio-claval suture (fig. 276). Pronotum often more or less uniformly red-brown, sometimes with dark brown markings. Aedeagus with distance between its apex and apex of lower pair of spines more than half of its total length (figs. 291-294, 297, 298, 313, 314).....9
- 9 Apex of aedeagus seen from behind in form of arrow-head (fig. 314) or tongue-shaped (fig. 315), one to one and a half times as long as broad; seen from side forming triangular spine (fig. 313); distance between apex and base of lower pair of spines greater than half total length of aedeagus. (Face light brown, sometimes with rather indistinct darker lines or mottling on frontoclypeus; vertex, pronotum and scutellum rust-brown, the former usually mottled rather darker along anterior margin. Ratio of length of vertex to that of pronotum about 0.90 (fig. 311). Fore wings variable in pattern, commonest form being brown with veins broadly darker, a dark transverse band towards apex and the extreme apex more or less narrowly hyaline (fig. 308); fore wings sometimes uniformly dark brown except for narrow hyaline patch apically or with three more or less dark bands separated by hyaline areas; in latter case, two basal dark bands often united by cross-band along corio-claval suture (figs. 309, 310); roundish hyaline spot sometimes present along inner margin just beyond apex of clavus (fig. 309). Anterior and median legs light brown with dark spot at apex of tibia and apical half of tarsus dark. Posterior femur with dark spot apically, posterior tibiae dark, tarsal segments dark apically. Overall length 3.7-4.2 mm.)  
 (= *assimilis*: Duffield nec Signoret) **duffieldi** Le Quesne  
*On grasses. England: Dungeness, Kent. vi-viii. Not recognised elsewhere, but perhaps conspecific with alpinus Wagner from the Alps.*
- Aedeagus apically rounded with narrow pair of spines towards apex (figs. 291-294, 297, 298) which are distinct in side view, not forming triangular projection on stem of aedeagus; distance between apex of aedeagus and base of lower pair of spines less than half total length of aedeagus.....10

10 Upper spines of aedeagus nearer apex, shorter ; lower spines longer, sinuate when seen from behind (figs. 297, 298). Fore wing without pale spot along inner margin beyond apex of corio-claval suture. (Face yellowish, more or less marked with brown ; antennary cavities largely dark. Vertex, pronotum and scutellum sometimes almost uniformly light brown, sometimes yellowish with distinct brown and blackish markings, which may leave posterior part of pronotum pale. Markings of fore wing variable, light or dark brown, usually with whitish spots ; apex usually narrowly whitish beyond dark transverse band. Overall length 3·6–3·8 mm.).....(= *kirschbaumi* (Edwards)) **albiger** (Germar)

*Local, in marshy places. England : Kent, Surrey, Sussex, Hants., Somerset. vii-ix. France. Germany.*

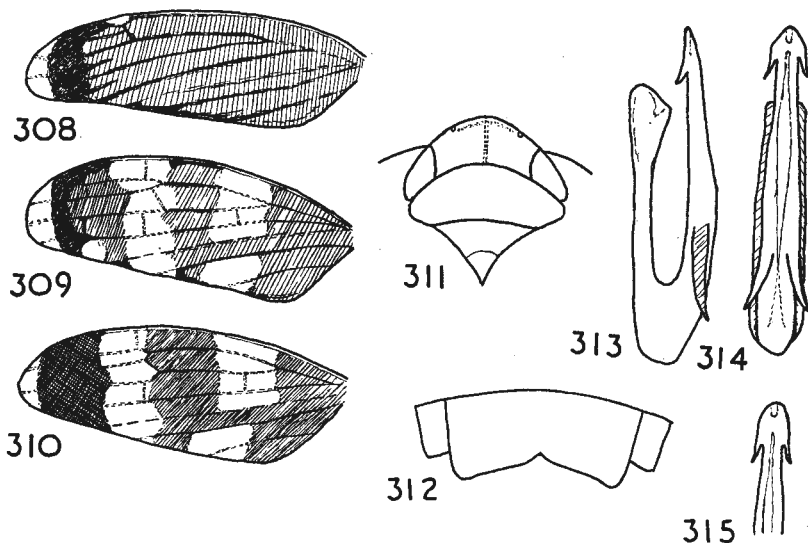
— Upper spines of aedeagus further from apex, longer ; lower spines about same length as upper, almost straight when seen from behind (figs. 291–294). Fore wing either with pale spot along inner margin just beyond apex of corio-claval suture (fig. 276) or almost unicolorous except at apex.....11

11 Overall length 4·0–4·7 mm. ; length of aedeagus 0·74–0·82 mm. (Face light brown, antennary cavities blackish. Vertex, pronotum and scutellum uniformly light brown or pronotum with obscure darker mottlings. Fore wings light brownish, sometimes with darker patches, with or without whitish spots ; latter, if present, usually not very sharply defined ; apex narrowly whitish, usually with narrow transverse darker band just before it. Aedeagus as in figs. 293, 294)

**limicola** (Edwards)

*Probably a salt-marsh race of albifrons. England : Yorks., Norfolk, Essex, Kent, Hants., Dorset. Ireland : Co. Cork (teste Halbert). vii-ix. Germany.*

— Overall length 3·3–4·0 mm. ; length of aedeagus 0·63–0·70 mm. (Face light brown ; antennary cavities often blackish ; vertex, pronotum and scutellum light brownish ; pronotum uniform in colour or rarely darker posteriorly. Fore wings sometimes light brown, with or without whitish spots, sometimes with distinct black-brown bands ; apex usually narrowly whitish with a transverse dark band just before it. Aedeagus as in figs. 291, 292).....**albifrons** (Linnaeus)



Figs. 308–315.—*Aphrodes duffieldi* : (308, 309, 310) fore wing (three specimens) ; (311) vertex, pronotum and scutellum ; (312) female, seventh abdominal sternum ; (313) aedeagus, side view ; (314) the same, from behind ; (315) apex of aedeagus, from behind (another specimen).

Common on grasses, usually near ground level. England. Wales. Scotland. Ireland. *vi-x*. Europe. Caucasus. Tunisia.

- 12 Vertex in side view convex, more broadly rounded into profile of face (fig. 281). Fore wings with veins and inner margin pale throughout, cells often with more or less darkened transverse streaks. (Face yellow-brown, usually with some variable dark brown markings; antennary cavities blackish. Vertex, pronotum and scutellum light brown, with blackish mottlings. Seventh abdominal sternum as in fig. 306. Overall length 4.1–4.6 mm.; width of pronotum 1.45–1.6 mm.)

**flavostriatus** (Donovan)

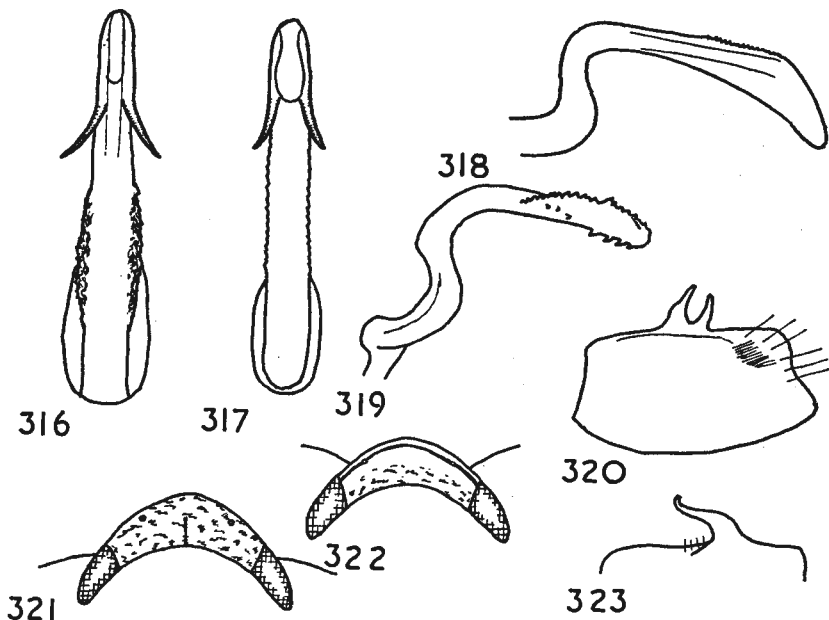
[See couplet 7]

- Vertex in side view concave towards apex, more narrowly rounded into profile of face (fig. 284). Fore wings often with dark patches on veins or inner margin. .13
- 13 Ratio of length of vertex to that of pronotum less than 0.87. Narrower; width of pronotum 1.25–1.4 mm. (Face light brown, often with darker band shaped like inverted "U" on lower part of frontoclypeus; antennary cavities blackish. Vertex, pronotum and scutellum light brown, often with blackish mottling, especially on vertex and scutellum. Fore wings with brownish and whitish markings, usually not forming very distinct pattern; inner margin and often also costal and apical margins with distinct alternation of dark brown and whitish patches. Seventh abdominal sternum as in fig. 305. Overall length 4.0–4.3 mm.)

**histrionicus** (Fabricius)

[See couplet 6]

- Ratio of length of vertex to that of pronotum at least 0.88. Broader; width of pronotum 1.45–1.7 mm. ....14
- 14 Posterior margin of seventh abdominal sternum distinctly concave, with narrow deep median incision (fig. 304). Fore wings pale brown with a few very distinct dark marks along margins towards apex, elsewhere with some less distinct dark



FIGS. 316, 318, 320, 321.—*Stroggylocephalus agrestis*: (316) aedeagus from behind; (318) paramere; (320) male, genital segment, side view; (321) vertex, showing pattern.

FIGS. 317, 319, 322, 323.—*S. livens*: (317) aedeagus from behind; (319) paramere; (322) vertex, showing pattern; (323) male, appendage of genital segment, side view.

mottlings. (Face light brown, usually with darker mottlings; antennary cavities blackish. Vertex, pronotum and scutellum grey-brown, usually with blackish mottlings. Overall length 4.3-4.7 mm.; width of pronotum 1.55-1.7 mm.)

**fuscofasciatus** (Goeze)

[See couplet 8]

- Posterior margin of seventh abdominal sternum with broader, relatively shallower median incision (figs. 303, 307, 312). Fore wings often pale or with dark markings forming a more uniformly mottled pattern.....15
- 15 Posterior margin of seventh abdominal sternum almost straight, with a clearcut median incision (fig. 303). (Face light brown, with blackish mottlings; vertex, pronotum, scutellum and fore wings light brown with blackish mottlings. Overall length 4.4-4.5 mm.; width of pronotum 1.5-1.6 mm.)

**albiger** (Germar)

[See couplet 10]

- Posterior margin of seventh abdominal sternum gradually incurving to form median incision, which is thus not sharply defined (figs. 307, 312).....16
- 16 Larger: overall length 5.2-5.6 mm.; width of pronotum 1.7 mm. (Face, vertex, pronotum, scutellum and fore wings light brown with fine blackish mottlings)

**limicola** (Edwards)

[See couplet 11]

- Smaller: overall length 4.4-5.0 mm.; width of pronotum 1.5-1.6 mm. (Face light brown, sometimes heavily mottled blackish. Vertex, pronotum, scutellum and fore wings light brown, sometimes heavily and rather uniformly mottled blackish, sometimes hardly darker marked.)

**albifrons** (Linnaeus) or **duffieldi** Le Quesne

[See couplet 9 or 11]

### Genus **Stroggylocephalus** Flor

(= *Strongylocephalus*: Kirschbaum et auctt.)

This genus contains two European species, both of which occur in Britain.

#### KEY TO SPECIES

- 1 Vertex with distinct curved black line parallel to anterior margin running through ocelli, otherwise pale anteriorly and with some dark mottlings posteriorly (fig. 322). In male, stem of aedeagus not appreciably broadened in middle (fig. 317); paramere with three or four distinct teeth towards apex of inner margin (fig. 319); sides of genital segment with single tooth along inner margin (fig. 323). (Face light brown mottled with black-brown, or black-brown with some lighter brown mottlings. Pronotum, scutellum and fore wings light brown, more or less mottled with black-brown. In female, seventh abdominal sternum with deep median incision. Overall length: ♂, 5.1-5.5 mm.; ♀, 5.5-5.8 mm.)

(= *megerlei* (Scott)) **livens** (Zetterstedt)

*In marshy places, local. England: Ranworth, Surlingham and Booton, Norfolk; Wicken Fen, Cambs.; New Forest, Hants.; West Parley, Dorset; Newcastle-on-Tyne (teste Bold). iii, viii, xi. N. and C. Europe.*

- Vertex with darker mottlings throughout, but without distinct black line running through ocelli (fig. 321). In male, stem of aedeagus laminately broadened in middle (fig. 316); paramere without teeth along inner margin (fig. 318); sides of genital segment with a pair of teeth along inner margin (fig. 320). (Face light brown, more or less heavily mottled with black-brown. Pronotum and fore wings light brown, more or less mottled with black-brown or chestnut-brown. Scutellum light brown, sometimes darker mottled and rarely with a pair of dark triangles basally. In female, seventh abdominal sternum usually with a weak median incision. Overall length: ♂, 5.3-5.9 mm.; ♀, 5.8-6.4 mm.)

**agrestis** (Fallén)

*In marshy places, local. England. Wales. Scotland. Ireland (teste Halbert). iii, iv, vii-ix. N. and C. Europe. Siberia. N. America.*



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