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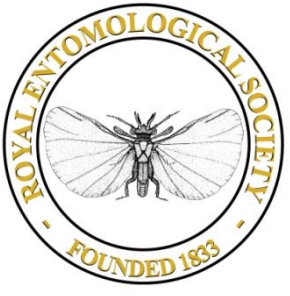

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Handbooks for the Identification of British Insects
Vol. II, Part 2(c)

CICADELLIDAE (TYPHLOCYBINAE)
WITH A
CHECK LIST OF THE BRITISH AUCHENORHYNCHA
(HEMIPTERA, HOMOPTERA)

W. J. Le Quesne and K. R. Payne

ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

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Editor: M. G. Fitton

CICADELLIDAE (TYPHLOCYBINAE)
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CHECK LIST OF THE BRITISH AUCHENORHYNCHA
(HEMIPTERA, HOMOPTERA)

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ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

The aim of the *Handbooks* is to provide illustrated identification keys to the insects of Britain, together with concise morphological, biological and distributional information. The series also includes a *Check list of British insects.*

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Contents

Introduction

The Auchenorhyncha is generally regarded as being divided into two series, the Cicadomorpha and the Fulgoromorpha. The latter group of about 84 species was keyed in an earlier handbook (Le Quesne, 1960). The Cicadomorpha forms the larger series, keys to all except the subfamily Typhlocybinae of the Cicadellidae being published as handbooks in 1965 and 1969 (Le Quesne, 1965a, 1969). The present handbook is aimed at completing the work on the British Auchenorhyncha by dealing with the 95 species of the Typhlocybinae. It also includes a revised check list of all the British Auchenorhyncha. The sections dealing with the Typhlocybinae are the work of W. J. Le Quesne whilst K. R. Payne was responsible for preparing the check list.

The subfamily Typhlocybinae consists of small and frail species of leaf-hoppers, of overall length less than 5.5mm. The British species are all macropterous as adults and without any forking or cross-veins in the basal two-thirds of the fore wing. Many of the British species of this subfamily can be recognised from the keys and figures of Ribaut (1936) and China (1942). However, there has been a substantial amount of subsequent work by European authors, especially Dworakowska, Günthart and Anufriev, which affects the British fauna.

Economic importance

The species occasionally appear in substantial numbers on trees and low plants. They are mainly mesophyll feeders, leaving small white patches on the leaves where cells have been "sucked dry". Only one species regularly causes serious damage however: this is *Hauptidia maroccana* which attacks a range of cultivated plants, such as *Primula* and chrysanthemums, usually indoors or in glasshouses.

Life-history

The majority of species have two generations in the year and overwinter in the egg stage. However, quite a few species have a single generation and some of these, e.g. *Empoasca* and certain *Zygina* species overwinter as adults, usually in conifers, ivy, gorse or holly. Hemiptera belong to the Exopterygota and thus have no pupal stage and the larval stages are often referred to as "nymphs". There are five nymphal instars in all cases studied and Kathirithamby (1974a, 1974b) has given characters to determine the particular instar for any Cicadellid and also to sex nymphs from the third instar onwards.

Host plant relationships

Almost two-thirds of the British Typhlocybinae are found on trees and shrubs and the rest on low plants, although only two are definitely associated with grasses. It is of interest to note that the genus *Eupteryx* is associated with a wide range of low plants with glandular hairs. Most species have only a single food plant or a narrow range of them, although adults are occasionally swept from other plants on which the larval stages do not feed. In all cases, larvae feed in the open, but usually cling to the leaf more firmly than the adults, so that they are far less likely to be swept or beaten from the foodplant.

No keys are given to the larval stages in this handbook, but a key to most of the species feeding on trees constructed by Wilson (1978) has been published recently. Larval polymorphism in two *Eupteryx* species has been discussed by Stiling (1980b).

A paper was published some years ago (Le Quesne, 1972) discussing the coexistence of three species of *Eupteryx* on nettle in relationship to the Gause exclusion principle. This work has recently been extended by Stiling (1980a, 1980c).

A list of host plants with the Typhlocybine species recorded from each follows the taxonomic section of this handbook. Parasitism in this subfamily has been discussed recently by Jervis (1980).

Methods of collection and preservation

Specimens are usually obtained from trees and bushes using either a stout sweep-net or a beating-tray and picked up with an aspirator ("pooter"). They may be collected from lower plants either with a sweep-net or by searching and taking up directly in the aspirator. Specimens may conveniently be killed by sucking in a little ethyl acetate vapour, but care should be taken not to wet the wings with the solvent or with moisture, which will make the specimens difficult to handle as dry mounts, particularly if the venation needs to be studied.

For most purposes insertion of a micro-pin through the scutellum, followed by staging on polyporus is the most convenient method. An alternative is to store in tubes of 70% ethanol or lactophenol, but this is apt to cause fading of the colour-pattern.

Methods of examination and dissection

Due to the necessity of examination of microscopic structures, usually including dissection of the male genitalia, a medium-power microscope, with magnification up to 100-200 diameters, should be used to study this group: a binocular dissecting model, which does not invert the image, is strongly recommended for dissection work.

When using the keys, one will often wish to study the venation of both fore and hind wings. In order to move the wings of dried specimens, one can put a droplet of 70% ethanol at the base, which allows the wing to be manipulated with a fine pin or forceps after 5-10 seconds without fear of breakage.

Mounting of dried specimens by pinning allows easy viewing of the ventral surface of the abdomen. Should the legs obstruct the view, they can be moved after treating the joints similarly with a droplet of 70% ethanol. This enables examination of the seventh abdominal sternum of females and of genital plates in the male, both of which can be good diagnostic characters.

To identify males of many genera at specific level, it is necessary to examine the internal male genitalia and sometimes also the sternal apodemes and phragma at the base of the abdomen associated with the drumming apparatus. For these purposes, it is most convenient to damp the wing bases and leg joints with 70% ethanol as mentioned above, hold the micro-pin between the left forefinger and thumb with the ventral surface of the insect outwards and use a mounted micro-pin in order to lever off the entire abdomen. This is a technique that requires some practice and one is thus advised to try it out first on specimens which are not difficult to replace. Sometimes the abdomen is flicked away and use of cardboard box-lid of height 4-5 cm around the hands considerably minimizes the danger of the loss of the abdomen in these circumstances. A box of suitable size to sit on the stage of the dissecting microscope should be chosen.

Subsequent clearing of the abdomen is best performed using an excavated glass slide, covering with two or three drops of 10% aqueous caustic potash (potassium hydroxide) or a mixture of NCS tissue solubilizer and water (in the ratio of 5:1) and a cover slip placed on top: clearance takes place on leaving overnight at room temperature. It must be strongly emphasized that both of these materials are dangerous to handle and extreme care should be taken not to get them into the eyes, which could cause serious damage: the wearing of safety spectacles is strongly recommended. If these materials come into contact with the skin they should be washed off with plenty of water as soon as possible.

NCS solubilizer is a quaternary ammonium base in toluene solution, manufactured by Amersham Corporation, U.S.A. and marketed in the U.K. by Messrs. Hopkin and Williams, P.O. Box 1, Romford RM1 1HA. (*cf.* Le Quesne, 1974). It should always be handled in glass vessels, since it attacks plastic materials such as polystyrene.

Abdomens cleared in aqueous potash are best transferred to a drop of glacial acetic acid for a few minutes and then into lactophenol or clove oil for dissection. Those cleared in NCS solubilizer are best transferred straight into lactophenol.

After dissection, the parts can be mounted on a small strip of card, fixing with a suitable water-soluble glue. For this purpose I have found Gloy children's glue, slightly thinned with water, to be very suitable and superior to gum tragacanth in ensuring that a part is not lost when the pin is jerked.

An alternative technique is to transfer the parts into a minute droplet of glycerol at the bottom of a tiny glass tube, the cork being fixed to the same pin as the polyporus strip. However, it can be tricky finding and removing a small but crucial part, such as a male aedeagus, from such a tube, whereas it is easy to locate such a part on a strip of card and to soak it off with a drop of water on a fine brush.

The sternal apodemes of *Zygina* are particularly tricky to examine, being rather transparent. It is best here to retain the abdomen entire: staining with weak cotton blue-lactophenol helps to visualize the apodemes, which are best seen in ventral view. The bristles of the anal tube are best seen also in the whole abdomen immersed in lactophenol viewed dorsally: it is important to get it at the correct angle.

General adult characteristics

The cells of the fore wings are hyaline, except for the waxy area in the centre of the outer margin. The hind wings are also hyaline. The nomenclature used for the veins and cells of the fore wing is shown in figure 1 and that for those of the hind wing in figure 3: it should be noted that the venation of the fore wing is simpler than in any other Auchenorhyncha. The parts of the face are labelled in figure 2. The external parts of the male genitalia are marked in figure 33 and the internal parts in figure 118: the sternal apodemes and tergal phragma are shown in figure 120. Figure 258 is used to illustrate the parts of the fore body seen from above. Some other parts are labelled in other drawings as indicated in the list below.

The male genitalia have often been regarded as morphologically constant, but this is not always the case and variation has been observed in certain species (*cf.* Le Quesne & Woodroffe, 1976; Le Quesne, 1977b; Knight, 1968). Further cases noted in these keys are *Eurhadina loewii* and *Edwardsiana crataegi*.

It should also be noted that forms with defective genitalia are sometimes found, usually as a result of parasitism, and these cannot always be identified down to species level. Kathirithamby (1974c, 1977, 1979) has discussed some examples, chiefly in the *Eupteryx* genus, in which normal development of the genitalia has been repressed.

A1, first anal vein (1,3)
A2, second anal vein (1,3)
AC, anteclypeus (2)
AE, aedeagus (penis) (118)
AEC, aedeagus connective (118)
AF1, first anal fold (3)
AF2, second anal fold (3)
AN, antenna (2)
AP, appendix (1)
AS, apodeme of second abdominal sternum (120)
AT, anal tube (tenth abdominal segment of male) (33, 118)
AV, anal vein (3)
CCS, corio-claval suture (1)
CE, compound eye (2, 258)
Cl, clavus (1)
Cu, cubital vein (1,3)
CuC, cubital cell (1)
EAC, external apical cell (1)
EAV, external apical vein (1)
FC, frontoclypeus (2)
G, gena (2)
GO, gonopore (145)
GP, gonoplac (ovipositor sheath) (23)
GPL, genital plate (33, 118)
GS, genital segment (male) (33)
IAV, internal apical vein (1)
IM, inner margin (of fore wing) (1)
L, lorum (2)
M, median vein (1,3)
MAV, median apical vein (1)
MC, median cell (1)
MI, median impression (of scutellum) (258)
OC, ocellus (2)
P, pronotum (258)
PA, paramere (style) (118)
PT, phragma of base of third abdominal tergum (120)
PV, peripheric vein (3)
R, radial vein (1,3)
RC, radial cell (1)
SAC, subexternal apical cell (1)
Sc, subcosta (1)
ScC, subcostal cell (1)
ScT, subcostal transverse vein (1)
ScV, subcostal vein (3)
ST, scutellum (258)
VA, valve (33)
VE, vertex (258)
VII, seventh abdominal sternum (50)
WA, waxy area (1)

Use of the keys

The keys are designed to fit the British species and the characters used to define genera and higher groups are not necessarily applicable to non-British species.

Lengths of whole insects are measured from the apex of the vertex to the wing-tips in specimens with the wings folded over the back in the resting position. They have been measured using a graticule in the eye-piece of the microscope.

After each species is keyed out, short notes are given outlining the distribution and host associations, as far as they are known. The months during which the adults of a species have been recorded are represented by Roman numerals: these should not be regarded as exclusive of other parts of the year in our present state of knowledge of the group.

In my earlier handbooks I referred in these notes to the well-established British counties, which have in the past few years suffered substantial changes (based entirely on the distribution of one highly atypical animal species!). In this part I have used, as far as possible, the accepted names of the Watsonian vice-counties, which correlate well with the former county names.

Auchenorhyncha recording scheme

The distribution of most of the species is very imperfectly known, and is partly an indication of areas where collections have been made. A scheme has just been launched by the Biological Records Centre for the mapping of Auchenorhyncha on a 10 km square grid, and it is hoped that this will promote efforts to give firmer distribution maps for those insects. Anyone willing to contribute records should write to Mr. K. R. Payne, 2 West End Lodge, Pinfold Lane, Southport, Merseyside.

Acknowledgements

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Subfamily TYPHLOCYBINAE

This is a large and world-wide subfamily of fragile species. Owing to a problem in allocation of a type-species to the genus *Cicadella* Dumeril, some authors have used the name Cicadellinae for this subfamily, but a decision of the International Commission (1963) regarding this genus has clarified the situation, so that the subfamily Cicadellinae, in its present sense, is described in a previous Handbook (Le Quesne, 1965a).

The tribal classification depends largely on Young (1952), though the Empoascini is here regarded, following Nast (1972), as separate from the Typhlocybini.

Key to tribes

1 Fore wing with distinct appendix (fig. 1). (Two well-defined ocelli present on junction between vertex and face, inside sutures marking boundaries of frontoclypeus (fig. 2). Hind wing with peripheric vein extending around near apex and recurved to meet subcostal vein approximately at level of cross-veins between subcostal and median veins (fig. 3)) ..... **ALEBRINI** (p.9)

— Fore wing without distinct appendix (figs. 37, etc.). (Ocelli often absent; if present, on junction between vertex and face, between lines of sutures making boundaries of frontoclypeus and corresponding eyes) 2

2 Internal apical vein of fore wing curved, reaching inner margin nearer apex of clavus than apex of wing (figs. 161, etc.). (Peripheric vein of hind wing not extending beyond median vein; anal vein of hind wing forked (figs. 243, 390). External apical vein and median apical vein of fore wing arising from common stem) ..... **TYPHLOCYBINI** (p.17)

— Internal apical vein of fore wing straight, terminating almost at apex of wing (figs. 37, 90, 394), parallel (or almost so) with median apical vein 3

3 Peripheric vein of hind wing not extending beyond median vein; anal vein of hind wing simple, not forked (fig. 395). Length of external apical cell of fore wing at most half that of subexternal cell (fig. 394). (In male, paramere terminating in two or more points or rather sharply truncate, with more or less well developed laminar projection of stem (figs. 398, 413, 430)) ..... **ERYTHRONEURINI** (p.32)

— Peripheric vein of hind wing extending beyond median vein to near apex of wing, either ending there (fig. 137) or recurved parallel to costal margin (fig. 38); anal vein of hind wing forked. Length of external apical cell of fore wing more than half that of subexternal apical cell (figs. 37, 57, etc.). (In male, paramere either without laminar projection of stem (figs. 44, 93, 94 etc.) or ending in a single blunt point (figs. 26, 35, 40). In the latter case, the laminar outgrowth may also exhibit a pointed appearance as in fig. 26) 4

4 Peripheric vein of hind wing ending at apex of subcostal vein, which is terminally coalescent with radial vein; median vein simple throughout (fig. 137). (Species always greenish, but this colour often fades after death except on legs) . **EMPOASCINI** (p.12)

— Peripheric vein of hind wing extending round apex and parallel to costal margin, meeting subcostal vein about half-way along; median vein branched apically (fig. 38) ..... **DIKRANEURINI** (p.10)

Tribe ALEBRINI

This tribe only includes one European genus, although represented by a number of genera on the American continent.

Genus **Alebra** Fieber

There are five European species of this genus, of which three are represented in Britain. The British species have been keyed by Le Quesne (1977a).

The three British species cannot be separated on the basis of the male genitalia, and those figured for *A. coryli* will typify all three species. Aedeagus simple, sinuate, as in fig. 15; paramere hooked apically as in fig. 13; genital plate as in fig. 8; genital segment with hooked appendage as in fig. 5.

Key to species

1 External row of spines of posterior tibiae with black points at base. In females, costal cell of fore wing bright yellow; if dark patch present on fore wing, this does not normally nearly reach apex of clavus. Apical cells and apices of cubital and median cells strongly tinged grey. In males, lateral attachments of second sternal apodemes broader and more widely rounded apically (fig. 6). (In most females and some males (particularly parasitized examples), face and vertex uniformly yellowish (One colour form of this species is largely greenish in life, but this colour changes to yellow or orange after death; descriptions here are from dried specimens), pronotum yellowish with two broad orange or red longitudinal streaks, occasionally not well defined; scutellum pale, often with two brownish or orange triangles at base; basal two-thirds of fore wings with two longitudinal hyaline bands, one along median cell and one in clavus adjacent to corio-claval suture; cubital cell and inner part of clavus either yellow or red. In other females, face yellowish or brownish, vertex more or less black-brown posteriorly; pronotum black-brown, pale at sides; scutellum uniformly black-brown; fore wings as above but with more or less well-defined black-brown patch medially. In other males, face, vertex, pronotum, scutellum and basal two-thirds of fore wings uniformly yellowish or orange. Abdomen variable in amount of dark pigmentation) ..... **albostriella** (Fallén)

On oak (on Continent also on alder), common. England, Wales, Scotland, Ireland, vix. Europe, Israel, Jordan, N. Africa, N. America.

— External row of spines of posterior tibiae without distinct dark points at base. In females, costal cell of fore wing hyaline or, more rarely, pale yellow; if dark patch present on fore wing, this normally extends backwards to (or almost to) apex of clavus. Apical cells and apices of cubital and medial cells of fore wing usually more weakly tinged grey. In males, lateral attachments of second sternal apodeme narrower and more pointed apically (figs. 9, 11) 2

2 Vertex narrower; width in ♂♂ 0.71-0.77 mm, ♀♀ 0.78-0.81 mm, more or less square between eyes (fig. 4). Females smaller; overall length 3.8-4.0 mm (males 3.5-3.9 mm). In females, two well-defined longitudinal orange or yellow streaks present on otherwise pale fore wing, one along inner margin and one covering cubital vein; pronotum always with two distinct longitudinal streaks. In male, second sternal apodemes without distinct incisions in inner margins, but with easily overlooked transparent membraneous area basally (fig. 9); first sternal apodeme with aperture narrow, usually pear-shaped, being narrowed at base (fig. 14). (In males, face, vertex and scutellum uniformly orange or yellowish; pronotum similarly coloured or sometimes paler anteriorly and laterally; basal two-thirds of fore wings, and veins apically, more or less deep orange. In females, face and vertex uniformly yellowish; scutellum usually with two orange triangles basally.) ..... **coryli** Le Quesne

On hazel (Corylus). *England: Gait Barrows, N.W. Lancs.; several localities, Bucks.; Headley Warren, Surrey. Wales: Coed-y-Bedw, Glam. vii-x. Netherlands. Switzerland. Channel Isles.*

— Vertex wider; width in ♂♂ 0.78-0.81 mm, ♀♀ 0.81-0.90 mm, distinctly wider than long between eyes (fig. 7). Females larger; overall length 4.1-4.5 mm (males 3.4-3.9 mm). In females, patterns of fore wings various, but if longitudinal orange or yellow streaks are present, that in cubital cell is less clearly defined than that along inner margin. In male, second sternal apodeme with more or less deep incisions in inner margins, surrounded by narrow transparent membraneous area (fig. 11); first sternal apodeme usually with broader, more or less uniformly oval, aperture (figs. 10, 12). (In males, face and vertex uniformly yellowish; pronotum mainly orange, usually rather paler anteriorly and laterally, and sometimes also with pale median longitudinal streak; basal two-thirds of fore wings, and veins apically, more or less deep orange. In females, face uniformly yellowish or light brownish, vertex usually coloured similarly, but occasionally with dark median streak posteriorly. Most females with pronotum pale, with or without two orange or light brownish longitudinal streaks; scutellum pale, with or without orange or brownish basal triangles. Dark females with pronotum widely black-brown, sometimes with pale median streak; scutellum widely marked black-brown. Fore wings of females broadly yellow, pink or orange along inner margin, usually also streaked narrowly yellowish or orange on or alongside cubital vein; in dark specimens also with broad black-brown patch medially) ..... **wahlbergi** (Boheman)

On elm (Ulmus *spp.), sycamore, maple* (Acer), *horse-chestnut* (Aesculus), *lime* (Tilia) *and other trees. England as far N. as S. Lancs and N. Lincs. Wales: Glam. vii-ix. Europe.*

Tribe DIKRANEURINI

This tribe is now regarded as represented by eight genera in Europe, of which five occur in Britain.

Key to genera

1 In male, genital plates broader than long, only about one-third to one-half as long as preceding sternum, overlapping each other apically (fig. 20); aedeagus branched, with two gonopores (figs. 21, 22). In female, seventh abdominal sternum deeply excised medially, leaving base of gonoplacs exposed (fig. 23) ..... **Notus** Fieber (p.11)

— In male, genital plates generally longer than broad, usually longer than preceding sternum, not overlapping each other apically; aedeagus simple or branched, but with only one gonopore. In female, seventh abdominal sternum not excised medially, base of gonoplacs not exposed (figs. 27, 50, 56) 2

2 In male, genital plates widely separated, with concave inner margins (figs. 44, 47). In female, seventh abdominal sternum divided into three lobes by deep incisions (figs. 50, 56) ..... **Forcipata** De Long & Caldwell (p.11)

— In male, genital plates with contiguous straight inner margins (e.g. fig. 30). In female, seventh abdominal sternum entire (fig. 27) 3

3 General shape squat—overall length 3 to 4 times width of pronotum. Area of fore wing beyond transverse veins broader than long (fig. 43) ..... **Erythria** Fieber (p.12)

— General shape slender—overall length substantially more than four times width of pronotum. Area of fore wing beyond transverse veins longer than broad (fig. 37) 4

4 Pronotum somewhat broader than vertex (fig. 18); a line joining posterior angles of eyes would pass completely across anterior half of pronotum. In side view, compound eye about as high as long (fig. 31). In male, genital segment with strongly developed curved teeth, directed backwards (fig. 33); aedeagus with strongly developed bifurcate process, with base remote from gonopore (figs. 32, 36, 39). (Face, vertex, pronotum, scutellum and fore wings yellowish, unmarked) ..... **Emelyanoviana** Anufriev (p.12)

— Vertex (including eyes) somewhat broader than pronotum (fig. 19); a line joining posterior angles of eyes would pass approximately through centre of pronotum. In side view, compound eye distinctly longer than high (fig. 25). In male, genital segment with more weakly developed tooth directed upwards (fig. 24); aedeagus with smaller apical appendages, with bases situated close to gonopore (figs. 28, 29) ..... **Dikraneura** Hardy (p.12)

Genus **Notus** Fieber

In Britain we have one of the two European species.

Face, vertex, pronotum, scutellum and basal two-thirds of fore wings uniformly bright yellowish; fore wings hyaline apically, with veins yellow, vertex rounded anteriorly in male (fig. 16), more sharply pointed in female (fig. 17). Abdomen largely blackish above. Overall length: ♂ ♀ 3.5-4.1 mm ..... **flavipennis** (Zetterstedt)

On Carex *spp., including* flacca *von Schreber,* acutiformis *Ehrhart and* rostrata *Stokes, locally common in base-rich habitats. v-ix. England. Wales. Scotland. Ireland. Palaearctic and Nearctic Regions.*

Genus **Forcipata** DeLong and Caldwell

This genus includes five European species, two of which are found in Britain.

Key to species

1 In male, genital plates much longer than preceding sternum, in dorsal view terminating in two fairly sharp teeth directed inwards (fig. 44), in lateral view tapering to a point (fig. 45): apex of aedeagus seen from behind narrow apically (fig. 49), in side view making approximately right angle with adjacent part of stem (fig. 48). In female, median lobe of seventh abdominal sternum approximately as long as or slightly longer than broad (fig. 50). (Face, vertex, pronotum, scutellum and fore wings yellowish, without distinct markings. Overall length: ♂ ♂ 3.0-3.3 mm; ♀ ♀ 3.4-3.6 mm.) .. **citrinella** (Zetterstedt)

On Carex *spp., and grasses in damp places, locally common, vi-ix. England. Wales. Scotland. Ireland. Palaearctic and Nearctic Regions.*

— In male, genital plates not or hardly longer than preceding sternum, in dorsal view terminating in two blunter teeth, one apical and one on outer margin (fig. 47), in lateral view truncate, with apical margin distinctly concave (fig. 46): apex of aedeagus seen from behind broadened like rose of watering-can (fig. 52), in lateral view making acute angle with adjacent part of stem (fig. 51). In female, median lobe of seventh abdominal sternum distinctly broader than long (fig. 56). (Face, vertex, pronotum, scutellum and fore wings yellowish, sometimes tinged greenish in fresh specimens or brownish in dried ones, without distinct markings. Overall length: ♂ ♀ 3.4-3.8 mm.) .... **forcipata** (Flor)

In damp areas, presumably associated with Carex *or grasses, usually in woodland, local. England. Scotland: Perths. vii, ix. Europe and eastwards to Mongolia.*

Genus **Dikraneura** Hardy

In its present restricted sense, there are only two European species, one of which occurs in Britain. The genus has been monographed by Knight (1968), in which he figured the extent of variation in *D. variata,* among other species.

Face, vertex, pronotum, scutellum and fore wings rather dirty greenish, occasionally turning to a reddish brown colour, especially in overwintering specimens. Vertex normally with a paler longitudinal streak. In male, apex of paramere as in fig. 26; genital plates as in fig. 30; aedeagus as in figs 28, 29. In female, seventh abdominal sternum as in fig. 27. Overall length: ♂ ♀ 2.8-3.4 mm ..... **variata** Hardy

On grass often in heathy areas. England. Wales. Scotland. ii-x. Palaearctic and Nearctic regions.

Genus **Emelyanoviana** Anufriev

Both European species of this recently erected genus have been found in Britain. *E. contraria* was added to the British list by Woodroffe (1972).

Key to species

1 Smaller—overall length: ♂ ♀ 3.2-3.6 mm. In male, aedeagus with paired appendages directed backwards, as in figs. 32, 34: paramere with apical spine more elongate (fig. 35). In both sexes, abdomen largely dark dorsally. Female with apex of gonoplac narrowly dark in mature specimens ..... **mollicula** (Boheman)

On calcareous soils, has been bred from Betony (Betonica officinalis *L.), also associated with* Primula, Plantago, Calamintha *and* Verbascum, *and perhaps* Origanum. *England. Scotland to Kincardines. Ireland. iv, vi-x. Europe, N. Africa, and eastwards to Altai Mountains.*

— Larger—overall length: ♂ ♀ 3.6-3.9 mm. In male, aedeagus with large paired appendages curved round, apically directed towards gonopore, as in figs. 36, 39: paramere with apical spine shorter (fig. 40). Female with abdomen and gonoplac entirely pale. In male, abdomen broadly banded with black ..... **contraria** (Ribaut)

On rock-rose (Helianthemum). *Scotland: Marron, near Braemar, Aberdeens. England: Selside, Ribblesdale, Mid-West Yorks. vii. France. Austria.*

Genus **Erythria** Fieber

Only one of the six European species has been reported from Britain.

Frontoclypeus light brown with divided dark horizontal streaks in lower part and an oval pattern in upper part, genae and anteclypeus usually more or less widely dark, face in general more darkly patterned in male. Vertex, pronotum and scutellum dull yellowish or light brown with darker markings as in figs. 53, 54. Fore wings greyish or greenish grey, without distinct markings. Abdomen mainly blackish. In male, aedeagus as in figs. 41, 42; genital segment with apical processes as in fig. 55. Overall length: ♂ ♂ 2.1-2.4 mm; ♀ ♀ 2.4-2.7 mm. ..... **aureola** (Fallén)

On mixed Carex *and* Calluna *on moorland. Scotland: Forres and Findhorn, Morays. Most of Europe.*

Tribe EMPOASCINI

This tribe was regarded as part of the Typhlocybini by Young (1952), although based on a group separated by Distant (1908).

Key to genera

1 All three apical veins of fore wing arising from median cell (fig. 66). In male, anal tube with anterior appendage short, not much longer than broad (figs. 67, 87). (Genital segment of male with spine-like appendage from ventral margin (figs. 69, 88). Margins of abdominal sterna developed in double curves as in fig. 68.) 2

— Only internal apical vein of fore wing arising from median cell, other two apical veins arising from radial cell (figs. 57, 90, 91). Anal tube of male with anterior appendages considerably longer than broad (figs. 61, 71, 112 etc.) 3

2 Anterior margin of vertex rounded; vertex hardly longer medially than near eyes (fig. 85). Fore wing with small blackish spot at apex of cubital cell. In male, paramere more sharply narrowed apically (fig. 83); genital plate more elongate (fig. 141) ..... **Kyboasca** Zakhvatkin (p.14)

— Vertex distinctly longer medially than near eyes (fig. 84). Fore wing without dark spot at apex of cubital cell. In male, paramere only slightly narrowed at apex (fig. 63); genital plate relatively broader, with inner margin distinctly bent apically (fig. 138) ..... **Austroasca** Lower (p.13)

3 Vertex almost equally long throughout (fig. 89). The two apical veins joining radial cell of fore wing meeting at or before union with latter (making subexternal apical cell triangular) (fig.90). Genital plates of male with numerous fine spines in regular series (fig. 95); parameres curved towards apex with row of teeth on outside of curve (fig. 93). (Genital segment of male with spine-like appendages from ventral margin (figs. 127, 129, 131). Some darker markings usually present, especially on abdomen. Overall length at least 3.9 mm.) ..... **Kybos** Fieber (p.15)

— Vertex distinctly longer in middle than at sides (figs. 58, 92). The two apical veins joining radial cell of fore wing separate throughout (making subexternal apical cell quadrilateral (figs. 57, 91)). Genital plates of male with few or no fine spines (fig. 96); parameres curved towards apex with a row of teeth on inside of curve (fig. 94) or without teeth (fig. 62). (Uniformly green without darker markings) 4

4 Fore wings with subcostal cell shorter than cubital cell (fig. 57). Insect short and relatively broad: overall length: ♂♀ 2.7-3.1 mm. Genital segment of male without long appendages. (Anal tube of male with long appendages (fig. 61); aedeagus with long appendages (figs. 59, 60); apex of paramere without fine teeth (fig. 62)) ..... **Chlorita** Fieber (p.14)

— Fore wings with subcostal cell and cubital cell about equally long (fig. 91). Insect more elongate; overall length ♂♀ 3.1-4.1 mm. Genital segment of male with long spiniform appendages from ventral surface (figs. 80, 81, 86). (Anal tube of male with moderately long appendages (figs. 71, 75, 77): aedeagus simple, without appendages (figs. 72, 73, 78, 79); apex of paramere with row of teeth on inside of curve (fig. 94) ..... **Empoasca** Walsh (p.14))

Genus **Austroasca** Lower

This genus is closely related to *Kyboasca* Zakhvatkin, the two genera having been separated by Dworakowska (1973). As defined at present, we have one of the two European species in Britain.

— Head, pronotum and scutellum greenish with more or less definite white spots. Fore wings with a yellow longitudinal band in the clavus and in each of the discal cells; apical cells fumose. In male, abdomen dorsally with more or less definite dark spots; appendages of genital segment as in fig. 69; apex of paramere as in fig. 63; aedeagus as in figs. 64, 65. Overall length: ♂ 4.1 mm ..... **vittata** (Lethierry)
Single specimen by sweeping (recorded in Europe from Artemisia absinthium *L.). England: Osterley Park, Middlesex. xi. Europe. Siberia. China. Korea. Japan.*

Genus **Kyboasca** Zakhvatkin

As defined at present, this genus contains one European species which has only very recently been found in Britain (Wilson, 1979). This genus is associated with trees, while *Austroasca* occurs on low plants.

— Face and vertex brownish-olive, face without distinct markings, vertex usually with two small round, somewhat darker spots, pronotum and scutellum greenish, usually with some yellowish marblings. Fore wings uniformly greenish except for small dark spot near apex of cubital cell. In male, appendage of genital segment as in fig. 88; aedeagus as in fig. 82. Overall length: ♂ ♀ 3.6-4.0 mm ..... **bipunctata** (Oshanin)
On English elm (Ulmus procera *Salisb.*). *England: Mitcham, Surrey; Otford, W. Kent. vii. Most of Europe. Siberia. China.*

Genus **Chlorita** Fieber

In Britain we have only one out of about 28 European species.

General colour green; fore wings uniformly green in basal two-thirds, more or less fumose apically. In male, aedeagus with a pair of recurved appendages, longer than main stem, without tooth along outer margin (figs. 59, 60); base of abdomen as in fig. 70
..... **viridula** (Fallén)
On Artemisia maritima *L. England: Seasalter, Sheppey and Oare, E. Kent; Benfleet, S. Essex. vii, ix. Europe. N. Africa, Siberia.*

Genus **Empoasca** Walsh

This genus in its restricted sense (cf.Le Quesne, 1961) includes three British species out of the ten European ones listed by Nast. *E. pteridis* has been included on the British list by China (1938, 1943), but the only undoubted British examples have been taken recently in Chelsea Physic Garden, though I have also taken it in the Channel Isles. For this reason I am loath to regard it as being synonymous with Curtis' *solani,* as Nast (1972) and Metcalf (1968) do in their check-lists, especially since I have taken both the other species in Britain on potato.

Key to species

1 Median cell of fore wing hyaline, rest of wing greenish, at least in basal two-thirds. In male, anal tube anteriorly with smoothly curved appendages making S-shaped profile to anterior margin (fig. 71). (In male, aedeagus as in figs. 72, 73; sternal apodemes moderately elongate and smoothly curved apically as in fig. 74; appendage of genital segment as in fig. 81. Overall length: ♂♂ 3.1-3.8 mm; ♀♀ 3.4-4.0 mm) . **vitis** (Göthe)
Common, especially on trees and bushes, hibernating as adult in conifers, holly and ivy. England. Wales. Scotland. Ireland.
— Basal two-thirds of fore wings uniformly greenish. In male, anal tube anteriorly with appendages curved in opposite direction and rugose below towards apex (figs. 75, 77)
..... 2
2 In male, appendage of genital segment acuminate and with sharp tooth above (fig. 80). Anal tube with second well-defined projection posterior to main appendage (fig. 77). (Overall length: ♂♂ 3.1-3.3 mm) ..... **pteridis** (Dahlbom)
Only recorded from Britain with certainty from Chelsea Physic Garden, London; also from Jersey, Channel Isles. Europe. N. Africa. Mongolia.

— In male, appendage of genital segment acuminate, but without other sharp tooth (fig. 86). Anal tube merely with obtuse projection posterior to principal appendage (fig. 75). (In male, aedeagus as in figs. 78, 79; sternal apodemes very elongate and rather truncate apically (fig. 76). Overall length: ♂ ♀ 3.5-4.1 mm.) ..... **decipiens** Paoli
Common by sweeping lower plants, e.g. nettle and raspberry, occasionally on trees. England, as far N. as N.E. Yorks. Wales: Caerns. Ireland: Co. Clare. vi, viii-xi. C. and S. Europe. N. Africa. W. Asia.

Genus **Kybos** Fieber

In a recent monograph of the Palaearctic species of this group, Dworakowska (1976) has recognised 22 European species, of which eight are found in Britain. Seven of these were keyed by Le Quesne (1961), while Dworakowska has added *K. calyculus* to the British list in her paper. Dworakowska now regards *Kybos* as a subgenus of *Empoasca,* but I prefer to follow Nast's check-list and keep the genera distinct.

Males and females are keyed separately below: females cannot always be recognized with certainty. In the drawings of abdomens of males, the phragma of the third abdominal tergum is shaded with diagonal lines and the apodeme of the second abdominal sternum by dotting.

Keys to species
Males

1 Aedeagus simple, without horn-like appendages (figs. 121, 125, 126). Fore wings with corio-claval suture not darkened. (Appendages of anal tube long and thin (figs. 124, 132)) 2
— Aedeagus with a pair of horn-like appendages (figs. 108, 110, etc.). Fore wings usually with corio-claval suture darkened 4
2 Appendages of ventral surface of genital segment acuminate, regularly tapered towards apex (figs. 127, 129). A broad dark band present on fore wing against inner margin. (On *Salix* spp.) 3
— Appendages of ventral surface of genital segment swollen towards apex, with spoon-shaped incision near apex (fig. 131). No dark band present on fore wing. (Face, vertex, pronotum and scutellum in mature examples greenish, otherwise without distinct markings, except for a pair of somewhat darker spots on the vertex of some specimens. Sternal apodemes well developed as in fig. 122. Teneral specimens often tinged reddish. Overall length 4.3-4.8 mm.) ..... **populi** (Edwards)
On Populus *spp. (poplars and aspen). England: N.E. and Mid-W. Yorks, S. Lancs., E. Glos., Oxon., Bucks., Middlesex, Surrey, N. Hants., S. Wilts. vii-x. Europe. Siberia.*
3 Phragma of base of third abdominal tergum with two large lobes, longer than abdominal segment (fig. 120). Aedeagus not cut off truncately at widest part (fig. 125). (Face greenish or brownish, sometimes with paler median streak. Vertex greenish, sometimes with two somewhat darker spots. Pronotum anteriorly and at sides greenish; scutellum and rest of pronotum brownish-grey, often with pale longitudinal streak. Overall length 4.0-4.3 mm) ..... **butleri** (Edwards)
On Salix repens *L.* cinerea *L.* caprea *L. (sallows and dwarf sallow) and* pentandra *L. (bay willow). England: S.W. and Mid-W. Yorks, S. Lancs., Bucks., E. Kent, N. Hants. Wales: Glam., Carms. vii-ix. Europe. Siberia. Colorado (probably introduced).*
— Phragma of base of third abdominal tergum narrower, its length about half that of abdominal segment (fig. 119). Aedeagus broadly truncate at widest part (fig. 121). (Face greenish or brownish. Vertex greenish, sometimes with two somewhat darker spots, pronotum and scutellum usually rather greyish green, sometimes with pale longitudinal streak. Overall length 3.9-4.3 mm.) ..... **rufescens** (Melichar)
On Salix pupurea *L. (purple osier) and some hybrid and garden willows. England: mid-W. & N.W. Yorks., S. Lancs., Cambs., Bucks. vii-ix. Europe. Mongolia.*

4 Appendages of aedeagus seen from behind approximately parallel to each other (fig. 110) 5

— Appendages of aedeagus seen from behind very distinctly divergent at base (figs. 108, 128) 6

5 Apodeme of second abdominal sternum shorter, with its posterior margin gently curved, not divided by sharp incision in middle (fig. 105). (Face brownish or greenish, often with pale median longitudinal streak. Vertex greenish. Pronotum and scutellum greenish, with pale median longitudinal streak, broadly edged brownish. Aedeagus as in figs 109, 110. Appendages of anal tube broad, with or without thin spine at apex (fig. 113). Overall length 4.0-4.4 mm.) ..... **smaragdula** (Fallén)

On Alnus *(alder), also reported from birch and* Salix *in Scotland (Woodroffe, 1974). England. Wales. Scotland. Ireland. vi-ix. Europe. Siberia.*

— Apodeme of second abdominal sternum longer, with posterior margin divided into two rounded lobes by deep median incision (fig. 111). (Face brownish or greenish, often with pale median longitudinal streak. Vertex greenish, often with two greyish spots. Pronotum anteriorly and at sides greenish; scutellum and rest of pronotum brownish grey, often with pale median longitudinal streak, especially in females. Appendages of anal tube broad basally, suddenly narrowed to thin spine at apex (fig. 134). Overall length 4.0-4.4 mm.) ..... **betulicola** (Wagner)

On Betula *spp. (birch). England: S.E., N.E. and Mid-W. Yorks., S. and W. Lancs., Bucks, Berks., N. Somerset. Wales: Glam. Scotland: Midlothian (Edinburgh), Clyde Isles, Easterness. Ireland: Co. Clare (?). vii-ix. Netherlands. Germany. Scandinavia. British Colombia (introduced).*

6 Appendages of anal tube broad basally, often suddenly narrowed to thin spine towards apex (fig. 112). Apical part of aedeagus usually with more or less well developed irregular serrate projections (figs. 107, 108, 136). Apodemes of second abdominal sternum shorter (fig. 106) 7

— Appendages of anal tube narrow throughout (fig. 133). Apical part of aedeagus without serrate projections (figs. 128, 130). Apodeme of second abdominal sternum longer (fig. 123). (Face greenish, often with pale median longitudinal streak. Vertex greenish, sometimes with two darker spots, pronotum anteriorly and at sides greenish; scutellum and rest of pronotum greyish brown, often with pale median longitudinal streak. Overall length 4.0-4.5 mm.) ..... **virgator** (Ribaut)

On Salix alba *L., (white willow),* S. pentandra *L. (bay-leaved willow) and* S. fragilis *L. (crack willow). England: Mid-W. Yorks., S. Lancs., Middlesex, Bucks., Berks., S. Wilts. vii-ix. Europe. Mongolia.*

7 Stem of aedeagus above appendages seen from behind more or less broadened towards apex, with crests normally visible; in side view, stem above appendages more broadened (figs. 107, 108). (Face greenish or brownish, often with pale median longitudinal stripe. Vertex greenish, often with two greyish spots. Pronotum anteriorly and at sides greenish; scutellum and rest of pronotum grey-brown, usually with pale median longitudinal streak. In male, appendage of anal tube usually narrowed to thin spine towards apex (fig. 112). Overall length 4.2-4.7 mm) ..... **strigilifer** (Ossiannilsson)

On Salix caprea *L. and* S. cinerea *L. (sallows). England: Mid-W. Yorks., Oxon., Bucks., Middlesex, E. Kent, Berks. Wales: Montgomerys. Scotland: Midlothian (Edinburgh). Ireland: Co. Clare. vi-viii, x. N. and C. Europe.*

— Stem of aedeagus above appendages seen from behind not at all broadened towards apex; crests, if present, only visible in side view, in which stem above appendages is narrower and more smoothly tapering (figs. 135, 136). (Face greenish, without distinct markings. Vertex greenish, with two greyish spots. Pronotum and scutellum greenish with indistinct brownish marblings and tendency towards paler longitudinal median streak. Corio-claval suture of fore wings not darkened; inner margin extremely narrowly darkened. Appendages of anal tube without thin spine apically (fig. 140). Overall length 4.2 mm.) ..... **calyculus** (Cerutti)

On birch (Betula *spp.), rare. England: Burnham Beeches, Bucks.; London. viii. Switzerland. Poland.*

Females

(For fuller description of colour-pattern and distribution notes see key to males above.)

1 Posterior margin of seventh abdominal sternum with long tongue-like median projection (figs. 99-104, 114-117). Fore wings usually darkened either along corio-claval suture or along inner margin (or both) 2

— Posterior margin of seventh abdominal sternum more or less evenly rounded, without tongue-like projection (figs. 97, 98). Fore wings not darkened along corio-claval suture or along inner margin. Overall length 4.3-4.8 mm. ..... **populi** (Edwards)

2 Fore wings with distinct dark band along inner margin; corio-claval suture not darkened. Seventh abdominal sternum as figs. 101-104. Overall length 4.3-4.9 mm. ..... **rufescens** (Melichar) or **butleri** (Edwards)

— Fore wings either with corio-claval suture darkened or without dark band along inner margin 3

3 Tongue-like projection of seventh abdominal sternum longer than broad in ventral view, almost parallel-sided (figs. 117, 116). (Fore wings with corio-claval suture darkened; inner margin sometimes faintly darkened. Overall length 4.1-4.7 mm.) ..... **smaragdula** (Fallén) or **betulicola** (Wagner)

— Tongue-like median projection of seventh abdominal sternum broader at base than long, with sides more divergent (figs. 99, 100, 114, 115, 139). (Fore wings with or without corio-claval suture darkened. Overall length 4.2-4.8 mm.) ..... **virgator** (Ribaut) or **strigilifer** (Ossiannilsson) or **calyculus** (Cerutti)

Tribe TYPHLOCYBINI

The majority of British Typhlocybine species belong to this tribe. It is now regarded as including fourteen European genera, of which eleven are represented in Britain.

Key to genera

1 Radial and subcostal veins of hind wing distinct throughout (fig. 243) 2

— Radial and subcostal veins of hind wing coalescent before apex (fig. 390) 4

2 Face in side view with front margin and lower margin both almost straight with rather sharp angle between them (fig. 147). (Whole insect with characteristic, rather flattened appearance. Vertex either pale, unmarked or uniformly dark brown posteriorly, often becoming paler anteriorly, but without any well-defined blackish markings. External apical vein of fore wing often covered medially by distinct dark brown spot or streak; transverse vein at apex of subcostal cell covered by dark streak. Head (including eyes) distinctly narrower than pronotum (fig. 144). Fore wings broader medially than in apical part (figs. 142, 143 etc.) ..... **Eurhadina** Haupt (p.18)

— Face more or less smoothly curved in side view 3

3 Head (including eyes) distinctly narrower than pronotum (figs. 232, 237). (Vertex, pronotum and scutellum, either uniform whitish or olive-green, with at most rather indistinct brownish markings. Fore wings not distinctly widened medially (fig. 235). Overall length 3.9-4.7 mm) ..... **Aguriahana** Distant (p.24)

— Head (including eyes) approximately same width as pronotum or somewhat wider (figs. 228, 241, etc.). (In most species, vertex and pronotum with distinct black markings. Overall length often less than 3.9 mm) ..... **Eupteryx** Curtis (p.20)

4 Pronotum with three or more black spots (figs. 284, 285, etc.), rarely black posteriorly or entirely black 5

— Pronotum pale or red-brown, unmarked or with a single dark dot in middle of anterior margin 6

5 Pronotum with distinct oval spot medially and two large black spots on either side (fig. 284); sometimes other smaller paired spots present ..... **Eupterycyba** Dlabola (p.26)

— Pronotum without median spot (figs. 285, 286, 288) or rarely with rather unclearly delimited dark streak (fig. 289). (In male, paramere apically with two projections, the longer being almost parallel with the stem and the shorter almost at right angles to it (fig. 276); genital plates rather flattish, with apical margin excised (fig. 272). In female, seventh abdominal sternum elongate, posterior margin forming three obtuse angles (fig. 270)) ..... **Linnavuoriana** Dlabola (p.26)

6 Fore wing with black or dark brown streaks at apices of internal apical, external apical and subcostal transverse veins (fig. 265); basal half of fore wings pale yellowish or greenish, sometimes with hyaline streak, otherwise unmarked; apical part also with some greyish suffusion. In male, aedeagus with paired long appendages emanating from near base and gonopore at apex of median stem (figs. 260, 264, etc.) . **Ribautiana** Zakhvatkin (p.24)

— Fore wing either without markings or marked differently from above. In male, either gonopore near base of short stem of aedeagus with paired appendages on either side (fig. 325) or aedeagus with (figs. 315 etc.) or without a single long appendage emanating near base 7

7 Overall length greater: ♂♂ 4.0-4.4 mm; ♀♀ 4.2-4.8mm. In male, aedeagus with stem short and paired curved appendages on either side of gonopore (figs. 325, 326). (In female, seventh abdominal sternum rounded apically, with longitudinal median bar standing out in relief (fig. 307)) ..... **Ossiannilssonola** Christian (p.27)

— Overall length usually shorter: ♂♂ usually less than 4.0 mm; ♀♀ usually less than 4.2 mm. In male, aedeagus either without appendages or with long stem, with or without long appendage emanating near base 8

8 Fore wings either with two broad transverse black bands extending to costal margin (fig. 313) (which are sometimes more or less widely united, covering all or most of fore wing except apical part (figs. 316, 317)) or with three brick-red (or orange) spots in clavus (fig. 310) ..... **Typhlocyba** Germar (p.27)

— Fore wings without broad transverse black bands (if dark markings are present, they do not reach costal margin) and without series of distinct reddish or orange spots in clavus . 9

9 Fore wing yellow basally, more or less widely hyaline along costal margin, with apical area strongly smoke-grey, with apical and transverse veins narrowly bordered yellow. Dorsal surface of abdomen largely blackish (except in teneral specimens). In male, aedeagus with single long appendage emanating near base (figs. 315, etc.) ..... **Lindbergina** Dlabola (p.27)

— If apical area of fore wing smoke-grey, apical and transverse veins not pale-bordered. Dorsal surface of abdomen largely or wholly pale. In male, aedeagus without long appendage emanating near base 10

10 In male, paramere with sharp tooth inwardly and one or two longer sharp projections outwards (figs. 329, 333); genital plates stouter in side view (figs. 297, 299); aedeagus simple, without appendages (figs. 330, 334). In female, seventh abdominal sternum triangular, narrowly pointed apically (figs. 302, 303); ovipositor stout, its lower margin with apex not recurved (figs. 296, 298) ..... **Fagocyba** Dlabola (p.28)

— In male, paramere ending in a single point, but with no other sharp teeth or projections (fig. 385); genital plates narrower in side view (fig. 301); aedeagus with two or more appendages (figs. 355-372, etc.). In female, seventh abdominal sternum usually more or less semicircular (figs. 304-306), sometimes obtusely pointed at apex (fig. 309); ovipositor narrower, its lower margin with distinct double curve in form of letter "S" (figs. 300, 308) ..... **Edwardsiana** Zakhvatkin (p.28)

Genus **Eurhadina** Haupt

Five out of the seven recognized European species have been recorded from Britain. Of these, *E. kirschbaumi* (Woodroffe, 1971a) and *ribauti* (Claridge and Wilson, 1976, 1978a) have only been found here in recent years.

Dlabola (1967) has described *untica* as a species differing from *loewii* by the absence of branching of the upper appendage; however, specimens with and without a short spine on this appendage occur together in some populations in Britain and the Netherlands and I therefore regard this as variation within the species *loewii*.

The presence or absence of a clear oval patch surrounding the dark streak of the external apical vein has been used by Dworakowska (1969) as a distinguishing character between *ribauti* and *concinna,* but is present in males of British and Channel Island specimens of both species.

Key to species

1 More or less round or oval blackish spot present along external apical vein of fore wing (figs. 142, 143) 2

— Narrow linear streak present or absent along external vein of fore wing (figs. 168, 169) . 3

2 Dark spot across external apical vein of fore wing larger, its diameter greater than length of unmarked part of external apical vein basal to it (fig. 142). Ground colour variable, often bright yellow, fore wings sometimes widely pinkish; pronotum, scutellum and fore wings often more or less widely marked with black-brown. In male, aedeagus as in figs. 151, 153. (Face pale, in dark specimens with some rather indistinct greyish markings. Fore wings in paler specimens with two narrow dark transverse lines reaching costa, one reaching inner margin and widely greyish area apically. Overall length: ♂♂ 3.7-4.0 mm; ♀♀ 4.0-4.4 mm) ..... **pulchella** (Fallén)

Normally on oak, occasionally on other trees. England. Wales. Scotland, as far N. as E. Sutherland. Ireland. vii-x. Europe. Siberia. Japan. N. Africa.

— Spot across external cell usually smaller, its diameter often less than length of unmarked part of external apical vein basal to it (fig. 143). Face, vertex, pronotum and scutellum whitish or light yellowish; fore wings whitish, except for two narrow dark transverse lines reaching costa, one reaching inner margin and some light brownish patches in apical cells. In male, aedeagus as in figs. 148, 154. (Overall length: ♂♂ 3.6-3.9 mm; ♀♀ 3.8-4.4 mm) ..... **kirschbaumi** Wagner

Very local on Quercus petraea *(sessile oak). England: East Malling, Kent. Wales: Blackmill, Pentrebach, Trehafod and Coed-y-Bedw, Glam. viii. Most of Europe.*

3 External apical vein of fore wing without distinct marking. Fore wing usually with broad black-brown longitudinal streak extending across basal two-thirds of corio-claval suture and curving round to meet costal margin just behind waxy area (fig. 169), occasionally absent, especially in teneral specimens. In male, aedeagus with upper appendages normally simple, sometimes with short spine visible in side view (figs. 152, 145), upper appendages approximately as long as long as lower appendages. In female, overall length 4.3-4.7 mm (♂♂ 4.0-4.3 mm). (Face light brownish-yellow, without distinct markings. Vertex, pronotum and scutellum yellowish, sometimes with some indistinct brownish markings. Fore wing with narrow transverse dark line reaching costa and another reaching inner margin at base of apical cells; apical cells hyaline, occasionally with a little brownish suffusion) ..... **loewii** (Then)

On sycamore, rarely on field maple. England: Mid-W. Yorks, W. Lancs., Westmorland and most southern counties. Wales: Glam. vi-ix. Most of Europe.

— External apical vein of fore wing with narrow dark streak of variable length, rarely completely absent (fig. 168). Fore wing without broad black-brown longitudinal streak, but with two narrow transverse dark lines reaching costa and another reaching inner margin. In male, aedeagus with upper appendages either dividing into three branches (figs. 150, 155) or much shorter than lower appendages (figs. 146, 149). In females, overall length 3.7-4.1 mm (♂♂ 3.5-4.1 mm). (Face, vertex and scutellum light yellowish, without distinct markings; scutellum yellowish or more or less widely grey-brown; apical cells with brownish suffusion, leaving some clear areas, normally including oval patch surrounding dark streak of external apical vein.) 4

4 In male, aedeagus with upper appendages more or less equal in length to lower appendages, with three branches (figs. 150, 155) ..... **ribauti** Wagner

On oak, elm and alder, rare. England: Burnham Beeches, Bucks; Chenies, Herts; Botley Wood, S. Hants. Wales: Roath Park, Cardiff, Glam. vii. N. and C. Europe. Cyprus.

— In male, aedeagus with upper appendages about half length of lower appendages, with (or rarely without) single rather fine spine forming a second branch (figs. 146, 149) ..... **concinna** (Germar)

On oak, occasionally on birch, beech, Nothofagus *and alder, widespread and fairly common. England. Wales. Scotland. vi-x. Europe. N. Africa.*

Genus **Eupteryx** Curtis

This genus includes sixteen British species out of the 39 European ones listed by Nast. *E. origani* has been added (Le Quesne, 1974) since the 1964 check-list. On the other hand, *E. simplex* is here regarded as a synonym of *E. cyclops* Matsumura: it is clearly based on a deformed specimen. Moreover, *E. gallica* appears to have been added to the British list due to a cataloguing error: I can find no evidence that it really has been found here. A study of Flor's type material by Vilbaste (1973) has shown that the species long regarded as *collina* must now be named *florida* Ribaut.

Insects of this genus are found on plants of several families (nettles, Labiates, Malvaceae, etc.) which have glandular hairs on their leaves.

Key to species

1 Pronotum and scutellum without blackish markings (except possibly for dark line along median impression of scutellum) 2

— Either pronotum or scutellum (or both) with distinct blackish markings or wholly blackish 4

2 More or less extensive black-brown spot across or against radial vein of fore wing immediately posterior to waxy area (fig. 161). (Clavus of fore wing often with a large dark spot about half-way along inner margin, otherwise without distinct markings. Vertex with or without two black or greyish round spots. Face entirely pale except usually for small dark patches at base of antennae. In male, aedeagus as in figs. 163, 165; appendage of side of genital segment as in fig. 166. Overall length: ♂♂ 3.2-3.6 mm; ♀♀ 3.4-3.7 mm) ..... **signatipennis** (Boheman)

Locally common, on Filipendula ulmaria *(L.) (meadow-sweet). England. Wales. Scotland. Ireland. vi-ix. N. and C. Europe.*

— No well-defined dark spot present across or against radial vein of fore wing. (Clavus with or without small dark dots) 3

3 Larger: overall length ♂♀ 3.3-3.9 mm. Basal two-thirds of fore wing golden yellow, without dark markings; apical area uniformly smoky grey. In males, aedeagus as in figs. 244, 245. (Face light yellowish; frontoclypeus sometimes dark-edged, rarely with some greyish suffusion. Length of vertex about two-thirds of its width between eyes (fig. 228). Vertex, pronotum and scutellum uniformly yellowish. Abdomen mainly blackish above.) ..... **filicum** (Newman)

On ferns, including Polypodium vulgare *L., local. England: Notts., E. Glos., London, E. Kent, S. Hants, Dorset, N. Somerset, N. Devon, W. Cornwall. Wales: Glam. Ireland: Co. Clare. vi, ix, x. C. and S. Europe. Azores. Madeira.*

— Smaller: overall length: ♂♂ 2.6-2.9 mm; ♀♀ 2.8-3.2 mm. Fore wings pale yellowish green, with more or less well developed dark streaks in corium and clavus, some dark dots also often present in clavus; grey patches present in apical cells (figs. 231). In males, aedeagus as in figs. 233, 238. (The thin appendages usually adhere to sides of aedeagus in dry-mounted dissections). (Face yellowish, usually without distinct darker markings. length of vertex about one-half of width between eyes, its front margin smoothly rounded (fig. 240). Vertex rather dirty yellowish, often with some rather indistinct greyer markings. Pronotum greenish, often with grey markings consisting of two comma-shaped marks medially and dark patches at posterior corners. Scutellum

greenish yellow, often indistinctly marbled and sometimes with dark line along median impression. Abdomen mainly black above. Side of genital segment with aculeate projection (fig. 234)) ..... **artemisiae** Kirschbaum

On Artemisia abrotanum *(southernwood, a garden plant) and* A. maritima. *England: S.E. and N.E. Yorks., W. Lancs. E. (? and W.) Norfolk, Cambs., Oxon., W. Kent, Surrey. Scotland: Edinburgh (Midlothian), Ayrs., E. Perths., Elgin. vii, viii. Most of Europe. Nearctic area.*

4 Pronotum entirely black or almost so; posterior margin always black (fig. 241). In fore wing, clavus with single large yellow-green spot medially, posterior half of clavus entirely black-brown; apical margin of fore wing more truncate (fig. 242) 5

— If black markings present on pronotum, these do not reach its posterior margin (except rarely in very dark specimens of *aurata).* Posterior half of clavus of fore wing not normally entirely dark; apical margin of fore wing smoothly rounded (figs. 173, 175, etc.) 6

5 Larger—overall length ♂ ♀ 3.1-3.6 mm. In male, anal tube with long spine on each side (fig. 247); genital segment with one apical spine on each side (fig. 248); aedeagus without expansions along stem or at apex, apically with two long recurrent appendages (figs. 250, 251). (Face yellow, sometimes with some rather indistinct brownish markings. Vertex yellowish or brownish, usually more or less widely marked posteriorly with black-brown. Scutellum black-brown, often with a more or less distinct pale median longitudinal stripe) ..... **vittata** (Linnaeus)

Occasional, but widespread, on ground-ivy (Glechoma hederacea *L.),* Mentha *spp.* Ranunculus repens, Plantago major *and nettle. England. Wales. Scotland, as far N. as Elgin. Ireland. vi-xi. Most of Europe.*

— Smaller—overall length ♂ ♀ 2.2-2.7 mm. In male, anal tube without spines; genital segment with two apical spines on each side, one recurved, emanating from base (fig. 249); aedeagus expanded apically and along stem, without recurrent appendages apically (figs. 230, 239). (Face yellow. Vertex yellowish, more or less widely marked posteriorly with black-brown. Scutellum black-brown,often with a more or less distinct pale median longitudinal stripe or pale spot apically ..... **notata** Curtis

On low calcareous vegetation, probably associated with Prunella, Thymus *and various Compositae spp. England. Wales. Scotland. Ireland. v, vi, viii-x. Most of Europe. Siberia. Mongolia.*

6 Base of apical internal vein of fore wing at posterior end of median cell (figs. 161, etc.) . 7

— All three apical veins of fore wing originating from radial cell (fig. 201). (Vertex with three rather irregularly shaped black spots, occasionally contiguous. Ground colour greenish, sometimes fading to yellowish after death) 14

7 Fore wing with two longitudinal dark streaks; one strongly marked in basal half of radial cell and one rather less pronounced along corio-claval suture (third one rarely present between these): basal half of inner margin also narrowly dark (fig. 157). Vertex with three distinct black spots as in fig. 156; pronotum mainly brownish without distinct black markings. (Anteclypeus brownish; two brown longitudinal streaks on frontoclypeus. Scutellum with two black triangles basally. In male, aedeagus as in figs. 159, 162. Overall length; ♂ ♀ 2.7-3.1 mm) ..... **tenella** (Fallén)

Local, on yarrow (Achillea millefolium *L.). England, as far N. as N.E. Yorks. Wales: Montgomerys. v, ix, x. Most of Europe.*

— Fore wing either with dark markings in form of a single longitudinal streak (figs. 160) or including spots of more or less rounded form. If vertex with black spots, black markings also present on pronotum 8

8 Inner margin of fore wing not wholly dark margined in basal half (figs. 160, 173 etc.). Vertex either with two black spots (figs. 158, 171, 172) (occasionally confluent anteriorly) or without black spots 9

— Inner margin of fore wing wholly dark margined in basal half (fig. 170). Vertex either with three black spots (figs. 170, 221) (posterior one sometimes absent in teneral specimens) or with a single Y- or mushroom-shaped spot (fig. 222) 13

9 Fore wing well defined black or black-brown spot across subcostal and (usually) radial cells, about half-way along costal margin (figs. 173, 175, 176), ... 10

— Fore wing without distinct black spot along costal margin, with a broad longitudinal brown stripe with irregular margins along cubital cell and adjacent areas (fig. 160). (Markings

of vertex, pronotum and scutellum as in fig. 158. In male, aedeagus as in fig. 164; appendage inside genital segment as in fig. 167. Overall length ♂ ♀ 3.7-4.2 mm.)
..... **heydenii** Kirschbaum

Rare, possibly occasionally introduced, recorded once from wild plum and later from garden chrysanthemums. ix, x. C. and S. Europe. England: Arminghall, Norwich; Wisley, Surrey.

10 Lateral black spots of pronotum remote from anterior margin. No dark marking present on scutellar angle of clavus of fore wing (fig. 161)
..... **signatipennis** (Boheman) (see couplet 2)

— Lateral black spots of pronotum reaching anterior margin (figs. 171, 172). In fore wing scutellar angle of clavus dark marked (figs. 173, 175, 176) 11

11 Smaller—overall length: ♂ ♀ 2.9-3.4 mm. Pronotum anteriorly without dark marks medially, at either side with smallish black spot which is cut off almost straight about half-way between anterior and posterior margins of pronotum (fig. 172). In male, appendage inside genital segment recurved, with or without a fine spine (figs. 185-188). (In male, aedeagus in side view with appendages extending above upper margin of stem (figs. 178, 181). Black markings of face not very extensive, much as in *aurata* (figs. 197-200). Black markings of fore wing not strongly developed (fig. 176)
..... **origani** Zakhvatkin

On Origanum *(marjoram) and* Veronica chamaedrys *L. (germander speedwell). England: Mid.-W. Yorks., Bucks., Herts., W. Kent, Surrey, Berks., S. Hants. Scotland: E. Perths. vi-x. Netherlands. Germany. Poland. Russia.*

— Larger—overall length: ♂ ♀ 3.4-4.3 mm. Pronotum with black spots usually more extensive, sometimes confluent; often with two other small spots or V-shaped mark in middle of anterior margin (fig. 171). In male, appendage inside genital segment with two branches, one of which is recurved (figs. 182-184) 12

12 Usually larger—overall length: ♂ ♀ 3.5-4.3 mm. Vertex, pronotum, fore wings and posterior legs often more or less orange. Vertex usually with rather elongate or irregularly shaped black spots (fig. 180), which are sometimes confluent and usually extend into upper margin of face (figs. 189-192). Fore wing with black spots of inner and costal margins usually rather larger and often with dark longitudinal streak in cubital cell; apical external cell largely dark in female (fig. 173). Face longer; in first generation males, sides of frontoclypeus unmarked or very narrowly black (fig. 189); in first generation females and second generation males, sides of frontoclypeus with strong black line but anteclypeus clear or just darkened at upper margin (figs. 190, 191); second generation females similar, but the dark colour encroaches more onto anteclypeus (which is very seldom wholly dark) (fig. 192). (In male, aedeagus in side view with appendages not extending above upper margins of stem (figs. 174, 177, 179))
..... **aurata** (Linnaeus)

Common on nettle, later in year also on Labiates (mint, catmint, etc.), cow-parsnip, burdock, hemp-agrimony (Eupatorium cannabinum *L.), potato and other plants (cf Woodroffe, 1975; Stiling, 1980a). England. Wales. Scotland. Ireland. v-xi. Europe.*

— Usually smaller—overall length: ♂ ♀ 3.4-3.7 mm. Vertex, pronotum, fore wings and posterior legs light greenish, not tinted orange. Vertex with two distinct more or less round or oval spots (fig. 171), which do not extend so far forwards onto face (figs. 193-196). Fore wing with black spots of inner and costal margins usually rather smaller and rarely with dark longitudinal streak in cubital cell; apical external cell mainly pale in female (fig.175). Face relatively broader; in first generation males, sides of frontoclypeus strongly marked with black, often extending onto anteclypeus (fig. 193); first generation females and second generation males similar, but dark border rather wider and anteclypeus with definite dark areas (figs. 194, 195); second generation females similar, but anteclypeus almost completely black (fig. 196). (Aedeagus usually as in *origani*—c.f. figs. 178, 181) ..... **atropunctata** (Goeze)

On potato, sage and mallow. England: Yorks (all vice-counties), Hunts., Bucks., Oxon., W. Kent, Berks., Isle of Wight. ? Scotland. ? Ireland. v, vi, viii-x. Europe. N. Africa.

13 Vertex with three black spots, the posterior forming a triangle broader than high (fig. 170). Two well defined roundish black spots near upper margin of frontoclypeus (fig. 229). Hind tibiae black (except in teneral examples). (Frontoclypeus more or less broadly

dark at sides; lorae pale or dark; anteclypeus sometimes more or less widely dark in upper part. Pronotum with dark spots and two longitudinal streaks. Scutellum with two black triangles basally. Fore wings with veins and waxy area yellowish, otherwise greenish with dark brown and hyaline areas. In male, apex of aedeagus with two pairs of recurrent appendages, without fine spines (figs. 213, 215). Overall length : ♂ ♀ 3.3-3.8 mm) ..... **urticae** (Fabricius)

Common on nettle, also bred from pellitory-of-the-wall (Parietaria judaica *L.). England. Wales. Scotland, as far N. as E. Sutherland. Ireland. vi-xii. Most of Europe. W. Siberia.*

— Vertex either with single Y- or mushroom-shaped black spot (fig. 222) or with three black spots; in latter case, posterior one forming a triangle higher than broad (fig. 221). Upper margin of frontoclypeus most often with a single dark brown patch (fig. 223), but sometimes with two angular or rounded dark brown spots and sometimes unmarked. Posterior tibiae pale. (Frontoclypeus broadly dark at sides or dark throughout lower part; lorae dark in males and some females; upper part of anteclypeus more or less widely dark. Pronotum with dark spots and two longitudinal dark streaks (figs. 221, 222). Scutellum with two black triangles basally. Fore wings with veins and waxy area yellowish, otherwise greenish with dark brown and hyaline areas. In males, apex of aedeagus with a single pair of appendages, each with several fine spines (figs. 217, 219). Overall length: ♂ ♀ 3.4-3.9 mm.) ..... **cyclops** Matsumura

On nettle, often in damper or upland situations. England. Wales: Glam. Scotland. Ireland. vi-xii. Most of Europe. Siberia.

14 Black spot posterior to waxy area of fore wing covering radial vein or extending partly over it to leave a wedge-shaped pale marking (figs. 204, 205) 15

— Black spot posterior to waxy area of fore wing separated completely into two by pale radial vein (fig. 206) 16

15 Posterior black spot of vertex with deep incision in anterior margin (fig. 220). Wedge-shaped pale marking usually extending along radial vein into area of black spot behind waxy area (fig. 205). Aedeagus of male with single pair of appendages apically, each with a fine tooth near base (figs. 214, 218). (Frontoclypeus with two black spots near upper margin and sometimes a pair of oval or elongate spots near eyes (as in *thoulessi*—c.f. fig. 227); lower part usually with two more or less well defined brown longitudinal streaks. Genae black against margins of frontoclypeus. Anteclypeus wholly dark, dark in upper part or pale. Pronotum with dark marking somewhat like four-pointed crown. Scutellum with two black triangles and two black dots between them. Overall length: ♂ ♀ 2.9-3.5 mm) ..... **florida** Ribaut

On Ballota, Stachys, Mentha *and other Labiates, also taken on* Arctium. *England as far N. as S. Lancs. Wales: Carms. iv-x. Europe. S.W. Siberia. N. Africa.*

— Posterior black spot of vertex with anterior margin more or less irregular in shape, but without deep incision (fig. 224). Black spot posterior to waxy area of fore wing covering radial vein more or less completely (fig. 204). Aedeagus of male with a pair of bifurcate appendages apically (figs. 207, 208, 216). (Face variable in markings; frontoclypeus usually with pair of black spots near upper margin, occasionally missing; black spots or streaks near eyes present or absent; lower part of face more or less marked with brown or pale. Anteclypeus pale or dark. Genae dark against margins of anteclypeus. Pronotum with dark marking somewhat resembling four-pointed crown (fig. 224). Scutellum with two black triangles and often two black dots between them. Overall length: ♂ ♀ 2.9-3.5 mm.) ..... **stachydearum** (Hardy)

Common on Labiates, especially Stachys sylvatica *L.,* Teucrium scorodonia *L. and* Lamiastrum galaeobdolon *(L.), also reported from* Arctium. *England. Wales. Scotland. Ireland. vi-xi. Most of Europe. N. Africa.*

16 Posterior black spot of vertex wide anteriorly, its width more than half distance between eyes, with deep incision in anterior margin (fig. 220). Posterior tarsi more than 0.7 mm long, in male with basal segment ringed with black
..... **florida** Ribaut (see couplet 15 above)

— Posterior black spot of vertex variable in shape, but narrower, without deep incision in anterior margin (fig. 225). Posterior tibiae less than 0.7 mm long, unmarked. (Genae with black streak along edges of frontoclypeus, which is unmarked in lower part, and has two black spots towards upper margin. Pronotum with four or six black spots anteriorly

and large irregular, more or less dark greyish area posteriorly. Scutellum usually with two black triangles posteriorly) 17

17 Two well defined black spots present on upper extremities of frontoclypeus near eyes, of comparable size to lower pair of black spots on upper part of frontoclypeus, the four making a smooth curve roughly parallel to upper margin of head (fig. 227). In male, aedeagus with four apical appendages (figs. 203, 211); side of genital segment without sharp tooth inwardly near lower margin (fig. 202). (Overall length: ♂♂ 2.9-3.1 mm; ♀♀ 3.0-3.4 mm) ..... **thoulessi** Edwards

Local, on Mentha *spp.*, Lycopus *and other Labiates. England: Staffs., E. Norfolk, Oxon., Berks., S. Hants., Dorset, N. and S. Somerset. vi, viii-x. C. and S. Europe.*

— Upper extremities of margins of frontoclypeus unmarked, or with narrow linear streak (fig. 226). In male, aedeagus with two recurrent apical appendages crossing over each other (figs. 210, 212); side of genital segment with sharp tooth inwardly near lower margin (fig. 209). (Overall length: ♂♂ 2.9-3.1 mm; ♀♀ 3.0-3.4 mm.) . **melissae** Curtis

On catmint, sage, lemon balm and other Labiates, also on tree mallow (Lavatera), *hollyhock,* Arctium *and fleabane* (Pulicaria dysenterica), *sometimes locally numerous. England. Wales. Southern Scotland. Ireland. v-xii. Europe. N. Africa. Nearctic and Ethiopian regions.*

Genus **Aguriahana** Distant

This genus has recently been redefined by Dworakowska (1972). As now regarded, it contains three European species, two of which reach Britain. Wilson (1978) has pointed that the nymphs of the two British species are markedly different.

Key to species

1 Fore wings with apical margin excised, whitish, with black-brown markings as in fig. 235. Face, vertex, pronotum and scutellum whitish, tinged slightly brownish or yellowish. In male, genital plates with apex rather sharply bent upwards (fig. 256); sides of genital segment with toothed comb-like appendages, bearing several stiff bristles (fig. 246); aedeagus broadened somewhat at apex with two short appendages adpressed to stem (figs. 236, 255). (Vertex and pronotum as in fig. 237. Overall length: ♂♂ 3.9-4.2 mm; ♀♀ 4.1-4.4 mm.) ..... **stellulata** (Burmeister)

On Tilia *(lime), plum and cherry. England: S.W. Yorks., Bucks., Herts., Middlesex, W. and E. Kent, Surrey, S. Wilts. Wales: Glam. vii-x. Palaearctic and Nearctic Regions.*

— Fore wings with apical margin not excised, darker or lighter olive green, without distinct markings. Face, vertex, pronotum and scutellum darker or lighter olive green, sometimes with rather indistinct brownish markings. (In male, genital plates in side view with apical part sharply bent upwards (figs. 252, 254); aedeagus with two long curved appendages arising at base (fig. 257); genital segment as in fig. 253. Overall length: ♂♂ 4.2-4.5 mm; ♀♀ 4.3-4.7 mm. Vertex and pronotum as in fig. 232.)
..... **germari** (Zetterstedt)

On pines. England. Scotland: Easterness, Elgin, Mid Perths., Rhum. Wales: Caerns. vii-ix. Europe. N. Africa. Siberia.

Genus **Ribautiana** Zakhvatkin

A rather distinctive genus in appearance. Five out of the seven European species have been reported from Britain.

Key to species

1 Row of dark dots present at base of spines of posterior tibiae. Basal two-thirds of fore wings usually bright yellow, pigment not interrupted along corio-claval suture. (Face, vertex, pronotum and scutellum yellowish, without distinct marking. Fore wings apically suffused with grey-brown, usually rather definitely, but not forming strongly localized patch as in *tenerrima*. In male, aedeagus with well developed appendages as in figs. 268, 269. Abdomen largely blackish. Overall length: ♂♂ 3.2-3.5 mm; ♀♀ 3.3-3.8 mm.)
..... **scalaris** (Ribaut)

On oak (Quercus robur, petraea *and* cerris). *England: N.E. and Mid-W. Yorks., Cheshire, Oxon., Bucks., W. Kent, S. Hants., Surrey. Scotland: Sutherland, Argylls. Wales: Glam., Brecon. vii, viii. C. and S. Europe.*

— Posterior tibiae without row of dark dots at base of external spines of posterior tibiae (except rarely in *tenerrima*, where yellow pigment of fore wings is interrupted along corio-claval suture.). Fore wings bright or paler yellow, pigment either distinctly interrupted (in *tenerrima)* or not interrupted along corio-claval suture 2

2 Larger species—overall length: ♂♂ 3.6-4.0 mm; ♀♀ 3.9-4.4 mm. Basal two-thirds of fore wings bright yellow, pigment not interrupted along corio-claval suture: apical part more or less strongly suffused with grey-brown. In males, lateral appendages from base of aedeagus distinctly shorter than main stem; apex of latter without appendages, simply bidentate (figs. 262, 264). Vertex about half as long as pronotum and (including eyes) of almost same width (fig. 258). (Vertex and face yellowish; females usually and males rarely with two blackish round spots at junction of vertex and face. Pronotum yellow, sometimes with rather indistinct greyish suffusion, usually with small black spot medially on anterior margin. Scutellum yellowish, apically with a small black dot or more or less widely darkened; sometimes two greyish triangles present basally. Abdomen largely dark.) ..... **ulmi** (Linnaeus)

Normally on elm, also reported from oak, sallow, whitebeam, hornbeam and hazel. England. Wales. Scotland. Ireland. v-xi. Europe. Nearctic Region.

— Smaller species—overall length at most 3.6 mm. Basal two-thirds of fore wings either distinct yellow with more or less wide unpigmented streak along corio-claval suture or rather pale yellowish. In males, lateral appendages from base of aedeagus as long as or nearly as long as main stem; some appendages present on main stem. Vertex distinctly more than half as long as pronotum and including eyes, narrower than pronotum 3

3 Basal two-thirds of fore wing bright yellow with more or less broad unpigmented streak along corio-claval suture; apical part of fore wing with a well defined dark triangular patch covering the cross-veins and strong blackish spots at apices of three veins (fig. 265). In male, aedeagus with bidentate appendage on posterior margin of stem of aedeagus towards base (figs. 266, 267). Vertex sharper apically, about 0.75 times length of pronotum; including eyes, distinctly narrower than pronotum (fig. 261). (Face, vertex, pronotum and scutellum pale yellowish, vertex sometimes with two comma-shaped marks and scutellum sometimes with two greyish triangles basally. Abdomen largely dark above. Posterior tibiae usually without dark dots at base of spines (rarely present in specimens from oak). Overall length: ♂♂ 3.1-3.3 mm; ♀♀ 3.3-3.5 mm)
..... **tenerrima** (Herrich-Schaeffer)

Often common on bramble, dewberry and loganberry. Also reported from oak, willow, birch, alder, elm, sallow, holly, agrimony and hazel. England. Wales. Scotland, as far N. as Elgin. Ireland. vi-xii. Europe. Iran. Australian and Nearctic Regions.

— Basal two-thirds of fore wings paler yellow, not appreciably less pigmented along corio-claval suture; apical part of fore wing more diffusely tinted grey. In male, stem of aedeagus without appendages except near apex (figs. 260, 263, 294, 295). Vertex more obtuse, apically about 0.6 times length of pronotum (fig. 259) 4

4 Dark spots absent at transition between vertex and face. Apical third of fore wings moderately strongly infused greyish, with well developed dark spots at apices of veins. In male, stem of aedeagus distinctly shorter than lateral appendages from base, with two small teeth towards apex (figs. 294, 295). (Face, vertex, pronotum and scutellum yellowish, unmarked. Overall length: ♂♂ 3.1-3.4 mm; ♀♀ 3.3-3.6 mm.)
..... **cruciata** (Ribaut)

On loganberry, blackberry, whitebeam, sallow and hazel (cf Woodroffe, 1971b).

England, as far N. as Mid-W. Yorks. vi-xi. Bulgaria, France, Italy, Portugal, Sweden, Azerbaijan. Nearctic Region.

— Two blackish round spots present at transition between vertex and face in females and occasionally in males. Basal two-thirds of fore wings pale yellowish; apical third weakly infused greyish, apices of veins rather indistinctly darkened. In males, stem of aedeagus approximately as long as lateral appendages from base, apically bearing thin, rather irregularly branched appendages on either side (figs. 260, 263). (Face, vertex, pronotum and scutellum yellowish, in females pronotum often with small median dark spot along anterior margin and scutellum often more or less widely dark at apex. Overall length: ♂ ♀ 3.2-3.5 mm.) ..... **debilis** (Douglas)

Rather local: reported from loganberry, blackberry, apple, beech, willow, ivy, hazel, maple and alder. England. Wales. Scotland: Renfrews. Ireland. vi-xii. Czechoslovakia. France. Italy.

Genus **Eupterycyba** Dlabola

Only one species has been ascribed to this genus.

— Face yellowish, unmarked. Vertex, pronotum and scutellum greenish or yellowish: two round black spots anteriorly on vertex, three large black spots on pronotum and often some dark markings along anterior edge; scutellum with two black triangles anteriorly and other variable dark markings posteriorly, sometimes extending medially to anterior margin (fig. 284). Fore wings with veins pale, apical cells grey; dark streaks present between veins as in fig. 290. Abdomen largely black above. In male, aedeagus with two bifurcate appendages at apex (figs. 287, 291); paramere curved apically, with a strong tooth on outer margin (fig. 273). In female, seventh abdominal sternum weakly notched medially (fig. 274). Overall length: ♂ ♀ 4.1-4.5 mm.) .... **jucunda** (Herrich-Schaeffer)

On alder. England, as far N. as S.W. and Mid-W. Yorks. and S. Lancs. Wales. vii-x. C. and S. Europe.

Genus **Linnavuoriana** Dlabola

Two European species are listed by Nast and both occur in Britain.

Key to species

1 Pronotum with four more or less well developed spots (fig. 288). (Some specimens have been reported from the Continent with the pairs of spots on either side fused into bands). Vertex, pronotum, scutellum and fore wings pale greenish. Dark areas of fore wing often tending to form two distinct transverse bands with clear area between them (fig. 292). In male, stem of aedeagus with weak lamellar projection towards base (fig. 277). (Face yellowish, in males sometimes narrowly darkened along edges of frontoclypeus. Two well developed black spots present at junction of vertex and face. Scutellum with or without two black triangles at base. Overall length: ♂ ♀ 3.1-3.8 mm.) ..... **sexmaculata** (Hardy)

On Salix *spp. especially* cinerea *L. and* caprea *L. (sallows). England. Wales. Scotland, as far N. as Sutherland. Ireland. iv-xi. Palaearctic and Nearctic Regions.*

— Pronotum with six spots, the three on either side sometimes fusing to form two irregular longitudinal bands (figs. 285, 286, 289). Vertex, pronotum, scutellum and fore wings usually more or less rusty brownish, especially in specimens taken in late autumn, winter or early spring. Dark area of fore wing variable, in well pigmented specimens usually tending to form wide longitudinal dark patch (fig. 293). In male, stem of aedeagus towards base with peg-like projection longer than broad (fig. 275). (Face yellowish or brownish, anteclypeus and sides of frontoclypeus more or less widely darkened, degree of pigmentation otherwise variable. Two black spots present at junction of vertex and face. Scutellum usually with two black triangles, other dark markings sometimes present. Overall length: ♂ ♀ 3.4-3.8 mm.) ..... **decempunctata** (Fallén)

Rather local, on Betula, *hibernates as adult on Conifers and gorse. England. Scotland, as far N. as Elgin. Wales: Glam. Most of Europe. Siberia. Mongolia.*

Genus **Typhlocyba** Germar

This genus is now regarded in a much more narrow sense than previously and Nast only lists two European species, both of which are found in Britain.

Key to species

1 Basal two-thirds of fore wings strongly marked with brick-red or orange spots; in apical parts veins pale, broadly outlined in brownish grey (fig. 310). In male, genital plate apically with beak-like projection (fig. 271); stem of aedeagus almost as long as lateral projections from base (figs. 280, 281). (Face yellowish, unmarked. Vertex pale yellowish, sometimes with grey-brown or orange streak on either side parallel to anterior margin. Pronotum and scutellum light yellowish, more or less strongly marked with orange or brownish patches. In male, paramere regularly tapering in apical part (fig. 279); small sclerotized black spine apically on sides of genital segment (fig. 278). Overall length: ♂ ♀ 3.0-3.5 mm.) ..... **quercus** (Fabricius)

On oak, hornbeam, plum, sloe, birch, Nothofagus *and other trees. England. Wales. Scotland, as far N. as E. Sutherland. Ireland. vii-x. Most of Europe. Azores. Kazakhstan. Nearctic Region.*

— Fore wings pale yellowish, either with two broad transverse bands or with basal two-thirds largely or wholly black (figs. 313, 316, 317); apical part entirely pale or rarely with a small dark round spot. In male, genital plate without beak-like projection apically (fig. 314); stem of aedeagus less than half length of projections from base (figs. 282, 283). (Face, vertex and pronotum rather dirty yellowish, usually unmarked, but sometimes with two small dark transverse streaks on vertex. Scutellum black, this colour sometimes showing through posterior part of pronotum. In male, paramere almost uniform in width for much of its length (fig. 311); sides of genital segment without sclerotized tooth apically. Overall length: ♂ ♀ 3.2-3.7 mm.) ..... **bifasciata** (Boheman)

On hornbeam (Carpinus) *and elm* (Ulmus *spp.). England. Wales. Scotland, as far N. as Elgin. Ireland. vii-x. Most of Europe. Tadzhikistan.*

Genus **Ossiannilssonola** Christian

This genus contains only one European species, which is found in Britain.

— Face, vertex, pronotum and scutellum light yellowish. Fore wings light yellowish, often with more or less broad dark brown band along basal part of inner margin and bordering on scutellum; apices of cubital, median and radian cells often also darkened, and apical cells sometimes with more or less dark greyish suffusion. Paramere with strong tooth inwardly and long curved projection outwards (fig. 328) ..... **callosa** (Then)

Local, on sycamore, also reported from lime, horsechestnut and beech. England. Wales: Caerns., Brecon, Glam. Scotland: Perths. vi, vii, ix. C. and S. Europe.

Genus **Lindbergina** Dlabola

Ribaut (1936) described three species from France. Le Quesne (1977b) has recently suggested that British specimens should all be regarded as belonging to a single, highly variable species and that examples showing the form of the aedeagus figured by Ribaut as *"aurovittata"* are rather rare abberrations, at any rate in the British Isles: a new species from Jersey, Channel Isles was also described in this paper.

— Face, vertex, pronotum and scutellum yellow or greenish yellow. Fore wings yellowish in basal two-thirds, rarely with reddish streak along inner margin. Apical cells grey, narrowly pale-edged; apices of cubital, median and radian cells often also greyish.

Abdomen widely darkened above. In male, aedeagus usually apically with a pair of teeth standing out at right angles to stem (figs. 318, 321, 324), stem broadened medially, sometimes with teeth or laminate crest; more rarely with poorly developed apical teeth in same direction as stem, stem parallel-sided (fig. 315) or broadened medially and tapering to a point (fig. 322); apex of aedeagus, seen from above, as in figs. 319, 320. Paramere with inner tooth (fig. 323). In female, seventh abdominal sternum elongate, with apical margin coming to obtuse angle medially (fig. 312). Overall length: ♂ 2.9-3.2 mm; ♀ 3.1-3.4 mm ..... **aurovittata** (Douglas)

On oak, bramble and loganberry (cf. Claridge and Wilson, 1978b, Woodroffe 1971b), sometimes from beech, alder, hazel, birch and hornbeam. England: Bucks., Kent, Surrey, Berks., Dorset. Wales: Glam. Ireland: Co. Clare. viii-xi. C. and S. Europe.

Genus **Fagocyba** Dlabola

This genus is at present regarded as containing three Palaearctic species, two of which occur in Britain.

Key to species

1 In male, paramere with single long projection outwards (fig. 333); genital plate in side view distinctly broader in middle, with upper and lower margins both strongly curved (fig. 297). In female, seventh abdominal sternum with straight sides, forming a rather sharp angle of less than 90° (fig. 302); upper margin of ovipositor curved distinctly in form of letter "S" (fig. 298). (Colouring variable; usually wholly light yellowish, fore wings often somewhat darker towards inner margin. Some specimens with vertex, pronotum and scutellum chestnut-brown, sometimes with paler median longitudinal streak on vertex, and in fore wings clavus, median and cubital cells almost wholly red-brown. Other examples have fore wings with clavus partly or wholly grey-brown, a dark streak in apical part of radial, median and cubital cells, and apical cells more or less greyish; vertex often grey-brown. In male, aedeagus as in fig. 334. Overall length: ♂ ♀ 3.4-4.1 mm.) ..... **cruenta** (Herrich-Schaeffer)

Often abundant on beech, also found on oak, sycamore, hazel, whitebeam and various other trees. England. Wales. Scotland. Ireland. vi-x. Most of Europe.

— In male, paramere with two parallel projections outwards (fig. 329); genital plates in side view less clearly broadened in middle and with upper and lower margins less strongly curved (fig. 299). In female, sides of seventh abdominal sternum slightly concave, forming less sharp angle apically (fig. 303); upper margin of ovipositor more smoothly concave (fig. 296). (Overall colour always uniform light yellowish; apical cells of fore wings usually lightly suffused greyish. In male, aedeagus as in fig. 330. Overall length: ♂ ♀ 3.8-4.3 mm.) ..... **carri** (Edwards)

Local, on oak. England: N.E. and Mid-W. Yorks., Notts., E. Glos., Bucks., Berks. Wales: Glam., Brecon. Scotland: Selkirk, Argylls. Ireland: Co. Clare. viii, ix. N. and C. Europe.

Genus **Edwardsiana** Zakhvatkin

This is a difficult genus since most of the species can only be recognized by the male genitalia; parasitized males may have the aedeagus reduced and then cannot always be identified. Further study may show some female characters, *e.g.* in the form of the seventh abdominal sternum, but at present females of only one or two of the species below can be recognized with any certainty.

Nast lists 42 species from Europe, of which 21 occur in Britain. Of these, two *(E. flavescens* and *diversa)* were inadvertently omitted from my check-list (Le Quesne,) 1964), *E. rosaesugans* has recently been added to the list (Claridge and Wilson, 1978a) and *E. ishidai* is here added for the first time, being only recently clearly separated from *lanternae* (Dworakowska *in litt.)*.

Key to species

1 Fore wings light yellowish, with a broad black-brown streak across corio-claval suture (fig. 327). Scutellum largely blackish. (In male, aedeagus with six branches apically, of which the lower pair are very long and recurved (figs. 331, 332). Vertex, pronotum and face pale yellowish. Apical cells of fore wing more or less suffused greyish. Overall length: ♂♀ 3.7-4.2 mm.) ..... **geometrica** (Schrank)

On alder. England. Wales. Scotland, as far N. as Elgin. Ireland. vii-x. Most of Europe.

— Fore wing light yellowish, with corio-claval suture unmarked. Scutellum pale 2

2 Clavus of fore wing usually more or less narrowly darkened along inner margin. In male, aedeagus with stem rather narrow and five branches apically, the length and direction of upper pair of appendages rather variable (figs. 335-338). (Apical cells weakly suffused greyish, extending to apices of cubital, median and radial cells. In females, ovipositor as in fig. 308. Overall length: ♂♂ 3.5-3.8 mm; ♀♀ 3.7-3.9 mm.) ..... **crataegi** (Douglas)

On hawthorn (Crataegus), *rowan, alder, apple and cherry. England. Wales: Glam. Scotland, as far N. as E. Ross. Ireland: Co. Clare. vii-ix. Most of Europe. Siberia. Australian and Nearctic Regions.*

— Whole of fore wing light yellowish, without any dark markings on clavus. In male, aedeagus either with all appendages paired or (in *spinigera)* with stem strongly flattened laterally. Face, vertex, pronotum and scutellum light yellowish, normally unmarked . 3

3 In male, aedeagus flattened, with three appendages at apex roughly in direction of stem, of which median appendage is often narrowly bifurcate apically; two other short appendages present on stem (figs. 339-341). (Overall length: ♂♂ 3.4- 3.6 mm.) ..... **spinigera** (Edwards)

On hazel and alder. England: E. Glos., Bucks., E. Kent, Surrey, N. Hants. vi-ix. C. and S. Europe.

— In male, aedeagus with all appendages paired: stem sometimes flattened 4

4 In male, aedeagus with a single pair of stout, unbranched appendages at apex, forming smooth U-shaped curve in posterior view, often also with a pair of filiform appendages (figs. 342, 343, 346). (Overall length: ♂♂ 3.6-4.2 mm.) ..... **avellanae** (Edwards)

On hazel, also reported from elm, sycamore and horsechestnut. England. Wales: Glam. Scotland, as far N. as Perths. Ireland: Co. Clare. vi-x. Most of Europe.

— Aedeagus with at least two pairs of well developed appendages at apex, or with a single pair of forked appendages (some parasitized *rosae*) 5

5 Aedeagus with four (or two) branches apically 6

— Aedeagus with at least six branches apically 9

6 Lower appendages of aedeagus with a common median stem, the branches in side view curved upwards and claw-like, in rear view in form of a "Y"; upper appendages somewhat slender and sinuate (figs. 344, 345). (Overall length: ♂♂ 3.9-4.2 mm.) ..... **alnicola** (Edwards)

Local, on alder, also reported from maple. England: E. Glos., Bucks., Kent. Wales: Glam. vii, viii. Austria. Finland. Germany. Poland. Rumania. Sweden.

— Lower appendages of aedeagus arising separately from main aedeagus stem, without a common stalk, not forming a "Y" shape in terminal view 7

7 Stem of aedeagus strongly flattened in side view, laminate along anterior margin; outer appendages approximately at right angles to stem; inner appendages usually with a few fine tubercles near base, in side view crossing underneath the outer ones (figs. 347, 348): in parasitized specimens inner and outer appendages occasionally fused (figs. 349, 350). (Colouration often rather pale yellowish; face usually unmarked, but rarely with some brownish spots on upper part. In females, seventh abdominal sternum usually forming obtuse angle apically (fig. 309). Overall length: ♂♂ 3.4-3.8 mm; ♀♀ 3.4-4.0 mm.) ..... **rosae** (Linnaeus)

On wild and cultivated rose, apple, rowan, cherry, hawthorn and whitebeam; also reported from strawberry, alder, oak, Salix *and hazel. (cf. Claridge and Wilson, 1978b). England, as far N. as N.E. and Mid-W. Yorks. Wales: Glam., Brecon, Caerns. Scotland: Polton, Midlothian. vi, viii-x. Europe, Siberia. Japan. Nearctic and Oriental Regions.*

— Stem of aedeagus not or less strongly flattened in side view, not laminate along anterior margin; appendages not crossing one over the other in side view; upper appendages extending more or less in direction of axis of stem 8

8 Stem of aedeagus distinctly flattened in side view; upper appendages seen from above widely divergent at base; lower appendages in side view strongly curved, in basal half recurrent in direction of axis of stem (figs. 354, 355). Sides of genital segment entirely pale. (Seventh abdominal of female as in fig. 306. Overall length: ♂♂ 3.7-4.0 mm.)
..... **salicicola** (Edwards)
On Salix *spp. (sallows and willows). England. Wales: Glam. Scotland: Renfrews. vi-x. Most of Europe. Siberia. Mongolia. Iran*

— Stem of aedeagus not flattened in side view; upper appendages seen from above making acute angle with each other at base, more divergent towards apex; lower appendages in side view usually approximately at right angles to stem, somewhat flattened and narrow at base (figs. 352, 353). Posterior ventral angle of side of genital segment with a prominent black tubercle (fig. 351). (Overall length: ♂♂ 3.6-3.9 mm.)
..... **nigriloba** (Edwards)
On Sycamore. England: Cumberland, S. Lancs., E. Glos., Bucks., Kent. Wales: Glam. Scotland: Perths. vii. Most of Europe.

9 Aedeagus with six apical branches 10

— Aedeagus with eight or more apical branches 19

10 Upper appendages of aedeagus directed forwards, in side view more or less at right angles to the axis of the stem 11

— Upper appendages of aedeagus erect, in side view more or less continuing line of axis of stem 15

11 Branches of each lower appendage of aedeagus with apices more or less converging, so that in side view they are shaped somewhat like lobster's pincer (fig. 356): seen from above, upper appendages directly above lower ones, forming a horseshoe shape (fig. 357). (In female, seventh abdominal sternum as in fig. 305. Overall length: ♂♂ 3.5-3.8 mm.)
..... **frustrator** (Edwards)
In small numbers on a wide range of trees. England, as far N. as N.E. Yorks. Wales: Glam., Brecon. Ireland: Co. Clare. vii, ix, x. N. and C. Europe. Nearctic Region.

— Branches of each lower appendage of aedeagus in side view with apices strongly divergent
..... 12

12 Appendages of aedeagus short; inner appendage forked near base, so that branches have very short common stem: point of branching hidden in side view by outer appendage (figs. 358, 361). (Overall length: ♂♂ 3.7-4.0 mm.) ..... **prunicola** (Edwards)
On sloe, cultivated plum, currant Viburnum lantana *and sallow. England: Notts., Glos., Bucks., W. (? and E.) Kent, Surrey, N. Hants., S. Somerset. Wales: Glam., Brecon. Scotland: Thurso, Caithness. vii-x. Most of Europe. Nearctic Region.*

— Appendages of aedeagus longer; inner appendages forked well away from base, having common stem at least one-third of length of upper branch: in side view, outer appendage above level of inner appendages, at any rate in basal part 13

13 Lower appendages of aedeagus strongly flattened, seen from above; upper appendages seen from above smoothly curved in form of letter "U" (figs. 364-366), apices occasionally somewhat divergent. (Overall length: ♂♂ 3.7-3.9 mm.)
..... **diversa** (Edwards)
From dogwood (Cornus), *also reported from maple. England: Notts., E. Glos., Bucks., Herts., Surrey, Kent. vii, x. C. and S. Europe. Kirghizia.*

— Lower appendages of aedeagus not flattened, seen from above: upper appendages seen from above almost straight or gently sinuate, with apex curved outwards (figs. 359, 360, 362, 363) 14

14 Appendages of aedeagus more elongate; lower appendage forking below middle so that common stem of each appendage is as long as or longer than resulting branches; upper appendages in side view distinctly curving upwards (figs. 359, 363). (Overall length: ♂♂ 3.5-3.8 mm.) ..... **lanternae** (Wagner)
On alder and rowan, local. England: Kent, S. Hants. Wales: Glam. vii, x. C. and S. Europe. Siberia. Mongolia.

— Appendages of aedeagus less elongate; common stem of lower appendage distinctly shorter than resulting branches; upper appendage in side view more or less straight (figs. 360, 362). (Overall length: ♂♂ 3.5-3.8 mm.) ..... **ishidai** (Matsumura)
On elm, and possibly hazel. England: Herts., Bucks., Surrey, N. Hants. vii, ix, x. Europe. Siberia. Japan.

15 Aedeagus stem in side view swollen towards apex, so that lower branch of lower appendage is quite close to the swelling; upper appendage rather variable in length and curvature (figs. 391-393). (Overall length: ♂♂ 3.4-3.8 mm.) .... **rosaesugans** (Cerutti)
On Rosa *sp., Glais Valley, Brecon, Wales (Claridge and Wilson, 1978a). vii. Switzerland. N. Italy.*

— Aedeagus in side view relatively narrower apically, though sometimes widened towards base 16

16 Upper appendage of aedeagus distinctly shorter than longest branch of lower appendage, especially in side view, not distinctly sinuate (figs. 367, 369, 370) 17

— Upper appendage of aedeagus in side view as long as or longer than branches of lower appendage (figs. 373, 377), in side view weakly sinuate, from base roughly in direction of stem 18

17 Branches of lower appendage of aedeagus shorter, in side view widely divergent at base (figs. 367, 368, 372); stem of aedeagus without distinct keel along basal part of anterior margin. (Overall length: ♂♂ 3.8-4.1 mm.) ..... **plebeja** (Edwards)
On oak, elm, alder and birch, possibly also lime and hazel. England: S.W. Yorks., Notts., Bucks., Kent. Wales: Glam. vii, ix. N. and C. Europe. Siberia.

— Branches of lower appendage of aedeagus longer, in side view forming quite acute angle at base (figs. 369-371); stem of aedeagus with flattened keel along basal part of anterior margin. (Overall length: ♂♂ 3.9-4.1 mm.) ..... **tersa** (Edwards)
On Salix *spp. (sallows and willows). England: Mid-W. Yorks., S. Lancs., Derbys., Norfolk. ix. Wales: Glam. Europe. Turkey. Siberia.*

18 Upper appendages of aedeagus, seen from above, gently sinuate or almost straight (fig. 378); lower appendages approximately as long as upper appendages, as in fig 373; stem of aedeagus seen from behind narrowed slightly but regularly towards apex (fig. 374). (Overall length: ♂♂ 3.5-3.8 mm.) ..... **candidula** (Kirschbaum)
On white and grey poplar (Populus alba *L. and* canescens *Sm.). England: S. Lancs., W. Kent, Surrey. Wales: Glam. vii, ix. Most of Europe, Nearactic region.*

— Upper appendages of aedeagus, seen from above, regularly curved, in the form of the letter "U"; lower appendages each rather like a lobster's claw, much shorter than upper appendages (figs. 379, 377); stem of aedeagus, seen from behind, broadest medially with sinuate margins (figs. 375). (In female, ovipositor as in fig. 300; seventh abdominal sternum as in fig. 304. Overall length: ♂♂ 3.5-3.8 mm.) ..... **flavescens** (Fabricius)
From hornbeam and beech, also reported from sycamore, maple, elm, oak and willow. England: N.E. Yorks., N. Lincs., E. Glos., Bucks., Surrey, Dorset. Wales: Glam. Ireland: Co. Clare. vii, ix. Most of Europe.

19 Main branch of upper appendage of aedeagus almost straight, nearly parallel to axis of stem: lower appendage with long stem before branching, after which branches are strongly divergent (figs. 376, 380, 384). (Overall length: ♂♂ 4.0-4.1 mm.) ..... **bergmani** (Tullgren)
On birch and alder. England: E. Glos., Bucks., Surrey, S. Hants. Wales: Glam. Scotland: Inverness, Perths. Ireland: Co. Kildare. vi-viii, x. N. and C. Europe. Mongolia.

— Main branch of upper appendage of aedeagus strongly sinuate, apical part curving forwards (figs. 386-389); lower appendages with short stem before branching, after which upper branch apically curves more or less strongly towards direction of apex of lower branch 20

20 Inner and outer branches of lower appendages of aedeagus, in side view, widely separated and with opposing concavities, outer branch rarely with spine (fig. 386); seen from above, outer branches of lower appendage widely divergent from each other (fig. 383). (Overall length: ♂♂ 3.7-3.9 mm.) ..... **lethierryi** (Edwards)
On lime, maple and horse-chestnut, also reported from hazel, hawthorn, elm and black poplar. England. Wales: Glam. Scotland: Renfrews. Ireland: Co. Dublin (teste Edwards). vii, ix-xi. Most of Europe. N. Africa.

— Inner and outer branches of lower appendages of aedeagus in side view more closely approximated, convexity of the outer in apical part usually fitting into concavity of inner branch (figs. 387-389); outer branch of this appendage often with spine; seen from above, outer branches of this appendage less widely separated from each other, particularly at base (figs. 381, 382). (Overall length: ♂♂ 3.6-3.9 mm.)

..... **hippocastani** (Edwards)

On elm, alder and hazel, occasionally on other trees. England. Scotland: Berriedale and Dunbeath, Caithness. Wales: Glam., Brecon. vi, vii, ix, x. N. and C. Europe. Nearctic Region.

Tribe ERYTHRONEURINI

This tribe was first recognized by Young (1952). It is at present regarded as containing nine European genera, five of which are represented in Britain.

Key to genera

1 Vertex, pronotum, scutellum and fore wings uniform yellowish, without dark or reddish markings. Overall length 3.6-4.1 mm. In male, genital segment with long upper appendage and shorter curved lower appendage, both visible without dissection (fig. 402) ..... **Alnetoidia** Dlabola (p.32)

— Dark or reddish markings present on vertex, pronotum, scutellum or fore wings. Overall length often less than 3.6 mm. In male, genital segment with or without short appendage 2

2 Vertex (including eyes) wider than pronotum. Scutellum with three distinct black triangles, two basally and one at apex (fig. 396) ..... **Zyginidia** Haupt (p.32)

— Vertex narrower than pronotum or both approximately equal in width (figs. 408, 417-422). Scutellum with at most two out of these three black triangles 3

3 Vertex pale with two more or less round black spots (fig. 408). Scutellem pale, with two black triangles anteriorly 4

— Vertex with single black longitudinal streak (fig. 422) or without black markings, often marked with red. Scutellum dark or pale; if pale, without distinct black triangles anteriorly ..... **Zygina** Fieber (p.34)

4 Anteclypeus largely or wholly pale. Face elongate; in side view frontoclypeus flatter, extending well behind level of eyes (fig. 403). In male, paramere truncated apically, without projection from apical surface (fig. 401) ..... **Hauptidia** Dworakowska (p.33)

— Anteclypeus usually wholly blackish. Face less elongate; in side view frontoclypeus more convex, not extending appreciably behind level of eyes (fig. 405). In male, paramere apically with three more or less angular points (figs. 413, 414) ..... **Arboridia** Zakhvatkin (p.33)

Genus **Alnetoidia** Dlabola

This genus is now regarded as having only one European species, which varies to some extent in size and depth of colouration depending on the foodplant. Possibly it is a complex of biological species which cannot at present be separated on a morphological basis.

— Vertex, pronotum, scutellum and fore wings uniformly yellowish, unmarked. In male, genital segment with two appendages, visible without dissection, as in fig. 402. Paramere in dorsal view as in fig. 398, aedeagus as in fig. 397 ..... **alneti** (Dahlbom)

On alder, hazel and a wide range of other trees. England. Wales. Scotland. Ireland. vi-x. Most of Europe. Japan.

Genus **Zyginidia** Haupt

Only one of the eleven European species reaches Britain.

— Face yellowish, marked with more or less distinct brownish olive horizontal streaks on lower part of frontoclypeus and less sharply on upper part; anteclypeus usually largely

dark. Vertex anteriorly olive, enclosing two paler spots, posteriorly light yellowish. Pronotum yellowish, rather indistinctly suffused greyish medially. Fore wings yellowish green, without very distinct markings, but sometimes with tendency towards two greyish bands. Abdomen mainly blackish. Sides of male genital segment with Y-shaped lobe internally (fig. 404); aedeagus complex as in figs. 406, 407. Overall length: ♂♂ 2.3-2.6 mm; ♀♀ 2.6-3.0 mm ..... **scutellaris** (Herrich-Schaeffer)

Common in grass, mainly associated with Dactylis glomerata *L. and* Festuca rubra *L. England, as far N. as N.E. Yorks and N. Lancs. N. Wales. i, ii, v-xii. C. and S. Europe. N. Africa. Siberia.*

Genus **Hauptidia** Dworakowska

This genus was described in 1970 and includes six European species, of which one is found in Britain.

— Face straw-coloured, usually without distinct markings, sides of frontoclypeus usually somewhat brownish. Pronotum straw-coloured with greyish or brownish markings, normally rather indistinct but occasionally better defined. Fore wings yellow with two greyish bands parallel to corio-claval suture, one in clavus and the other in the cubital cell; apical cells clouded faintly greyish. In male, aedeagus as in figs. 399, 400; paramere as in fig. 401. Overall length: ♂♂ 3.1-3.5 mm; ♀♀ 3.4-3.7 mm . **maroccana** (Melichar)

In W. England (Berks., S. Somerset, N. Devon, E. Cornwall, Cheshire, S. Lancs.) and S. Wales (Brecon), native on foxglove (Digitalis purpurea *L.) and red campion* (Silene dioica *(L.)). Elsewhere on cultivated plants especially* Primula *and chrysanthemums, often indoors and sometimes in numbers. (Various parts of England. Scotland: Argylls). i, iii, iv, viii-x, xii. France. Spain. Morocco. Yugoslavia.*

Genus **Arboridia** Zakhvatkin

Two out of the fifteen European species have been reported from Britain. One of the British species is only so far represented by females, so that a slight doubt must remain about its identity.

Key to species

1 Dark streak in cubital cell of fore wing narrowing medially to enclose pale area of width more than half that of cell (fig. 410). Usually larger, overall length ♀♀ 3.1-3.5 mm. In male, spines of aedeagus very close to main branch in side view (figs. 415, 416); apical spine of paramere long and incurved (fig. 414). (Frontoclypeus yellowish, sometimes with rather indistinct chestnut brown pattern, broadly black-brown at sides. Vertex often with brown or greyish markings, distinct from the two black spots. Markings of pronotum usually including four small black spots anteriorly, often more or less fused into broad median greyish or dark brownish markings. Fore wings pale yellowish, with longitudinal streaks in clavus and cubital cell usually more or less chestnut brownish. Abdomen usually largely dark) ..... **ribauti** (Ossiannilsson)

Only females so far taken in Britain (China, 1938). On oak, possibly also on elm. England: Middlesex, S. Essex, E. Kent, Surrey, S. Hants., Dorset. i, ii, iv, vi, viii-xi. C. and S. Europe.

— Dark streak in cubital cell of fore wing more or less parallel-sided, usually more than half width of cell throughout (fig. 411). Usually smaller, overall length ♂♀ 2.6-3.0 mm. In male, spines of aedeagus well separated from main branch in side view (figs. 412, 409); apical spine of paramere short and straight (fig. 413). (Frontoclypeus yellowish in upper part, often greyish below at sides. Pronotum greyish or dark brownish, with pale margin anteriorly and at sides. Fore wings pale yellowish, with longitudinal streaks in clavus and cubital cell usually more or less greyish. Abdomen largely dark) . **parvula** (Boheman)

Found on low plants on calcareous soils and fenland, possibly associated with Helianthemum *on former. England. Wales. Scotland, as far N. as Haddington. Ireland. ii, iv-xi. Europe, N. Africa. Siberia.*

Genus **Zygina** Fieber

In Britain we have eight out of the twenty-three species of this genus recorded from Europe. All but one of the British species belong to the subgenus *Flammigeroidia,* the members of which have been until recently separated mainly on the basis of colour-pattern: however, some species, like *angusta* and *ordinaria,* differ widely between individuals, while others, like *schneideri* and *suavis,* show marked seasonal changes in colouration (Vidano, 1961; Günthart, 1974). Recently Günthart has found useful characters in the male sternal apodemes and anal tube: techniques for studying these are described in the last paragraph of the introductory section headed "Methods of examination and dissection". Following a recent paper by Günthart (1979), *pruni* is regarded as representing teneral specimens of *flammigera.*

Key to species

1 In males, fore wings yellow, apically greyish, without markings; vertex unmarked or sometimes narrowly darkened along median furrow; pronotum unmarked; scutellum pale, with dark patch apically (fig. 421). In females, black marking present on vertex, anteriorly in form of a diamond, fused posteriorly into large roughly square patch (fig. 422); pronotum with broad black (or in part dark red) longitudinal band; scutellum nearly entirely black; fore wings yellowish with well developed rust-red streak along inner margin of clavus. (Face pale. Vertex rounded anteriorly in male, rather sharply angled apically in female. In male, aedeagus as in fig. 427; paramere as in fig. 423; lobe of inside of genital segment as in fig. 429. Overall length: ♂ ♀ 2.6-2.9 mm.)
..... **hyperici** (Herrich-Schaeffer)
On Hypericum *spp., especially* perforatum *L., in calcareous situations. England: Leics., E. Norfolk, E. Glos., Bucks., Herts., Kent, Surrey, Wilts., Dorset. vi, viii-x. Most of Europe. Siberia.*

— In both sexes, fore wings normally with reddish markings, occasionally yellowish or greyish (especially in immature examples). Markings of vertex, if present, red or grey, except occasionally for narrow darkening along median furrow. (In male, aedeagus as in fig. 426; paramere as in fig. 430) 2

2 Tibiae greyish (in males) or brownish yellow (in females), posterior tibiae with small brown marks at the base of each spine. Smaller: overall length ♂ ♂ 2.3-2.5 mm; ♀ ♀ 2.4-2.7 mm. (Face light yellowish. In males and some females, vertex, pronotum and scutellum yellowish, lightly suffused with orange, otherwise unmarked; in most females, vertex and pronotum with more or less well developed red markings, forming variable longitudinal bands (*e.g.* as in fig. 420), sometimes also with some reddish stippling at sides, and scutellum also with some red markings. Fore wings with more or less well developed reddish streak (*e.g.* as in fig. 424). Posterior tarsi about 0.4 times length of tibiae, entirely blackish in males. In male, anal tube with hairs arranged in a single bundle (fig. 444) and apodemes of second abdominal sternum well developed, with apices of lobes often touching or overlapping *in situ* (figs. 433, 434)
..... **rubrovittata** (Lethierry)
On Calluna. *England: Bucks., Surrey, N. and S. Hants., Dorset. vii-ix. Most of Europe.*

— Tibiae pale yellowish, without trace of darker colouration and without brown marks at the base of the spines. Overall length over 2.7 mm 3

3 Scutellum wholly or largely dark brown or grey-brown, sometimes with paler median longitudinal band, but never with reddish markings. In male, posterior tarsi with basal segment and part of next segment pale 4

— Scutellum pale yellowish, unmarked or with reddish markings. In male, posterior tarsi often with all segments darkened 7

4 Basal part of clavus with a well developed red band sharply bounded by corio-claval suture for much of its length, remaining wide right up to scutellar margin; other parts of clavus without trace of fumose tint (fig. 425). (Vertex with or without red longitudinal band, 0.35-0.4 times as long as broad (including eyes). Pronotum usually with two longitudinal

red bands, sometimes with greyish area between them. Scutellum uniformly dark brown. Lobes of sternal apodemes moderately well developed, their appearnce depending on angle of view (figs. 436, 438). Anal tube with single bundle of bristles (fig. 445). Overall length ♂ ♀ 3.0-3.4 mm.) ..... **flammigera** (Fourcroy)

On various trees and bushes, especially oak, hawthorn and Prunus *spp: overwinters as adult in conifers, holly and ivy. England. Wales. Scotland, as far N. as E. Ross. i-v, vii-xii. Most of Europe. Siberia. Nearctic Region.*

— Basal part of clavus with more or less well developed reddish or orange band, but rarely reaching scutellar margin and usually narrowing towards base; other parts of clavus often more or less fumose 5

5 Fore wings with more or less well developed pinkish orange band (fig. 428); unmarked parts of clavus without trace of fumose tint. Vertex and pronotum without reddish markings, latter sometimes with indistinct greyish median suffusion. (Scutellum brown with tendency to have darker V-shaped mark. Posterior tarsi pale or with apical segment brownish) ..... teneral **flammigera** (see couplet 4)

— Fore wings usually with more or less extensive red markings; unmarked parts of clavus often more or less suffused with fumose tint. Vertex and pronotum often marked with red 6

6 In male, lobes of sternal apodeme elongate (fig. 441). Vertex usually rather more elongate and pointed (fig. 417); ratio of its length to width (including eyes) 0.36-0.42. Parts of clavus not marked with red with well developed fumose tint. (Vertex unmarked or with two narrow longitudinal red streaks. Pronotum with two more or less distinct reddish or pinkish grey bands, divergent posteriorly, usually with greyish colouration between them. Scutellum grey-brown, often with narrow paler medial longitudinal band. Red markings of fore wings variable, often forming zigzag streak across corio-claval suture (fig. 431), sometimes forming more or less entire red streaks along most of the veins of the corium. Anal tube with a single bunch of bristles (fig. 446). Overall length: ♂ ♀ 2.9-3.4 mm) ..... **angusta** Lethierry

On various trees and bushes, especially oak and hawthorn: overwinters as adult in conifers, holly and ivy. England. Wales: Montgomerys. Scotland, as far N. as E. Ross. Ireland. i-v, vii-xii. C. and S. Europe. Siberia.

— In male, lobes of sternal apodeme very poorly developed (fig. 435). Vertex usually rather less elongate and more smoothly curved apically; ratio of its length to width (including eyes) 0.27-0.37. Parts of clavus not marked with red usually, but not always, with more or less well developed fumose tint. (Vertex and pronotum with or without reddish markings. Scutellum brownish or pale, rarely with reddish markings. Red markings of fore wings very variable. Anal tube with single bunch of bristles (as in fig. 445). Overall length: ♂ ♀ 2.9-3.3 mm) ..... **ordinaria** (Ribaut)

On hawthorn, oak, willow and sloe, not very common. England: Bucks., Herts. (Other British records need confirmation). v, viii, ix. Most of Europe. Siberia.

7 In mature males, all segments of posterior tarsi blackish. (This colour may take some weeks to develop, especially in *Z. schneideri.)* In males, sternal apodemes more or less well developed (figs. 437, 439, 440) 8

— In males, basal segment of posterior tarsus and basal part of second segment pale. In males, sternal apodemes with very poorly developed lobes (fig. 435) ..... **ordinaria** (Ribaut) (see couplet 6 above)

8 In males, two pairs of lobes present on sternal apodemes, ventral ones rather short and broad, dorsal ones very short and acuminate, pointing inwards (fig. 437). Red markings of fore wings always forming clearly defined bands, sharply bounded by corio-claval suture for much of their length (fig. 432). Pronotum always with two reddish longitudinal bands, more or less well separated from each other and more or less widely divergent posteriorly (fig. 418). Ratio of length of posterior tarsi to that of tibiae 0.51-0.57 in males, 0.44-0.48 in females. (Vertex with two red longitudinal streaks. Those parts of clavus without red markings with or without faint fumose tint. Anal tube with single bunch of bristles (as in fig. 445). Overall length: ♂ ♀ 3.0-3.4 mm) ..... **tiliae** (Fallén)

On alder, lime and oak, local. England: S.E., N.E., and S.W. Yorks., E. Norfolk, Hunts., Kent, Dorset. Wales: Glam. Scotland: Elgin. Ireland: Co. Clare. viii, ix. Most of Europe.

— In males, single pair of lobes of sternal apodemes longer, more clearly visible in ventral

view (figs. 439, 440). Red markings of fore wings and body more variable, usually rather less well developed in summer and becoming brighter and more extensive during the autumn and winter (*e.g.* as in fig. 419). Pronotum often with two reddish longitudinal bands, which are usually slightly divergent posteriorly and often tend to coalesce in places. Ratio of length of posterior tarsi to that of tibiae 0.42-0.52 in males, 0.44-0.49 in females. (Those parts of clavus without red markings without trace of fumose tint) .. 9

9 Lobes of sternal apodemes broader and more broadly rounded apically, often touching or overlapping *in situ* (fig. 439). Anal tube with bristles in a single bundle (fig. 443). (Overall length: ♂ ♀ 2.8-3.2 mm) ..... **schneideri** (Günthart)

On wild rose, hawthorn and elm. England: Gait Barrows, N.W. Lancs.; Longdown Hill, Bucks.; Heston, Middlesex; Durlston, Dorset. v, ix, x, Switzerland. Channel Isles.

— Lobes of sternal apodemes narrower and more narrowly rounded apically, normally well separated from each other *in situ* (fig. 440). Anal tube with bristles in two bundles separated by a distinct gap (fig. 442). (Overall length: ♂ ♀ 3.1-3.5 mm) .... **suavis** Rey

On buckthorns (Rhamnus catharticus *L. and* Frangula alnus *Mill.). England: Mid-W. Yorks., Bucks., E. Essex, N. Hants., S. Wilts., E. Glos. Wales: Glam. viii, ix, x. Europe. Siberia.*

Host plant records

In general, trees are indexed under their English names and most low plants under their scientific names, but entries should easily be found from the cross-indexing. References should also be made to certain general classifications, such as trees, conifers, low plants, Labiates and Composites. Brackets are used in this list to denote less well authenticated host-plants.

Acer see Sycamore and Maple
Achillea millefolium ..... *Eupteryx tenella*
Aesculus see Horse-chestnut
Agrimonia eupatoria ..... *(Ribautiana tenerrima)*
Alder *(Alnus)* ..... *Kybos smaragdula*
Eupterycyba jucunda
Edwardsiana geometrica
E. alnicola
E. lanternae
E. hippocastani
E. spinigera
E. plebeja
E. bergmani
Alnetoidia alneti
Zygina tiliae
(Alebra albostriella)
(Eurhadina concinna)
(E. ribauti)
(Ribautiana tenerrima)
(R. debilis)
(Lindbergina aurovittata)
(Edwardsiana crataegi)
(E. rosae)
Apple ..... *Edwardsiana crataegi*
E. rosae
(Ribautiana debilis)
Arctium ..... *Eupteryx aurata*
E. florida
(E. stachydearum)

Artemisia abrotanum ..... *Eupteryx artemisiae*
A. absinthium ..... *Austroasca vittata*
A. maritima ..... *Eupteryx artemisiae*
Chlorita viridula

Ballota nigra ..... *Eupteryx florida*
Beech ..... *Fagocyba cruenta*
Edwardsiana flavescens
Eurhadina concinna
(Ribautiana debilis)
(Ossiannilssonola callosa)
(Lindbergina aurovittata)
Birch *(Betula)* ..... *Kybos betulicola*
K. calyculus
Linnavuoriana decempunctata
Eurhadina concinna
Typhlocyba quercus
Edwardsiana bergmani
E. plebeja
(Ribautiana tenerrima)
(Lindbergina aurovittata)
Blackberry see *Rubus*
Buckthorns ..... *Zygina suavis*
Burdock see *Arctium*
Buttercup see *Ranunculus*

Calluna ..... *Erythria aureola*
Zygina rubrovittata
Campion see *Silene dioica* .....
Carex ..... *Notus flavipennis*
Forcipata citrinella
F. forcipata
Erythria aureola
Catmint ..... *Eupteryx melissae*
Cherry see *Prunus*
Chrysanthemum (garden) ..... *Eupteryx heydenii*
Hauptidia maroccana
Composites (generally) ..... *Eupteryx notata*
Conifers (generally, in winter) ..... *Empoasca* spp.
Zygina spp.
Linnavuoriana decempunctata
Cornus see Dogwood
Corylus see Hazel
Cow-parsnip see *Heracleum*
Crataegus see Hawthorn
Currant ..... *Edwardsiana prunicola*

Dewberry see *Rubus*
Digitalis ..... *Hauptidia maroccana*
Dogwood ..... *Edwardsiana diversa*

Elm ..... *Alebra wahlbergi*
Kyboasca bipunctata
Ribautiana ulmi
Typhlocyba bifasciata
Edwardsiana ishidai
E. hippocastani
E. plebeja
Zygina schneideri

	Eurhadina ribauti
	(Ribautiana tenerrima)
	(Edwardsiana avellanae)
	(E. lethierryi)
	(Arboridia ribauti)
Eupatorium cannabinum	*Eupteryx aurata*
Fagus see Beech	
Ferns	*Eupteryx filicum*
Filipendula ulmaria	*Eupteryx signatipennis*
Fleabane see *Pulicaria*	
Foxglove see *Digitalis*	
Frangula see Buckthorns	
Glechoma hederacea	*Eupteryx vittata*
Gorse (in winter)	*Linnavuoriana decempunctata*
	Empoasca spp.
	Zygina spp.
Grasses	*Dikraneura variata*
	Zyginidia scutellaris
	Forcipata citrinella
	F. forcipata
Ground Ivy see *Glechoma hederacea*	
Hawthorn	*Edwardsiana crataegi*
	E. rosae
	Zygina flammigera
	Z. angusta
	Z. ordinaria
	Z. schneideri
	(Edwardsiana lethierryi)
Hazel	*Alebra coryli*
	Ribautiana cruciata
	Edwardsiana avellanae
	E. spinigera
	E. hippocastani
	Alnetoidia alneti
	(Ribautiana ulmi)
	(R. tenerrima)
	(R. debilis)
	(Lindbergina aurovittata)
	(Fagocyba cruenta)
	(Edwardsiana rosae)
	(E. ishidai)
	(E. plebeja)
	(E. lethierryi)
Heath see *Calluna*	
Hedera see Ivy	
Helianthemum	*Emelyanoviana contraria*
	Arboridia parvula
Hemp Agrimony see *Eupatorium cannabinum*	
Heracleum spondylium	*Eupteryx aurata*
Holly (in winter)	*Empoasca* spp.
	Zygina spp.
	(Ribautiana tenerrima)
Hollyhock	*Eupteryx melissae*
Horehound see *Ballota nigra*	
Horse-chestnut	*Alebra wahlbergi*
	Edwardsiana lethierryi

	(E. avellanae)
	(Ossiannilssonola callosa)
Hypericum	*Zygina hyperici*
Ilex see Holly	
Ivy (in winter)	*Empoasca* spp.
	Zygina spp.
	(Ribautiana debilis)
Labiates (generally)	*Emelyanoviana mollicula*
	Eupteryx aurata
	E. florida
	E. stachydearum
	E. thoulessi
	E. melissae
Lamiastrum galaeobdolon	*Eupteryx stachydearum*
Lavatera	*Eupteryx melissae*
Lime	*Alebra wahlbergi*
	Aguriahana stellulata
	Edwardsiana lethierryi
	Zygina tiliae
	(Ossiannilssonola callosa)
	(Edwardsiana plebeja)
Loganberry see *Rubus*	
Low plants (generally)	*Empoasca decipiens*
	E. pteridis
	Arboridia parvula
Malva (Mallow)	*Eupteryx atropunctata*
Maple	*Alebra wahlbergi*
	Edwardsiana lethierryi
	(E. alnicola)
	(E. diversa)
	(Ribautiana debilis)
	(Eurhadina loewii)
Marjoram see *Origanum*	
Meadowsweet see *Filipendula ulmaria*	
Mentha (Mint)	*Eupteryx aurata*
	E. vittata
Mullein see *Verbascum*	
Nepeta cateria see Catmint	
Nettle	*Eupteryx aurata*
	E. urticae
	E. cyclops
	Empoasca decipiens
	(Eupteryx vittata)
Nothofagus	*Eurhadina concinna*
	Typhlocyba quercus
Oak	*Alebra albostriella*
	Eurhadina pulchella
	E. kirschbaumi
	E. ribauti
	E. concinna
	Ribautiana scalaris
	Typhlocyba quercus
	Lindbergina aurovittata
	Fagocyba carri

	Edwardsiana plebeja
	Arboridia ribauti
	Zygina flammigera
	Z. angusta
	Z. ordinaria
	(Z. tiliae)
	(Ribautiana ulmi)
	(R. tenerrima)
	(Fagocyba cruenta)
	(Edwardsiana rosae)
Origanum vulgare	*Eupteryx origani*
	(Emelyanoviana mollicula)
Parietaria judaica (Pellitory-of-the-wall)	*Eupteryx urticae*
Pinus	*Aguriahana germari*
Plantago (Plantain)	*Eupteryx vittata*
	Emelyanoviana mollicula
Plum see *Prunus*	
Polypodium vulgare	*Eupteryx filicum*
Populus (Poplar)	*Kybos populi*
	Edwardsiana candidula
	(E. lethierryi)
Potato	*Eupteryx atropunctata*
	Eupteryx aurata
	Empoasca spp.
Primula	*Emelyanoviana mollicula*
	Hauptidia maroccana
Prunella	*Eupteryx notata*
Prunus	*Aguriahana stellulata*
	Typhlocyba quercus
	Edwardsiana prunicola
	E. rosae
	E. crataegi
	Zygina flammigera
	Z. ordinaria
	(Eupteryx heydenii)
Pulicaria	*Eupteryx melissae*
Purple Osier see *Salix purpurea*	
Quercus see Oak	
Ranunculus repens	*Eupteryx vittata*
Raspberry see *Rubus*	
Rhamnus see Buckthorn	
Rockrose see *Helianthemum*	
Rose	*Edwardsiana rosae*
	E. rosaesugans
	Zygina schneideri
	Z. angusta
Rowan see *Sorbus*	
Rubus	*Empoasca decipiens*
	Ribautiana tenerrima
	R. cruciata
	R. debilis
	Lindbergina aurovittata
Sage	*Eupteryx atropunctata*
	E. melissae
St. John's Wort see *Hypericum*	

Salix (generally) ..... *Edwardsiana salicicola*
E. tersa
E. prunicola
(E. rosae)
(Zygina ordinaria)
(Ribautiana tenerrima)
(R. debilis)
(R. ulmi)
(R. cruciata)
Salix alba ..... *Kybos virgator*
Salix caprea and *cinerea* ..... *Kybos strigilifer*
K. butleri
Linnavuoriana sexmaculata
Salix fragilis ..... *Kybos virgator*
Salix pentandra ..... *Kybos virgator*
K. butleri
Salix purpurea ..... *Kybos rufescens*
Salix repens ..... *Kybos butleri*

Sallow see *Salix caprea* and *cinerea*
Sedges see *Carex*
Self-heal see *Prunella*
Silene dioica ..... *Hauptidia maroccana*
Sloe see *Prunus*
Sorbus ..... *Edwardsiana crataegi*
E. rosae
E. lanternae
Southernwood see *Artemisia abrotanum*
Speedwell see *Veronica*
Stachys sylvatica ..... *Eupteryx stachydearum*
Strawberry ..... *(Edwardsiana rosae)*
Sycamore ..... *Alebra wahlbergi*
Eurhadina loewii
Ossiannilssonola callosa
Edwardsiana nigriloba
(E. avellanae)
(Fagocyba cruenta)

Teucrium scorodonia ..... *Eupteryx stachydearum*
Thymus (Thyme) ..... *Eupteryx notata*
Tilia see Lime
Tree Mallow see *Lavatera*
Trees (Generally) ..... *Empoasca vitis*
Typhlocyba quercus
Fagocyba cruenta
Edwardsiana frustrator
E. flavescens
Alnetoidia alneti
(Alebra wahlbergi)
(Empoasca decipiens)
(Eurhadina pulchella)
(Edwardsiana hippocastani)
(Zygina flammigera)
(Z. angusta)

Ulex see Gorse
Ulmus see Elm
Urtica see Nettle

Verbascum ..... *Emelyanoviana mollicula*
Veronica chamaedrys ..... *Eupteryx origani*
Viburnum lantana ..... *Edwardsiana prunicola*

Wayfaring Tree see *Viburnum lantana*
Whitebeam see *Sorbus*
Willow see *Salix*
Wood-sage see *Teucrium scorodonia*
Wormwood see *Artemisia*
Woundwort see *Stachys sylvatica*

Yarrow see *Achillea millefolia*
Yellow Archangel see *Lamiastrum galaeobdolon*

Check-list of British Auchenorhyncha

In view of the changes in nomenclature which have taken place in the years since the publication of the last check-list (Le Quesne, 1964), a revised check-list of the whole of the British Auchenorhyncha, prepared by Mr. K. R. Payne for use in the recording scheme for this group just started by the Biological Records Centre, is published here.

The check-list is based as closely as possible on the Palaearctic check-list of Nast (1972).The synonymy given should enable correlation with the check-list of Le Quesne (1964), Kloet and Hincks (1945) and China (1950, 1951), and also with Edwards' *Hemiptera-Homoptera of the British Islands* (1894-1896), Ribaut's volumes in the *Faune de France* series (1936, 1952) and China's other papers on this group (1938, 1939, 1943).

The format in this check-list corresponds closely with that in the Royal Entomological Society's (Kloet and Hincks Second Edition) check-lists (*cf.* Le Quesne, 1964). Some terms are here used in the special sense used in the Hymenoptera check-list, as below:—

misident. = misidentification. This follows a genus or species incorrectly identified at some time. For a genus, it includes allocation of species no longer ascribed to it. For a species, it includes cases where it has subsequently been split off from another closely related one.

preocc. = preoccupied. This follow a name which is unavailable because it is a junior homonym.

suppressed. This follows a name which is unavilable because it has been suppressed in an Opinion of the International Commission on Zoological Nomenclature.

misspelling. This follows a name which differs from the original in spelling, including unjustified emendations.

In this check-list, *Aphrodes bicinctus* has been used in its widest sense, despite indications that probably two or three species are involved here (Le Quesne, 1965b; Nast, 1976). It was felt that in view of some uncertainty of the true identity of the type of *bicinctus,* any attempt to separate species would cause confusion in the recording scheme. Nevertheless, it would be helpful if recorders note the form involved.

HEMIPTERA

HOMOPTERA

AUCHENORHYNCHA

CICADOMORPHA

1. CICADIDAE

TIBICININAE
CICADETTA Kolenati, 1857
MELAMPSALTA Kolenati, 1857
montana (Scopoli, 1772)

2. CERCOPIDAE

CERCOPINAE
CERCOPIS Fabricius, 1775
TRIECHPHORA Amyot & Serville, 1843
vulnerata Illiger in Rossi, 1807
sanguinea (Geoffrey in Fourcroy, 1785) preocc.
sanguinolenta Panzer, 1796 preocc.

APHROPHORINAE
APHROPHORA Germar, 1821
alni (Fallén, 1805)
spumaria misident.
alpina Melichar, 1900
major misident.
myricae Edwards, 1926
costalis Matsumura, 1903
forneri Haupt, 1919
maculata Edwards, 1920
salicina (Goeze, 1778)
salicis (Degeer, 1773) non binom.
grisea Haupt, 1919
unicolor Haupt, 1919

PHILAENUS Stål, 1864
spumarius (Linnaeus, 1758)
leucophthalmus (Linnaeus, 1758)

NEOPHILAENUS Haupt, 1935
PHILAENUS misident.
campestris (Fallén, 1805)
exclamationis (Thunberg, 1784)
lineatus (Linnaeus, 1758)
longiceps (Puton, 1895)

3. MEMBRACIDAE

CENTROTINAE
CENTROTUS Fabricius, 1803
cornutus (Linnaeus, 1758)

GARGARA Amyot & Serville, 1843
genistae (Fabricius, 1775)

4. CICADELLIDAE
JASSIDAE

ULOPINAE
ULOPA Fallén, 1814
reticulata (Fabricius, 1794)
trivia Germar, 1821

MEGOPHTHALMINAE
PAROPIINAE
MEGOPHTHALMUS Curtis, 1833
PAROPIA Germar, 1833
scabripennis Edwards, 1915
scanicus (Fallén, 1806)
bipunctatus Curtis, 1833

LEDRINAE
LEDRA Fabricius, 1803
aurita (Linnaeus, 1758)

CICADELLINAE
TETTIGELLINAE
TETTIGONIELLINAE
CICADELLA Latreille, 1817
AMBLYCEPHALUS Curtis, 1831 preocc.
TETTIGONIA misident.
TETTIGELLA China & French, 1945
TETTIGONIELLA misident.
viridis (Linnaeus, 1758)
arundinis (Germar, 1821)

GRAPHOCEPHALA Van Duzee, 1916
fennahi Young, 1977
coccinea misident.

EVACANTHINAE
EVACANTHUS Lepeletier & Serville, 1825
EUACANTHUS Burmeister, 1835
acuminatus (Fabricius, 1794)
interruptus (Linnaeus, 1758)

IDIOCERINAE
RHYTIDODUS Fieber, 1868
IDIOCERUS misident.
decimusquartus (Schrank, 1776)
scurra (Germar, 1836)

IDIOCERUS Lewis, 1834
albicans Kirschbaum, 1868
confusus Flor, 1861
nubilis Buckton, 1890
distinguendus Kirschbaum, 1868
cognatus Fieber, 1868
elegans Flor, 1861
viduatus Edwards, 1886
fulgidus (Fabricius, 1775)
cupreus Kirschbaum, 1868

socialis Fieber, 1868
aurulentus Kirschbaum, 1868
herrichi Kirschbaum, 1868
laminatus Flor, 1861
lituratus (Fallén, 1806)
maculipennis Curtis, 1839
nitidissimus (Herrich-Schaeffer, 1835)
fulgidus misident.
poecilus (Herrich-Schaeffer, 1835)
venustus Scott, 1877
populi (Linnaeus, 1761)
rutilans Kirschbaum, 1868
similis Kirschbaum, 1868
varius: (Germar, 1821) misident.
stigmaticalis Lewis, 1834
adustus (Herrich-Schaeffer, 1837)
tremulae (Estlund, 1796)
vitreus (Fabricius, 1803)
h-album Fieber, 1868
vittifrons Kirschbaum, 1868
tibialis Fieber, 1868
heydeni misident.

JASSINAE
IASSINAE
BATRACOMORPHUS Lewis, 1834
BATRACHOMORPHUS Agassiz, 1846
irroratus Lewis, 1834
microcephalus (Herrich-Schaeffer, 1838)
punctuosus Kirschbaum, 1868

IASSUS Fabricius, 1803
JASSUS Fallén, 1806
BYTHOSCOPUS Germar, 1833
lanio (Linnaeus, 1761)
scutellaris (Fieber, 1868)

MACROPSINAE
ONCOPSIS Burmeister, 1838
BYTHOSCOPUS misident.
alni (Schrank, 1801)
fenestrata (Schrank, 1776) preocc.
ferruginea (Curtis, 1837)
avellanae Edwards, 1920
carpini (J. Sahlberg. 1871)
carpinicola Edwards, 1920
flavicollis (Linnaeus, 1761)
frontalis (Curtis, 1837)
personata (Curtis, 1837)
pulchella (Curtis, 1837)
reticulata (Curtis, 1837)
subangulata (J. Sahlberg, 1871)
fortior Wagner, 1944
tristis (Zetterstedt, 1840)
fenestrata (Curtis, 1837) preocc.
rufuscula (Fieber, 1868)

PEDIOPSIS Burmeister, 1838
tiliae (Germar, 1831)

MACROPSIS Lewis, 1834
albae Wagner, 1950
cerea (Germar, 1836)
planicollis Thomson, 1870
nitidula (Herrich-Schaeffer, 1836)
harrisoni Wagner, 1950
fuscinervis (Boheman, 1845)
fuscula (Zetterstedt, 1828)
nassatus (Germar, 1836)
rubi (Boheman, 1845)
glandacea (Fieber, 1868)
graminea (Fabricius, 1798)
populi Edwards, 1919
impura (Boheman, 1847)
infuscata (J. Sahlberg, 1871)
distincta (Scott, 1874)
decorata Edwards, 1919
marginata (Herrich-Schaeffer, 1836)
mendax (Fieber, 1868)
ulmi (Scott, 1873)
glandacea misident.
prasina (Boheman, 1852)
virescens: Lewis,1834 misident.
scotti Edwards, 1920
scutellata misident.
scutellata (Boheman, 1845)
tibialis (Scott, 1874)

HEPHATHUS Ribaut, 1952
MACROPSIS misident.
nanus (Herrich-Schaeffer, 1836)

AGALLIINAE
AUSTROAGALLIA Evans, 1936
PERAGALLIA Ribaut, 1948
AGALLIA misident.
sinuata (Mulsant & Rey, 1855)

AGALLIA Curtis, 1833
brachyptera (Boheman, 1847)
consobrina Curtis, 1833
puncticeps (Germar, 1836)
versicolor Flor, 1861
laevis Ribaut, 1935
ribauti Ossiannilsson, 1938
venosa: Ribaut, 1935 misident.
venosa (Fallén, 1806)
aspera Ribaut, 1935

EUPELICINAE
DORYCEPHALINAE
EUPELIX Germar, 1821
cuspidata (Fabricius, 1775)
depressa (Fabricius, 1803)
spathulata Germar, 1838
producta Germar, 1838

APHRODINAE
ACOCEPHALINAE
APHRODES Curtis, 1831
ACUCEPHALUS Germar, 1833
ACOCEPHALUS Burmeister, 1835 misspelling
albifrons (Linnaeus, 1758)
testudo Curtis, 1833
interruptus (Scott, 1873)
polystolus (Scott, 1873)
limicola (Edwards, 1908)
albiger (Germar, 1821)
kirschbaumi (Edwards, 1920)
bicinctus (Schrank, 1776)
rusticus (Fabricius, 1775) preocc.
nervosus (Schrank, 1781)
adustus Hardy, 1850
makarovi Zakhvatkin, 1948
diminutus Ribaut, 1952
aestuarinus (Edwards, 1908)
bifasciatus (Linnaeus, 1758)
tricinctus (Curtis, 1836)
major Duffield, 1963
duffieldi Le Quesne, 1964
assimilis: Duffield, 1963 misident.
flavostriatus (Donovan, 1799)
rivularis (Germar, 1821)
flavostrigatus (Edwards, 1908)
histrionicus (Fabricius,1794)
arenicola (Marshall, 1866)
serratulae (Fabricius, 1775)
fuscofasciatus (Goeze, 1778)
trifasciatus (Geoffroy in Fourcroy, 1785)

STROGGYLOCEPHALUS Flor, 1861
STRONGYLOCEPHALUS Kirschbaum, 1868 misspelling
AMBLYCEPHALUS Kirschbaum, 1858 preocc.
agrestis (Fallén, 1806)
maculipes (Curtis, 1835)
irroratus (Curtis, 1835)
livens (Zetterstedt, 1838)
megerlei (Scott, 1874)

DELTOCEPHALINAE
EUSCELINAE

DORATURINI
DORATURA J. Sahlberg, 1871
impudica Horvàth, 1897
stylata (Boheman, 1847)
? exilis Horvàth, 1903

DELTOCEPHALINI
DELTOCEPHALUS Burmeister, 1838
maculiceps Boheman, 1847
pulicaris (Fallén, 1806)

RECILIA Edwards, 1922
DELTOCEPHALUS misident.
coronifera (Marshall, 1866)
coroniceps (Kirschbaum, 1868)
i-album (Scott, 1881)

PARALIMNINI
PARAMESUS Fieber, 1866
obtusifrons (Stål, 1853)
nervosus (Fallén, 1826) preocc.

METALIMNUS Ribaut, 1948
SCAPHOIDEUS misident.
DELTOCEPHALUS misident.
formosus (Boheman, 1845)

COSMOTETTIX Ribaut, 1942
PALUS Delong & Sleesman, 1929 preocc.
DELTOCEPHALUS misident.
caudatus (Flor, 1861)
costalis (Fallén, 1826)
panzeri (Flor, 1861)

AROCEPHALUS Ribaut, 1946
DELTOCEPHALUS misident.
punctum (Flor, 1861)

TURRUTUS Ribaut, 1946
DELTOCEPHALUS misident.
socialis (Flor, 1861)

ADARRUS Ribaut, 1946
ERRASTUNUS Ribaut, 1946
DELTOCEPHALUS misident.
multinotatus (Boheman, 1847)
ocellaris (Fallén, 1806)

JASSARGUS Zakhvatkin, 1934
LAUSULUS Ribaut, 1946
DELTOCEPHALUS misident.
distinguendus (Flor, 1861)
pseudocellaris (Flor, 1861)
falleni (Fieber, 1869)
paleaceus (J. Sahlberg, 1871)
repletus: (Edwards, 1908) misident.
flori (Fieber, 1869)
oculatus (J. Sahlberg, 1871)
picturatus: (Edwards, 1895) misident.
sursumflexus (Then, 1901)

DIPLOCOLENUS Ribaut, 1946
DELTOCEPHALUS misident.
EUSCELIS misident.
abdominalis (Fabricius, 1803)
s. *juvencus* (Hardy, 1850)
temperei Ribaut, 1959
bensoni (China, 1933)
obenbergeri (Dlabola, 1945)
bohemicus (Lang, 1947)

MOCUELLUS Ribaut, 1946
DELTOCEPHALUS misident.
CICADULA misident.
collinus (Boheman, 1850)
metrius (Flor, 1861)

EBARRIUS Ribaut,1946
cognatus (Fieber, 1869)

SORHOANUS Ribaut, 1946
DELTOCEPHALUS misident.
xanthoneurus (Fieber, 1869)

ARTHALDEUS Ribaut, 1946
DELTOCEPHALUS misident.
pascuellus (Fallén, 1826)
minki (Fieber, 1869)
striifrons (Kirschbaum, 1868)
longicaput (Scott, 1876)

PSAMMOTETTIX Haupt, 1929
RIBAUTIELLUS Zakhvatkin, 1933
DELTOCEPHALUS misident.
albomarginatus Wagner, 1941
cephalotes (Herrich-Schaeffer, 1834)
citrinellus (Kirschbaum, 1868)
assimilis: (Scott, 1876) misident.
normani (Scott, 1881)
confinis (Dahlbom, 1850)
thenii (Edwards, 1915)
frigidus (Boheman, 1847)
maritimus (Perris, 1857)
nodosus (Ribaut, 1925)
striatus: (Edwards, 1895) misident.
putoni: Ribaut, 1952 misident.
putoni (Then, 1898)
halophilus (Edwards, 1924)
sabulicola (Curtis, 1837)
striatus (Linnaeus, 1758)

PARALIMNUS Matsumura, 1902
PARAMESUS misident.
phragmitis (Boheman, 1847)

PLATYMETOPIINI
PLATYMETOPIUS Burmeister, 1838
undatus (Degeer, 1773)

ATHYSANINI
EUSCELINI
RHYTISTYLUS Fieber, 1875
GLYPTOCEPHALUS Edwards, 1883
EDWARDSIASTES Kirkaldy, 1900
proceps (Kirschbaum, 1868)
canescens (Douglas & Scott, 1873)

GRAPHOCRAERUS Thomson, 1869
ventralis (Fallén, 1806)

SARDIUS Ribaut, 1946
DELTOCEPHALUS misident.
argus (Marshall, 1866)

ALLYGUS Fieber, 1872
ALLYGIDIUS Ribaut, 1948
JASSUS misident.
commutatus Fieber, 1872
mixtus (Fabricius, 1794)
modestus Scott, 1876

SCLERORACUS Van Duzee, 1894
OPHIOLA Edwards, 1922
THAMNOTETTIX misident.
corniculus (Marshall, 1866)
orichalceus (Thomson, 1869)
intractabilis (Kontkanen, 1949)
striatulus misident.
decumanus (Kontkanen, 1949)
striatulus (Fallén, 1806) preocc.
corniculus: (Ribaut, 1952) misident.
plutonius (Uhler, 1877)
striatulellus (Edwards, 1894)
russeolus misident.

LIMOTETTIX J. Sahlberg, 1871
DRYLIX Edwards, 1922
atricapillus (Boheman, 1845)
striola (Fallén, 1806)

CONOSANUS Osborn & Ball, 1902
EUSCELIS misident.
obsoletus (Kirschbaum, 1858)
sejungendus (Kirschbaum, 1868)
piceus (Scott, 1875)

EUSCELIS Brullé, 1832
PHRYNOMORPHUS Curtis, 1833
ATHYSANUS misident.
THAMNOTETTIX misident.
incisus (Kirschbaum, 1858)
plebejus (Fallén, 1806) preocc.
albingensis Wagner, 1939
galiberti Ribaut, 1952
lineolatus Brullé, 1832
bilobatus Wagner in Ribaut, 1952
ohausi Wagner, 1939
distinguendus: (Edwards, 1920) misident
venosus (Kirschbaum, 1868)

EUSCELIDIUS Ribaut, 1942
EUSCELIS misident.
THAMNOTETTIX misident.
schenckii (Kirschbaum, 1868)
variegatus (Kirschbaum, 1858)
irroratus (Scott, 1875)

STREPTANUS Ribaut, 1942

ATHYSANUS misident.
aemulans (Kirschbaum, 1868)
sahlbergi (Reuter, 1880)
marginatus (Kirschbaum, 1858)
brevipennis (Kirschbaum, 1858)
depressus (Scott, 1875)
sordidus (Zetterstedt, 1828)

MACUSTUS Ribaut, 1942
ATHYSANUS misident.
grisescens (Zetterstedt, 1828)

ATHYSANUS Burmeister, 1838
argentarius Metcalf, 1955
argentatus (Fabricius, 1794) preocc.

PALUDA DeLong, 1937
RHOPALOPYX Ribaut, 1939
STICTOCORIS misident.
adumbrata (C. Sahlberg, 1842)
preyssleri misident.
flaveola (Boheman, 1845)
vitripennis (Flor, 1861)
s. *hibernica* (Le Quesne, 1964)
monticola: (Le Quesne, 1960) misident.

HARDYA Edwards, 1922
ATHYSANUS misident.
melanopsis (Hardy, 1850)

MOCYDIA Edwards, 1922
THAMNOTETTIX misident.
crocea (Herrich-Schaeffer, 1836)

MOCYDIOPSIS Ribaut, 1939
MOCYDIA misident.
THAMNOTETTIX misident.
attenuata (Germar, 1821)
parvicauda Ribaut, 1939

THAMNOTETTIX Zetterstedt, 1838
LOEPOTETTIX Ribaut, 1942
confinis (Zetterstedt, 1828)
simplex (Herrich-Schaeffer, 1834)
prasinus misident.
dilutior (Kirschbaum, 1868)

SPEUDOTETTIX Ribaut, 1942
THAMNOTETTIX misident.
subfusculus (Fallén, 1806)

IDIODONUS Ball, 1936
OROLIX Ribaut, 1942
THAMNOTETTIX misident.
cruentatus (Panzer, 1799)

COLLADONUS Ball, 1936
HYPOSPADIANUS Ribaut, 1942
THAMNOTETTIX misident.
torneellus (Zetterstedt, 1828)

LAMPROTETTIX Ribaut, 1942
THAMNOTETTIX misident.
nitidulus (Fabricius, 1787)
octopunctatus (Schrank, 1796)
splendidulus (Fabricius, 1803)

CICADULA Zetterstedt, 1838
LIMOTETTIX: Edwards, 1896 misident.
aurantipes (Edwards, 1894)
frontalis (Herrich-Schaeffer, 1835)
antennata (Boheman, 1845)
pellucens Salmon, 1954
intermedia (Boheman, 1845)
lunulifrons (J. Sahlberg, 1871)
persimilis (Edwards, 1920)
quadrinotata (Fabricius, 1794)
quinquenotata (Boheman, 1845)
nigricornis (J. Sahlberg, 1871)
saturata (Edwards, 1915)

ELYMANA DeLong, 1936
SOLENOPYX Ribaut, 1939
LIMOTETTIX misident.
sulphurella (Zetterstedt, 1828)
virescens misident.

OPSIINI
OPSIUS Fieber, 1866
LIMOTETTIX misident.
stactogalus Fieber, 1866
tamaracis (Kirschbaum, 1868)

FIEBERIELLINI
SYNOPHROPSINI
PLACOTETTIX Ribaut, 1942
taeniatifrons (Kirschbaum, 1868)

GRYPOTINI
GRYPOTES Fieber, 1866
puncticollis (Herrich-Schaeffer, 1834)
pinetellus (Zetterstedt, 1840)

MACROSTELINI
SONRONIUS Dorst. 1937
CICADULA misident.
dahlbomi (Zetterstedt, 1840)
quadripunctatus (Fallén, 1806) preocc.

MACROSTELES Fieber, 1866
CICADULA misident.
EROTETTIX Haupt, 1929
alpinus (Zetterstedt, 1828)
cristatus (Ribaut, 1927)
cyane (Boheman, 1845)
fieberi (Edwards, 1889)
frontalis: (Fieber, 1885) misident.
frontalis (Scott, 1875)

horvathi (Wagner, 1935)
fasciifrons: (Edwards, 1896) misident.
warioni: (Edwards, 1908) misident.
laevis (Ribaut, 1927)
lividus (Edwards,1894)
cyane: (Edwards, 1891) misident.
oshanini Razvyaskina, 1957
opacipennis misident.
ossiannilssoni Lindberg, 1954
ossiannilssoni Le Quesne, 1968
quadripunctulatus (Kirschbaum, 1868)
septemnotatus (Fallén, 1806)
sexnotatus (Fallén 1806)
sordidipennis (Stål, 1858)
salinus (Reuter, 1886)
variatus (Fallén, 1806)
viridigriseus (Edwards, 1924)

SAGATUS Ribaut, 1948
DAVISONIA misident.
CICADULA misident.
punctifrons (Fallén, 1806)

BALCLUTHA Kirkaldy, 1900
GNATHODUS Fieber, 1866 preocc.
punctata (Fabricius, 1775)

TYPHLOCYBINAE
CICADELLINAE suppressed
EUPTERYGINAE

ALEBRINI
ALEBRA Fieber, 1875
albostriella (Fallén, 1826)
coryli Le Quesne, 1977
wahlbergi (Boheman, 1845)

DIKRANEURINI
NOTUS Fieber, 1866
DIKRANEURA misident.
flavipennis (Zetterstedt, 1828)
armatus (Buckton, 1891)

FORCIPATA DeLong and Caldwell, 1936
DIKRANEURA misident.
DICRANONEURA Douglas, 1876 misspelling
ERYTHRIA misident.
citrinella (Zetterstedt, 1828)
similis (Edwards, 1885)
fieberi (Löw, 1886)
forcipata (Flor, 1861)
citrinella misident.

DIKRANEURA Hardy, 1850
ERYTHRIA misident.
variata Hardy, 1850

EMELYANOVIANA Anufriev, 1970
DIKRANEURA misident.
contraria (Ribaut, 1936)
mollicula (Boheman, 1845)

ERYTHRIA Fieber, 1866
DIKRANEURA misident.
aureola (Fallén, 1806)

EMPOASCINI
AUSTROASCA Lower, 1952
KYBOASCA misident.
EMPOASCA misident.
vittata (Lethierry, 1884)
artemisiae (Haupt, 1924)

KYBOASCA Zakhvatkin, 1953
EMPOASCA misident.
bipunctata (Oshanin, 1871)

CHLORITA Fieber, 1872
EMPOASCA misident.
viridula (Fallén, 1806)
subulata: (Duffield, 1957) misident.

EMPOASCA Walsh, 1862
decipiens Paoli, 1930
viridula: Edwards, 1908 misident.
pteridis (Dahlbom, 1850)
tullgreni Ribaut, 1933
? solani (Curtis, 1846)
? viridula: Edwards, 1908 misident.
vitis (Göthe, 1875)
flavescens misident.
aurantiaca Lethierry, 1880

KYBOS Fieber, 1866
EMPOASCA misident.
betulicola (Wagner, 1955)
butleri (Edwards, 1908)
calyculus (Cerutti, 1939)
populi (Edwards, 1908)
rufescens (Melichar, 1896)
smaragdula (Fallén, 1806)
strigilifer (Ossiannilsson, 1941)
virgator (Ribaut, 1933)

TYPHLOCYBINI
EURHADINA Haupt, 1929
EUPTERYX misident.
concinna (Germar, 1831)
kirschbaumi Wagner, 1937
loewii (Then, 1886)
untica Dlabola, 1967
pulchella (Fallén, 1806)
ribauti Wagner, 1935

EUPTERYX Curtis, 1833
CICADELLA Dumeril, 1806 suppressed

artemisiae (Kirschbaum, 1868)
abrotani (Douglas, 1874)
atropunctata (Goeze, 1778)
picta (Fabricius, 1794)
aurata (Linnaeus, 1758)
cyclops Matsumura, 1906
britteni Edwards, 1924
affinis Ossiannilsson, 1936
simplex Edwards, 1926
filicum (Newman, 1853)
florida Ribaut, 1936
collina misident.
heydenii (Kirschbaum, 1868)
ornata (Fieber, 1872)
pruni (Edwards, 1888)
melissae Curtis, 1837
notata Curtis, 1837
origani Zakhvatkin, 1948
signatipennis (Boheman, 1847)
stachydearum (Hardy, 1850)
tenella (Fallén, 1806)
thoulessi Edwards, 1926
urticae (Fabricius, 1803)
tarsalis Curtis, 1837
octonotata (Hardy, 1850)
vittata (Linnaeus, 1758)

AGURIAHANA Distant, 1918
EUPTEROIDEA Young, 1952
WAGNERIPTERYX Dlabola, 1958
EUPTERYX misident.
germari (Zetterstedt, 1838)
stellulata (Burmeister, 1841)

RIBAUTIANA Zakhvatkin, 1947
TYPHLOCYBA misident.
cruciata (Ribaut, 1931)
tenerrima: (McAtee, 1926) misident.
debilis (Douglas, 1876)
scalaris (Ribaut, 1931)
tenerrima (Herrich-Schaeffer, 1834)
rubi (Hardy, 1850)
ulmi (Linnaeus, 1758)
ocellata (Curtis, 1837)

EUPTERYCYBA Dlabola, 1958
TYPHLOCYBA misident.
jucunda (Herrich-Schaeffer, 1837)

LINNAVUORIANA Dlabola, 1958
TYPHLOCYBA misident.
decempunctata (Fallén, 1806)
betulicola (Edwards, 1925)
sexmaculata (Hardy, 1850)
sexpunctata (Fallén, 1826) preocc.

TYPHLOCYBA Germar, 1833
ANOMIA Fieber, 1866
bifasciata Boheman, 1851
nitidula (Fabricius, 1794) preocc.
quercus (Fabricius, 1777)

OSSIANNILSSONOLA
Christian, 1953
TYPHLOCYBA misident.
callosa (Then, 1886)
distincta (Edwards, 1914)

LINDBERGINA Dlabola, 1958
YOUNGIADA Dlabola, 1959
YOUNGIA Dlabola, 1958 preocc.
TYPHLOCYBA misident.
aurovittata (Douglas, 1875)
pandellei (Lethierry, 1876)

FAGOCYBA Dlabola, 1958
TYPHLOCYBA misident.
carri (Edwards, 1914)
cruenta (Herrich-Schaeffer, 1838)
douglasi (Edwards, 1878)
opaca (Edwards, 1888)
gratiosa: (Edwards, 1896) misident.
inquinata (Ribaut, 1936)

EDWARDSIANA Zakhvatkin, 1929
TYPHLOCYBA misident.
alnicola (Edwards, 1924)
avellanae (Edwards, 1888)
bidentata (Edwards, 1914)
staminata (Ribaut, 1931)
bergmani (Tullgren, 1916)
candidula (Kirschbaum, 1868)
crataegi (Douglas, 1876)
australis (Froggatt, 1918) preocc.
froggatti (Baker, 1925)
xanthippe (McAtee, 1926)
oxyacanthae (Ribaut, 1931)
diversa (Edwards, 1914)
tridentata (Edwards, 1928)
flavescens (Fabricius, 1794)
fratercula (Edwards, 1908)
frustrator (Edwards, 1908)
solearis (Ribaut, 1931)
geometrica (Schrank, 1801)
plagiata (Hardy, 1850)
hippocastani (Edwards, 1888)
lethierryi: (McAtee, 1926) misident.
ishidai (Matsumura, 1932)
ishidae: Nast, 1972 misspelling
lanternae (Wagner, 1937)
lethierryi (Edwards, 1881)
hippocastani: (Edwards, 1896) misident.
nigriloba (Edwards, 1924)
plebeja (Edwards, 1914)
divergens (Ribaut, 1931)
prunicola (Edwards, 1914)
barbata (Ribaut, 1931)

rosae (Linnaeus, 1758)
rosaesugans (Cerutti, 1939)
salicicola (Edwards, 1885)
spinigera (Edwards, 1924)
tersa (Edwards, 1914)

ERYTHRONEURINI
ALNETOIDIA Dlabola, 1958
ERYTHRONEURA misident.
alneti (Dahlbom, 1850)
coryli (Tollin, 1851)
mali (Edwards, 1915)

ZYGINIDIA Haupt, 1929
ZYGINA misident.
ERYTHRONEURA misident.
scutellaris (Herrich-Schaeffer, 1838)

HAUPTIDIA Dworakowska, 1970
ZYGINA misident.
ERYTHRONEURA misident.
maroccana (Melichar, 1907)
pallidifrons (Edwards, 1924)
tolosana (Ribaut, 1931)

ARBORIDIA Zakhvatkin, 1946
ERYTHRONEURA misident.
parvula (Boheman, 1845)
disjuncta (Ribaut, 1931) preocc.
ribauti (Ossiannilsson, 1937)
parvula: (Ribaut, 1931) misident.

ZYGINA Fieber, 1866
ERYTHRONEURA misident.
S. HYPERICIELLA Dworakowska, 1970
hyperici (Herrich-Schaeffer, 1836)
pygmaea (Douglas, 1876)
S. FLAMMIGEROIDIA Dlabola, 1958
angusta Lethierry, 1874
neglecta Edwards, 1914
rubrinervis Edwards, 1914
flammigera (Geoffroy in Fourcroy, 1785)
pruni Edwards, 1924
ordinaria (Ribaut, 1936)
rubrovittata (Lethierry, 1869)
schneideri (Günthart. 1974)
suavis Rey, 1891
rhamnicola Horváth, 1903
inconstans (Ribaut, 1936)
concinna Edwards, 1924
rhamni Fieber, 1884 preocc.
tiliae (Geoffroy in Fourcroy, 1785)

FULGOROMORPHA

5. CIXIIDAE
OLIARUS Stål, 1862
PENTASTIRIDIUS Kirschbaum, 1868
leporinus (Linnaeus, 1761)
pallidus (Herrich-Schaeffer, 1835)
panzeri Löw, 1883
leporinus misident.

TACHYCIXIUS Wagner, 1939
CIXIUS misident.
pilosus (Olivier, 1791)

CIXIUS Latreille, 1804
caledonicus China, 1942
cambricius China, 1935
borussicus Wagner, 1939
cunicularius (Linnaeus, 1767)
cynosbatis (Fabricius, 1775)
dionysii (Panzer, 1796)
dorsalis: Hardy, 1850 misident.
distinguendus Kirschbaum, 1868
intermedius Scott, 1870
brachycranus Scott, 1870
nervosus (Linnaeus, 1758)
dionysii misident.
remotus Edwards, 1888
similis: Scott, 1870 misident.
similis Kirschbaum, 1868
stigmaticus misident.
musivus: Marshall, 1864 misident.
leporinus: Marshall, 1864 misident.
simplex (Herrich-Schaeffer, 1835)
scotti Edwards, 1888

TRIGONOCRANUS Fieber, 1875
emmeae Fieber, 1876

6. DELPHACIDAE

ASIRACINAE
ASIRACA Latreille, 1796
DELPHAX misident.
clavicornis (Fabricius, 1794)

DELPHACINAE

KELISIINI
KELISIA Fieber, 1866
guttula (Germar, 1818)
pascuorum Ribaut, 1934
guttulifera (Kirschbaum, 1868)
fallax Ribaut, 1934
pallidula (Boheman, 1847)
punctulum (Kirschbaum, 1868)
ribauti Wagner, 1938
pannonica misident.
guttula: Ribaut, 1934 misident.
sabulicola Wagner, 1952
pannonica misident.
vittipennis (Sahlberg, 1868)

ANAKELISIA Wagner, 1963
KELISIA misident.

fasciata (Kirschbaum, 1868)
scotti (Scott, 1870)
perspicillata (Boheman, 1845)

STENOCRANINI
STENOCRANUS Fieber, 1866
fuscovittatus (Stål, 1858)
longipennis (Curtis, 1837)
major (Kirschbaum, 1868)
minutus (Fabricius, 1787)
lineola (Germar, 1818)
farinosus (Buckton, 1890)

CHLORIONINI
CHLORIONA Fieber, 1866
dorsata Edwards, 1898
danica Jensen-Haarup, 1917
glaucescens Fieber, 1866
unicolor: (Scott, 1870) misident.
smaragdula (Stål, 1853)
prasinula Fieber, 1872
unicolor (Herrich-Schaeffer, 1835)
prasinula: Edwards, 1898 misident.
edwardsi Le Quesne, 1960
vasconica Ribaut, 1934

ACHOROTILINI
EUCONOMELUS Haupt, 1929
lepidus (Boheman, 1847)
limbatus (Fabricius, 1794) preocc.

DELPHACINI
CONOMELUS Fieber,1866
anceps (Germar, 1821)
limbatus: (Boheman, 1845) misident.

DELPHAX Fabricius, 1798
ARAEOPUS Spinola, 1839
pulchellus (Curtis, 1833)
dubius: (Curtis, 1831) misident.
crassicornis: (Marshall, 1865) misident.

EUIDES Fieber, 1866
EUIDELLA Puton, 1886
speciosa (Boheman, 1845)

STIROMINI
DELPHACINUS Fieber,1866
mesomelas (Boheman, 1850)

EURYSA Fieber, 1866
douglasi (Scott, 1870)
lineata (Perris, 1857)

EURYSULA Vilbaste, 1968
EURYSA misident.
lurida (Fieber, 1866)

DITROPIS Kirschbaum, 1868
CRIOMORPHUS misident.
STIROMA misident.
pteridis (Spinola, 1839)

EURYBREGMA Scott, 1875
CRIOMORPHUS misident.
nigrolineata Scott, 1875

STIROMA Fieber, 1866
CRIOMORPHUS misident.
affinis Fieber, 1866
bicarinata (Herrich-Schaeffer, 1835)
nasalis (Boheman, 1847)

CRIOMORPHINI
CRIOMORPHUS Curtis, 1831
albomarginatus Curtis, 1833
moestus (Boheman, 1847)
thoracicus (Stål, 1858)
borealis: (Edwards, 1886) misident.
williamsi China, 1939

DICRANOTROPIS Fieber, 1866
divergens Kirschbaum, 1868
hamata (Boheman, 1847)

MEGAMELUS Fieber, 1866
notula (Germar, 1830)

MEGAMELODES Le Quesne, 1960
MEGAMELUS misident.
DELPHACODES misident.
lequesnei Wagner, 1963
quadrimaculatus misident.
quadrimaculatus (Signoret, 1865)
fieberi (Scott, 1870)

DELPHACODES Fieber, 1866
MEGAMELUS misident.
MEGAMELODES misident.
capnodes (Scott, 1870)
brevifrons: (Haupt, 1917) misident.
pilosus (Haupt, 1935)
paludicola (Lindberg, 1937)
venosus (Germar, 1830)
melanopachys (Scott, 1870)
thoulessi (Edwards, 1894)

MUELLERIANELLA Wagner, 1963
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
brevipennis (Boheman, 1847)
bivittata (Boheman, 1850)
hyalinipennis (Stål, 1854)
neglecta (Flor, 1861
fairmairei (Perris, 1857)
extrusa (Scott, 1871)

LAODELPHAX Fennah, 1963
CALLIDELPHAX Wagner, 1963
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
striatellus (Fallén, 1826)
marginatus misident.

HYLEDELPHAX Vilbaste, 1968
LAODELPHAX misident.
STRUEBINGIANELLA misident.
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
elegantulus (Boheman, 1847)
aemulator (Scott, 1873)

JAVESELLA Fennah, 1963
WEIDNERIANELLA Wagner, 1963
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
discolor (Boheman, 1847)
similis (Kirschbaum, 1868)
dubia (Kirschbaum, 1868)
difficilis (Edwards, 1888)
forcipata (Boheman, 1847)
obscurella (Boheman, 1847)
discreta (Edwards, 1888)
pellucida (Fabricius, 1794)
marginata (Fabricius, 1794)

TYRPHODELPHAX Vilbaste, 1968
NOTHODELPHAX misident.
MUIRODELPHAX misident.
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
distinctus (Flor, 1861)
albocarinatus misident.

RIBAUTODELPHAX Wagner, 1963
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
angulosus (Ribaut, 1953)
collinus misident.
imitans (Ribaut, 1953)
collinus misident.
pallens (Stål, 1854)
collinus misident.
pungens (Ribaut, 1953)
collinus misident.

CALLIGYPONA J. Sahlberg, 1871
DELPHACODES misident.
LIBURNIA misident.
DELPHAX misident.
reyi (Fieber, 1866)
albicollis J. Sahlberg, 1871

XANTHODELPHAX Wagner, 1963
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
flaveolus (Flor, 1861)
stramineus (Stål, 1858)
v-flava (Scott, 1881)

PARADELPHACODES Wagner, 1963
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
paludosus (Flor, 1861)

MUIRODELPHAX Wagner, 1963
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
aubei (Perris, 1857)
cognatus (Fieber, 1866)

KOSSWIGIANELLA Wagner, 1963
MUIRODELPHAX misident.
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
exigua (Boheman, 1849)
scutellata (Scott, 1873)

ACANTHODELPHAX Le Quesne, 1964
MUIRODELPHAX misident.
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
denticauda (Boheman, 1847)
insignis (Scott, 1882)

GRAVESTEINIELLA Wagner, 1963
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
boldi (Scott, 1870)
consanguinea (Scott, 1873)

PARALIBURNIA Jensen-Haarup, 1917

DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
adela (Flor, 1861)
signoreti (Scott, 1870)
clypealis (J. Sahlberg, 1871)
litoralis: (Ossiannilsson, 1944) misident.

FLORODELPHAX Vilbaste, 1968
STRUEBINGIANELLA misident.
PARALIBURNIA misident.
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
leptosoma (Flor, 1861)
albofimbriata (Fieber, 1866)
paryphasma (Flor, 1861)
thoracica: (Marshall, 1867) misident.
niveimarginata (Scott, 1870)
leptosoma: (Linnavuori, 1951) misident.

STRUEBINGIANELLA Wagner, 1963
PARALIBURNIA misident.
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
dalei (Scott, 1870)
litoralis (Reuter, 1880)
lugubrina (Boheman, 1847)

ONCODELPHAX Wagner, 1963
DELPHACODES misident.
CALLIGYPONA misident.
LIBURNIA misident.
DELPHAX misident.
pullulus (Boheman, 1852)

7. ISSIDAE
ISSUS Fabricius, 1803
coleoptratus (Fabricius, 1781)
muscaeformis (Schrank, 1781)

8. TETTIGOMETRIDAE
TETTIGOMETRA Latreille, 1804
impressopunctata Dufour, 1846
nitidula Kirschbaum, 1868

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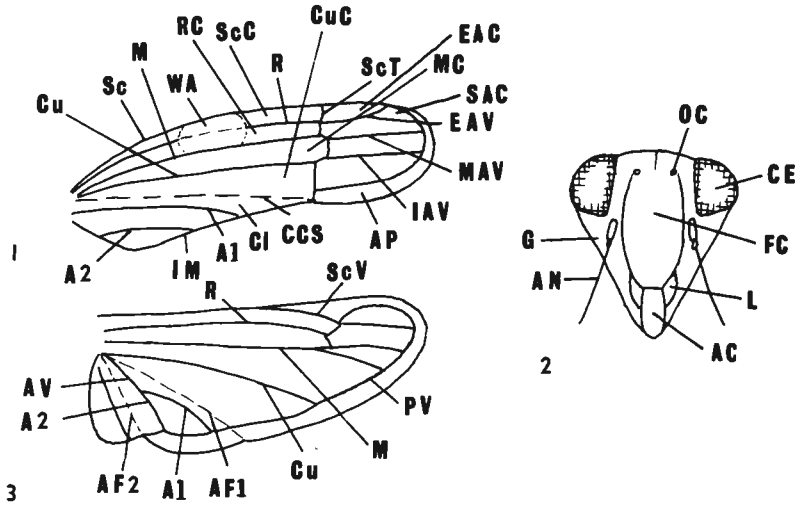
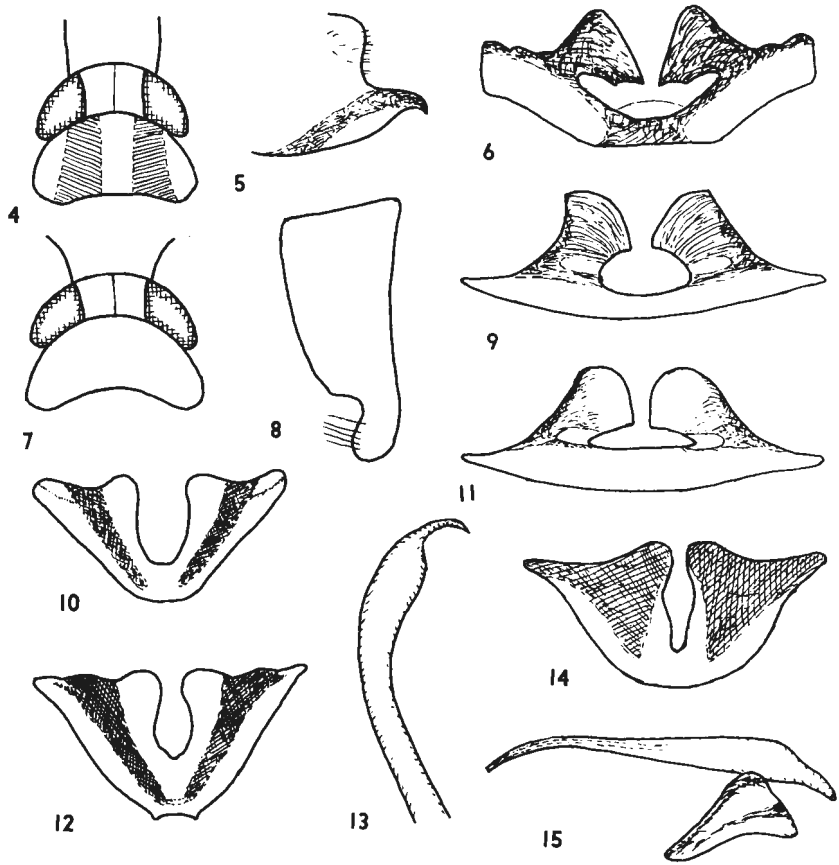
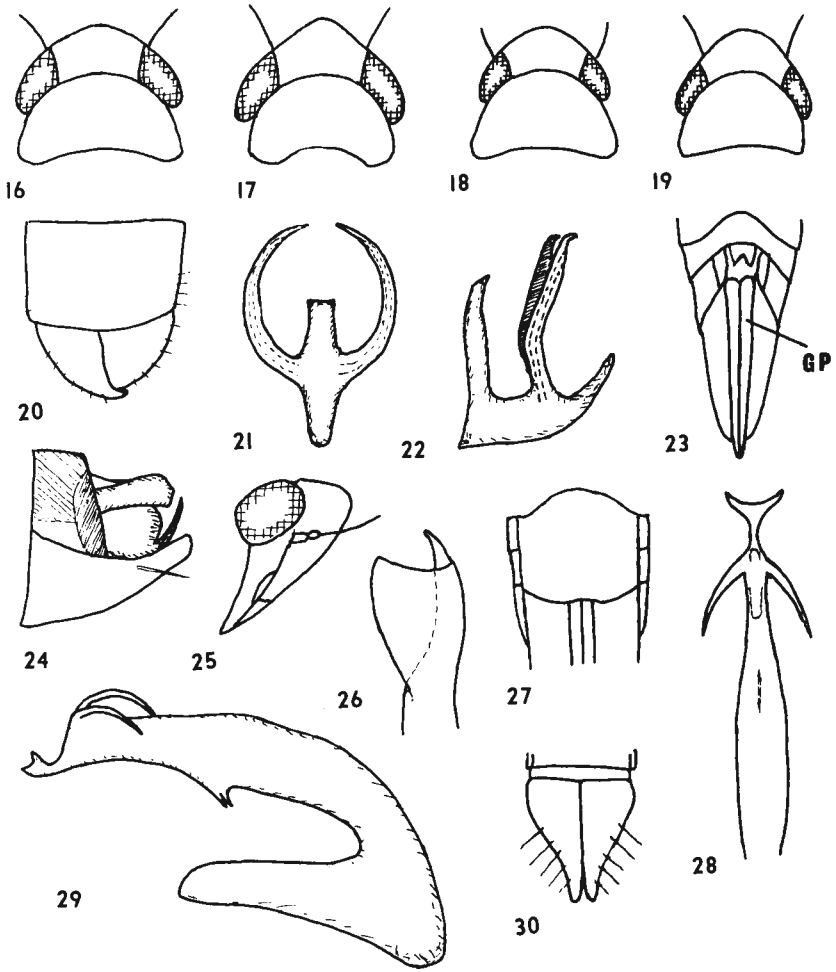


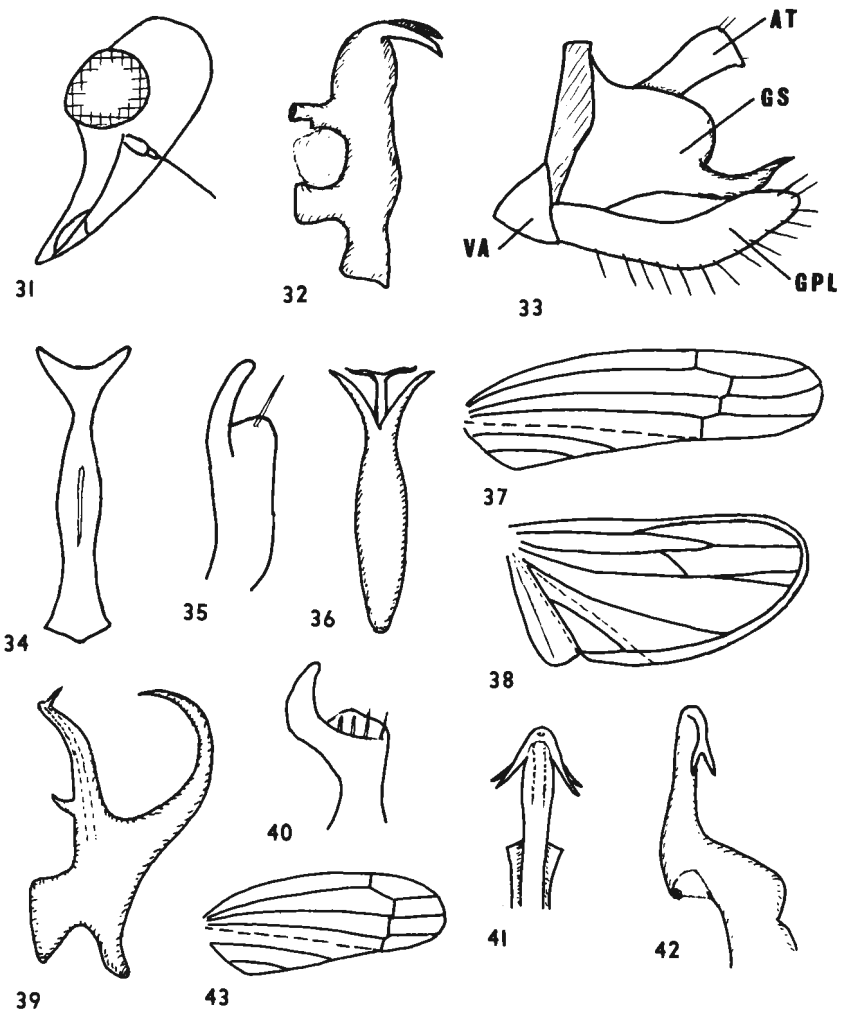
Figs. 1-3. *Alebra albostriella*. 1, fore wing. 2, face. 3, hind wing. A1, first anal vein. A2, second anal vein. AC, anteclypeus. AF1, first anal fold. AF2, second anal fold. AN, antenna. AP, appendix. AV, anal vein. CCS, corio-claval suture. CE, compound eye. CL, clavus. Cu, cubital vein. CuC, cubital cell. EAC, external apical cell. EAV, external apical vein. FC, frontoclypeus. G, gena. IAV, internal apical vein. IM, inner margin (of fore wing). L, lorum. M, median vein. MAV, median apical vein. MC, median cell. OC, ocellus. PV, peripheric vein. R, radial vein. RC, radial cell. SAC, subexternal apical cell. Sc, subcosta. ScC, subcostal cell. ScT, subcostal transverse vein. ScV, subcostal vein. WA, waxy area.



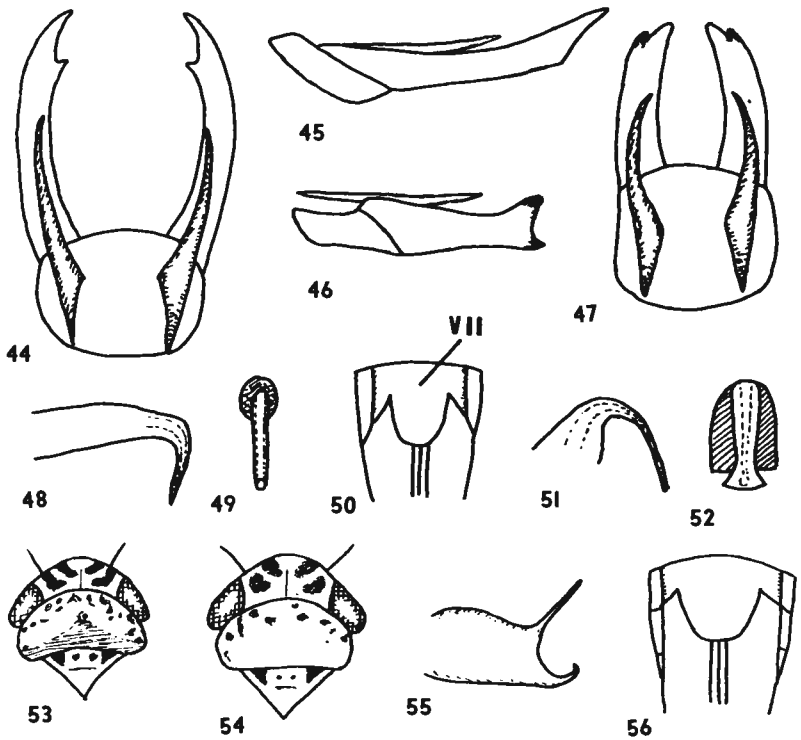
Figs. 4-15. *Alebra*. 4, *coryli* female, vertex and pronotum. 5, male, side of genital segment. 6, *albostriella* male, second sternal apodeme. 7, *wahlbergi* female, vertex and pronotum. 8, *coryli* male, genital plate. 9, second sternal apodeme. 10, *wahlbergi* male, first sternal apodeme. 11, second sternal apodeme. 12, first sternal apodeme (another specimen). 13, *coryli* male, apex of paramere. 14, first sternal apodeme. 15, aedeagus.



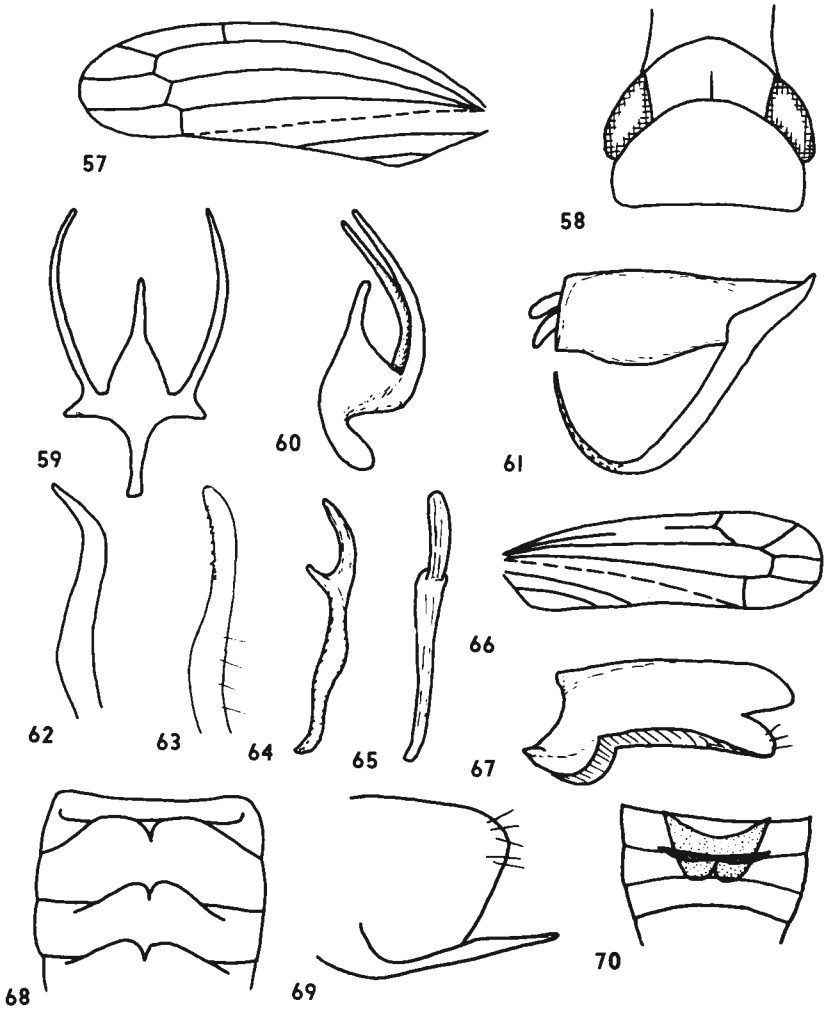
Figs. 16-30. *Notus flavipennis, Emelyanoviana mollicula* and *Dikraneura variata.* 16, *N. flavipennis* male, vertex. 17, female, vertex. 18, *E. mollicula,* vertex. 19, *D. variata* vertex. 20, *N. flavipennis* male genital segment and genital plates, ventral view. 21, aedeagus, from behind. 22, do., side view. 23, female, apex of abdomen, ventral view. 24, *D. variata,* male, genital segment, side view. 25, face, side view. 26, male paramere, apex. 27, female, seventh abdominal sternum. 28, male, aedeagus from behind. 29, do., side view. 30, male, genital plates, ventral view. GP, gonoplac (ovipositor sheath).



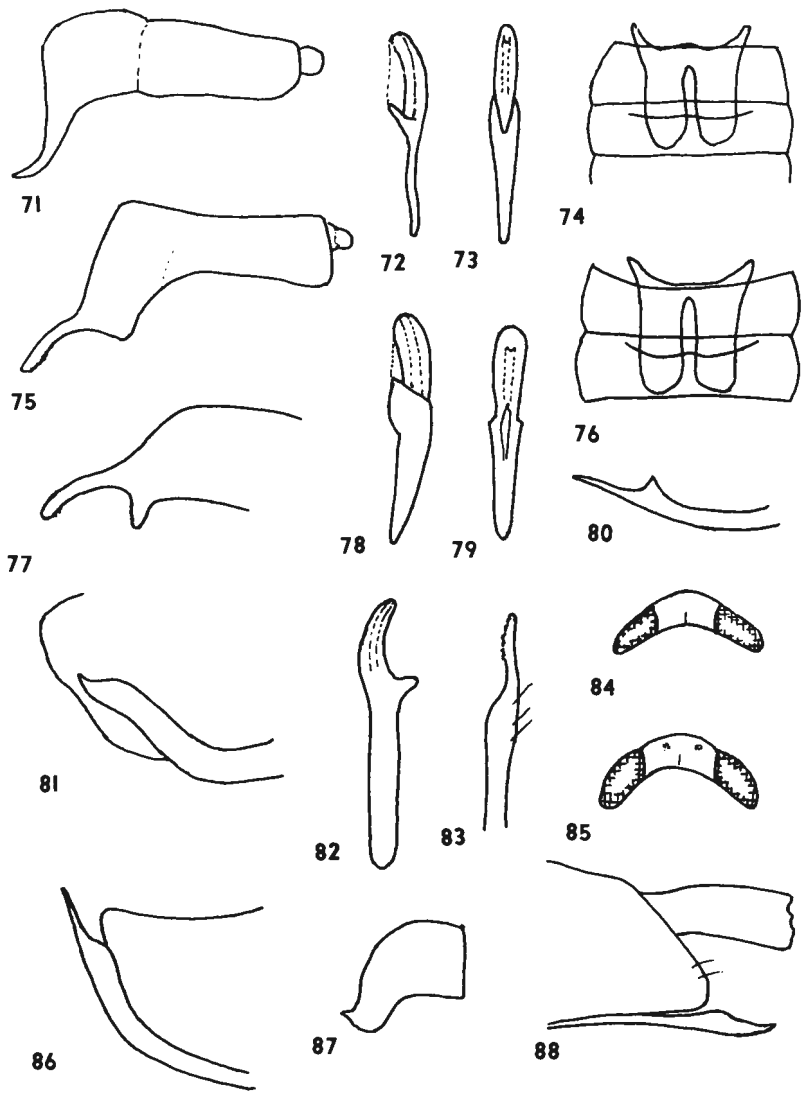
Figs. 31-43. *Emelyanoviana* and *Erythria aureola*. 31, *Em. mollicula* head, side view. 32, male, aedeagus, side view. 33, genital segment, side view. 34, aedeagus, from behind. 35, paramere, apical part. 36, *Em. contraria* male, aedeagus from behind. 37, *Em. mollicula* fore wing. 38, hind wing. 39, *Em. contraria* male, aedeagus, side view. 40, paramere, apical part. 41, *Er. aureola* male, aedeagus from behind. 42, do., side view. 43, fore wing. AT, anal tube. GPL, genital plate. GS, genital segment. VA, valve.



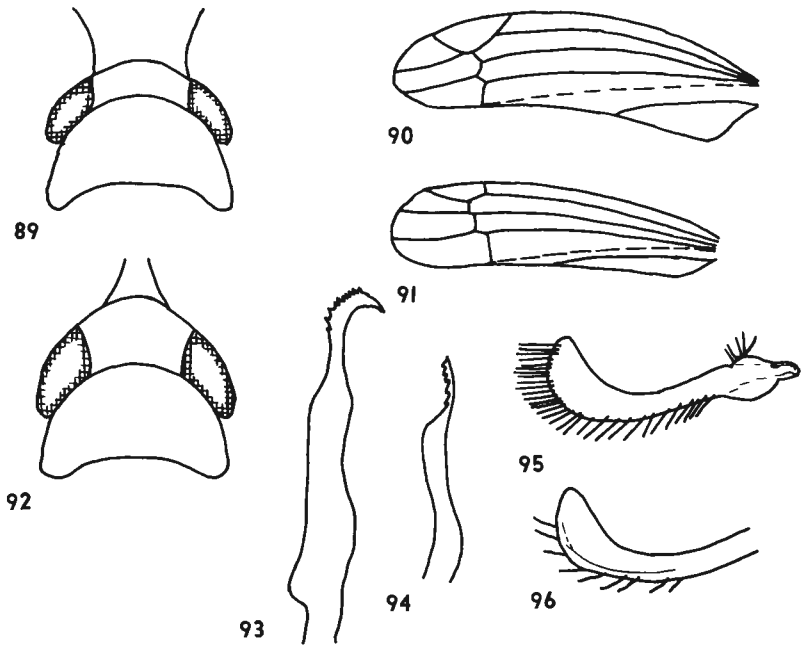
Figs. 44-56. *Forcipata* and *Erythria aureola.* 44, *F. citrinella* male, genital plates, valve and parameres, from above. 45, do., side view. 46, *F. forcipata,* do., side view. 47, do., from above. 48, *F. citrinella* male, aedeagus, side view. 49, do., from behind. 50, female, seventh abdominal sternum. 51, *F. forcipata* male, aedeagus, side view. 52, do., from behind. 53, *E. aureola* male, vertex, pronotum and scutellum. 54, female, do. 55, male, genital segment, apical processes. 56, *F. forcipata* female, seventh abdominal sternum. VII, seventh abdominal sternum.



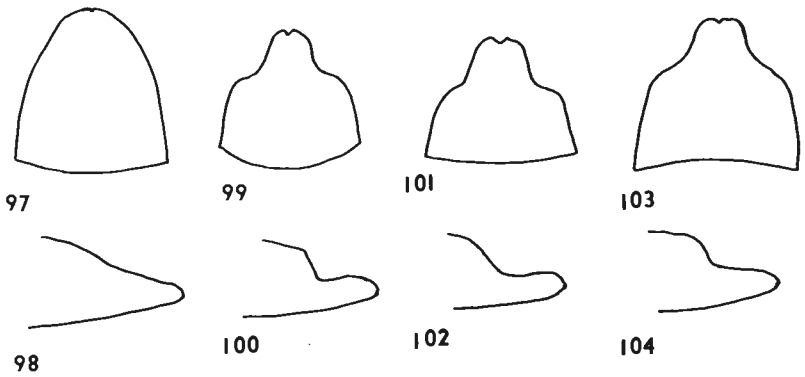
Figs. 57-70. *Chlorita viridula* and *Austroasca vittata*. 57, *C. viridula*, fore wing. 58, vertex and pronotum. 59, male, aedeagus, from behind. 60, do., from side. 61, anal tube. 62, apex of paramere. 63, *A. vittata* male, apex of paramere. 64, aedeagus, from side. 65, do., from behind. 66, fore wing. 67, male, anal tube. 68, male, basal part of abdomen, ventral view, 69, apex of genital segment, side view. 70, *C. viridula* male, basal part of abdomen.



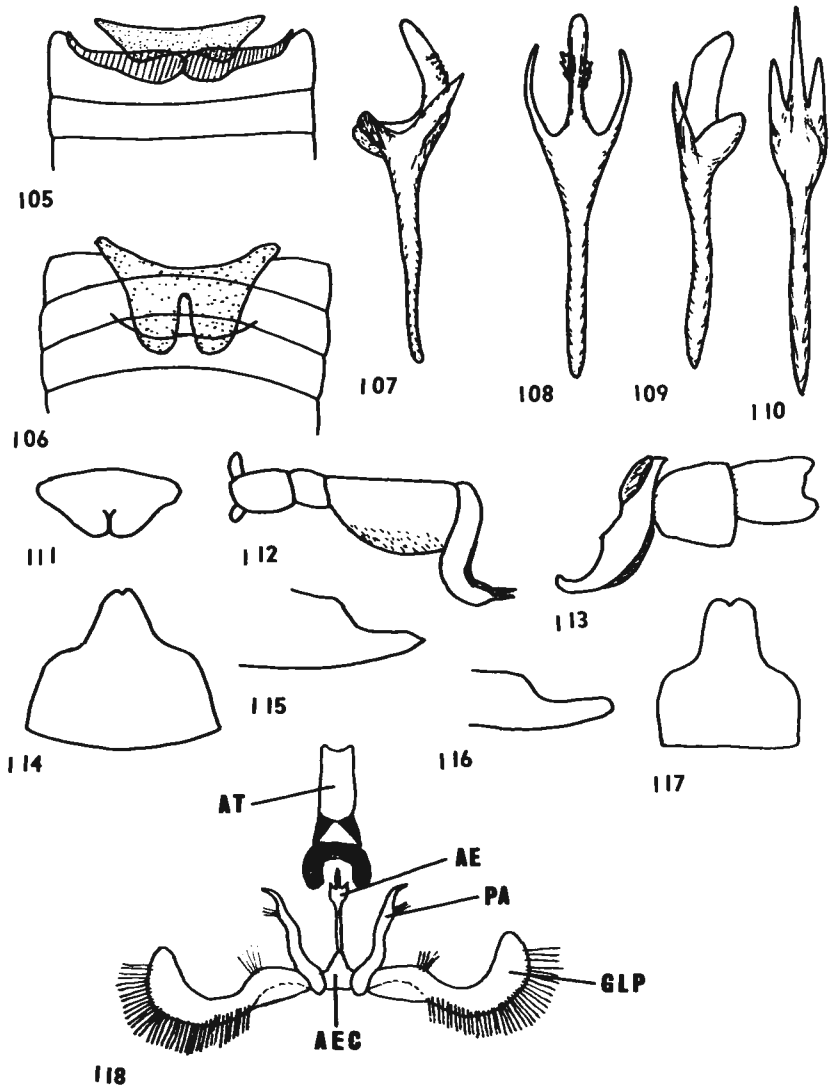
Figs. 71-88. *Emproasca* spp., *Kyboasca bipunctata* and *Austroasca vittata*. *71, E. vitis* male, anal tube side view. 72, aedeagus, side view. 73, do., from behind. 74, sternal apodeme. 75, *E. decipiens* male, anal tube, side view. 76, sternal apodeme. 77, *E. pteridis* male, anterior part of anal tube. 78, *E. decipiens* male, aedeagus, side view. 79, do., from behind. 80, *E. pteridis* male, appendage of genital segment. 81, *E. vitis,* male, appendage of genital segment. 82, *K. bipunctata* male, aedeagus, side view. 83, apex of paramere. 84, *A. vittata,* vertex. 85, *K. bipunctata* vertex. 86, *E. decipiens* male, appendage of genital segment. 87, *K. bipunctata* male, anterior part of anal tube. 88, genital segment,side view.



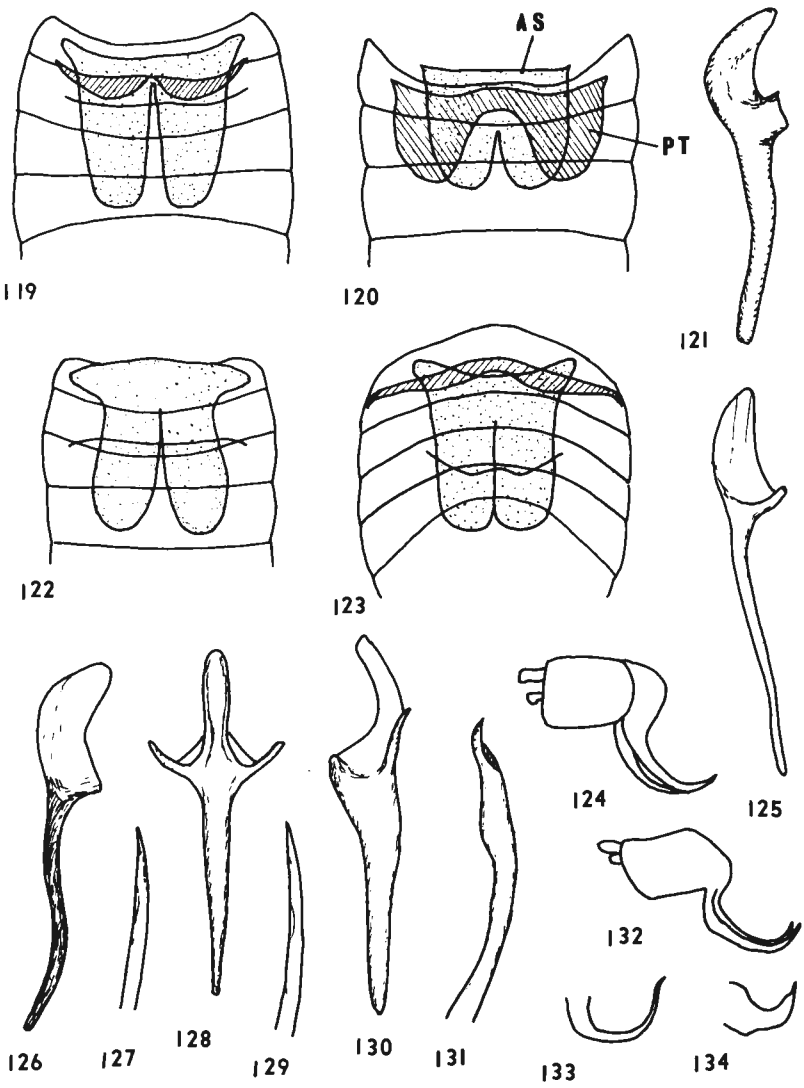
Figs. 89-96. *Kybos smaragdula* and *Empoasca vitis*. *89, K. smaragdula* vertex and pronotum. 90, fore wing. 91, *E. vitis* fore wing. 92, vertex and pronotum. 93, *K. smaragdula* male, apex of paramere. 94, *E. vitis* do. 95, *K. smaragdula* male, genital plate. 96, *E. vitis,* do.



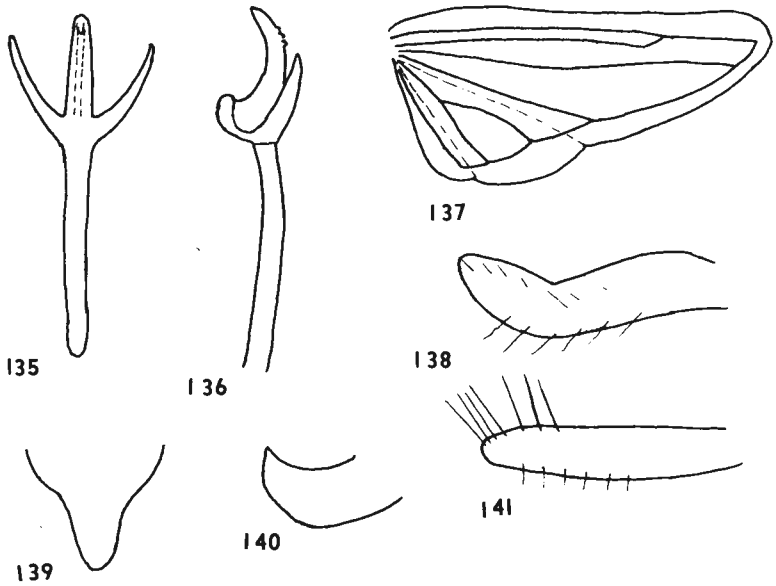
Figs. 97-104. *Kybos* spp., females, seventh abdominal sternum. 97, *populi* from beneath. 98, side view. 99, *virgator* from beneath. 100, side view. 101, *rufescens*, from beneath. 102, side view. 103, *butleri* from beneath. 104, side view.



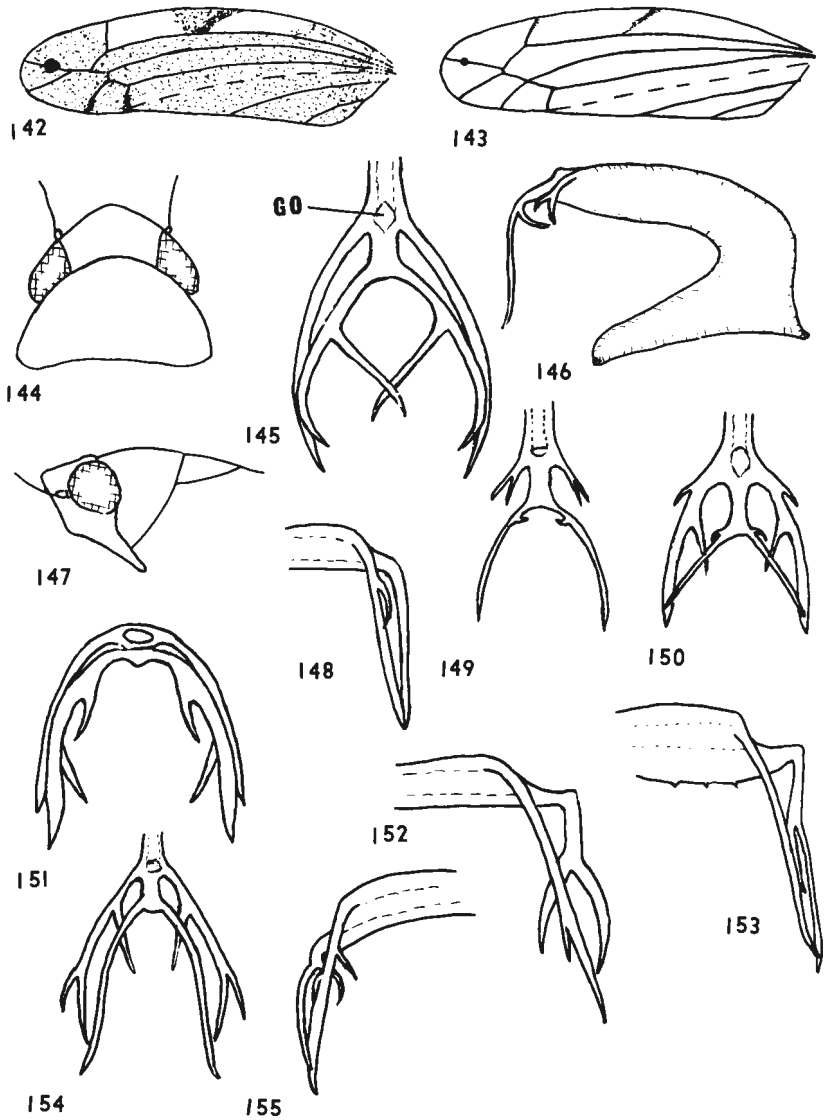
Figs. 105-118. *Kybos* spp. 105, *smaragdula* male, basal part of abdomen. 106, *strigilifer*, do. 107, aedeagus, side view. 108, do., from behind. 109, *smaragdula* male, aedeagus, side view. 110, do., from behind. 111, *betulicula* male, apodeme of second abdominal sternum. 112, *strigilifer* male, anal tube. 113, *smaragdula*, do. 114, *strigilifer* female, seventh abdominal sternum, from beneath. 115, do., side view. 116, *smaragdula*, do., side view. 117, from beneath. 118, *betulicola* internal male genitalia. AEC, aedeagus connective. AE, aedeagus. AT, anal tube. GPL, genital plate. PA, paramere.



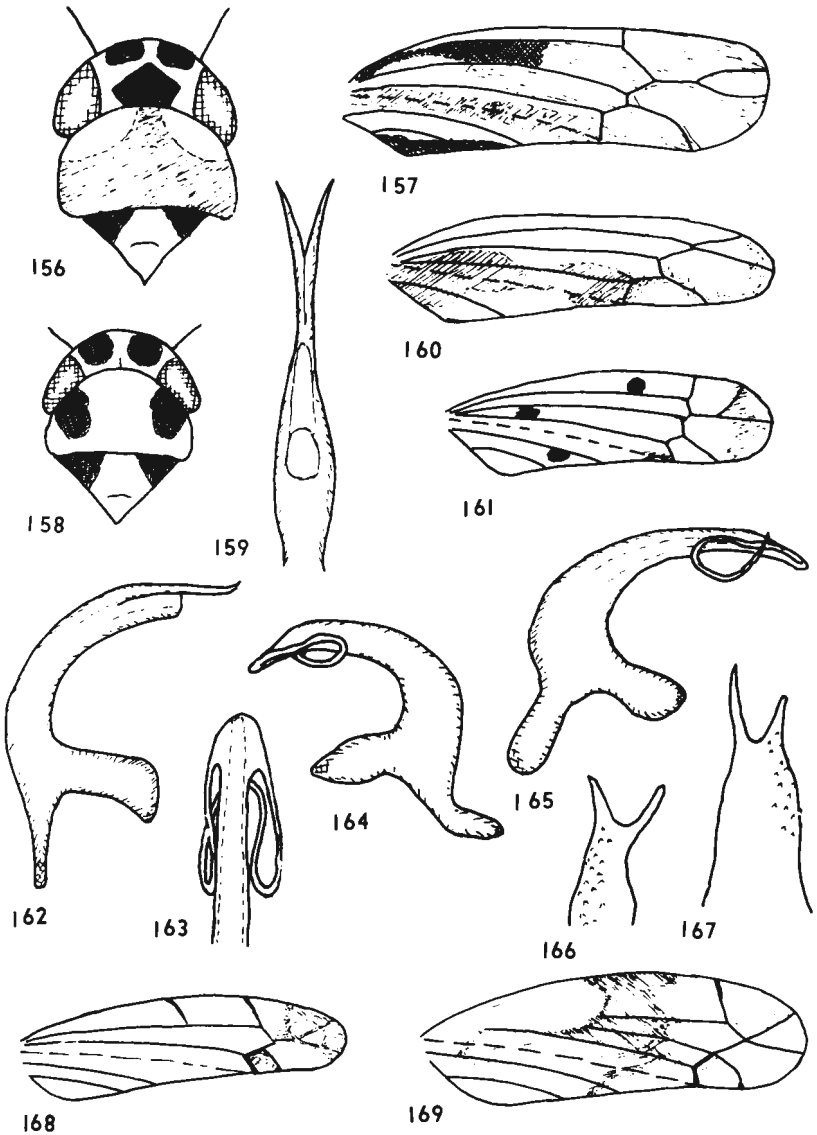
Figs. 119-134. *Kybos* spp., males. 119, *rufescens* basal part of abdomen. 120, *butleri,* do. 121, *rufescens* aedeagus, side view. 122, *populi* basal part pf abdomen. 123, *virgator,* do. 124, *populi* anal tube. 125, *butleri* aedeagus, side view. 126, *populi,* do. 127, *rufescens* apex of appendage of genital segment. 128, *virgator* aedeagus, from behind. 129, *butleri* apex of appendage of genital segment. 130, *virgator,* aedeagus, side view. 131, *populi* apex of appendage of genital segment. 132, *rufescens* anal tube. 133, *virgator* appendage of anal tube. 134, *betulicola,* do, AS, apodeme of second abdominal sternum. PT, phragma of base of third abdominal tergum.



Figs. 135-141. *Kybos* spp., *Austroasca vittata* and *Kyboasca bipunctata*. 135, *K. calyculus* male, aedeagus from behind. 136, do., side view. 137, *K. strigilifer* hind wing. 138, *A. vittata*, male, genital plate, ventral view. 139, *K. calyculus* female, seventh abdominal sternum. 140, male, spine of anal tube. 141, *K. bipunctata* male, genital plate, ventral view.



Figs. 142-155. *Eurhadina.* 142, *pulchella* fore wing. 143, *kirschbaumi,* do. 144, *pulchella* vertex and pronotum. 145, *loewii* male, apex of aedeagus, from behind. 146, *concinna* aedeagus,side view. 147, *pulchella* head and pronotum, side view. 148, *kirschbaumi* male, apex of aedeagus, side view. 149, *concinna* male, apex of aedeagus, from behind. 150, *ribauti,* do. 151, *pulchella,* do. 152, *loewii* apex pf aedeagus, side view. 153, *pulchella,* do. 154, *kirschbaumi* apex of aedeagus, from behind. 155, *ribauti* apex of aedeagus, side view. GO, gonopore.



Figs. 156-169. *Eupteryx* and *Eurhadina* spp. 156, *Eup. tenella* vertex, pronotum and scutellum. 157, fore wing. 158, *Eup. heydeni* vertex, pronotum and scutellum. 159, *Eup. tenella* male, aedeagus from behind. 160, *Eup. heydeni* fore wing. 161. *Eup. signatipennis* fore wing. 162, *Eup. tenella* male, aedeagus, side view. 163, *Eup. signatipennis* apex of aedeagus, from above. 164, *Eup. heydeni* aedeagus, side view. 165, *Eup. signatipennis*, do. 166, appendage of genital segment. 167, *Eup. heydeni*, do. 168, *Eur. ribauti* fore wing. 169, *Eur. loewii* male, do.

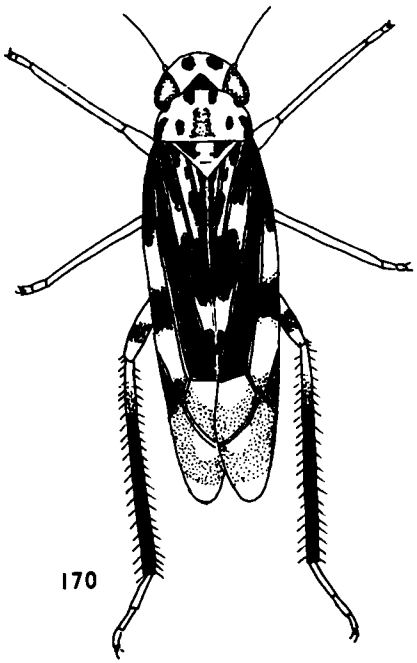
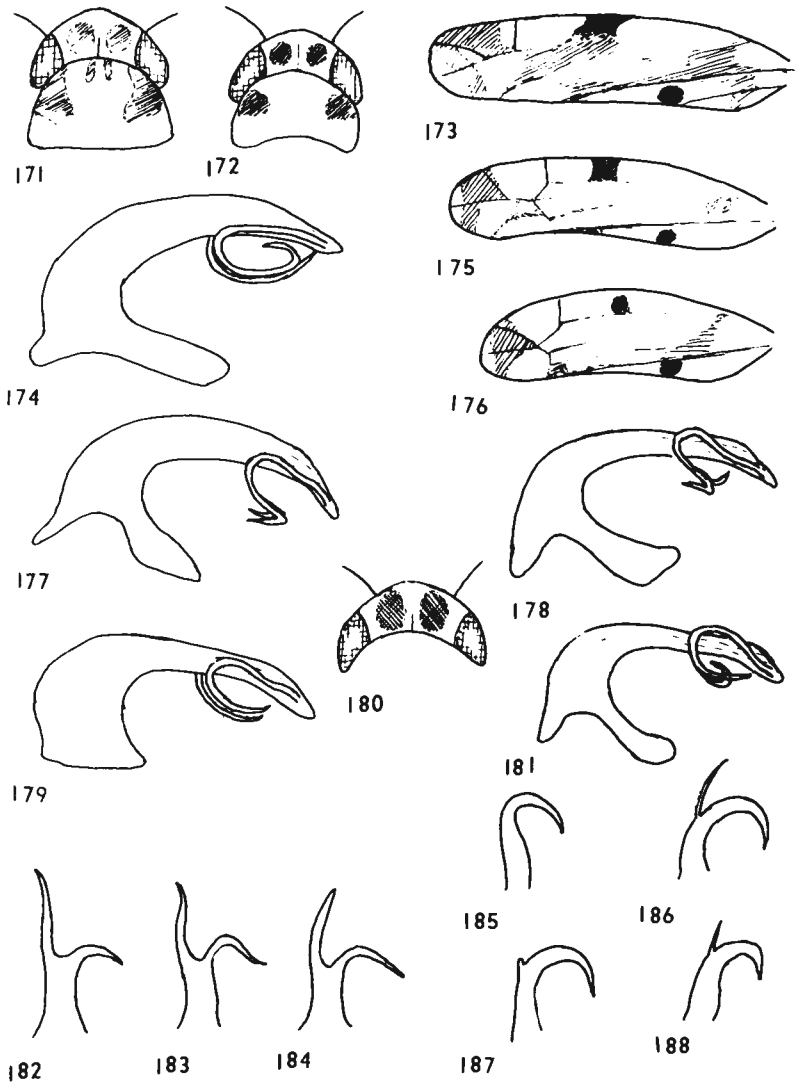
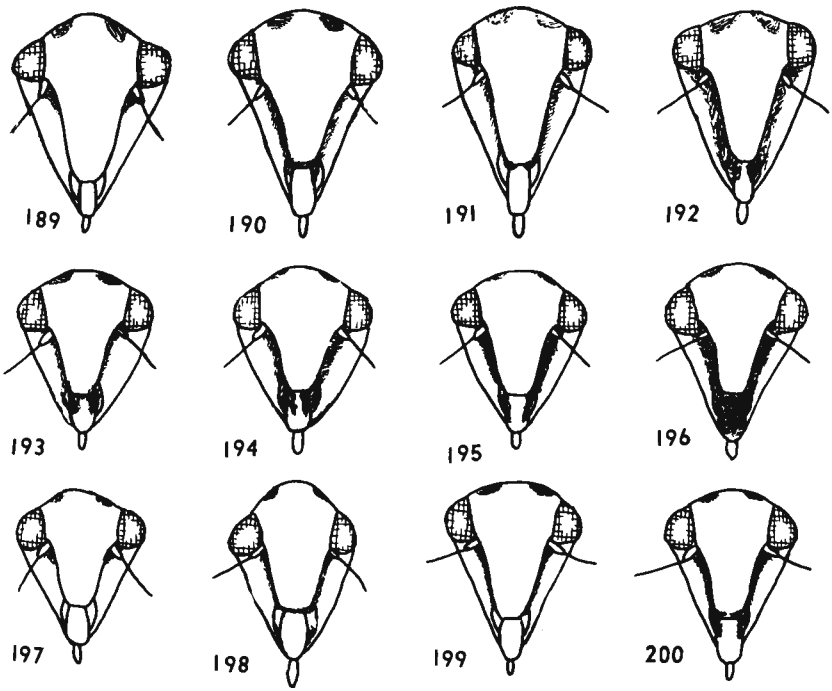


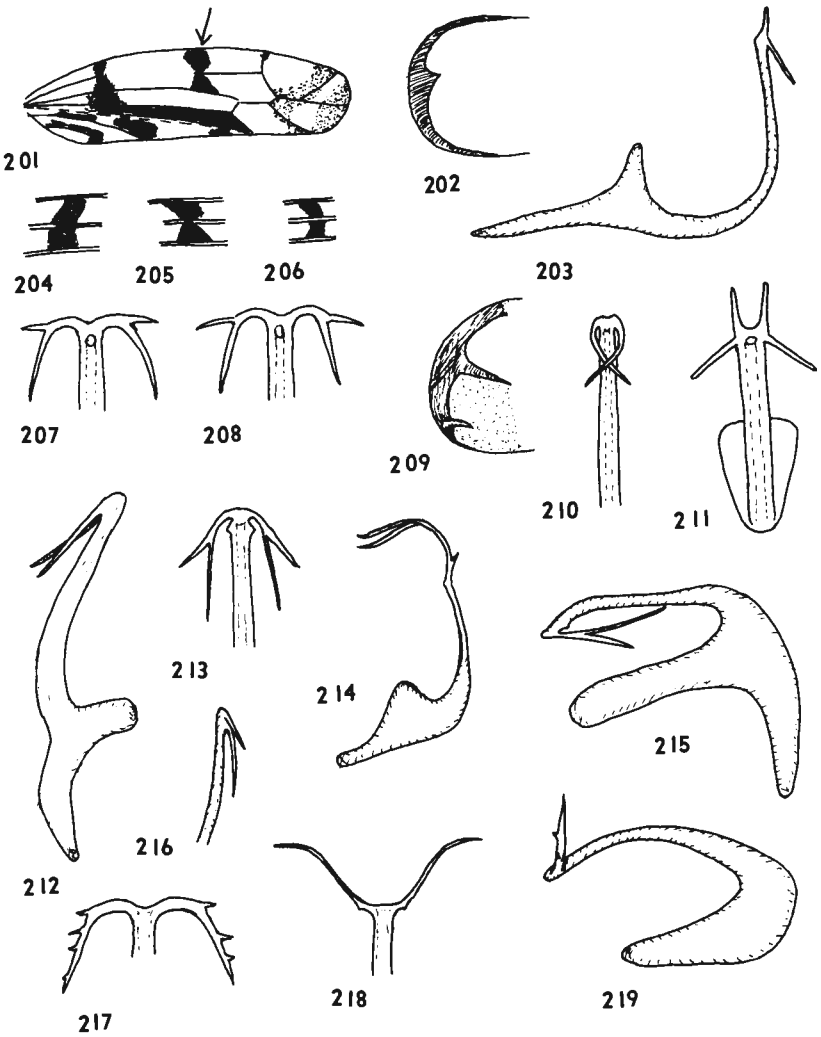
Fig. 170. *Eupteryx urticae.*



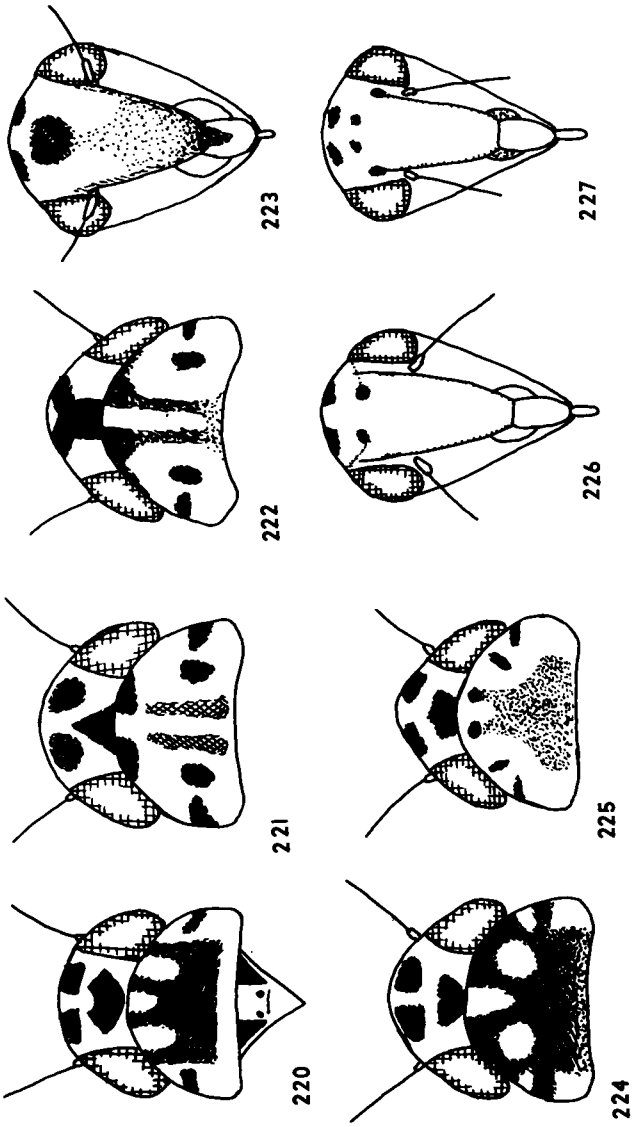
Figs. 171-188. *Eupteryx*. 171, *atropunctata*, vertex and pronotum. 172, *origani*, do. 173, *aurata* fore wing. 174, male, aedeagus, side view. 175, *atropunctata* fore wing. 176, *origani*, do. 177, *aurata* aedeagus, side view (another specimen). 178, *origani*, do. 179, *aurata*, do. (further specimen). 180, vertex. 181, *origani* aedeagus, side view (another specimen). 182, 183, 184, *aurata* male, appendage of male genital segment (three specimens). 185, 186, *origani*, do. (two specimens). 187, 188, do. (left and right appendages of a further specimen).



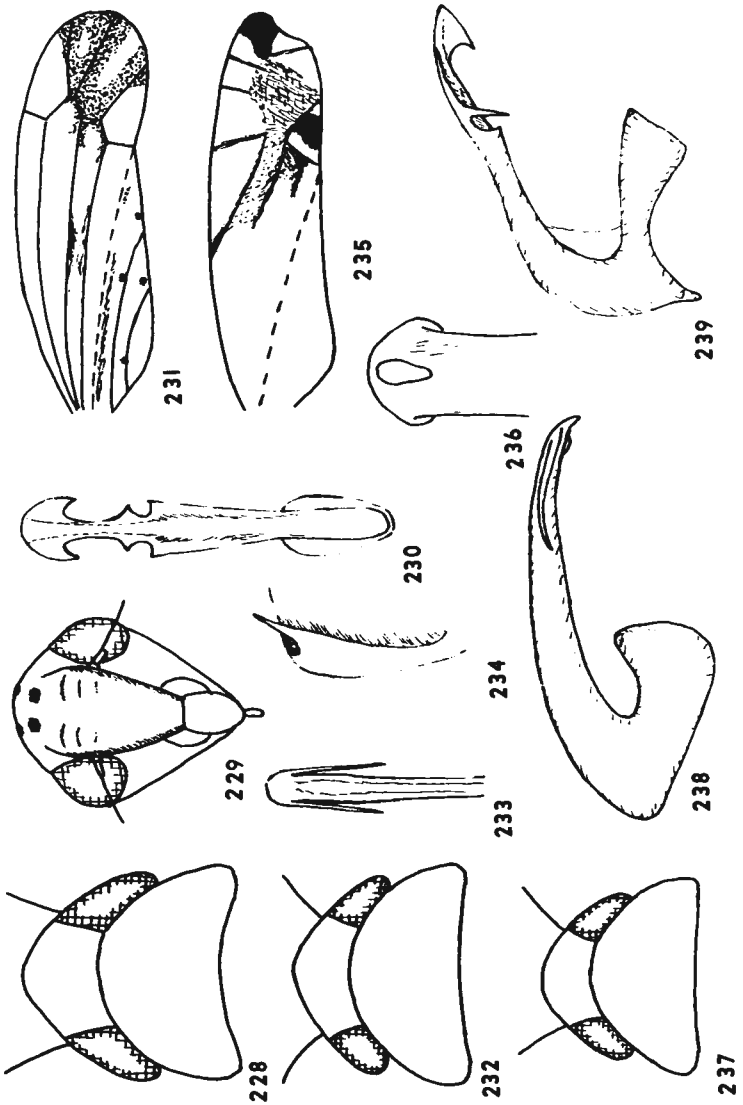
Figs. 189-200. *Eupteryx*, faces. 189, *aurata* male, first generation. 190, female, do. 191, male, second generation. 192, female, do. 193, *atropunctata* male, first generation. 194, female, do. 195, male, second generation. 196, female, do. 197, *origani* male, first generation. 198, female, do. 199, male, second generation. 200, female, do.



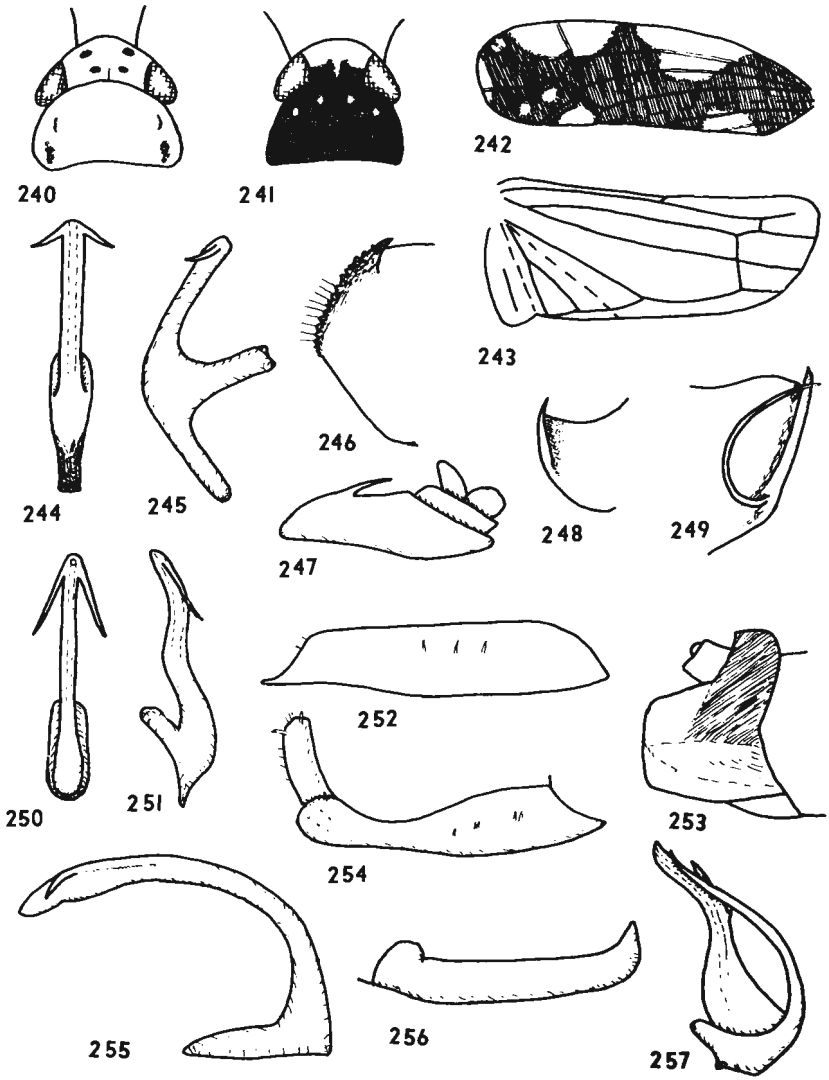
Figs. 201-219. *Eupteryx.* 201, *florida,* fore wing. 202, *thoulessi,* male, side of genital segment, from inside. 203, aedeagus, side view. 204, *stachydearum,* part of fore wing (as arrowed). 205, *florida,* do. 206, *thoulessi,* do. 207, *stachydearum,* male, aedeagus, from behind (Rhum). 208, do., (Herts). 209, *melissae* male, side of genital segment, from inside. 210, aedeagus, apex from behind. 211, *thoulessi* aedeagus, from behind. 212, *melissae* aedeagus, side view. 213, *urticae* aedeagus, apex from behind. 214, *florida* aedeagus, side view. 215, *urticae,* do. 216, *stachydearum,* do., apex. 217, *cyclops,* aedeagus, apex from behind. 218, *florida* do. 219, *cyclops* aedeagus, side view.



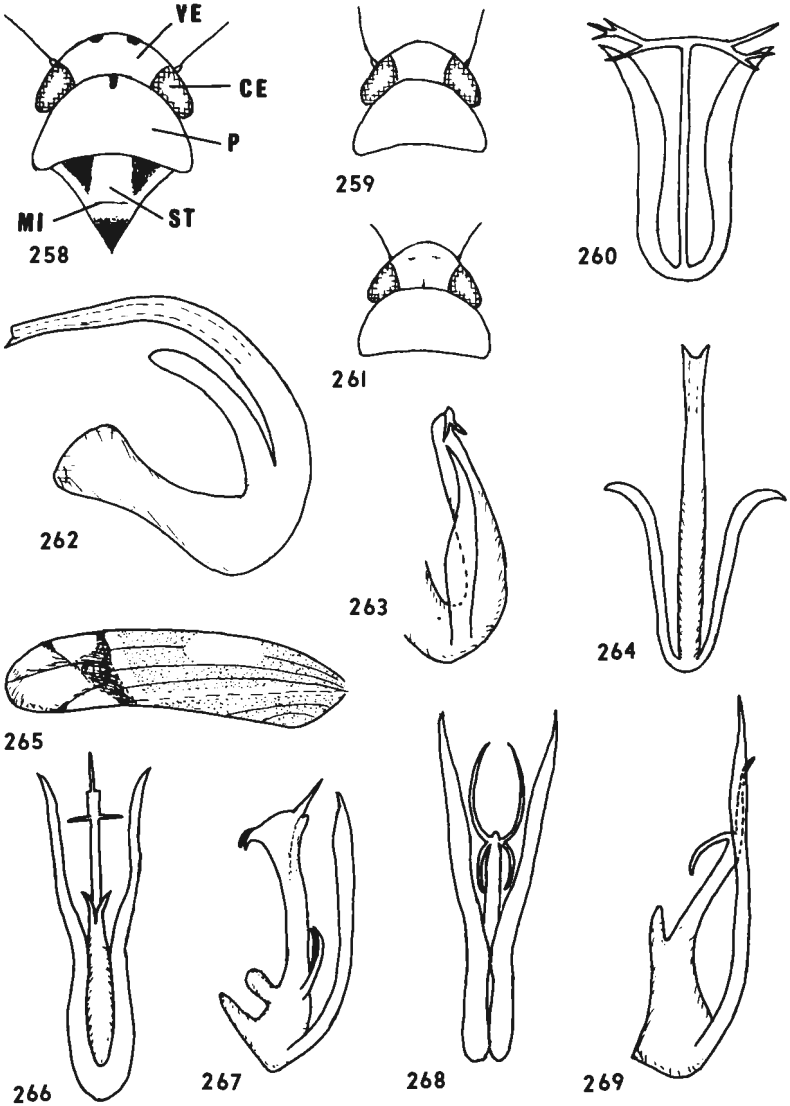
Figs. 220-227. *Eupteryx.* 220, *florida,* vertex, pronotum and scutellum. 221, *cyclops* vertex and pronotum. 222, do. (another specimen). 223, face. 224, *stachydearum* vertex and pronotum. 225, *melissae* vertex and pronotum. 226, face. 227, *thoulessi* face.



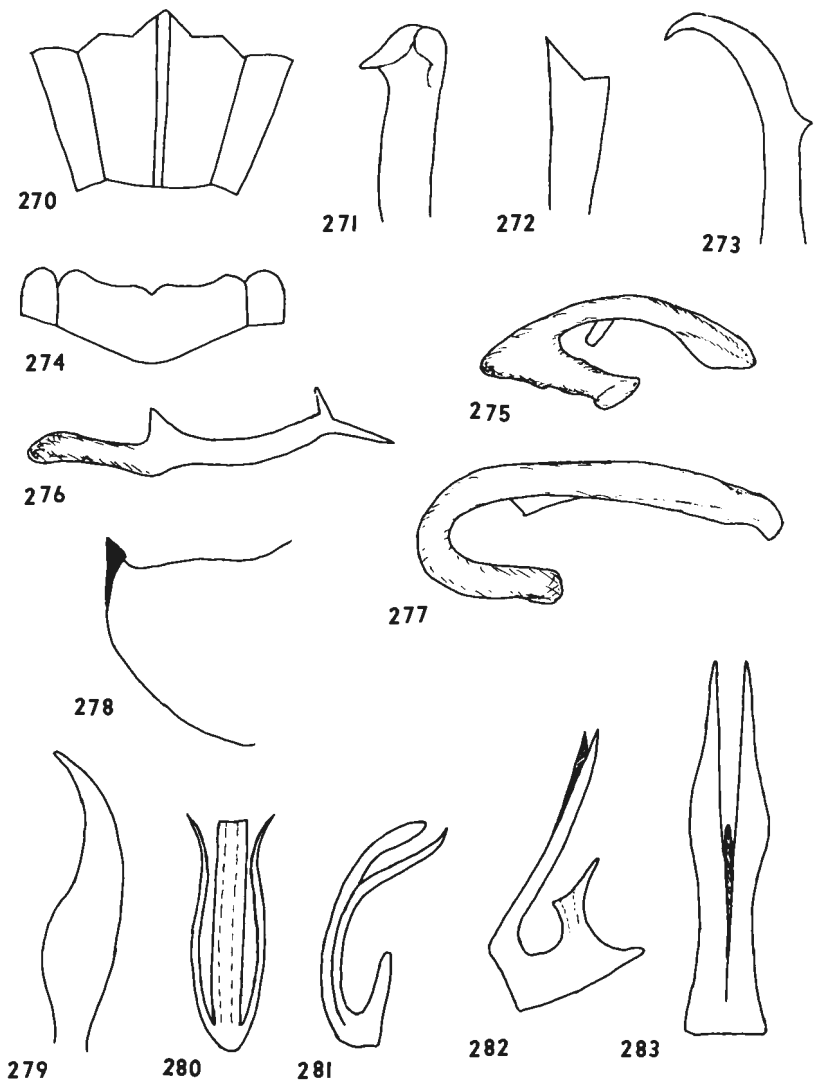
Figs. 228-239. *Eupteryx* and *Aguriahana* spp. 228, *E. filicum* vertex and pronotum. 229, *E. urticae* face. 230, *E. notata* male, aedeagus from behind. 231, *E. artemisiae* fore wing. 232, *A. germari* vertex and pronotum. 233, *E. artemisiae* aedeagus, apex from behind. 234, apex of side of genital segment. 235, *A. stellulata* fore wing. 236, male, apex of aedeagus from behind. 237, vertex and pronotum. 238, *E. artemisiae* aedeagus, side view. 239, *E. notata,* do.



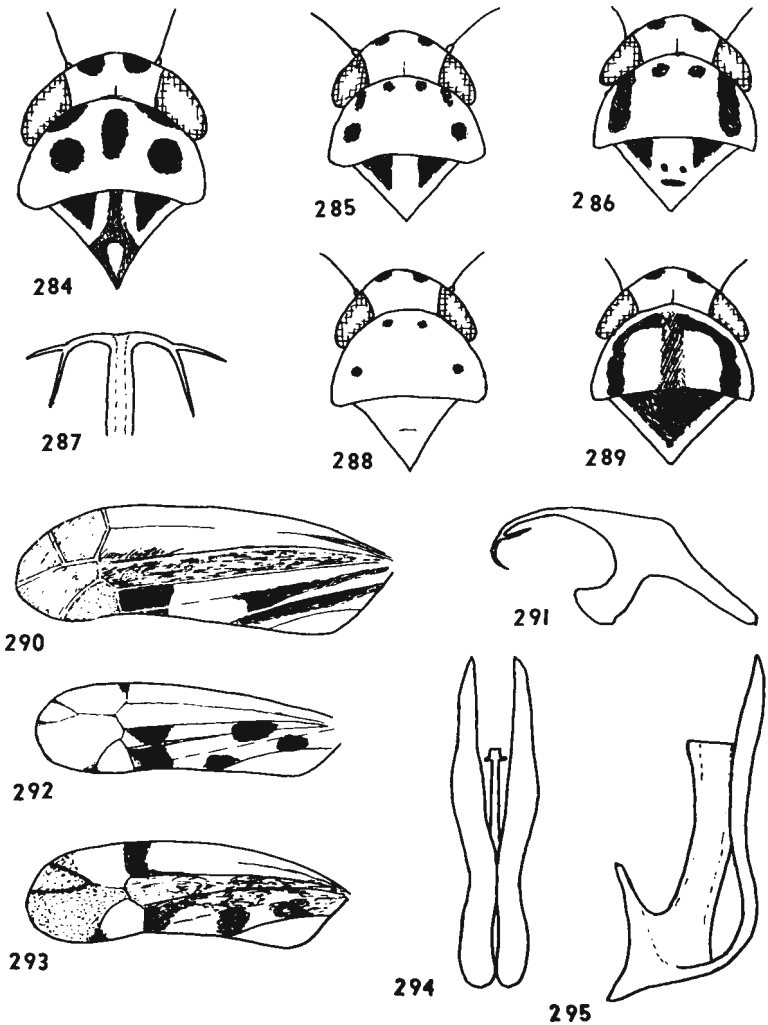
Figs. 240-257. *Eupteryx* and *Aguriahana* spp. 240, *E. artemisiae* vertex and pronotum. 241, *E. vittata,* do. 242, forewing. 243, *E. aurata* hind wing. 244, *E. filicum* male, aedeagus from behind. 245, do., side view. 246, *A. stellulata* male, apex of side of genital segment. 247, *E. vittata* male, anal tube. 248, apex of side of genital segment. 249, *E. notata,* do. 250, *E. vittata* aedeagus, from behind. 251, do., side view. 252, *A. germari* male genital plate, ventral view. 253, genital segment, side view. 254, genital plate, side view. 255, *A. stellulata,* aedeagus, side view. 256, genital plate, side view. 257, *A. germari,* aedeagus, side view.



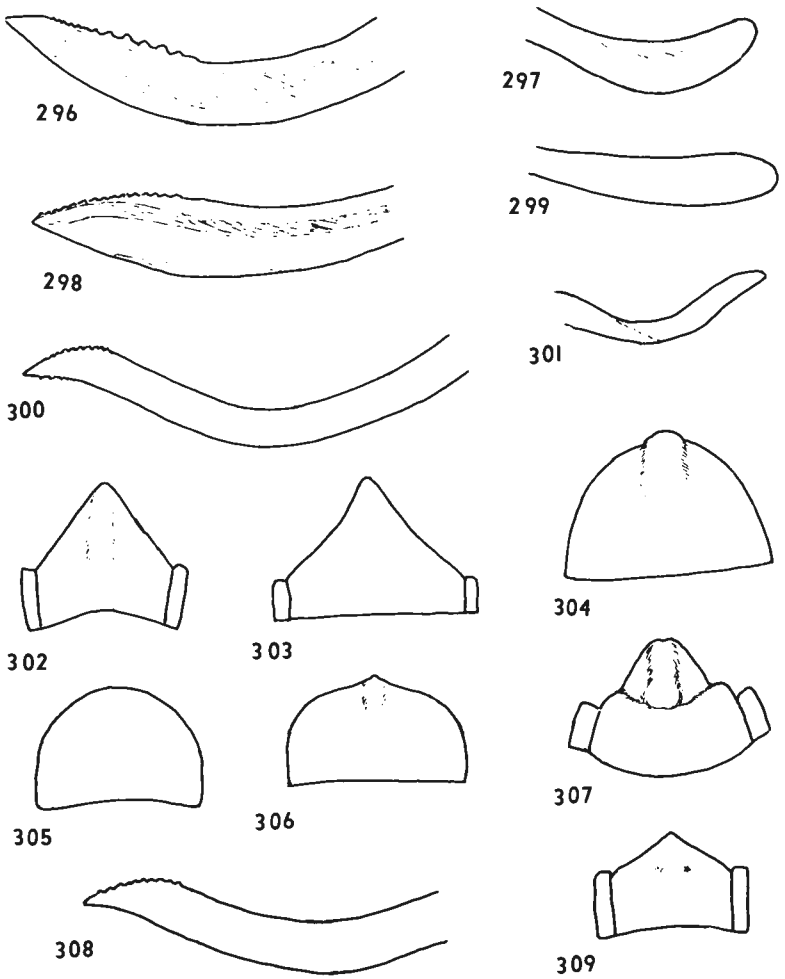
Figs. 258-269. *Ribautiana*. 258, *ulmi* vertex, pronotum and scutellum. 259, *cruciata* vertex and pronotum. 260, *debilis* male, aedeagus from behind. 261, *tenerrima* vertex and pronotum. 262, *ulmi* aedeagus, side view. 263, *debilis*, do. 264, *ulmi* aedeagus, from behind. 265, *tenerrima* fore wing. 266, aedeagus, from behind. 267, do., side view. 268, *scalaris* aedeagus, from behind. 269, do., side view. CE, compound eye. MI, median impression (of scutellum). P, pronotum. ST, scutellum. VE, vertex.



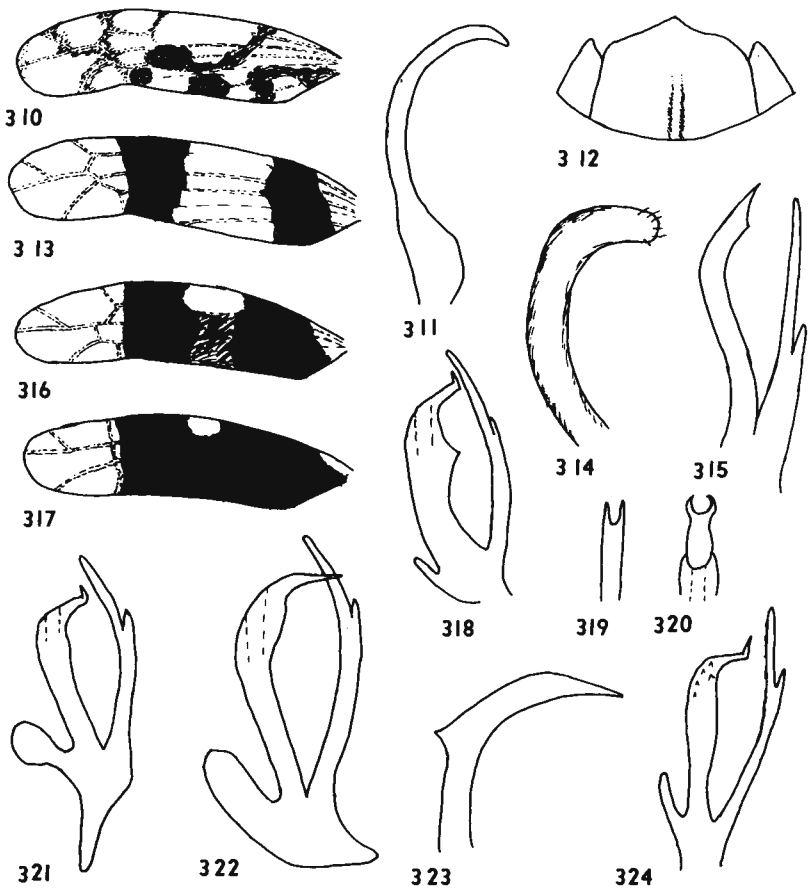
Figs. 270-283. *Linnavuoriana, Typhlocyba* and *Eupterycyba.* 270, *L. sexmaculata* female, seventh abdominal sternum. 271, *T. quercus* male, apex of genital plate, ventral view. 272, *L. sexmaculata,* do. 273, *E. jucunda,* male, apex of paramere. 274, female, seventh abdominal sternum. 275, *L. decempunctata* male, aedeagus, side view. 276, paramere. 277, *L. sexmaculata* aedeagus, side view. 278, *T. quercus* male, side of genital segment. 279, paramere. 280, aedeagus, from behind. 281, do., side view. 282, *T. bifasciata,* do. 283, do., from behind.



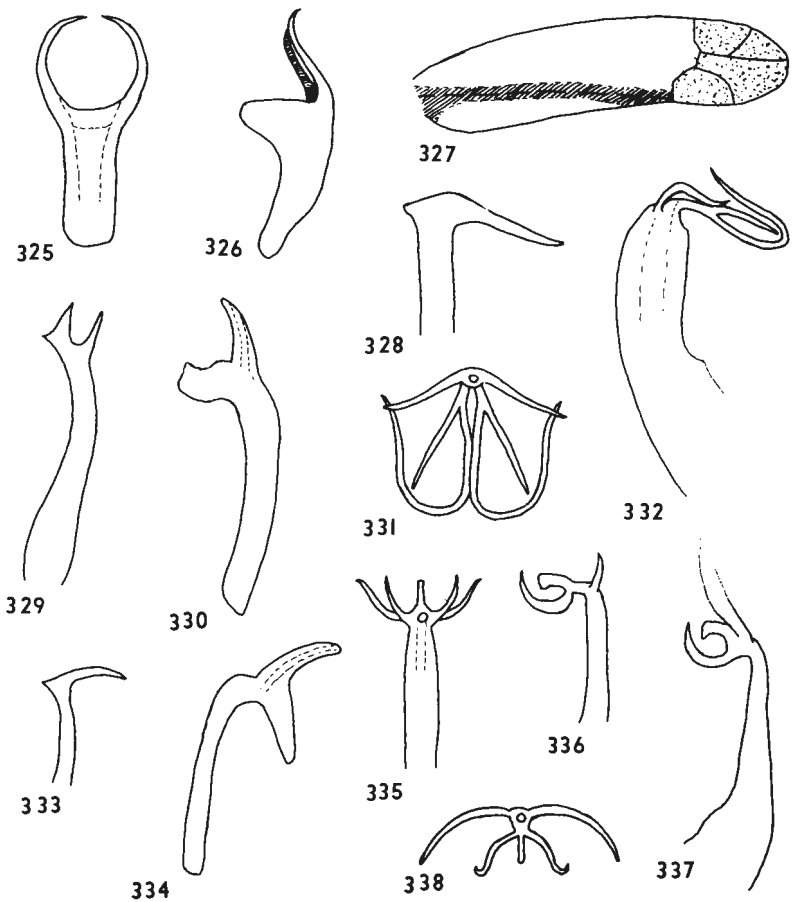
Figs. 284-295. *Linnavuoriana, Eupterycyba* and *Ribautiana cruciata.* 284, *E. jucunda* vertex, pronotum and scutellum. 285, *L. decempunctata,* do. 286, do. (another example). 287, *E. jucunda,* male, apex of aedeagus, from behind. 288, *L. sexmaculata* vertex, pronotum and scutellum. 289, *L. decempunctata,* do. (further example). 290, *E. jucunda* fore wing. 291, aedeagus, side view. 292, *L. sexmaculata* fore wing. 293, *L. decempunctata,* do. 294, *R. cruciata,* aedeagus, from behind. 295, do., side view.



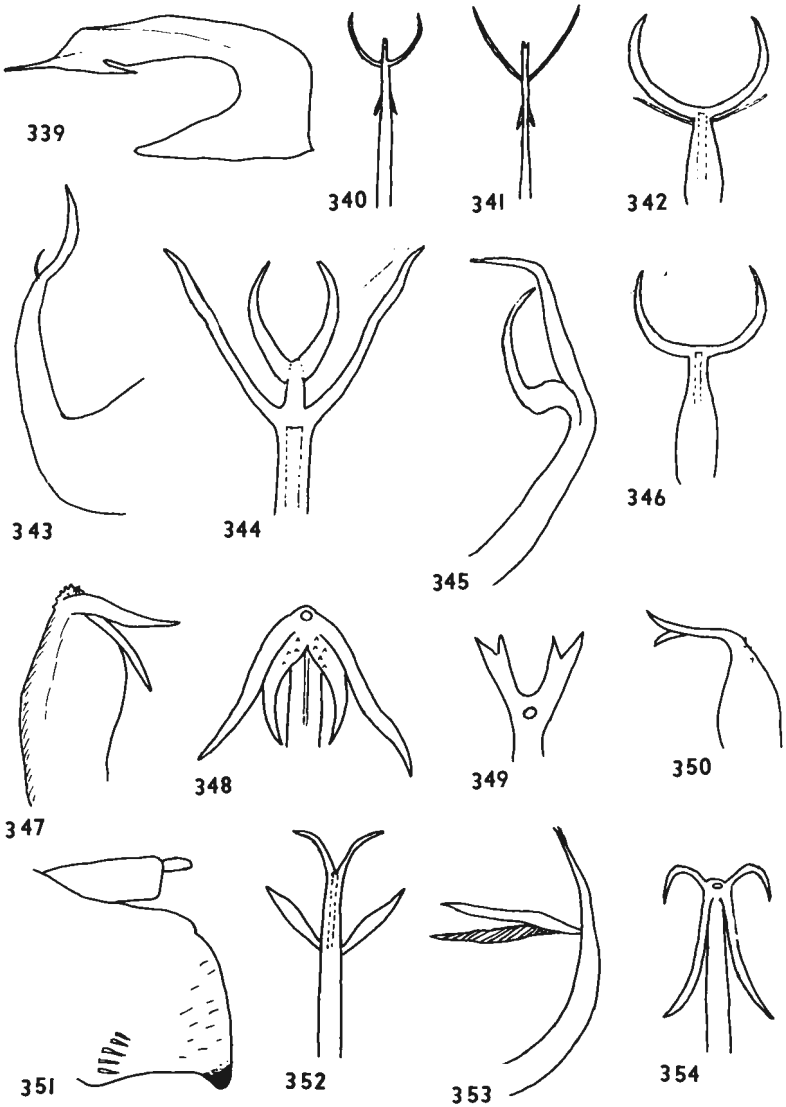
Figs. 296-309. *Fagocyba, Edwardsiana* and *Ossiannilssonola.* 296, *F. carri,* female, ovipositor. 297, *F. cruenta,* male, genital plate, side view. 298, female, ovipositor. 299, *F. carri* male, genital plate, side view. 300, *E. flavescens* female, ovipositor. 301, male, genital plate, side view. 302, *F. cruenta* female, seventh abdominal sternum. 303, *F. carri,* do. 304, *E. flavescens,* do. 305, *E. frustrator,* do. 306, *E. salicicola,* do., 307, *O. callosa,* do. 308, *E. crataegi* female, ovipositor. 309, *E. rosae* female, seventh abdominal sternum.



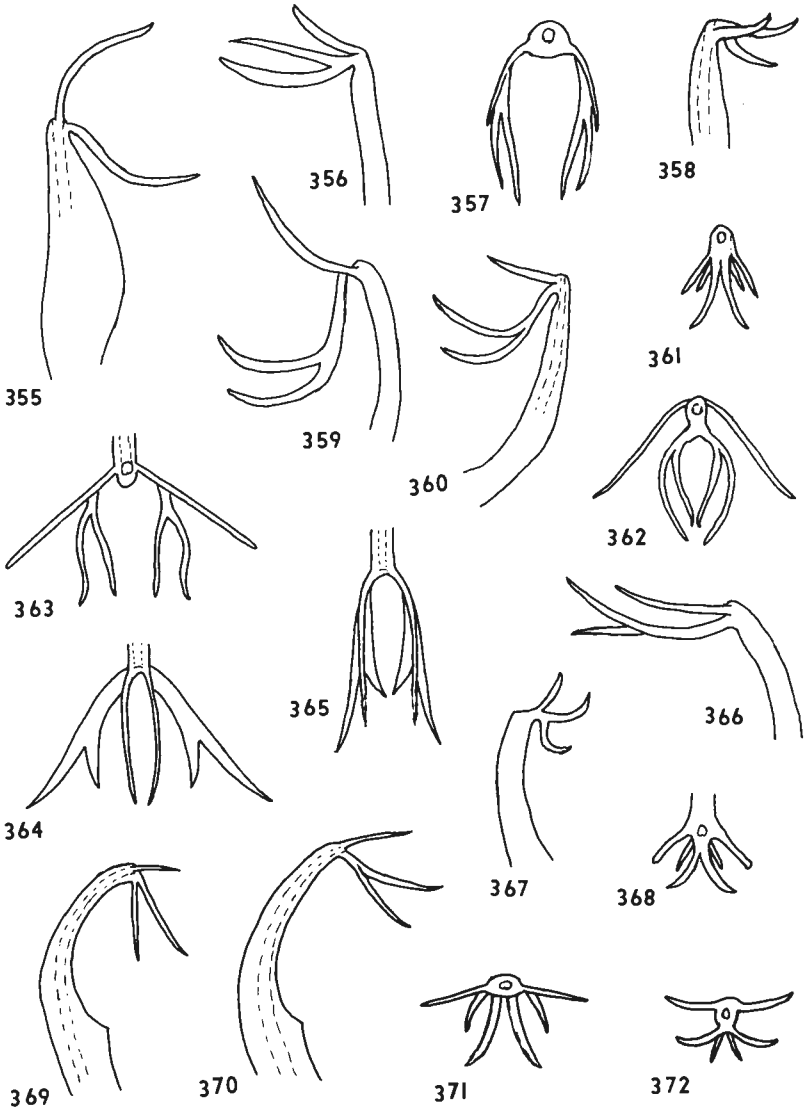
Figs. 310-324. *Typhlocyba* and *Lindbergina*. 310, *T. quercus*, fore wing. 311, *T. bifasciata* male, paramere. 312, *L. aurovittata*, female, seventh abdominal sternum. 313, *T. bifasciata* fore wing. 314, male, genital plate, side view. 315, *L. aurovittata*, male, aedeagus, side view. 316, 317, *T. bifasciata*, fore wing (further examples). 318, *L. aurovittata* aedeagus, side view (another example). 319, 320, do., apex from above (two examples). 321, 322, aedeagus, side view (further examples). 323, apex of paramere. 324, aedeagus, side view (another specimen).



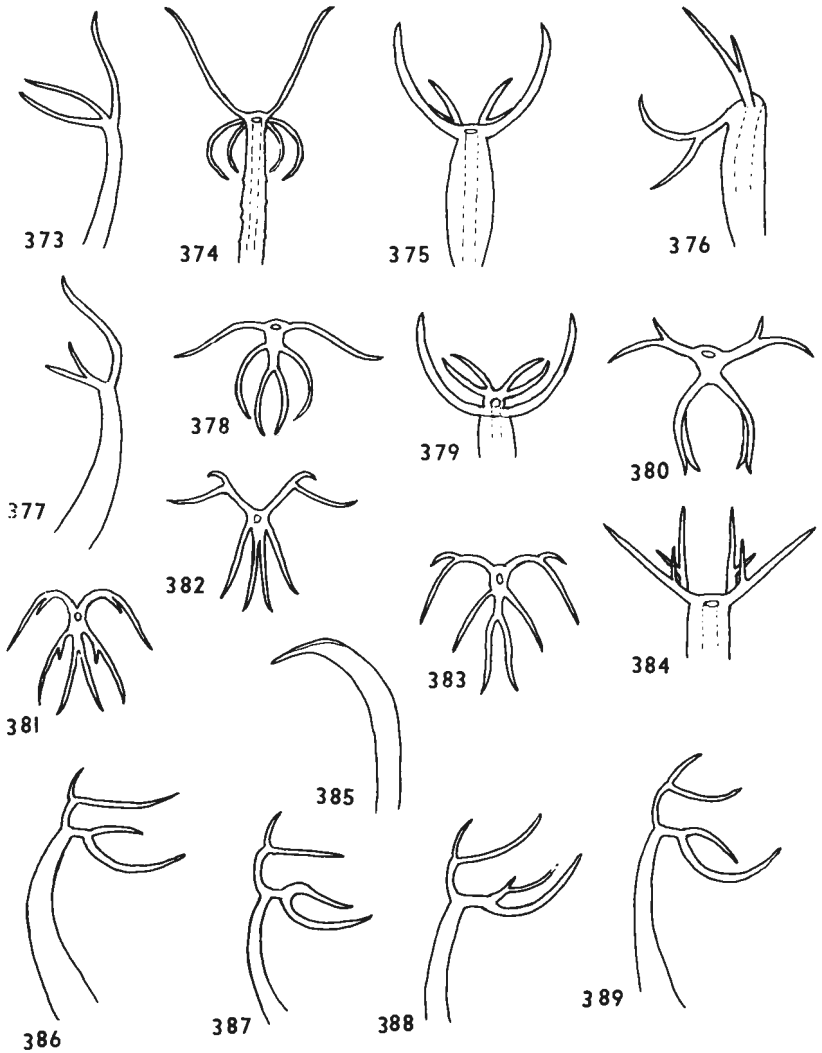
Figs. 325-338. *Ossiannilssonola, Edwardsiana* and *Fagocyba*. 325, *O. callosa,* male, aedeagus, from behind. 326, do., side view. 327, *E. geometrica,* fore wing. 328, *O. callosa* male, apex of paramere. 329, *F. carri,* male, paramere. 330, aedeagus, side view. 331, *E. geometrica,* aedeagus, apex from above. 332, do., side view. 333, *F. cruenta,* apex of paramere. 334, aedeagus, side view. 335, *E. crataegi,* male, aedeagus from above. 336, 337, do., side view (two examples). 338, do., apical view.



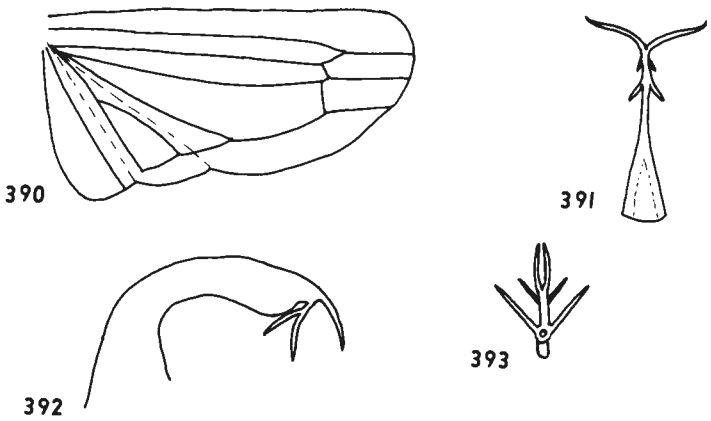
Figs. 339-354. *Edwardsiana* males. 339, *spinigera* aedeagus, side view. 340, 341, do., apex from behind (two examples). 342, *avellanae,* aedeagus, apex from behind. 343, do., side view. 344, *alnicola,* aedeagus, apex from above. 345, do., side view. 346, *avellanae* aedeagus, apex from behind (another example). 347, *rosae* aedeagus, side view. 348, do., apex from above. 349, do. (parasitized example). 350, aedeagus, side view (parasitized example). 351, *nigriloba,* genital segment. 352, apex of aedeagus, from behind. 353, do., side view. 354, *salicicola, apex of aedeagus, from behind.*



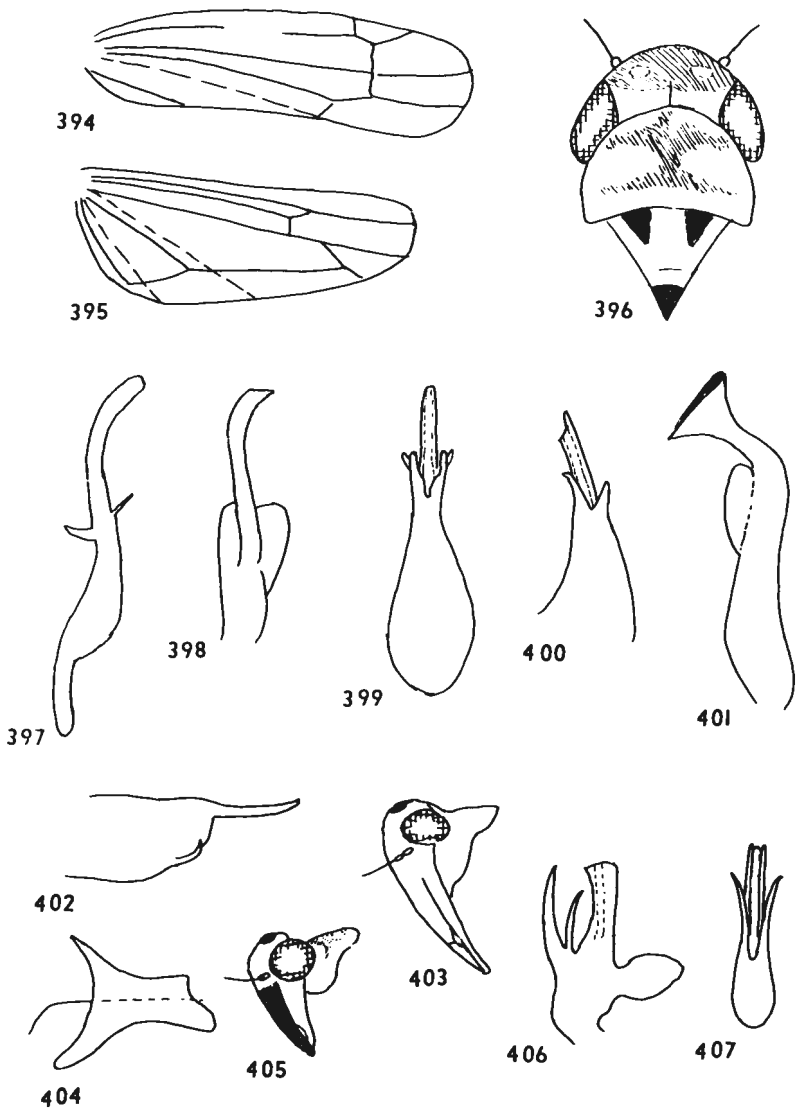
Figs. 355-372. *Edwardsiana,* males, aedeagi. 355, *salicicola,* side view. 356, *frustrator,* apex, side view. 357, do., from above. 358, *prunicola,* apex, side view, 359, *lanternae,* apex, side view. 360, *ishidai,* do. 361, *prunicola,* apex, from above. 362, *ishidai,* do. 363, *lanternae,* do. 364, 365, *diversa,* apex from above (two examples). 366, do., side view. 367, *plebeja,* apex, side view. 368, do., from above. 369, 370, *tersa,* side view (two examples). 371, apex, from above. 372, *plebeja,* apex from above (same example as 368, from different angle).



Figs. 373-386. *Edwardsiana* males. 373, *candidula,* apex of aedeagus, side view. 374, do., from behind. 375, *flavescens,* apex of aedeagus, from behind. 376, *bergmani,* apex of aedeagus, side view. 377, *flavescens,* do. 378. *candidula,* apex of aedeagus, from above. 379, *flavescens,* do. 380, *bergmani,* do. 381, 382, *hippocastani,* do. (two examples). 383, *lethierryi,* do. 384, *bergmani,* apex of aedeagus, from behind. 385, *hippocastani,* apex of paramere. 386, *lethierryi,* apex of aedeagus, side view. 387, 388, 389, *hippocastani,* do. (three examples).



Figs. 390-393. *Eupterycyba jucunda* and *Edwardsiana rosaesugans*. 390, *E. jucunda* hind wing. 391, *E. rosaesugans*, aedeagus, from behind. 392, do., side view. 393, do., apical view.



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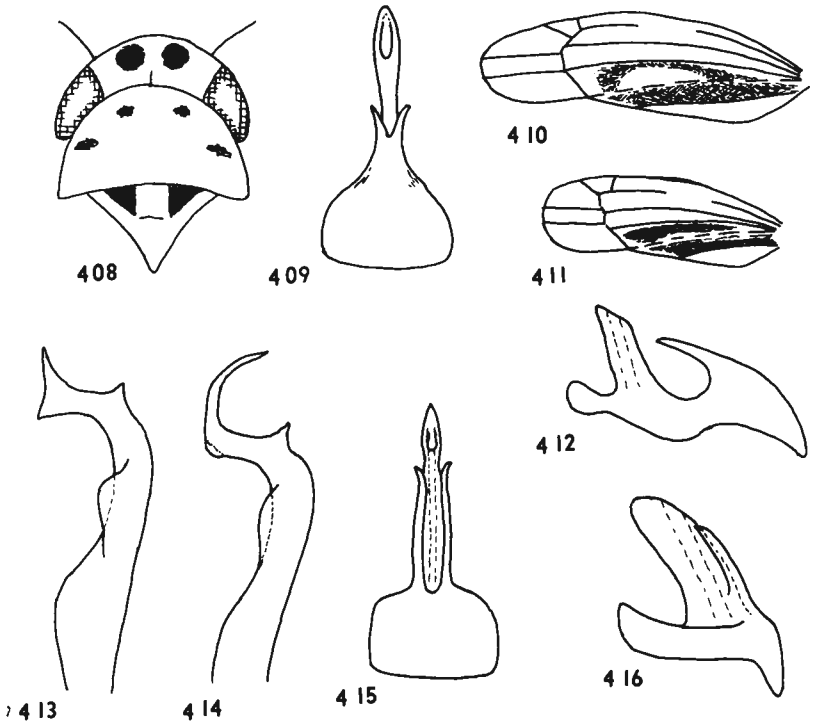

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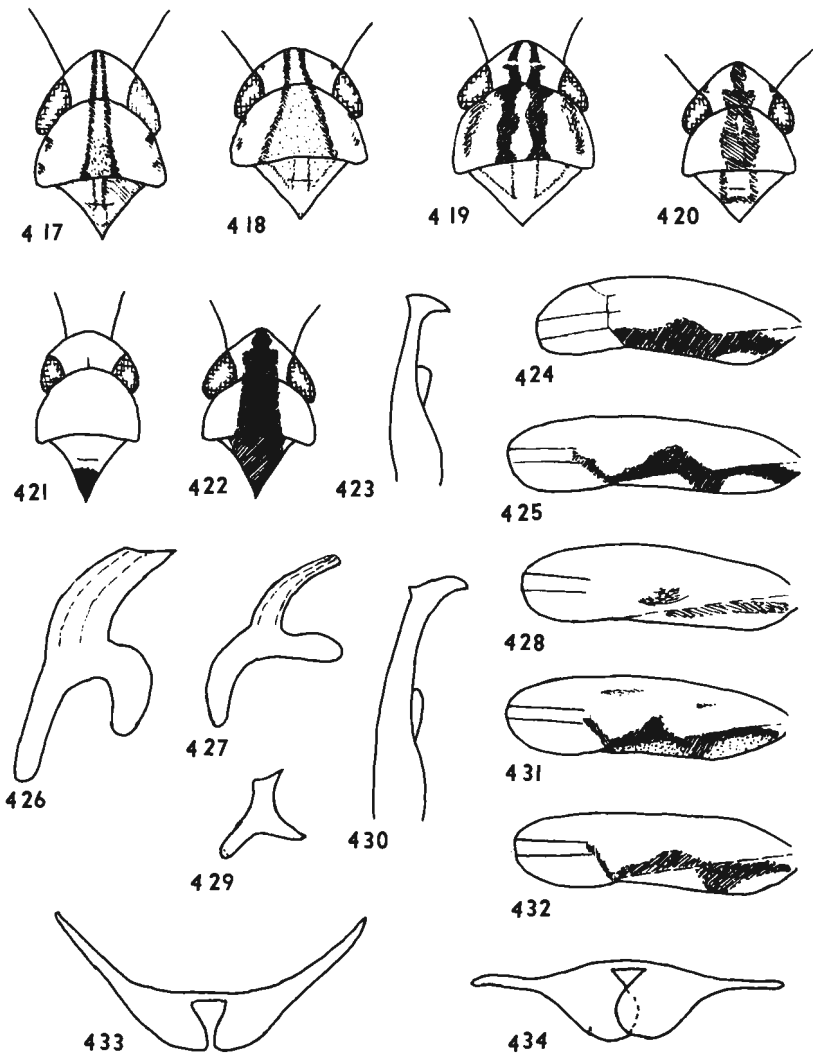
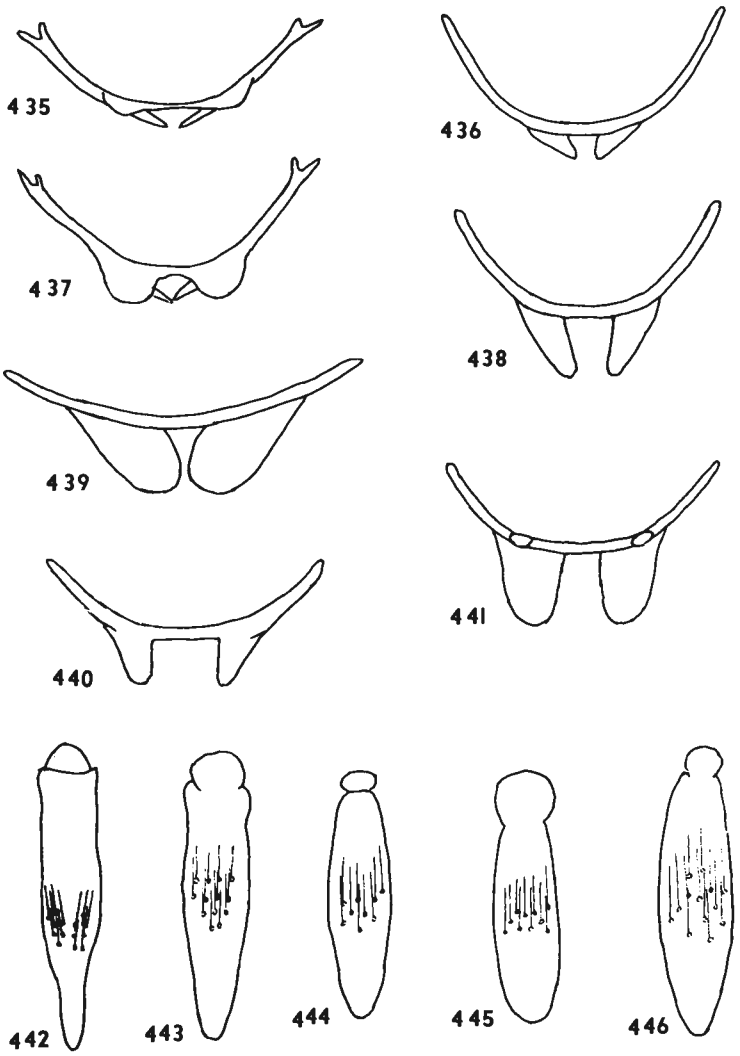


Figs. 417-434. *Zygina.* 417, *angusta,* vertex, pronotum and scutellum. 418, *tiliae,* do. 419, *suavis,* do. (winter colouration). 420, *rubrovittata* female, do. 421, *hyperici,* male, do, 422, female, do. 423, paramere, 424, *rubrovittata* female, fore wing. 425, *flammigera* fore wing. 426, aedeagus, side view. 427, *hyperici,* do. 428, *flammigera,* teneral male, fore wing. 429, *hyperici* male, lobe of side of genital segment. 430, *flammigera,* paramere. 431, *angusta* fore wing. 432, *tiliae,* do. 433, 434, *rubrovittata* sternal apodemes (two specimens).



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