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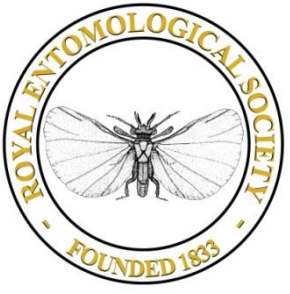


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Handbooks for the Identification of British Insects
Vol. II, Part 5(a)

# HOMOPTERA

## PSYLLOIDEA

I. D. Hodkinson & I. M. White

ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

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Identification of British Insects

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# HOMOPTERA
# PSYLLOIDEA

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## Contents



Cover-illustration: *Psyllopsis fraxini* (L.)

## Preface

Since going to press a second *Hippophaë*-feeding *Psylla* species, *zetterstedti* (Thomson, 1877), has been discovered in Britain. While it has been possible to add the species to both the check list and host plant list it has not been possible to incorporate details in the main text. Appendix III should be consulted for a discussion of the separation of this species.

## Introduction

The Psylloidea, or jumping plant-lice, are an important component of the hemipterous fauna of many dicotyledenous plants. At present 77 species are known to occur in Britain. Psyllids, in general appearance, resemble miniature cicadas, and vary in size from about 1.5 to 4.5 mm overall in length. They are characterized by their strongly developed hind legs which are adapted for leaping.

The first comprehensive work on the British Psylloidea was the monograph of Scott (1876). This was superseded 20 years later by Edward's (1896) monograph on 'the Hemiptera: Homoptera of the British Isles'. Subsequent work on the British fauna has been confined to the description of new species, publication of distribution records and occasional additions to the British species list. Consequently, Edwards' monograph has until now remained the standard reference work on the British species. Most recent taxonomic work on the Psylloidea has originated on the continent, particularly eastern Europe, and keys or monographs are now available to the psyllids of Poland (Klimaszewski, 1969, 1975), European U.S.S.R. (Loginova, 1964), Rumania (Dobreanu & Manolache, 1962), Czechoslovakia (Vondracek, 1957), Spain (Ramirez-Gomez, 1956a, b, 1960), Austria (Haupt, 1935) and Switzerland (Schaefer, 1949a). From these later works a much more soundly based system of psyllid classification has emerged.

The generally accepted system of classification divides the Psylloidea into six families; namely, Triozidae, Carsidaridae, Liviidae, Aphalaridae, Spondyliaspidae and Psyllidae. The relationships between the families and the evolution of the group as a whole have been discussed in detail by G. Heslop-Harrison (1949c, 1951c, d, 1952b, 1958, 1959), Klimaszewski (1964), Szelegiewicz (1971) and Becker-Migdisova (1973). All six families are known to occur in Britain although the Carsidaridae and Spondyliaspidae are not indigenous.

Most of the British species are reasonably cosmopolitan in their distribution and occur throughout Europe. However, *Aphorma bagnalli* is known only from British material. A number of species have been introduced into Britain on ornamental trees and shrubs. These include *Homotoma ficus* on figs, *Calophya rhois* on *Cotinus coggygria*, *Trioza alacris* on bay, *Psylla pulchella* on the Judas tree, *P. alaterni* on *Rhamnus alaternus* and *Ctenarytaina eucalypti* on *Eucalyptus* species. The latter species belongs to the Australasian family Spondyliaspidae. The geographical distribution of the British species both in this country and the world is given in the confirmatory description of each species. The distribution of psyllids largely, but not always, reflects the distribution of their host plants.

## Economic importance of the British Psylloidea

*Psylla mali* and *Psylla pyricola* are respectively, important pests of apple and pear. In North America *P. pyricola* is a known vector of both pear decline condition and fireblight. *Psylla pyri* and *P. pyrisuga* also occur on pear in this country but are scarce and cause less damage. *Trioza apicalis* causes sporadic damage to carrots on the continent but is of little economic importance in Britain. Several other psyllid species may occur at very high densities and cause severe damage to ornamental shrubs and trees. These species include in particular *Psyllopsis* species on ash, *Psylla buxi* and *Spanioneura fonscolombei* on box, and *Trioza alacris* on bay shrubs.

## Host plant relationships

The host plant relationships of the Psylloidea have been discussed in detail by Eastop (1972) and Hodkinson (1974b). In the nymphal stages the Psylloidea are

almost invariably host plant specific. Most species are associated with just one or two host plant species within a single genus. More rarely species may occur on two or more closely related host plant genera. Adult psyllids are more catholic in their choice of food plant. Thus, while most adults probably remain on the host plant on which they originated, some will disperse and feed, but not oviposit, on plants which are unsuitable for nymphal development. This habit is highly developed in species overwintering on shelter plants. A host plant is therefore defined as a plant on which the psyllid species is able to complete its nymphal development. A complete list of the host plants of the British species is given in Appendix I. Distinction has not been made between those host plant species on which a given psyllid has been recorded in Britain and known host plants which occur in Britain but on which the psyllid has not yet been recorded. The nymphs of several British species cause conspicuous gall or pseudo-gall formation on their host plant. *Livia juncorum* induces tassel galls on *Juncus* spp., *Psyllopsis fraxini* induces roll leaf galls on *Fraxinus excelsior* while *Trichochermes walkeri* and *Trioza remota* induce simple pit galls on *Rhamnus* and *Quercus* species respectively.

## Life-history

The Psylloidea pass through five nymphal instars before becoming adult. All the British species are dioecious and at emergence the sexes normally occur in a ratio which approximates 1 : 1. However, females are generally longer lived than males and this may, for a given species, bias the sex ratio in favour of females as time progresses.

The life-cycles of the British species fall into one of the four following categories:

1. Species which overwinter in the egg stage on the dormant buds of their host plant and commence nymphal development in the spring coincident with bud burst, e.g. *Psyllopsis* spp., some *Psylla* spp.
2. Species which overwinter as nymphs on the host plant, e.g. *Strophingia* spp., *Craspedolepta* spp. and *Psylla ambigua*.
3. Species which overwinter as adults on the host plant and which oviposit in late winter to early spring, e.g. *Psylla moscovita*, *Arytaina genistae*.
4. Species in which the adults move on to shelter plants in the autumn and move back on to their true host plant, possibly to mate, and oviposit in the spring, e.g. *Aphalara* spp., some *Psylla* spp., some *Trioza* spp.

Psyllids in category 4 utilize a wide range of evergreen shrubs and trees as overwintering sites. The most important plant species involved are *Pinus* spp., *Picea* spp., *Taxus baccata* L., *Ulex eureopaeus* L. and *Juniperus communis* L. The proportion of the population of a given species which utilizes shelter plants appears to vary. *Aphalara* spp. are never found on their true host plant during the winter, whereas some species such as *Psylla melanoneura* occur abundantly on *Pinus* spp. but scattered individuals can still be found during winter on the bare stems of the true host plant, *Crataegus*. Similarly, *Trioza urticae* occurs abundantly on evergreens but individuals can still be found in grass tussocks at the base of the dead host plant *Urtica dioica* L. In any one year the seasonal succession of species is related to the mode of overwintering. Hence the first species to appear as newly emerged adults are those which overwinter as nymphs. These are followed in succession by those species overwintering as eggs and finally by those overwintering as adults. Most British psyllid species

appear to have a single generation per year. However, *Trioza urticae* has at least three generations per year whereas *Strophingia ericae*, at high elevations, takes two years to complete its life-cycle. The overwintering stage (where known), the number of generations per year and the time of adult appearance for each species is given in Appendix II. Further information on the general biology of the Psylloidea can be found in Hodkinson (1974b). References to individual species are given in Appendix I.

### Methods of collecting and preserving psyllids

Adult psyllids may be collected throughout the year. During the period October to late March sweep-netting of coniferous shelter plants is usually the most productive collecting method. Species which overwinter on the true host plant rather than on shelter plants can be obtained either by sweeping the known host plant, e.g. *Psylla moscovita*, *Arytaina genistae*, or by searching among grass tussocks at the base of the dead host plant stems, e.g. *Trioza urticae*. During the remainder of the year the simplest method of obtaining adults of a given species is to locate and examine the known host plant. Where only nymphs are present it is usually possible to bring host plant samples, with nymphs attached, into the laboratory or greenhouse and breed out the adults. Care should be taken to maintain fairly high humidity levels as nymphs are highly susceptible to desiccation. When collecting psyllids it is advisable, whenever possible, to collect both males and females of a species. In certain genera, *Psylla* and *Trioza* in particular, the females of many species are very similar and males are required for exact species determination. In addition, careful note should be made of the host plant species from which the specimens are taken as this may be a valuable taxonomic character if used judiciously.

There is no ideal way of mounting and storing psyllids; each method has its advantages and disadvantages and it is recommended that three separate collections be made; a dry collection, a spirit collection and a slide mounted collection. Dry specimens should be mounted on cardboard points using a water soluble glue such as gum tragacanth. The use of micro-pins is not recommended. Dry specimens required for colour determination tend to shrivel and important morphological characters become obscured. Hence a parallel collection stored in 70% ethyl alcohol should be made. Specimens in spirit can be manipulated easily and usually the gross morphological characters can be observed under a dissecting microscope. Such specimens, however, unless highly pigmented, tend to become discoloured. Many characters, particularly wing microsculpture, prothoracic sclerites, genitalia and saltatorial spines, are not easily visible under the dissecting microscope and until the reader is very familiar with the psyllids it is recommended that he or she should examine these characters in cleared and dissected material under a compound microscope. Psyllids for dissection should be placed in 15% potassium hydroxide for 24 hours, washed twice for 30 minutes in distilled water, dehydrated by passing through a series of 30%, 50%, 70%, 90%, 100% alcohols (20 minutes in each) and cleared in either clove or cedar-wood oil. Specimens can then be dissected easily in a drop of clove oil on a microscope slide and mounted in Canada balsam. If permanent slides are not required then a semi-permanent mountant such as polyvinyl lactophenol or Berlese medium may be used, although clearing of specimens is still recommended for characters such as genitalia and propleurites. To prevent parts such as the head and genitalia from being distorted by the weight of the cover slip, a sufficient depth of mountant should be used. The main disadvantage with slide

mounted material is that the constituent parts of the psyllid can be examined only in one plane. Thus if few specimens are available, storage in spirit is the most flexible method; slides can then be made when required.

## Morphology

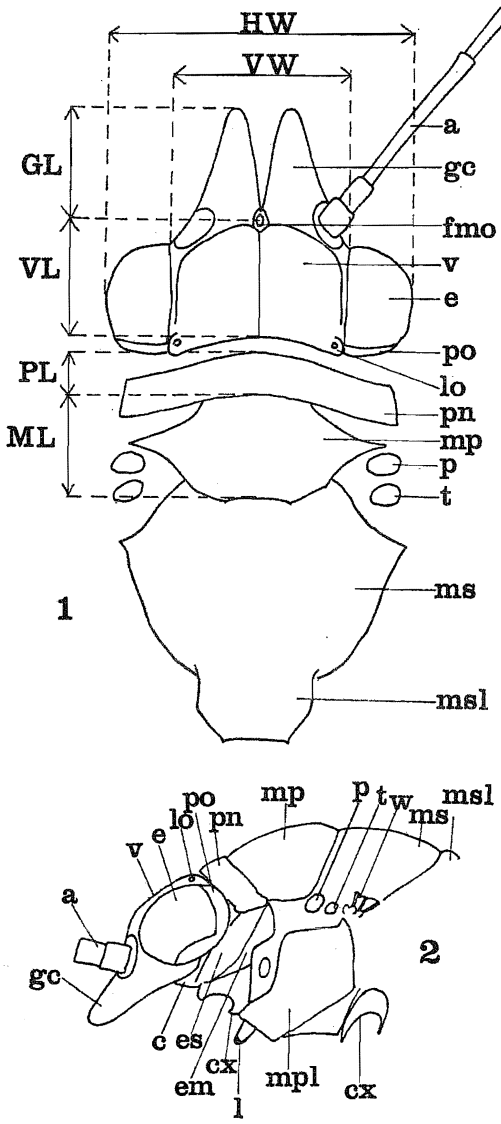
Detailed descriptions of psyllid anatomy can be found in Crawford (1914), Weber (1929), Tuthill (1943), Vondracek (1957) and Matsuda (1970, 1976). The following simplified account describes those important morphological characters used in the construction of the keys.

The general features of a psyllid head are illustrated in figs 1 and 2. In certain families such as the Psyllidae and Triozidae the genae are developed into a pair of anteriorly directed processes known as genal cones, and the frons, which bears the median ocellus is enveloped between their bases. In other families, such as the Aphalaridae (figs 44, 23), the genae are not developed into cones and the frons is visible as a free sclerite on the underside of the head. In the family Liviidae (fig. 7) the vertex is elongate and cleft anteriorly. Care should be taken not to confuse this development of the vertex with the genal cones. Where genal cones are present there is generally a distinct suture between the vertex and the base of the genae which often lie in a plane below that of the vertex. The size, shape and relative proportions of the head and its appendages are all useful taxonomic characters.

The thoracic features of taxonomic importance are illustrated in figs 1 and 2. The pronotum is usually broadly transverse, reaching its maximum development in the Liviidae. The position of the propleurites relative to the pronotum and the relative size and shape of the prothoracic epimeron and episternum are generally good taxonomic characters. The parypterae are normally tubercular but in *Livia* and *Aphorma* they are developed into flat quadrate plates which fit into the lateral angles of the mesothoracic praescutum and scutellum. The relative size and shape of the metathoracic sclerites is comparatively uniform throughout the Psylloidea and such characters have not been used in the keys.

The psyllid hind wings are small, thin and membranous and are of little use in the taxonomy of the group. The forewings, however, provide several useful characters. The basic *Psylla*-type venational arrangement is illustrated in fig. 3. The main modifications to this basic plan are first that the pterostigma may be absent, with vein $R_s$ meeting the costa approximately mid-way along the costal margin, e.g. *Aphalara* spp. (fig. 36), *Trioza* spp. (fig. 238); second the stalk of *M* and *Cu* (*M*+*Cu*) may be absent so that veins *M* and *Cu* arise directly at vein *R*, e.g. *Trioza* spp. (fig. 238).

In many species the membrane of the forewing is covered in minute cuticular protruberances termed spinules. The presence and distribution of spinules on the upper surface of the wing membrane is a valuable character in specific determination. In genera such as *Trioza* the spinules are of two types; the larger radular spinules, which occur in distinct V-shaped clusters in the cells around the apical and anal margin of the wing (fig. 238) and the smaller surface spinules which are distributed over the membrane and which may be present or absent. Other important forewing characters include shape, texture and pattern, relative length and shape of veins, relative shape and size of cells, the presence or absence of a costal break and the point at which vein $Cu_2$ meets the hind margin. The basal width to height ratio of cell $cu_1$ (fig. 3) is a particularly useful character for separating certain critical groups of species such as the *Psylla mali–peregrina–sorbi* complex.




**Figs 1–2.** Psyllid head and thorax. 1, dorsal view. 2, lateral view. a, antenna. b, clypeus. cx, coxa, e, eye. em, epimeron. es, episternum. fmo, frons bearing median ocellus. gc, genal cones. l, labium. lo, lateral ocellus. mp, mesothoracic praescutum. mpl, mesothoracic pleurites. ms, mesothoracic scutum. msl, mesothoracic scutellum. p, paryptera. pn, pronotum. po, post-orbital ridge. t, tegula. v, vertex. w, forewing. GL, genal cone length. HW, head width. ML, mesothoracic praescutum length. PL, pronotum length. VL, vertex length. VW, vertex width.

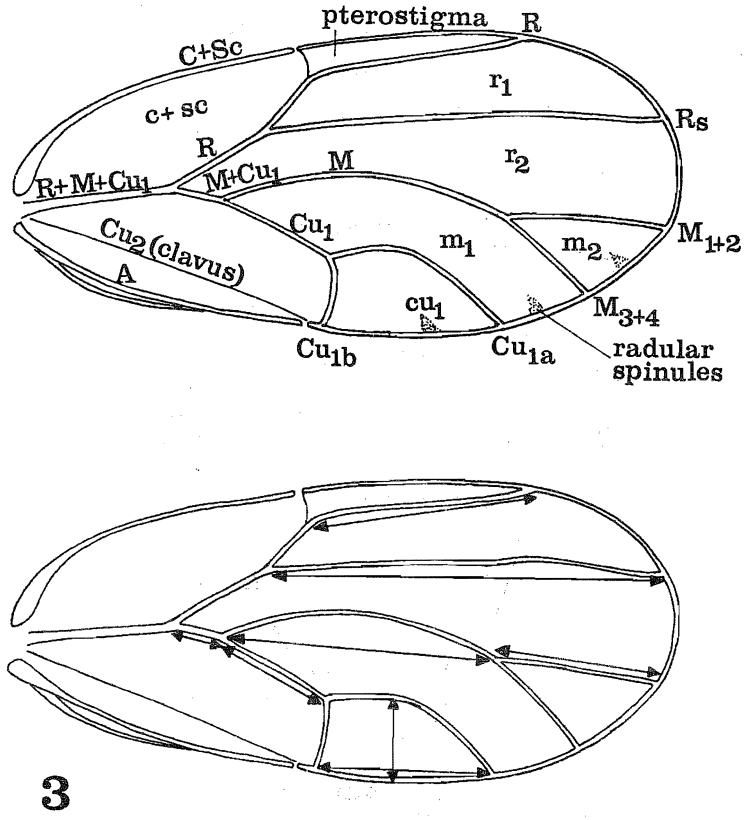



**Fig. 3.** Psyllid forewing. Arrows indicate distances to be measured when quantifying length of veins.

The pro- and mesothoracic legs are simple and of little taxonomic significance. The metathoracic legs (fig. 4), however, are highly modified for jumping and provide several useful characters. Each metacoxa is large and usually bears a characteristic posteriorly directed process, the meracanthus. The meracanthus, however, is absent in *Rhinocola* and *Camarotoscena*. The metatibiae often possess an outer basal genual spine or tubercle but this is absent in a genus such as *Psyllopsis*. The number of thick black saltatorial spines at the apex of the metatibia (fig. 4) varies from three in certain *Trioza* species to a maximum of ten in *Psyllopsis*. Similarly, the number of thick black saltatorial spines on the basal metatarsus (fig. 4) varies from a maximum of two in *Psylla* spp. to one in *Arytaina* spp. and none in *Aphorma* and *Trioza*.

The psyllid abdomen in general lacks good taxonomic features except for the terminalia. The male terminalia (fig. 5) are simple, consisting of a subgenital plate, a proctiger, a single pair of parameres and a folding aedeagus or penis. The proctiger, which bears the anus apically, is usually unipartite, though in *Homotoma* and *Ctenarytaina* it is bipartite. In genera such as *Psylla* the proctiger approximates a

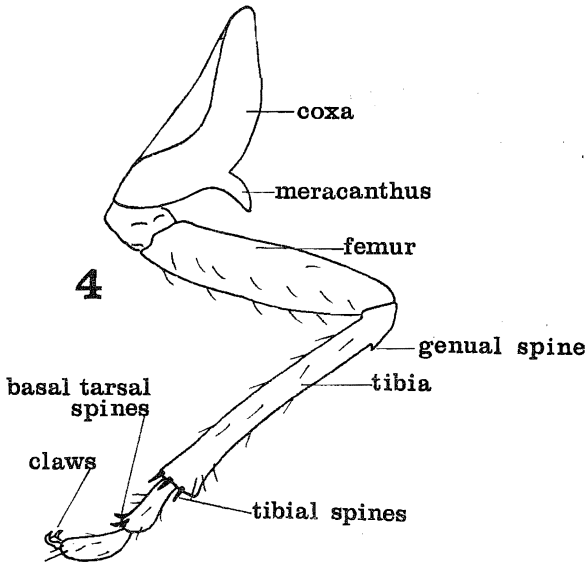


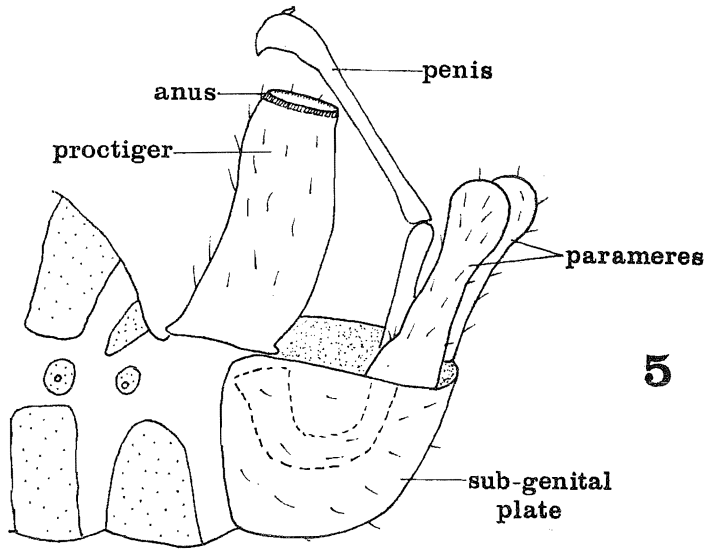

Fig. 4. Metathoracic leg.

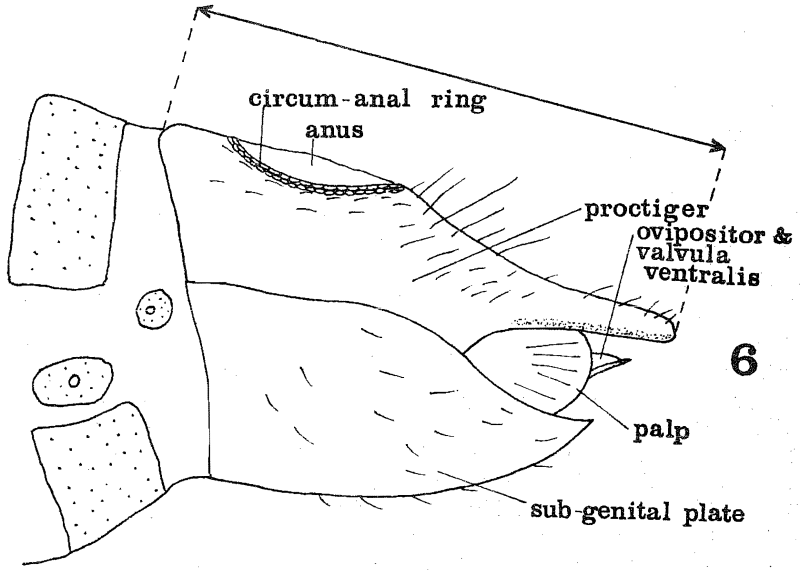
simple cylindrical tube (fig. 179), but in certain genera it bears posteriorly directed lobes or processes. In *Psyllopsis* (fig. 92) and certain *Trioza* spp. (fig. 283) the process takes the form of a simple lobe whereas in *Aphalara* and *Craspedolepta* spp. the process is narrow and elongate (figs 39, 65).

The male subgenital plate is highly uniform in shape throughout the Psylloidea and is of little taxonomic significance. The size and shape of the male parameres, however, is probably the single most important specific character in the Psylloidea. The shape of the parameres is highly variable, ranging from simple lamellate structures in species such as *Psylla melanoneura* (fig. 189) to rather complex structures in *Craspedolepta subpunctata* (fig. 64) and *Psyllopsis* spp. (fig. 95). The form of the apical part of the penis has limited taxonomic significance but is useful in certain instances for separating highly characteristic species, e.g. *Trioza chenopodii.*

The female terminalia (fig. 6) consist of a dorsal outer acuminate valve or proctiger and an outer shorter ventral valve or subgenital plate. These valves enclose the palps which in turn enclose the valvulae ventralis and ovipositor. The female proctiger bears the anus basally. The anus is circumscribed by the peri-anal ring, a ring of wax-secreting pores, the form of which is fairly constant in most genera, but of great taxonomic significance in *Aphalara*. The general shape of the female proctiger and subgenital plate is fairly uniform throughout the Psylloidea and within certain genera the female genitalia of several species may appear almost identical, e.g. several *Salix*-feeding *Psylla* species. However, the length and shape of the outer valves can be, in certain instances, a useful character for the separation of species. The form of the palps, valvulae ventralis and ovipositor are generally of little taxonomic value.

In adult Psylloidea the two sexes are usually of similar coloration, but in a few *Trioza* spp., e.g. *T. chenopodii*, the sexes may be colour dimorphic. For most psyllid




**Figs. 5–6.** 5. Psyllid ♂ genitalia, lateral view (slightly oblique). 6, Psyllid ♀ terminalia, lateral view. Arrow indicates length of proctiger.

species with long-lived adults the full adult coloration may take several months to develop. For instance, adult *Psylla peregrina* and *P. mali*, which emerge in June have a green body coloration. They remain green until the end of July when they begin to darken. By late September the have turned red and brown. Similarly species which overwinter as adults, e.g. *Psylla pulchra*, *P. moscovita*, are much darker in colour in spring than at the onset of winter. Hence coloration characters have only been used in the key couplets when they are known to be constant. The confirmatory description of each species in the key indicates, where appropriate, the range of colour variation in post-teneral adults.

## Nymphal taxonomy

The nymphal stages of many species of psyllid have been described in detail but no attempt has been made to produce a coherent nymphal taxonomy. Scott described the immature stages of some of the British species but his descriptions are inadequate for precise specific determinations. Ossiannilsson's key to the fifth instar nymphs of the Scandinavian *Psylla* spp. (Ossiannilsson, 1971) is the only satisfactory key available for the identification of British species. However, nymphal taxonomy is extremely difficult and the non-specialist will probably find it easier to breed nymphs through to the adult stage for identification. A complete list of references to larval descriptions of British species is given in Appendix I.

## Check list of British psyllids

The literature on the British psyllids is widely scattered and contains much nomenclatorial confusion. Fortunately we have been able to examine all the major psyllid collections on which data have been published. The following compilation represents as complete a list of names as possible which have found their way into the British literature, together with their interpretation by British authors. However, in addition to the references quoted there are a considerable number of records published in local natural history society journals. It has been impossible to trace and check all the specimens involved, but the records invariably relate to common species. The probable synonymies can be interpreted from this check list.

The present list contains a number of modifications to Kloet & Hinck's (1964) check list. Three species, *Strophingia cinereae* Hodkinson, *Craspedolepta pilosa* (Oshanin), and *Calophya rhois* (Löw) have been added, and a number of species have been removed or sunk in synonomy. *Craspedolepta pilosa* was an obvious omission (see Ossiannilsson, 1963). *Calophya rhois*, however, was recorded by G. Heslop-Harrison (1937a), from Scalpay in the Hebrides on its introduced host plant *Cotinus coggygria* (≡ *Rhus cotinus*). The exact systematic position of the genus *Calophya* is uncertain: Becker-Migdisova (1973) places it in the subfamily Calophyinae of the Carsidaridae whereas Vondracek (1957) and Loginova (1964) place it in the family Psyllidae. The nymph of *C. rhois* is not psylline in form but we have for simplicity included the genus in the family Psyllidae.

We can find no evidence to support the inclusion of *Psylla colorata* Löw, *Trioza dispar* Löw, *T. femoralis* Förster and *T. striola* Flor on the British list. The inclusion of *T. dispar* and *T. striola* was based on material from the Scott collection sent to Dr F. Ossiannilsson for determination. These specimens do not bear locality labels and probably represent foreign material, an abundance of which resides in

the Scott collections. Dr Ossiannilsson (pers. comm.) knows of no other genuine British records. Scott's (1882b) reference to *T. unifasciata* Löw, a synonomy of *T. striola* (Vondracek, 1957), most probably refers to *T. curvatinervis* Förster, as he lists *striola* as a non-British species on the next line.

*Trioza femoralis* Förster? was retained in the Kloet & Hincks list on the grounds that Edwards (1896) gave the host plant of *T. acutipennis* (Zetterstedt), a closely related species, as *Alchemilla vulgaris*, a known host plant of *femoralis* (see Ossiannilsson, 1963). We have now seen true *T. acutipennis* taken from *Alchemilla xanthoclora* Rothm. and thus *T. femoralis* has been deleted.

A number of species have been sunk in synonymy: *Psylla löwii* Scott ≡ *P. melanoneura* Förster, *P. concinna* Edwards ≡ *P. pulchella* Löw, (Hodkinson, 1974a), *P. venata* Edwards ≡ *P. hartigi* (China, 1929) while *P. pyricola* Förster has page priority over *P. simulans* Förster.

*Trioza maura* Förster of British authors is without doubt a synonym of *Trioza curvatinervis* Förster. The former was introduced onto the British list by Bagnall (1916a). His teneral female specimens, identified by J. W. Heslop-Harrison, were collected off *Salix* on the shores of Little Haweswater Lake near Silverdale. The present author swept these trees regularly over a four year period and collected only *T. curvatinervis*, a species not recorded by Bagnall (see Hodkinson, 1974a, 1976). Moreover, the *Salix* trees in question are broad leaf species, the host plant of *T. curvatinervis: T. maura* feeds on narrow leaf Salices (Vondracek, 1957). G. Heslop-Harrison (1936 a, b.) also records *T. maura* from Scotland and Northumbria. These specimens are lost but we have examined a series labelled *T. maura* collected by Heslop-Harrison at Estelle in Spain 1953: they are all *T. curvatinervis*.

The British records of *Psylla costalis* Flor all relate to either the red and brown autumnal forms of *P. peregrina* Förster and *P. sorbi* (L.), or to specimens of *P. melanoneura* Förster having a dark pterostigma. This species must therefore be removed from the list.

Ossiannilsson (1963) suggested that the British form of *Psylla moscovita* Andrianova feeding on *Salix repens* may be distinct. Dr Marianna Loginova (Leningrad) has kindly examined specimens collected by Heslop-Harrison at Ross-Links, Northumbria, and by ourselves at Ainsdale, Merseyside, and she states this material is true *moscovita*. Adult *Trioza proxima* Flor still remain unknown in Britain and the retention of this species on the list is only justified by Bagnall's (1916b) record of a *Trioza* nymph feeding on *Hiercacium pilosella* (a known host plant) at Penshaw Hill near Sunderland.

Two species still remain problematical. Bagnall (1934) refers to *Psylla ptarmicae* Kieffer forming galls on *Achillea ptarmica* in Co. Durham. Klimaszewski (1973), in the check list of Palaearctic psyllids, regards *P. ptarmicae* as a nomen dubium. It seems probable therefore that Bagnall's record refers to *Craspedolepta nervosa* (Förster), a species which is known to feed on *Achillea ptarmica*. *Psylla bagnalli* Heslop-Harrison has only ever been recorded by the Heslop-Harrison family. For a species which they state is so common (see Heslop-Harrison, G. 1936a, b, c, 1937b; Heslop-Harrison, J. W. & G., 1940), it is surprising that it has not appeared in other collections made in areas where it is known to occur. Moreover, the given host plant, *Juncus* spp., for reasons stated earlier (Hodkinson, 1974a) seems somewhat improbable. *P. bagnalli* is probably a synonym of an established species, although in the absence of male material some doubt must remain and we have reluctantly retained the species in our list. However, we have been unable to include *P. bagnalli* in our key to *Psylla* spp.

The species as presently conceived are listed alphabetically under their respective genera. Synonyms are inset in italics with the date of publication following the author's name. Misidentifications, misspellings and placements of species in genera other than the one in which they presently reside are inset in roman type face, without the date following the author's name.

SUPERFAMILY PSYLLOIDEA

FAMILY LIVIIDAE
LIVIA Latreille, 1804
1. crefeldensis (Mink, 1855)
   Diraphia crefeldensis Mink: (Heslop-Harrison, G., 1936a, 1948, 1949a; Kloet & Hincks, 1964)
2. juncorum (Latreille, 1798)

FAMILY APHALARIDAE
RHINOCOLA Förster, 1848
3. aceris (L., 1758)
   Rhinocola aceris Curtis: (Scott, 1882b)

CAMAROTOSCENA Haupt, 1935
4. speciosa (Flor, 1861)
   Rhinocola speciosa Flor: (Scott, 1876c, 1882b)

STROPHINGIA Enderlein, 1914
5. cinereae Hodkinson, 1971
6. ericae (Curtis, 1835)
   Psylla ericae Curtis
   Rhinocola ericae (Curtis): (Scott, 1876a, 1882a, b; Edwards, 1896, 1908b; Heslop-Harrison, J. W., 1915, Heslop-Harrison, G., 1935; Britten, 1930; Halbert, 1934)
   Aphalaroida ericae (Curtis): Heslop-Harrison, G., 1936a, b, c, 1937a; Heslop-Harrison, J. W. & G., 1940; Kloet & Hincks, 1964; Ing 1967, 1971, 1974)

APHORMA Hodkinson, 1974
7. bagnalli (Laing, 1929)
   Aphalara bagnalli Laing: (Kloet & Hincks, 1964)
   Aphorma bagnalli nomen nudum: (Heslop-Harrison, G., 1949b, 1952).

APHALARA Förster, 1848
8. borealis Heslop-Harrison, G., 1949b
9. exilis (Weber & Mohr, 1804)
10. maculipennis Löw, 1887
11. polygoni Förster, 1848
   Aphalara calthae (L.): (Scott, 1882a, b; Edwards, 1896, 1908b; Heslop-Harrison, J. W., 1915; Bagnall, 1916; Britten, 1930; Heslop-Harrison, G., 1935, 1936a, b, c, 1937a, 1949b)
   Craspedolepta subpunctata Förster (partim): (Ing, 1971)

CRASPEDOLEPTA Enderlein, 1921
12. flavipennis (Förster, 1848)
13. malachitica (Dahlbom, 1850)
   Aphalara artemesiae Förster: (Scott, 1882a, b; Edwards, 1908a, b)
   Aphalara pilosa Oshanin (partim): (Heslop-Harrison, G., 1936a)
   Craspedolepta malachita (Dahlbom): (Kloet & Hincks, 1964; Ing, 1971, 1974).
14. nebulosa (Zetterstedt, 1828)
   *Aphalara radiata* Scott, 1876a
   Aphalara nebulosa (Zetterstedt): (Scott, 1882a, b, c; Edwards, 1896, 1908b; Britten, 1930; Lal, 1934, 1937; Heslop-Harrison, G., 1936a, 1937a)
15. nervosa (Förster, 1848)
   Aphalara nervosa Förster: (Scott, 1876d, 1881a, 1882 a,b; Edwards, 1896, 1908b;

Halbert, 1934; Heslop-Harrison, G., 1936a, b, c; Heslop-Harrison, J. W. & G., 1940)

16. pilosa (Oshanin, 1870)
    Aphalara artemesiae Förster: (Scott, 1877a?; Edwards, 1896, 1908b; China, 1929)
17. sonchi (Förster, 1848)
    Aphalara picta (Zetterstedt): (Scott, 1876a, 1882a, b; Edwards, 1896, 1908b; Halbert, 1934; Heslop-Harrison G., 1935, 1936a, c, 1937a; Heslop-Harrison, J. W. & G., 1940)
    Craspedolepta flavipennis (Förster): (Ing, 1967)
18. subpunctata (Förster, 1848)
    Aphalara subpunctata Förster: (Scott, 1883a)

FAMILY PSYLLIDAE
CALOPHYA Löw, 1878
19. rhois (Löw), (1877)

PSYLLOPSIS Löw, 1879
20. discrepans (Flor, 1861)
21. distinguenda Edwards, 1913
    Psyllopsis fraxini (L.) (partim): (Ing, 1971)
22. fraxini (L., 1758)
    Psylla fraxini L.: (Scott, 1876a)
23. fraxinicola (Förster, 1848)
    Psylla fraxinicola Förster: (Scott, 1876a; Cooke 1882).

ARYTAINA Förster, 1848
24. genistae (Latreille, 1804)
    *Psylla ulicis* Curtis, 1835
    Arytaena ulicis (Curtis): (Scott, 1876a)
    Arytaena genistae Latreille: (Scott, 1880b, 1882a, b; Edwards, 1896, 1908b; Heslop-Harrison, J. W., 1915; Britten, 1930; Halbert 1934)

ARYTAINILLA Loginova, 1972
25. spartiophila (Förster, 1848)
    *Psylla spartii* Guérin-Méneville, 1843: (Scott, 1882a, b; Edwards, 1896, 1908b; Heslop-Harrison, J. W., 1915; Bagnall, 1916; Britten, 1930; Halbert, 1934; Heslop-Harrison, G., 1936a)
    *Arytaina spartii* (Guérin-Méneville, 1843): (Kloet & Hincks, 1964; Ing, 1967, 1971, 1974)
    Psylla spartiophila Förster: (Scott, 1876a)
    Spartina spartiophila (Förster): (Heslop-Harrison G., 1961)
    Psylla hartigi Flor (partim): (Ing, 1971)

LIVILLA Curtis, 1836
26. ulicis (Curtis, 1829)

PSYLLA Geoffroy, 1762
27. alaterni Förster, 1848
    Psylla hippophaes Förster (partim): (Scott, 1876a)
28. albipes Flor, 1861
29. alni (L., 1758)
    Psyllia alni L. (Lal, 1934a, 1937)
30. ambigua Förster, 1848
    *Psylla stenolabis* Löw, 1877: (Scott, 1876b, 1882a, b)
    Psyllia ambigua Förster: (Lal, 1934a, 1937)
    Psylla salicicola Förster: (Heslop-Harrison, G., 1935)
    Psylla abdominalis Meyer Dur: (Heslop-Harrison, G., 1936a, b, c, 1937a, 1938)
31. bagnalli Heslop-Harrison, J. W., 1916
32. betulae (L., 1758)
33. brunneipennis Edwards, 1896
    Psyllia brunneipennis Edwards: (Lal, 1934a)
    Psyllia klapaleki Sulc: (Lal, 1934a)

Psylla klapaleki Sulc: (Britten, 1930; Heslop-Harrison, G., 1938)
Psylla saliceti Förster (partim): (Ing, 1967)

34. buxi (L., 1758)
Psyllia buxi L.: (Lal, 1934, 1937)

35. crataegi (Schrank, 1801)
*Psylla ferruginea* Förster, 1848: (Scott, 1876a)
*Psylla costatopunctata* Förster, 1848: (Scott, 1876a, 1882a, b)

36. foersteri Flor, 1861
Psyllia foersteri Flor: (Lal, 1934a, 1937)
Psylla alni (L.) (partim): (Ing, 1967)

37. hartigi Flor, 1861
*Psylla venata* Edwards, 1896: (Edwards, 1908b; China, 1929)
*Psylla sylvicola* Lethierry 1874: (Scott, 1876a)
Psylla betulae (L.) (partim): (Ing, 1971)

38. hippophaes Förster, 1848

39. mali Schmidberger, 1836
*Psylla viridissima* Scott, 1876a
*Psylla aeruginosa* Förster, 1848: (Scott, 1876a; Britten, 1917b)
*Psylla occulata* Förster, 1848: (Scott, 1876a)
Psyllia mali Förster: (Lal, 1937)

40. melanoneura Förster, 1848
*Psylla lowii* Scott, 1876: (Scott, 1882a, b; Edwards, 1896, 1908b; China, 1929; Britten, 1930)
Psyllia melanoneura Förster: (Lal, 1934a, 1937)
Psylla costalis Flor: (Ing, 1967, 1971, 1974)
Psylla pulchra (Zetterstedt) (partim): (Ing, 1967)
Psylla betulae (L.) (partim): (Ing, 1967)

41. moscovita Andrianova, 1948
Psylla salicicola Förster (partim): (Scott, 1876a, 1882a, b; Edwards, 1896, 1908)
Psyllia dudai Sulc: (Lal, 1934a)
Psylla dudai Sulc: (Heslop-Harrison, G., 1936a, b, c, 1937a, 1938; Heslop-Harrison, J. W. & G., 1940)
Psylla klapaleki Sulc: (Heslop-Harrison, G., 1935)
Psylla saliceti Förster (partim): (Ing, 1967, 1971)
Psylla propinqua Schaefer: (Heslop-Harrison, G., 1951a)

42. peregrina Förster, 1848
Psylla crataegicola Förster: (Scott, 1876a; Cooke, 1882),
Psylla costalis Flor: (Scott, 1876b, 1882a, b; Edwards, 1896, 1908b; Heslop-Harrison, J. W., 1915)
Psylla sorbi L. (partim): (Scott, 1880a)
Psyllia mali Schmidberger race peregrina: (Lal, 1934b, 1937)
Psylla mali Schmidberger (partim): (Ing, 1971)
Psylla melanoneura Förster (partim): (Ing, 1966, 1971)

43. pruni (Scopoli, 1763)

44. pulchella Löw, 1877
*Psylla concinna* Edwards, 1896: (China, 1929; Kloet & Hincks, 1964)

45. pulchra (Zetterstedt, 1840)
*Psylla pineti* Flor, 1861: (Scott, 1876a, 1882a, b; Edwards, 1896, 1908b; Heslop-Harrison, J. W., 1915)
Psylla nigrita (Zetterstedt): (Edwards, 1915; Heslop-Harrison, J. W., 1916; Bagnall, 1916; Britten, 1930; Halbert, 1934; Heslop-Harrison, G., 1935, 1936a, b, c, 1937a, 1938)
Psylla saliceti Förster (partim): (Ing, 1967)
Psylla hartigi Flor (partim): (Ing, 1967)
Psylla melanoneura Förster (partim): (Ing, 1967)

46. pyri (L., 1758)

47. pyricola Förster, 1848
*Psylla apiophila* Förster, 1848: (Scott, 1882b)
*Psylla simulans* Förster, 1848: (Scott, 1882a, b; Edwards, 1896, 1908b; Kloet & Hincks, 1964; Ing, 1971, 1974)
Psylla pyri (L.): (Scott, 1876; Ing, 1974?)
Psyllia pyricola Förster: (Lal, 1934a, 1937)

48. pyrisuga Förster, 1848

49. rhamnicola Scott, 1876
    Psylla melanoneura Förster, (partim): (Ing, 1971)
50. saliceti Förster, 1848
    *Psylla salicicola* Förster, 1848 (partim): (Scott, 1876a, 1882a, b; Cooke, 1882; Edwards, 1896, 1908b; Heslop-Harrison, J. W., 1915; Halbert, 1934?)
    Psyllia salicicola Förster: (Lal, 1934a)

51. sorbi (L., 1758)
    Psylla costalis Flor (partim): (Heslop-Harrison, J. W., 1915)
    Psylla mali Schmidberger (partim): (Ing, 1971)
    Psylla melanoneura Förster (partim): (Ing, 1971)
52. subferruginea Edwards, 1915
    Psylla fumipennis Förster: (Scott, 1876a, 1882a; Cooke, 1882)
    Psylla löwii Scott: (Bagnall, 1916)
    Psylla betulae (L.) (partim): (Ing, 1967)
    Psylla subferrugineus Edwards: (Kloet & Hincks, 1964)
53. ulmi Förster, 1848
    Psyllia ulmi Förster: (Lal, 1934)
54. viburni Löw, 1876
55. visci Curtis, 1835
56. zetterstedti (Thomson, 1877)

SPANIONEURA Förster, 1848
57. fonscolombii Förster, 1848

FAMILY TRIOZIDAE
TRICHOCHERMES Kirkaldy, 1904
58. walkeri Förster, 1848
    Trioza walkeri Förster: (Scott, 1876a, 1882b)
    Trichopsylla walkeri (Förster): (Scott, 1882a; Edwards, 1896, 1908b; Lal, 1937)

TRIOZA Förster, 1848
59. abdominalis Flor, 1861
60. acutipennis (Zetterstedt, 1828)
    *Trioza silacea* Meyer-Dur, 1871: (Edwards, 1908a, b; China, 1929)
    *Trioza saundersi* Meyer-Dur, 1871: (Edwards, 1908b; China, 1929)
61. alacris Flor, 1861
62. albiventris Förster, 1848
63. apicalis Förster, 1848
    Trioza viridula (Zetterstedt): (Scott, 1876a, 1882a, b; Edwards, 1896, 1908b; China, 1929)
64. centranthi (Vallot, 1829)
    *Trioza neilreichii* Frauenfeld, 1874: (Scott, 1882b)
65. chenopodii Reuter, 1876
    *Trioza dalei* Scott, 1877: (Scott, 1882a, b)
    *Trioza atriplicis* Lichtenstein, 1878: (Heslop-Harrison, J. W., 1917)
66. crithmi Löw, 1879
67. curvatinervis Förster, 1848
    Trioza maura Förster: (Bagnall, 1916; Heslop-Harrison, G., 1936a, b, 1938)
    Trioza unifasciata Löw: (Scott, 1882b?)
68. flavipennis Förster, 1848
    *Trioza aegopodii* Löw, 1879: (Scott, 1882b; Falconer, 1933)
69. galii Förster, 1848
    *Trioza velutina* Förster, 1848: (Edwards, 1908a, 1918b; Heslop-Harrison, J. W., 1917)
70. munda Förster, 1848
71. proxima Flor, 1861
    *Trioza juniperi* Meyer-Dur, 1871: (Scott, 1876c, 1877b)
72. remota Förster, 1848
    *Trioza haematodes* Förster, 1848: (Scott, 1876a)
73. rhamni (Schrank, 1801)
    *Trioza abieticola* Förster, 1848: (Scott, 1876a, b)

74. salicivora Reuter, 1876
75. urticae (L., 1758)

FAMILY CARSIDARIDAE Guérin-Méneville, 1834
HOMOTOMA Guérin-Méneville, 1834
76. ficus (L., 1758)

FAMILY SPONDYLIASPIDAE
CTENARYTAINA Ferris & Klyver, 1932
77. eucalypti (Maskell, 1895)
Eurhinocola eucalypti Maskell: (Lal, 1937)

## Use of the keys

Two separate sets of keys to genera are provided. For those who just wish to quickly name a specimen a simple highly artificial key to genera is provided (p.15). This gives little indication of generic relationships but will work satisfactorily for most specimens. For users wishing to understand the taxonomy of the group, a more complete set of keys to families and genera is provided (p.16). In all keys except those to species of *Psylla* and *Trioza* additional confirmatory descriptions are given in brackets following the couplet statements. In the large genera *Psylla* and *Trioza* the confirmatory descriptions follow the key.

*Abbreviations used in keys*

HW = head width
WL = forewing length
GCV = genal cone length : vertex length ratio
AHR = antennal length : head width ratio
CUR = basal width : height ratio of cell $cu_1$ of forewing
FPHW = female proctiger length : head width ratio
WLHW = forewing length : head width ratio

### Simplified key to genera of British Psylloidea

1 Antennae markedly flattened, bearing long dark setae (fig. 309) **Homotoma** Guérin-Méneville (p.77)
– Antennae cylindrical, without long dark setae (fig. 23) ..... 2
2 Genal cones absent (figs 7, 23) ..... 3
– Genal cones present (figs 81, 212, 275) ..... 9
3 Antennal segment II dilated, longer than segment III (fig. 7) **Livia** Latreille (p.18)
– Antennal segment II small, shorter than segment III (figs 21, 70) ..... 4
4 Forewing membrane (fig. 19) with cellular appearance **Aphorma** Hodkinson (p.20)
– Forewing membrane not cellular ..... 5
5 Forewing without pterostigma (figs 36, 53) ..... 6
– Forewing with pterostigma (figs 24, 34) ..... 7
6 General body coloration brick red, white and brown **Aphalara** Förster (p.24)
– General body coloration green, yellow, brown or black and pale yellow **Craspedolepta** Enderlein (p.26)
7 Forewing (fig. 18) with brown colour-patterning **Camarotoscena** Haupt (p.22)
– Forewing (figs 24, 34) yellow, leathery, transversely wrinkled ..... 8
8 Vein $M_{1+2}$ of forewing (fig. 34) strongly curved **Rhinocola** Förster (p.22)
Vein $M_{1+2}$ of forewing (fig. 28) straight or weakly curved **Strophingia** Enderlein (p.22)

9 Forewing (fig. 238) with veins $Cu_1$ and $M$ not having common stem, each arising separately from common origin at vein $R$ ..... 10
— Forewing (fig. 3) with veins $Cu_1$ and $M$ having common stem arising from vein $R$ .... 11
10 Forewing with brown colour-pattern (fig. 234) **Trichochermes** Kirkaldy (p.62)
— Forewing without brown colour-pattern, occasionally uniformly yellow **Trioza** Förster (p.62)
11 Forewing with pointed apex (fig. 117) **Spanioneura** Förster (p.39)
— Forewing with rounded apex (fig. 3) ..... 12
12 Cell $cu_1$ of forewing (fig. 79) large and high **Calophya** Löw (p.33)
— Cell $cu_1$ of forewing (fig. 3) smaller and lower ..... 13
13 Metatibia with 9 or 10 thick black apical spines **Psyllopsis** Löw (p.33)
— Metatibia with at most 6 such spines ..... 14
14 Forewing (fig. 116) leathery brown, oval; cell $m_1$ long **Livilla** Curtis (p.39)
— Forewing (figs 109, 132) membranous, oblong oval, occasionally yellow or with brown markings; cell $m_1$ shorter ..... 15
15 Basal metatarsus with 1 (outer) thick black spine ..... 16
— Basal metatarsus with 2 such spines ..... 17
16 Forewing (fig. 109) with longitudinal brown streaks in apical cells **Arytaina** Förster (p.35)
— Forewing (fig. 105) dull yellow **Arytainilla** Loginova (p.35)
17 Cells $cu_1$ of forewing long, vein $cu_{1a}$ almost straight (fig. 313) **Ctenarytaina** Ferris & Klyver (p.78)
— Cell $cu_1$ shorter, vein $cu_{1a}$ strongly arched (fig. 3) **Psylla** Geoffroy (p.40)

## Key to families of Psylloidea

1 Antenna (fig. 309) markedly flattened, bearing long dense dark setae. Head in dorsal view (fig. 309) with anterior margin of vertex cleft; genal cones small, not visible in dorsal view, borne on underside of head. Forewing (fig. 308) with following combination of three characters always present: pterostigma absent, apex pointed, and veins $M$ and $Cu_1$ with common stem arising from vein $R$. Dorsal surface of head and thorax and wing veins bearing long dark setae. Male proctiger (fig. 311) bipartite. Tibiae (fig. 312) with conspicuous dark chitinous bands around apices. A single introduced species on fig. (*Ficus* spp.)
**Carsidaridae,** (*Homotoma* Guérin-Méneville) (p.77)

(Head strongly deflexed, vertex short, pre-occipital lobes absent; eyes strongly convex, extending beyond lateral extremities of post-orbital ridges; antennal segment II narrower than I and shorter than III. Forewing with cell $cu_1$ short and high, costal break present, gap in anal vein some distance from apex of vein $Cu_{1b}$. Propleurites lying below lateral margin of pronotum, divided by oblique or vertical suture. Mesotibia without subapical row of spines; basal metatarsus with two saltatorial spines.)

– Antenna (fig. 23) cylindrical, without long dark setae. Head in dorsal view either with genal cones clearly visible (figs 1, 275), or if vertex cleft then with genal cones absent (figs 7, 44). Forewing with at most two of following characters present: pterostigma absent; apex pointed; veins $M$ and $Cu_1$ with a common stem arising from vein $R$.
Head, thorax and wing veins without long black hairs, if pilose or setose then hairs pale (*Trichochermes walkeri*, *Craspedolepta pilosa*). Male proctiger (figs 61, 180, 277) almost invariably unipartite; if bipartite then apex of forewing rounded (*Ctenarytaina* fig. 313). Tibiae without chitinous bands at apex ..... 2

2 Head in dorsal view (fig. 7) with vertex elongate, at least as long as broad; eyes small, flattened, not extending beyond the lateral extremities of post-orbital ridges. Antennal segment II large (fig. 7), wider than segment I and longer than segment III. Propleurites (fig. 7) small, located in a notch on antero-lateral margin of the pronotum; epimeron and episternum divided by horizontal suture.
**Liviidae** (p.18)

(Head weakly deflexed, pre-occipital lobes absent, although small tubercle present on anterior margin of eye; genal cones absent; frons visible as distinct

sclerite on ventral side of head. Forewing with pterostigma short or absent; cell $cu_1$ variable; veins $Cu_1$ & $M$ with a common stem arising from $R$; gap in anal vein adjacent to apex of vein $Cu_{1b}$. Mesotibia without subapical row of spines; basal metatarsus with 2 saltatorial spines. Male proctiger unipartite.)

– Head in dorsal view (figs 70, 216) with vertex short, at most 0.8 times as long as broad, generally much shorter; eyes strongly convex, approximately spherical, extending well beyond lateral extremities of post-orbital ridges. Antennal segment II small, narrower than segment I and much shorter than segment III. Propleurites (figs 70, 217) usually larger, lying below lateral margin of the pronotum; epimeron and episternum divided by oblique or vertical suture.....3

3 Genal cones absent (figs 21, 44); genae smoothly rounded (fig. 21), or at most forming small tubercles ventral to antennal sockets (fig. 44). Frons (which bears median ocellus) clearly visible as free sclerite on ventral surface of head. Metatibia with apical crown of at least six (usually more) thick black spines

**Aphalaridae** (p.18)

(Head weakly to moderately deflexed, pre-occipital lobes usually absent. Forewing with pterostigma present or absent; vein $R$ when present conspicuous; cell $cu_1$ variable; veins $M\&Cu_1$ having a common stem arising at $R$; gap in anal vein adjacent to apex of vein $Cu_{1b}$. Mesotibia without subapical row of spines; basal metatarsus with 0–2 saltatorial spines. Male proctiger unipartite.)

– Genae developed into conspicuous, anteriorly directed processes, the genal cones (figs 81, 106, 205, 275). Frons greatly reduced and enveloped between bases of genal cones; median ocellus visible in dorsal view at base of the cones. Metatibia usually with 6 or less apical spines, if more than 6 then antennae at least 1.75 times as long as head width (*Psyllopsis* spp.).....4

4 Forewing (figs 234, 239) with veins $Cu_1$ and $M$ not having common stem, each arising separately from common origin at vein $R$; gap in anal vein some distance from apex of vein $Cu_{1b}$; wing apex more or less angular. Basal metatarsus without thick black saltatorial spines **Triozidae** (p.61)

(Head moderately deflexed, occipital lobes absent. Forewing with pterostigma and costal break absent; cell $cu_1$ usually short. Mesotibia without subapical row of spines. Male proctiger unipartite.)

– Forewings (figs 3, 117) with veins $Cu_1$ and $M$ having common stem arising from vein $R$; gap in anal vein adjacent to apex of vein $Cu_{1b}$; apex of wing usually rounded, if angular then pterostigma present (*Spanioneura* fig. 117). Basal metatarsus with 1 or 2 thick black saltatorial spines (but absent in *Calophya rhois:* Psyllidae).....5

5 Forewing (fig. 313) with vein $R$ posterior to pterostigma becoming obsolete, anterior margin merging with pterostigma, not forming a well-defined posterior margin to pterostigma; cell $cu_1$ long, basal width to height ratio greater than 3.0. Male proctiger (fig. 316) bipartite. Head (fig. 315) strongly deflexed, forming an angle of almost 90° with plane of thorax; occular sclerite extended forward to form small pre-occipital lobes between eye and antennal socket. Mesotibia with sub-apical row of stout spines (fig. 314). Small species; wing length less than 1.9 mm, head width less than 0.62 mm. A single introduced species on *Eucalyptus* spp.

**Spondyliaspidae** (*Ctenarytaina* Ferris & Klyver) (p.78)

– Forewing with pterostigma present or absent, when pterostigma present (fig. 3) vein $R$ clearly visible, forming posterior margin of pterostigma. Cell $cu_1$ short, basal width to height ratio less than 2.9 (usually much less). Male proctiger unipartite (fig. 5). Head (figs 106, 217) moderately deflexed at most forming an angle of 70° with a plane of thorax; pre-occipital lobes usually absent. Mesotibia without a subapical row of spines. Almost invariably larger species; wing length greater than 1.65 mm (usually greater than 2 mm); head width greater than 0.62 mm. (In *C. rhois*, the exception, head width less than 0.45 mm, wing length less than 1.9 mm)

**Psyllidae** (p.31)

## Family Liviidae

A small Holarctic-Oriental family containing 22 species in the single genus *Livia* Latreille. Members of this family, which are easily recognized by the shape of the head and the opaque yellow forewings, are associated with monocotyledonous plant species of the genera *Juncus* and *Carex*. Two species, *L. juncorum* (Latreille) and *L. credfeldensis* (Mink), are found in Britain. Prior to 1974, *L. crefeldensis* was placed in a separate genus, *Diraphia* Waga. However, in a recent revision of the world Liviidae, Loginova (1974a) combined the two genera.

### Genus *Livia* Latreille

*Key to species*

1 Vertex with deep notch in anterior margin (fig. 7). Anterior lobes of vertex narrowly rounded and only partly covering basal antennal segments. Antennal segment II; with broad lateral bulge on inner side distally, approximately 2 times length of segment I, as long as segments III–VIII together (fig. 7). Forewing oval, broadest in middle (fig. 8) **juncorum** (Latreille)

(Colour: Head and thorax orange-brown, antennal segments I–II red, III–VIII yellow, IX–X dark. Forewing yellow with brown spots around margin from pterostigma to $Cu_2$ and often with indistinct brown spots on the membrane. Abdomen brown dorsally and white ventrally. WL=1.9–2.5 mm, HW=0.48–0.58 mm, AHR=1–1.4. Male genitalia fig. 10. Female genitalia fig. 9.)

*Locally common in wet meadows throughout Britain. Ireland. Throughout Europe, Caucasus, Middle Asia, Siberia, N. India. On* Juncus *spp.*

– Vertex with shallow notch in anterior margin (fig. 11). Anterior lobes of vertex broadly rounded, their lateral margins greatly overlapping basal antennal segments. Antennal segment II; cylindrical, only slightly longer than I, as long as III–V together (fig. 11). Forewing oblong-oval, broadest in apical third (fig. 12) **crefeldensis** (Mink)

(Colour: head, prothorax, forewing and abdomen yellow. Forewing often with indistinct brown spots on membrane in apical cells. Antennal segments I–VIII yellow, IX–X dark. Meso- and metathorax brown. WL=2–2.8 mm, HW=0.48–0.72 mm, AHR=0.9–1.5. Male genitalia fig. 14. Female genitalia fig. 13.)

*Rare, Norfolk – Brecklands, Suffolk, Newham Bog Northumbria, Stainton N. Yorks. Throughout Europe to Turkey and the Caucasus. On* Carex *spp.*

## Family Aphalaridae

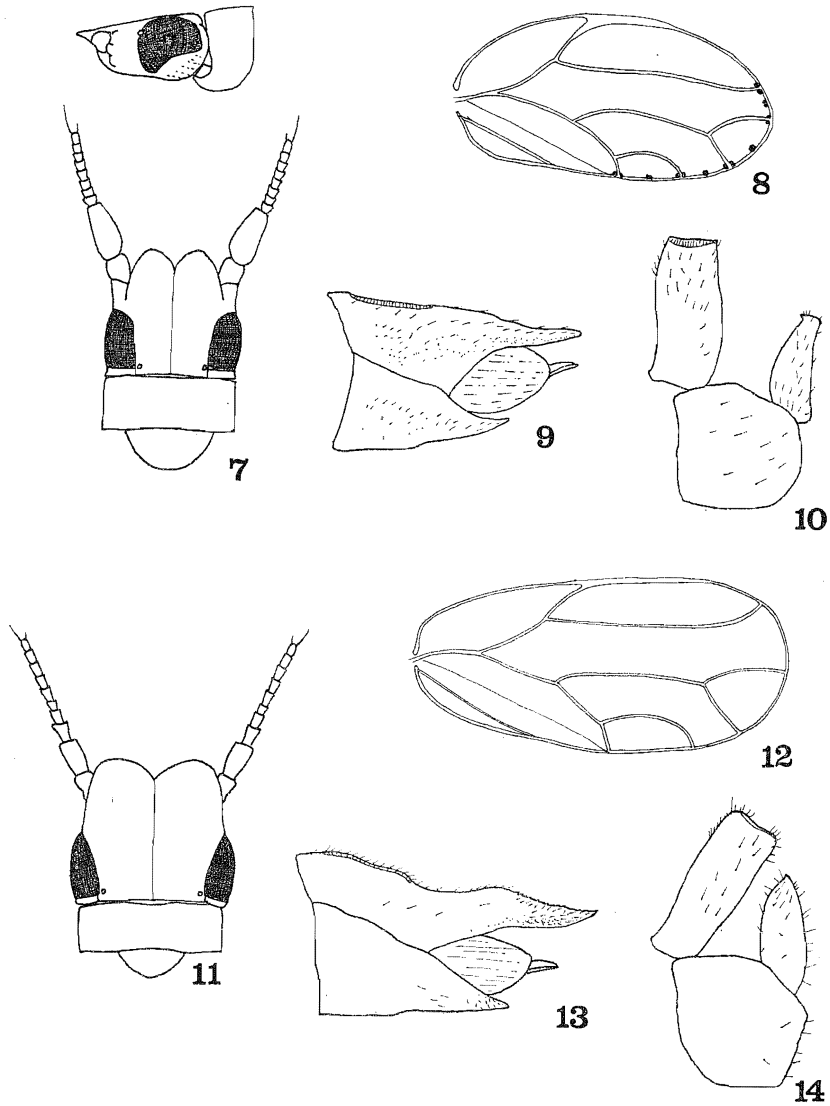
A large family with the majority of described species occurring in the holarctic regions. On a wide variety of host plants.

*Key to genera of Aphalaridae*

1 Membrane of forewing (fig. 19) with distinctive cellular appearance, surface spinules absent; brown colour-patterning of characteristic form. Frons reduced to small oval plate scarcely larger than unpaired median ocellus which it bears. Parypterae expanded into large flat quadrate plates which fit into lateral angles of mesothoracic praescutum (fig. 21). Basal metatarsus without saltatorial spines **Aphorma** Hodkinson (p.20)

(Head in lateral view (fig. 21), globular, genae smoothly rounded, clypeus scarcely visible. AHR=0.82–1.1. Rhinaria on antennal segments IV, V, VI, VII, VIII and IX. Forewing without pterostigma. Propleurites fig. 21. Meracanthus normally developed. Metatibia with 7 or 8 saltatorial spines. Male proctiger without narrow wing-like posterior processes.)

– Membrane of forewing not cellular in appearance, spinules present or absent (N.B. In *Craspedolepta malachitica* (fig. 58) spinules form honeycomb pattern over membrane surface). Frons much larger than median ocellus, flask- or pear-shaped,




**Figs. 7–14.** *Livia* spp. 7, *L. juncorum* head. 8, forewing. 9, ♀ terminalia. 10, ♂ genitalia. 11, *L. crefeldensis* head. 12, forewing. 13, ♀ terminalia. 14, ♂ genitalia.

usually clearly visible on underside of head. Parypterae usually in the form of small tubercles; if expanded then forewing yellow and leathery (*Rhinocola*). Basal metatarsus usually with 2 saltatorial spines; if spines absent then forewing with distinct pterostigma (*Camarotoscena*) .....2

2 Forewing without pterostigma (figs 37, 55). Male proctiger bearing two long narrow wing-like posterior processes (figs 39, 61). Rhinaria present on antennal segments IV, V, VI, VII, VIII and IX. Head in lateral view with clypeus distinctly protruberent (figs 44, 70). Propleurites in lateral view (figs 44, 70) equal quadrate, vertical, distinctly divided by vertical suture.....3

– Forewing with pterostigma (figs 18, 24, 34). Male proctiger without long narrow wing-like posterior processes (figs 17, 29). Rhinaria usually only on antennal segments IV, VI, VIII and IX; if present on segments IV, V, VI, VII, VIII and IX then meracanthi reduced to small tubercles (*Rhinocola*). Head in lateral view with clypeus scarcely visible (figs 16, 23). Propleurites in lateral view either unequal, elongate and vertical figs 16, 23) or hidden beneath overlapping pronotum (fig. 31).....4

3 Clypeus in lateral view long and cylindrical, projecting to anterior margin of head (fig. 44). Genae forming small rounded tubercles ventral to the antennal sockets (fig. 44). General body coloration brick-red with white and black markings

**Aphalara** Förster (p.24)

(AHR=0.9–1.3, Meracanthus well developed; metatibia with at most 8 saltatorial spines; basal metatarsus with 2 saltatorial spines.)

– Clypeus in lateral view shorter (fig. 70) not reaching anterior margin of head. Genae (fig. 70) smooth, not forming rounded tubercles ventral to antennal sockets. General body coloration green, yellow, brown or black and pale yellow, never brick-red

**Craspedolepta** Enderlein (p.26)

(AHR=0.9–1.6. Meracanthus well developed; metatibia with at most 8 saltatorial spines; basal metatarsus with 2 saltatorial spines.)

4 Forewing (fig. 18), membraneous; broadest in apical third; pattern consisting of characteristic brown clouds. Cell $cu_1$ longer than cell $m_2$ basal width to height ratio greater than 3.3. Apex of metatibia with a crown of 9–12 saltatorial spines. Basal metatarsus without saltatorial spines **Camarotoscena** Haupt (p.22)

(Head in lateral view (fig. 18) globular, genae smooth, AHR 0.8–0.9. Meracanthus reduced to a small tubercle.)

– Forewing (figs 24, 34) leathery, yellow, transversely wrinkled; broadest at or before middle; pattern, if present, consisting of scattered small round spots. Cell $cu_1$, equal to or shorter than cell $m_2$ (figs 24, 34); basal width to height ratio less than 2.8. Apex of metatibia with at most 8 saltatorial spines; basal metatarsus with 2 saltatorial spines.....5

5 Head in lateral view wedge-shaped (fig. 31); vertex length greater than 0.6 times vertex width. Forewing (fig. 34) with vein $M_{1+2}$ strongly curved; basal width to height ratio of cell $cu_1$ less than 1.6. Mesothoracic praescutum (fig. 31) short and wide. Propleurites in lateral view (fig. 31) hidden beneath overhanging pronotum. Parypterae (fig. 31) developed into flat plates. Meracanthus (fig. 33) reduced to small tubercle. Female genitalia (fig. 35) long and slender. (AHR=0.7–0.9)

**Rhinocola** Förster (p.22)

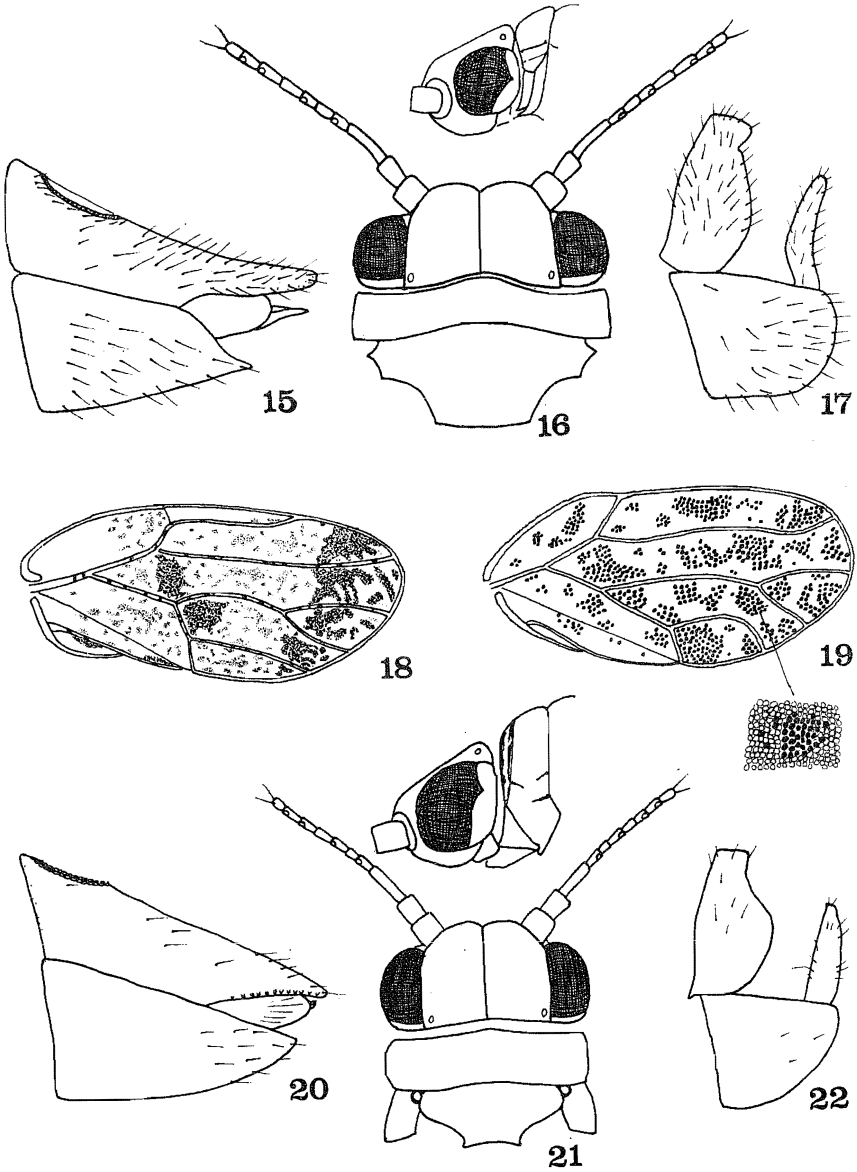
– Head in lateral view globular (fig. 23); vertex length at most 0.5 times vertex width. Forewing (figs 24, 28) with vein $M_{1+2}$ straight or weakly curved; basal width to height ratio of cell $cu_1$ at least 1.8. Mesothoracic praescutum (fig. 23) longer and narrower. Propleurites (fig. 23) lateral, clearly visible, pronotum not overhanging. Parypterae in the form of small tubercles. Meracanthus normally developed (fig. 25). Female genitalia (fig. 27) short and stout. (AHR=0.6–0.8)

**Strophingia** Enderlein (p.22)

## Genus *Aphorma* Hodkinson

A western palaearctic genus containing one described species, *Aphorma bagnalli* (Laing), from Britain. Heslop-Harrison (1949, 1952a) referred to a further species from Iraq but failed to describe it adequately. The host plant relationships of *Aphorma* are unknown.

General body coloration brown or red-brown with yellow or white markings. Antennal segments I, II, IX & X brown, remainder yellow. Forewing membrane (fig. 19) white,




**Figs. 15–22.** *Camarotoscena speciosa* & *Aphorma bagnalli*. 15, *C. speciosa* ♀ terminalia. 16, head. 17, ♂ genitalia. 18, forewing. 19, *A. bagnalli* forewing. 20, ♀ terminalia. 21, head. 22, ♂ genitalia.

cellular, with brown spots. Legs yellow, femora sometimes darkened. WL=1.7–1.9 mm. HW=0.5–0.6 mm. Male genitalia fig. 22; female genitalia fig. 20 **bagnalli** (Laing)

*Rare, Berks, Wilts, Dorset. Known only from England.*

### Genus *Camarotoscena* Haupt

A palaearctic-ethiopian genus containing 12 described species all associated with poplar trees (*Populus* spp.) (Loginova, 1975). A single species, *Camarotoscena speciosa* (Flor), is thought to occur in Britain.

General body coloration orange or yellow, with brown patterning; antennae and legs yellow. Forewing (fig. 18) with characteristic brown pattern. WL=2.2–2.5 mm, HW=0.6–0.7 mm. Male genitalia fig. 17, female genitalia fig. 15 **speciosa** (Flor)

*Rare, a single British record, locality unknown. S. and central Europe, Caucasus, Turkmen and Mongolia.*

### Genus *Rhinocola* Förster

A western palaearctic genus containing one species *Rhinocola aceris* (L) which is associated with maple trees (*Acer* spp.).

General body coloration yellow, abdominal sternites greenish yellow, female terminalia orange-yellow. Forewing (fig. 34) yellow with few scattered small brown spots. WL=1.5–2.2 mm, HW=0.5–0.6 mm. Male genitalia fig. 32, Female genitalia fig. 35 **aceris** (L).

*Locally common, southern England, north to Durham. Throughout Europe to Middle Asia, Armenia, Georgia.*

### Genus *Strophingia* Enderlein

A western palaearctic genus containing four described species, all associated with plants of the family Ericaceae (Loginova, 1976b). In the past *Strophingia* has often been considered synonymous with *Aphalaroida*, (Crawford, 1914), a nearctic genus containing several species which occur on Leguminosae in the southern U.S.A. Recent evidence suggests that the two genera are distinct.

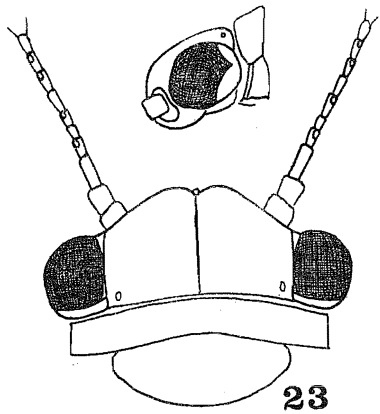
In Britain *Strophingia ericae* exists as two distinct physiological races which are morphologically almost identical (Parkinson & Whittaker, 1975). The high altitude race, which occurs above about 1,000 ft has a two-year life-cycle, while the low altitude race occurs below 1,000 ft and has a one-year life-cycle (Hodkinson, 1973a, b). Members of this genus are among the smallest psyllids, being less than 2 mm in length.

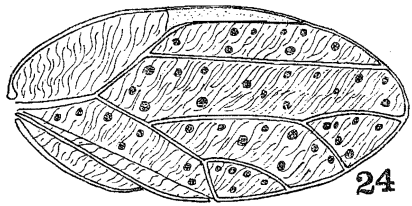
1 Forewing (fig. 28) somewhat rhomboidal, without maculation; cell $m_2$ twice as large as cell $cu_1$. Head in lateral view extending anteriorly only a short distance beyond the eye; antennal scrobes only partially visible; vertex convex between the eyes. Male parameres (fig. 29) short and wide, half to two-thirds as long as proctiger; apex of penis somewhat reniform. Valvula ventralis of female (fig. 30) evenly convex ventrally on apical part, barely extending beyond palps **cinereae** Hodkinson

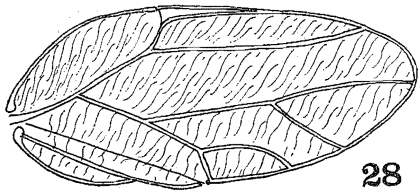
(General coloration yellow, forewing yellow. WL=1.1–1.5 mm, HW=0.48–0.57 mm, AHR=0.5–0.65

*Locally common in S.W. England. Jersey, Spain, France, Corsica. On* Erica *spp.*

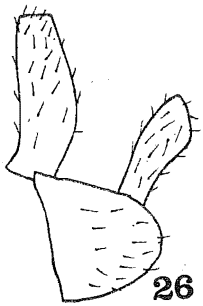
– Forewing (fig. 24) oblong-oval, with round grey maculations; cell $m_2$ equal in size to cell $cu_1$. Head in lateral view extending anteriorly well beyond eye; antennal scrobes

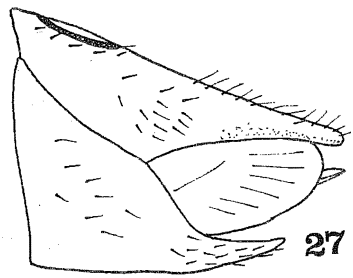


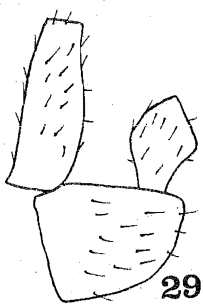



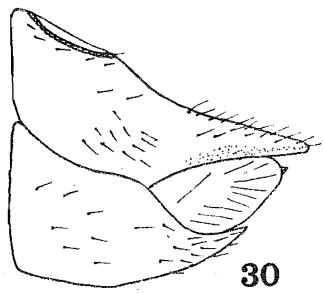





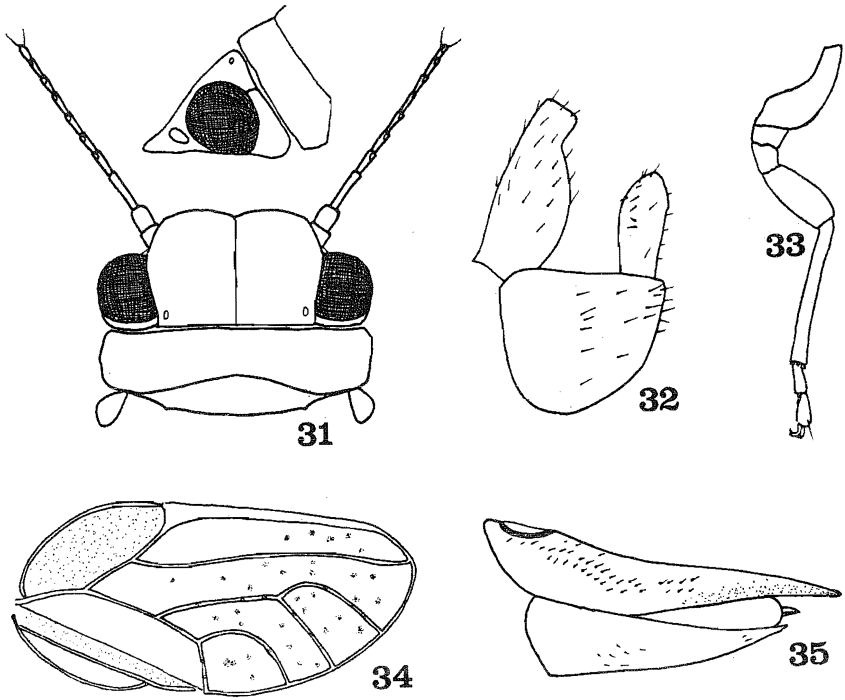



**Figs 23–30.** *Strophingia*. 23–27, *ericae*. 23, head. 24, forewing. 25, metathoracic leg. 26, ♂ genitalia. 27, ♀ terminalia. 28–30, *cinereae*. 28, forewing. 29, ♂ genitalia. 30, ♀ terminalia.




**Figs 31–35.** *Rhinocola aceris.* 31, head. 32, ♂ genitalia. 33, metathoracic leg. 34, forewing. 35, ♀ terminalia.

completely visible; vertex flat between eyes. Male parameres (fig. 26) long and narrow, about three-quarters length of proctiger, apex of penis elongate bulbous. Valvula ventralis of female (fig. 27) strongly concave ventrally on apical part, extending well beyond palps. **ericae** (Curtis)

(General coloration light olive-green to tawny; abdomen often bluish in newly emerged specimens; forewing yellow. WL = 1–1.5 mm, HW = 0.32–0.38 mm, AHR = 0.6–0.8.)

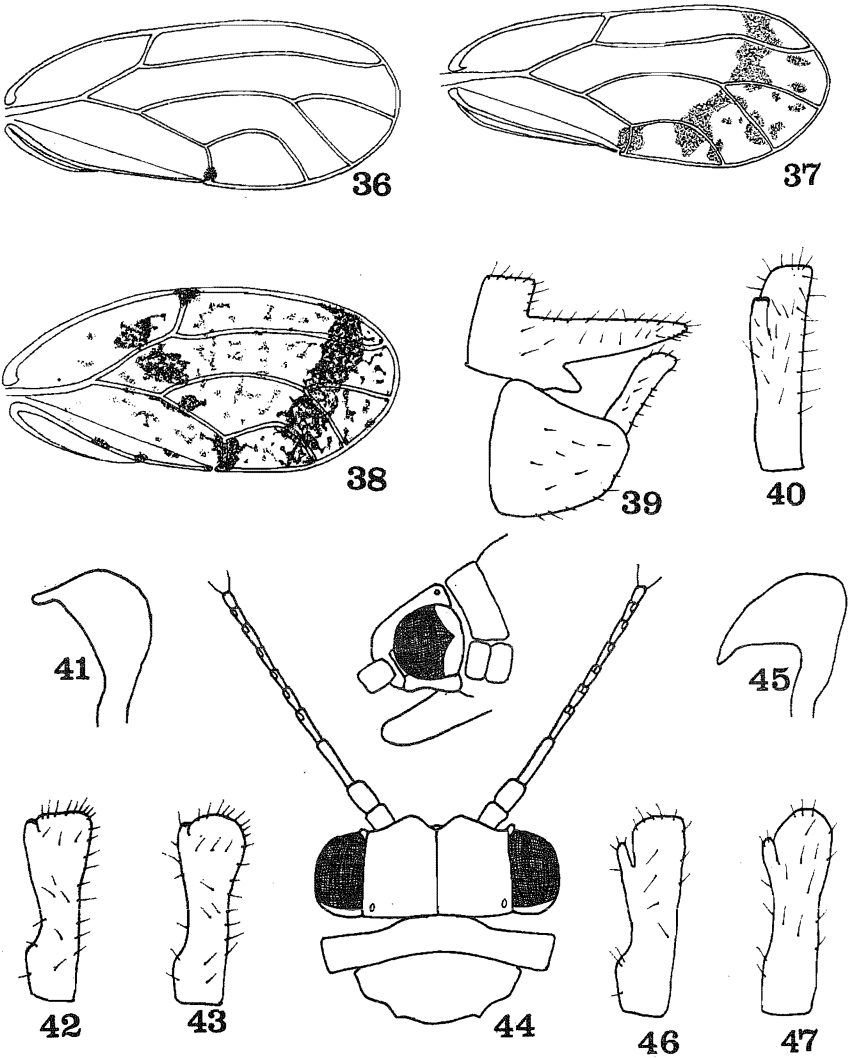
*Common throughout Britain. Ireland. Widely distributed throughout Europe, European U.S.S.R. On* Calluna vulgaris.

## Genus *Aphalara* Förster

A large holarctic genus containing four British species. *Aphalara* species are particularly associated with plants of the family Polygonaceae (Klimaszewski, 1973; Caldwell, 1937). This is a 'difficult' genus and often both males and females are required for exact specific determination.

*Key to species*

1 Forewing (figs 37, 38) with brown or black colour-pattern; most obvious in apical third of wing where it forms oblique transverse band ..... 2
– Forewing (fig. 36) without distinct brown or black colour-pattern except for single dark spot on vein $Cu_{1b}$; membrane yellow at least in apical half of wing ..... 3
2 Forewing (fig. 38) broad, length less than 2.2 times maximum breadth; colour-pattern brown or black, conspicuously present in basal half of wing; membrane whitish;




**Figs. 36–47.** *Aphalara*. 36, *polygoni* forewing. 37, *maculipennis* forewing. 38, *exilis* forewing. 39, *exilis* ♂ genitalia, lateral. 40, *exilis* ♂ paramere, inner view. 41, *polygoni* apex of penis. 42, *polygoni* f. *typica* paramere, inner view. 43, *polygoni* f. *rumicicola* paramere, inner view. 44, *polygoni* head. 45, *borealis* apex of penis. 46, *borealis* paramere inner view. 47, *maculipennis* paramere inner view.

spinules stout, forming obvious raised transverse rows across the membrane. Male paramere in lateral view (figs 39, 40) with posterior margin distinctly concave **exilis** (Weber & Mohr)

(WL=1.7–2.4 mm, HW=0.6–0.78 mm, AHR=0.97–1.2. Male genitalia figs 39, 40, female genitalia fig. 48.)

*Common throughout Britain. Ireland. Throughout Europe, east to Armenia, Georgia and Kazakhstan. On* Rumex *spp.*

– Forewing (fig. 37) narrower, length more than 2.4 times maximum breadth; colour-pattern light to dark brown, confined mainly to an oblique transverse band in apical half of wing; membrane pale yellowish; spinules small, light coloured, not forming obvious transverse rows on the membrane. Male paramere in lateral view (fig. 47) with posterior margin straight **maculipennis** Löw

(WL=2–2.4 mm, HW=0.5–0.6 mm, AHR 1.02–1.21. Male genitalia fig. 47, female genitalia fig. 49.)

*Rare, known only from Aviemore, Scotland. Central and N. Europe, Caucasus, European U.S.S.R. eastwards to Middle Asia, N. India. On* Polygonum *spp.*

3 Inner tooth of male parameres (fig. 46) broadly separated from rest of paramere, apex of tooth not reaching paramere apex. Apex of penis (fig. 45) strongly recurved so that tip lies in plane parallel to shaft **borealis** Heslop-Harrison

(Forewing as fig. 36. WL=2.2–2.4 mm, HW=0.57–0.62 mm, AHR=1.02–1.13. The female of this species is inseparable from that of *polygoni* Förster.)

*Rare, known only from Beetham and Ennerdale, Cumbria. Northern and Central Europe, European U.S.S.R. Kazakhstan, Siberia. On* Polygonum *spp.*

– Inner tooth of male paramere (fig. 42) narrowly separated from rest of paramere, apex of tooth reaching level of paramere apex. Apex of penis (fig. 41) not strongly recurved, tip not lying in a plane parallel to the shaft **polygoni** Förster

(Forewing fig. 36, often with yellow coloration more intense in apical half of wing. Female genitalia fig. 50. WL=2.2–2.4 mm, HW=0.55–0.66 mm, AHR=1.03–1.26.)

*Common throughout Britain. Throughout the Palaearctic from Europe to Japan. On* Polygonum *and* Rumex *spp.*

Certain authors (e.g. Klimaszewski, 1975) regard *A. polygoni* var. *rumicicola* Loginova (1962) (a nomen nudum) as a distinct species living on *Rumex*. This form can be distinguished from *A. polygoni* form *typica* by the following characters. Female with posterior portion of peri-anal wax gland bearing a double row of pores (fig. 52) as opposed to 6–8 rows in form *typica* (fig. 51). Apex of male paramere rounded (fig. 43) as opposed to flattened in form *typica*. In both sexes the wing membrane, veins and surface spinules are lighter coloured in var. *rumicicola* than in form *typica*. The status of *A. rumicicola* as a distinct species, however, is somewhat dubious as intermediate forms occur with a combination of the above characters. Furthermore we have collected form *typica* from *Rumex acetosella*.

## Genus *Craspedolepta* Enderlein

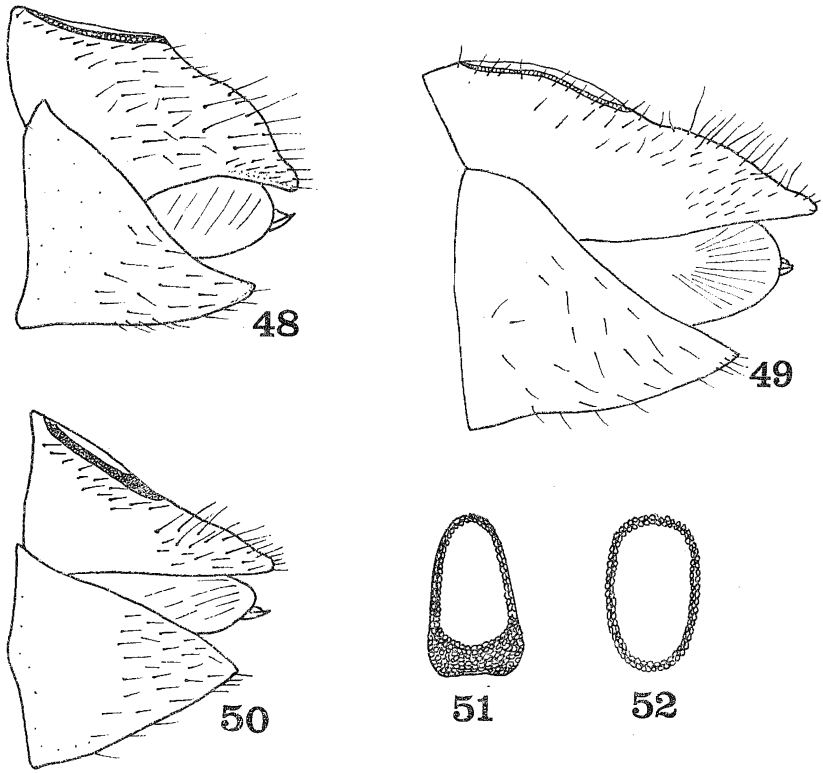
A large holarctic genus associated with plants of the families Compositae and Onagraceae (Klimaszewski, 1973; Russell, 1973). Seven species are known to occur in Britain.

*Craspedolepta flavipennis* (Förster) was described partly from British material collected in S. England and S. Ireland. These still remain the only records for the species in Britain, but the original specimens are lost. The following account of *C. flavipennis* is based on material collected by Dr Eger in the Valais, Switzerland.

British material of *C. pilosa* (Oshanin) differs from the type-series in having the long setae on the body and forewing up to 0.06 mm as opposed to 0.03 mm in length (see Wagner, 1947; Vondracek, 1952).

*Key to species*

1 Head and thorax covered in dense setae up to 0.06 mm long. Forewing (fig. 53) with conspicuous setae up to 0.06 mm long arranged in double rows along veins. Cell $cu_1$ of forewing very long; basal width to height ratio greater than 3.0. **pilosa** (Oshanin)




Figs 48–52. *Aphalara*. 48, *exilis* ♀ terminalia. 49, *maculipennis* ♀ terminalia. 50, *polygoni* ♀ terminalia. 51, *polygoni* f. *typica* peri-anal ring. 52, *polygoni* f. *rumicicola* peri-anal ring.

General body coloration whitish, pale yellow or pale green. Forewing opaque whitish, setae concolorous with veins. Antennae 10-segmented. WL = 1.8–2.2 mm, HW = 0.64–0.72 mm, AHR = 0.9–1.1. Male paramere fig. 63, female terminalia fig. 73.)

*Rare, Norfolk, Durham, Portland, Dorset. Switzerland, Mongolia, U.S.S.R. – Armenia, Daghestan, Kazakhstan to Middle Asia. On* Artemesia *spp.*

– Head and thorax not covered in dense setae. Forewing without conspicuous setae along veins. Cell $cu_1$ of forewing shorter; basal width to height ratio less than 2.9, usually not greater than 2.7 ..... 2

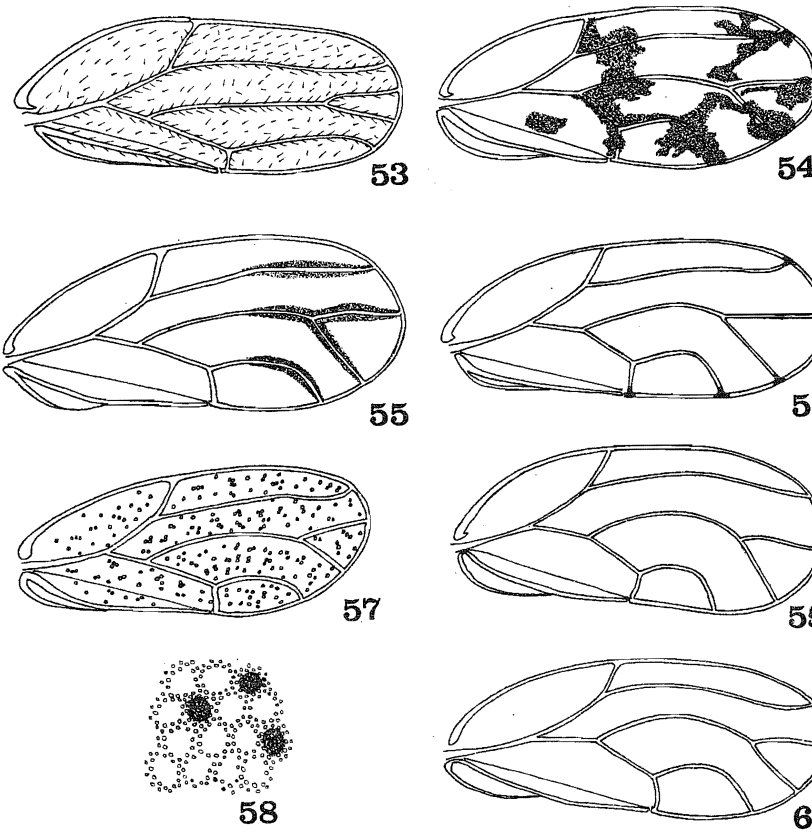
2 Antennae 8-segmented (very occasionally 9-segmented); segment 3 at least 1.3 times length of vertex. Forewing (fig. 55) whitish; pattern consisting of brown streaks running parallel to veins in apical half of wing **nervosa** (Förster)

(General body coloration green or yellow. WL = 2.1–2.6 mm, HW = 0.6–0.69 mm, AHR = 1.3–1.5. Male paramere fig. 67, female terminalia fig. 75.)

*Common throughout Britain. Ireland. Throughout Europe, European U.S.S.R. east to Irkutsk and Yakutia. On* Achillea *spp.*

– Antennae 10-segmented; segment 3 less than 1.25 times length of vertex. Forewing pattern, if present, not consisting of brown streaks parallel to veins ..... 3

3 Forewing pattern consisting of conspicuous grey or black clouds (fig. 54). General body coloration in mature specimens black, with grey or yellow markings. In lateral view posterior process of male proctiger lanceolate (fig. 65.) **nebulosa** (Zetterstedt)




**Figs 53–60.** *Craspedolepta.* forewings. 53, *pilosa.* 54, *nebulosa.* 55, *nervosa.* 56, *subpunctata.* 57, *malachitica.* 58, *malachitica* wing microsculpture. 59, *flavipennis.* 60, *sonchi.*

(WL = 2.2–2.8 mm, HW = 0.6–0.69 mm, AHR = 1.2–1.5. Male paramere fig. 66 female terminalia fig. 74.)

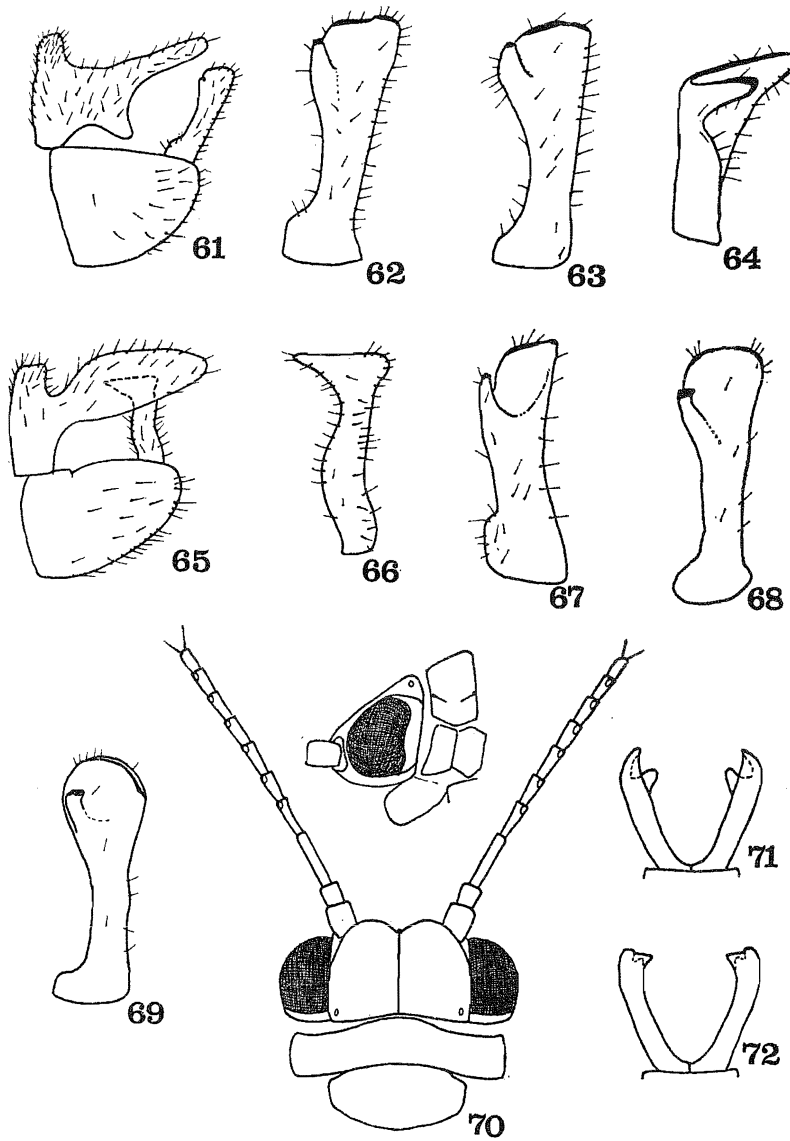
*Common throughout southern Britain, becoming scarcer in Scotland. Central and N. Europe, European U.S.S.R., Kazakhstan, Georgia, Siberia, N. America. On* Chamaenerion angustifolium.

– Forewing pattern, if present, consisting of small round spots. General body coloration green, yellow or brown, never black. In lateral view posterior process of male proctiger gradually narrowed to the apex, not lanceolate (fig. 61) ..... 4

4 Forewing (fig. 56) white, semi-transparent, veins unicolorous with membrane, without spots on membrane; pattern consisting of small brown spots on the marginal vein at intersection of veins *Rs*, $M_{1+2}$, $M_{3+4}$, $Cu_{1a}$ and $Cu_{1b}$. Female proctiger in lateral view with dorsal margin markedly convex (fig. 77); in dorsal view apex deeply notched. Male paramere in internal lateral view with conspicuous posterior projection (fig. 64) **subpunctata** (Förster)

(General body coloration green. WL = 2.4–3.3 mm, HW = 0.67–0.76 mm, AHR = 1.3–1.6.)

*Uncommon, southern England. Central and N. Europe, European U.S.S.R., Daghestan, Kazakhstan, Central Siberia, Alaska, W. Canada. On* Chamaenerion angustifolium.




**Figs 61–72.** *Craspedolepta*. 61, *malachitica* ♂ genitalia. 62, *malachitica* paramere inner view. 63, *pilosa* paramere inner view. 64, *subpunctata* paramere inner view. 65, *nebulosa* ♂ genitalia. 66, *nebulosa* paramere inner view. 67, *nervosa* paramere inner view. 68, *sonchi* paramere inner view. 69, *flavipennis* paramere inner view. 70, *nebulosa* head. 71, *sonchi* parameres posterior view. 72, *flavipennis* parameres posterior view.

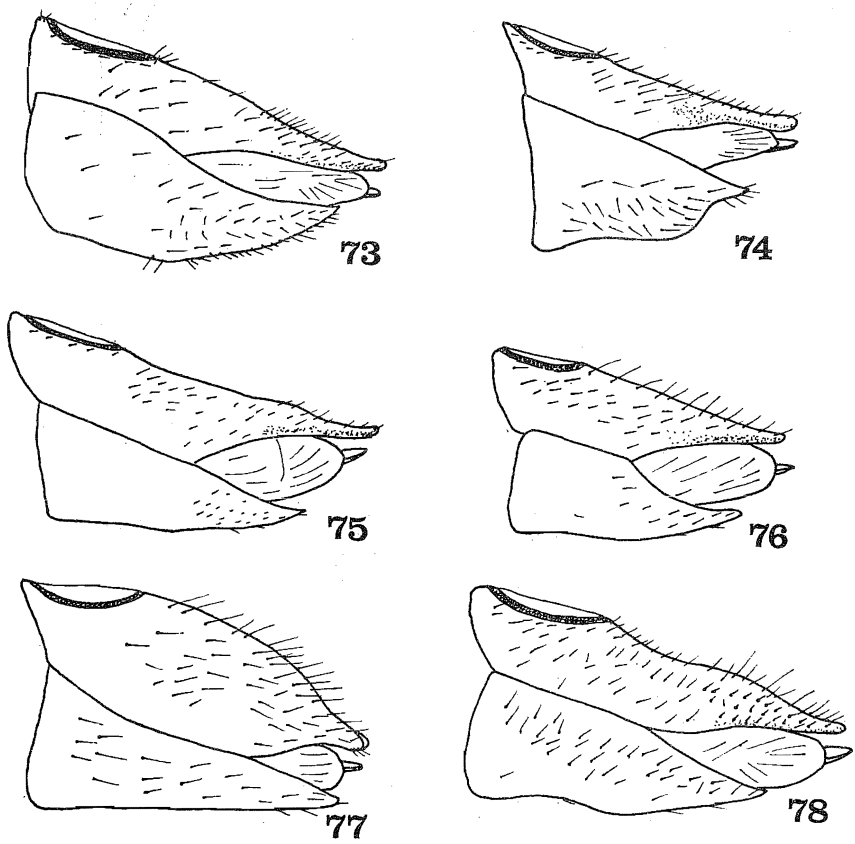
– Forewing with bright yellow membrane, or with brown veins, or with pattern of round spots on membrane. Female proctiger in lateral view with dorsal margin straight, apex not notched (fig. 78). Male paramere in lateral view club-shaped, without conspicuous posterior projection (fig. 62).....5

5 Forewing (fig. 57) pattern consisting of small round spots on membrane; surface spinules arranged so as to form distinct honeycomb pattern on forewing, small spots, where present, coinciding with 'cells' of honeycomb (fig. 58). Posterior process of male proctiger (fig. 61) extending at most just beyond margin of subgenital plate. Small species, forewing length less than 2.65 mm, head width less than 0.75 mm.
**malachitica** (Dahlbom)

(General body coloration green or pale yellow. Wings whitish WL=2–2.6 mm, HW=0.54–0.7 mm, AHR=1–1.3. Male genitalia figs 61, 62. Female terminalia fig. 76.)

*Rare, Seaton Sluice, Northumbria, St Albans, Hertfordshire, Flint, Anglesey, N. Wales. Throughout Europe, European U.S.S.R. and Armenia, Daghestan, Georgia, Kazakhstan, S. Siberia. On* Artemesia *spp.*

– Forewing with spinules not arranged in honeycomb pattern; brown spots if present, faint, not coinciding with any particular spinule pattern. Posterior process of male




**Figs 73–78.** *Craspedolepta* ♀ terminalia. 73, *pilosa*. 74, *nebulosa*. 75, *nervosa*. 76, *malachitica*. 77, *subpunctata*. 78, *sonchi*.

proctiger extending well beyond (at least one-third length of subgenital plate) the posterior margin of the subgenital plate. Larger species; forewing length greater than 2.9 mm, head width greater than 0.81 mm.....6

6 Forewing membrane uniform yellow, veins unicolorous with membrane; brown spots never present in apical cells. Head in dorsal view with outer anterior margins of vertex adjacent to antennal insertions, straight. Male parameres in posterior view with inner tooth not visible (fig. 72); in inner lateral view with tooth arising at mid point of the apical expansion (fig. 69) **flavipennis** (Förster)

(General body coloration green or yellow with brown markings. WL=3.2–3.5 mm, HW=0.83–0.88 mm, AHR=up to 1.6. Female terminalia as fig. 78.)

*Rare, known only from S. Ireland. Central and S. Europe, European U.S.S.R. Siberia. On Compositae.*

– Forewing membrane whitish to yellow; veins brown, not unicolorous with membrane; faint brown spots sometimes present in apical cells. Head in dorsal view with outer anterior margins of vertex convex. Male parameres in posterior view with inner teeth clearly visible (fig. 71); in inner view with tooth arising at base of apical expansion (fig. 68) **sonchi** (Förster)

(General body coloration green or yellow, with brown markings. Membrane of forewing ranges in colour from white to yellow; when yellow, coloration often most intense towards apex. Brown pigment in veins often unevenly distributed so that veins have a banded appearance. WL=2.9–3.7 mm, HW=0.82–0.94 mm, AHR=1.2–1.5. Female terminalia fig. 78.)

*Locally common in scattered localities throughout Britain. Ireland. Central and N. Europe, European U.S.S.R., Armenia, Daghestan, Georgia, Siberia. On* Compositae.

## Family Psyllidae

A very large family of worldwide distribution, on a variety of host plants.

### *Key to genera of Psyllidae*

1 Cell $cu_1$ of forewing (fig. 79) large and high, about three times as large as cell $m_2$. Genal processes (fig. 81) flattened dorso-ventrally, apices strongly displaced laterally. Basal metatarsus without saltatorial spines. Antennae short, less than 0.9 times head width. Small species; head width less than 0.45 mm, wing length less than 1.6 mm. **Calophya** Löw (p.33)

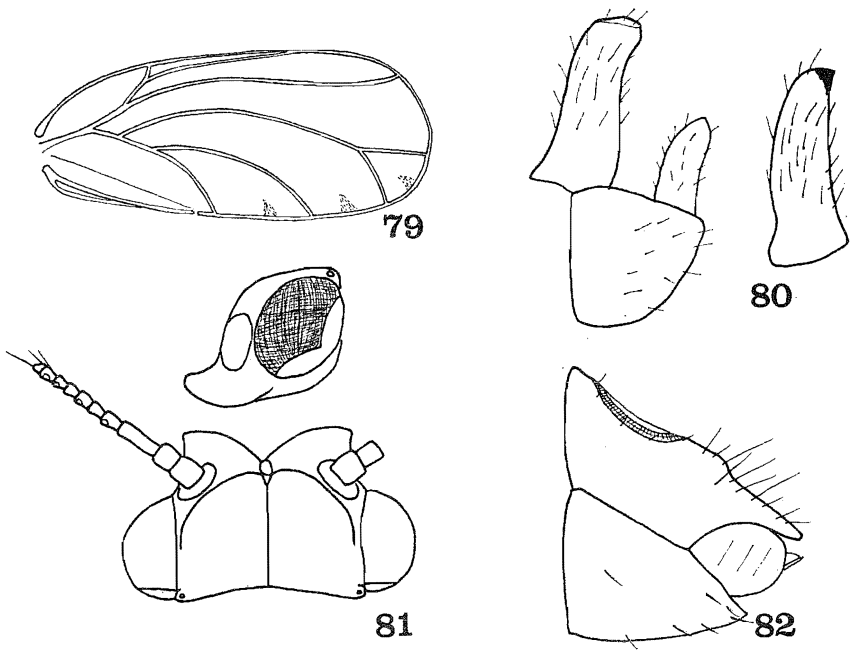
(Eyes not displaced posteriorly; pronotum short, at most 0.65 times length of mesothoracic praescutum. Forewing membranous, oblong-oval; pterostigma well developed, costal break present; radular spinules distinct. Metatibia with 4 thick black apical spines. Male proctiger simple, parameres without numerous thick black inner spines. Female ventral valve with acute apex, without dense long hairs.)

– Cell $cu_1$ of forewing (fig. 132) smaller, usually approximately equal in size to cell $m_2$. Genal processes (fig. 216) not flattened, apices directed anteriorly. Basal metatarsus with at least 1 thick black saltatorial spine. Antennae longer, at least 1.09 times head width (usually much longer). Larger species: head width greater than 0.59 mm, wing length greater than 1.65 mm, usually much greater).....2

2 Metatibia with apical crown of 9 or 10 thick black spines, without genual tubercle at the base. Vein $M+Cu_1$ of forewing at least 0.75 times as long as vein $Cu_1$ (figs 83, 85). Male proctiger in lateral view (fig. 94) with well-developed posterior lobe; parameres with numerous thick black spines on inner surface (figs 90, 93). Ventral valve of female terminalia (fig. 101) notched at apex, with long dense hairs beneath **Psyllopsis** Löw (p.33)

(Genae short, pyramid-shaped (fig. 87), up to 0.6 times length of vertex; eyes not displayed posteriorly. Pronotum short, at most 0.4 times length of mesothoracic praescutum. Forewing membranous, oblong oval; pterostigma well developed, costal break present, radular spinules indistinct cell $m_1$ short. Basal metatarsus with two saltatorial spines.)

– Metatibia with apical crown of at most 6 thick black spines and with basal genual spine or tubercle. Vein $M+Cu_1$ of forewing less than 0.75 times the length of vein $Cu_1$ (fig. 121). Male proctiger simple (figs 107, 189); parameres without numerous thick




**Figs 79–82.** *Calophya rhois*. 79, forewing. 80, ♂ genitalia. 81, head. 82, ♀ terminalia.

black spines on inner surface. Ventral valve of female terminalia (fig. 160) with an acute apex, not notched; hairs shorter and less dense.....3

3 Forewing (fig. 116) thick, leathery and brown throughout; strongly convex, oval, at most 2.1 times as long as broad; veins in apical half of wing more or less parallel; cell $m_2$ very long, vein $M_{1+2}$ more than 1.5 times as long as vein $M$; wing membrane adjacent to veins with an open network of shallow furrows running at right angles to veins. Mature inspect resembles a spherical brown seed **Livilla** Curtis (p.39)

(Genal cones, long cylindrical, 0.9–1.3 times as long as vertex (fig. 115). Pronotum broad, at least 0.8 times as long as mesothoracic praescutum. Eyes not displaced posteriorly. Forewing with radular spinules absent. pterostigma absent, costal break absent. Basal metatarsus with one (outer) saltatorial spine.)

– Forewing (figs 105, 109, 132) membranous, occasionally yellow or brown, flat, either elongate oval, elipitical or with pointed apex, at least 2.2 times as long as broad; veins in apical half of wing not appearing parallel; cell $m_2$ shorter, vein $M_{1+2}$ at most 1.2 times length of vein $M$; wing membrane without furrows. Mature insect not resembling a seed.....4

4 Forewing (fig. 117) long and narrow with pointed apex, broadest in basal third, at least 2.85 times as long as broad; cell $m_2$ long, vein $M_{1+2}$ at least 0.86 times as long as vein $M$; radular spinules dark brown, dense, forming very distinct spots around apical margin of wing. Head in dorsal view (fig. 118) with genal cones elongate, at least 1.22 times length of vertex; eyes displaced posteriorly from hind margin of vertex, which is deeply concave **Spanioneura** Förster (p.39)

(Pronotum length less than 0.5 times mesothoracic praescutum length; pterostigma well developed, basal metatarsus with 2 spines.)

– Forewing (figs 105, 109, 132) shorter and broader, with rounded apex, broadest at or beyond the middle, at most 2.85 times as long as broad, usually shorter; cell $m_2$ shorter, vein $M_{1+2}$ at most 0.86 times as long as vein $M$, usually much less; radular spinules less dense, rarely forming distinct spots around apical margin of wing (but

see *Psylla rhamnicola, P. crataegi* figs 128, 142). Head in dorsal view (fig. 216) with genal cones at most 1.25 times length of vertex; eyes usually not displaced posteriorly from hind margin of vertex, posterior margin of head usually shallowly concave; if eyes displaced then forewing without pterostigma (*Psylla buxi*) ..... 5

5 Basal metatarsus with two (inner and outer) saltatorial spines. Propleurites (fig. 217) unequal, epimeron and episternum divided by oblique suture originating at postero-lateral margin of the pronotum. Forewing usually with well-developed pterostigma (fig. 132); if pterostigma apparently absent then distinct break present in vein $C+Sc$ adjacent to its confluence with vein $R$ and female terminalia long and slender (*Psylla buxi*) (fig. 155). Head in lateral view (fig. 217) with genal cones deflexed from plane of vertex **Psylla** Geoffroy (p.40)

(Genal cones up to 1.1 times length of vertex. Pronotum length less than 0.5 times mesothoracic praescutum length.)

– Basal metatarsus with one (outer) saltatorial spine. Propleurites (figs 106, 110) equal, epimeron and epipleuron divided by vertical suture originating at centre of lateral margin of pronotum. Forewing (figs 105, 109) with or without a costal break, pterostigma absent or very short. Head in lateral view (figs 106, 110) with genal cones in same plane as vertex ..... 6

6 Forewing (fig. 109) somewhat elliptical, broadest in middle, with brown colour-pattern which is predominant in cells $r_2$ and $cu_2$ but with small patches in cells $m_2$, $cu_1$ and apex of $m$; pterostigma absent, costal break absent, vein $M+Cu_1$ at most 0.42 times length of vein $Cu_1$. Head width 0.89–1 mm; genal cones 0.4–0.66 times as long as vertex. Pronotum (fig. 110) long, at midline at least 0.8 times as long as meso-thoracic praescutum. Female proctiger in lateral view (fig. 111) with dorsal margin straight. **Arytaina** Förster (p.35)

– Forewing (fig. 105) oblong oval, broadest in apical third, pale yellow throughout; without brown colour-pattern; pterostigma very short, costal break present; vein $M+Cu_1$ at least 0.51 times length of vein $Cu_1$. Head width 0.62–0.71 mm, genal cones 0.19–0.25 times as long as vertex. Pronotum shorter, at most 0.55 times length of mesothoracic praescutum. Female proctiger in lateral view (fig. 108) with dorsal margin concave **Arytainilla** Loginova (p.35)

## Genus *Calophya* Löw

A small neotropical-holarctic-oriental genus associated with the family Anacardiaceae (Klimaszewski, 1973; Tuthill, 1943). A single introduced species, *Calophya rhois* (Löw), occurs in Britain.

Size: HW ♂ 0.37–0.44 mm, ♀ 0.38–0.55 mm; WL ♂ 1.39–1.47 mm, ♀ 1.44–1.55 mm. Genal processes (fig. 81) short, GCV = 0.39–0.45; AHR = 0.65–0.85. Forewing (fig. 79) membranous, clear; veins yellow; pterostigma long; CUR = 1.05–1.18. Male genitalia fig. 80, female terminalia fig. 82. General body coloration: young specimens head and thorax reddish brown, abdomen green or yellow; older specimens, head and thorax chestnut brown, abdomen red and brown. Antennae yellow **rhois** (Löw)

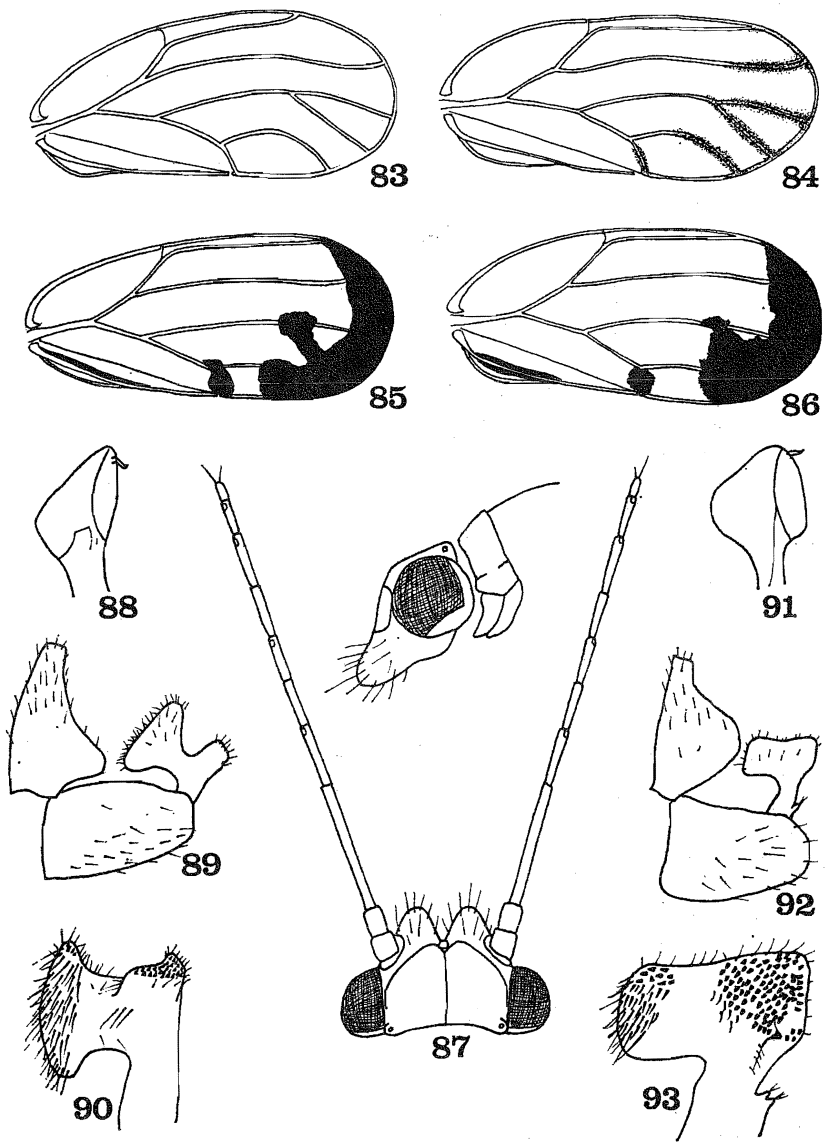
*Rare, a single British record from Scalpay in the Hebrides. Central and southern Europe, south and south western U.S.S.R., Georgia. On* Cotinus *and* Rhus *spp.*

## Genus *Psyllopsis* Löw

A small western palaearctic genus associated with Ash trees (*Fraxinus* spp.) (Loginova, 1963). Males are usually required for specific determination.

### *Key to species*

1 General body coloration green or greenish yellow. Forewing (fig. 83) clear, without brown or black pattern on membrane; veins unicolorous with membrane basally, becoming brown apically. (Male subgenital plate in lateral view (fig. 89) dorso-ventrally narrow.) **fraxinicola** (Förster)




**Figs 83–93.** *Psyllopsis*. 83, *fraxinicola* forewing. 84, *discrepans* forewing. 85, *fraxini* forewing. 86, *distinguenda* forewing. 87, *fraxini* head. 88, *fraxinicola* apex of penis. 89, *fraxinicola* ♂ genitalia. 90, *fraxinicola* paramere inner view. 91, *discrepans* apex of penis. 92, *discrepans* ♂ genitalia. 93, *discrepans* paramere inner view.

(WL=2.2–2.9 mm, HW=0.68–0.78 mm, AHR=1.95–2.4, GCV=0.36–0.49. Male genitalia figs 88–90, female terminalia fig. 101.)

*Common throughout Britain, Ireland. Throughout Europe, N. Africa, European U.S.S.R., Armenia, Georgia, Kazakhstan, N. America (introduced)*

– General body coloration black and yellow. Forewing with brown or black colour-pattern, predominantly in apical half; veins brown throughout.....2

2 Forewing (fig. 84) with colour-pattern restricted to diffuse spots around end of veins in apical half of wing, not forming distinct apical band. Male paramere in lateral view (figs 92, 93) hammer shaped. Apex of male penis (fig. 91) somewhat triangular. Male subgenital plate in lateral view (fig. 92) dorso-ventrally narrow **discrepans** (Flor)

(WL=2.1–3.2 mm, HW=0.58–0.76 mm, AHR=1.83–2.24, GCV=0.31–0.55. Male genitalia figs 91–93; female terminalia fig. 103.)

*Throughout Britain, becoming commoner in the North. Central and N. Europe, European U.S.S.R., Georgia, Tadzhikstan.*

– Forewing (figs 85, 86) with colour-pattern forming distinct broad band around apical margin. Male parameres in lateral view (figs 95, 98) approximately triangular in shape. Apex of male penis (fig. 100) bulbous. Male subgenital plate in lateral view not markedly narrow (figs 94, 97).....3

3 Male proctiger in lateral view (fig. 94) with posterior lobe reaching maximum breadth in basal third. Male paramere in inner lateral view as in fig. 95: in posterior view (fig. 96) with an inner, inwardly directed, plate-like tooth **distinguenda** Edwards

(WL=2.4–3.4 mm, HW=0.68–0.84 mm, AHR=1.9–2.7, GCV=0.36–0.48. Forewing fig. 86, Female terminalia fig. 102.)

*Uncommon, S. England, apparently absent north of Cheshire. Czechoslovakia, Poland, Rumania, European U.S.S.R., Abkhazia, Georgia.*

– Male proctiger in lateral view (fig. 97) with posterior lobe reaching maximum breadth at approximately mid height. Male parameres in inner lateral view as in fig. 98; in posterior view (fig. 99) without an inner, inwardly directed tooth **fraxini** (L.)

(WL=2.3–3.3 mm, HW=0.67–0.8 mm, AHR=1.7–2.4, GCV=0.34–0.58. Forewing fig. 85, Female terminalia fig. 104.)

*Common and widely distributed throughout Britain. Ireland. Throughout Europe, Asia Minor, N. India, N. America (introduced).*

## Genus *Arytaina* Förster

A diverse, widely distributed genus of about 30 species which is in urgent need of revision. A single species *Arytaina genistae* occurs on leguminous shrubs in Britain.

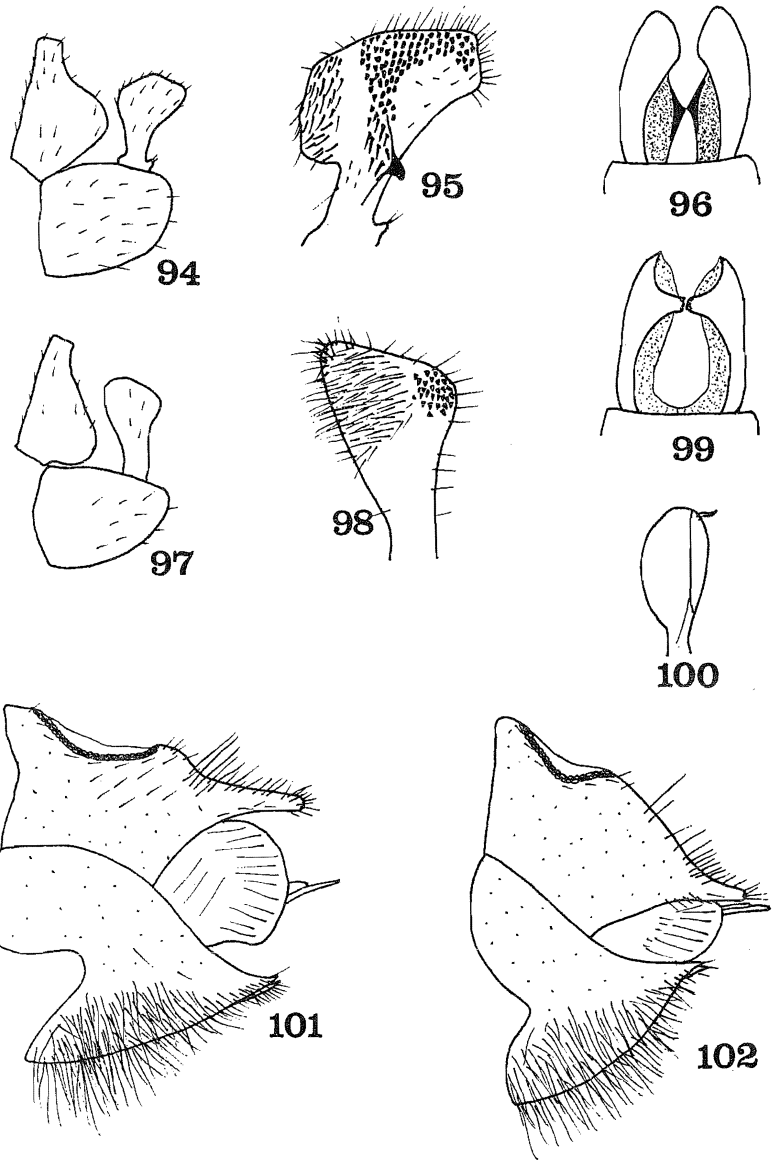
General body coloration pale green, olive green or pale brown, with darker brown markings. Antenna and legs unicolorous with body. Forewing membrane (fig. 109) with characteristic brown pattern; veins pale brown to dark brown. Female terminalia often black dorsally HW=0.92–1 mm, AHR 1.93–2.16, GCV=0.4–0.66. WL=2.4–3 mm. Male genitalia fig. 112; female terminalia fig. 111. **genistae** (Latreille)

*Common throughout Britain. Ireland. Throughout Europe except the extreme north. N. America (introduced). On* Cytisus *and* Genista *spp.*

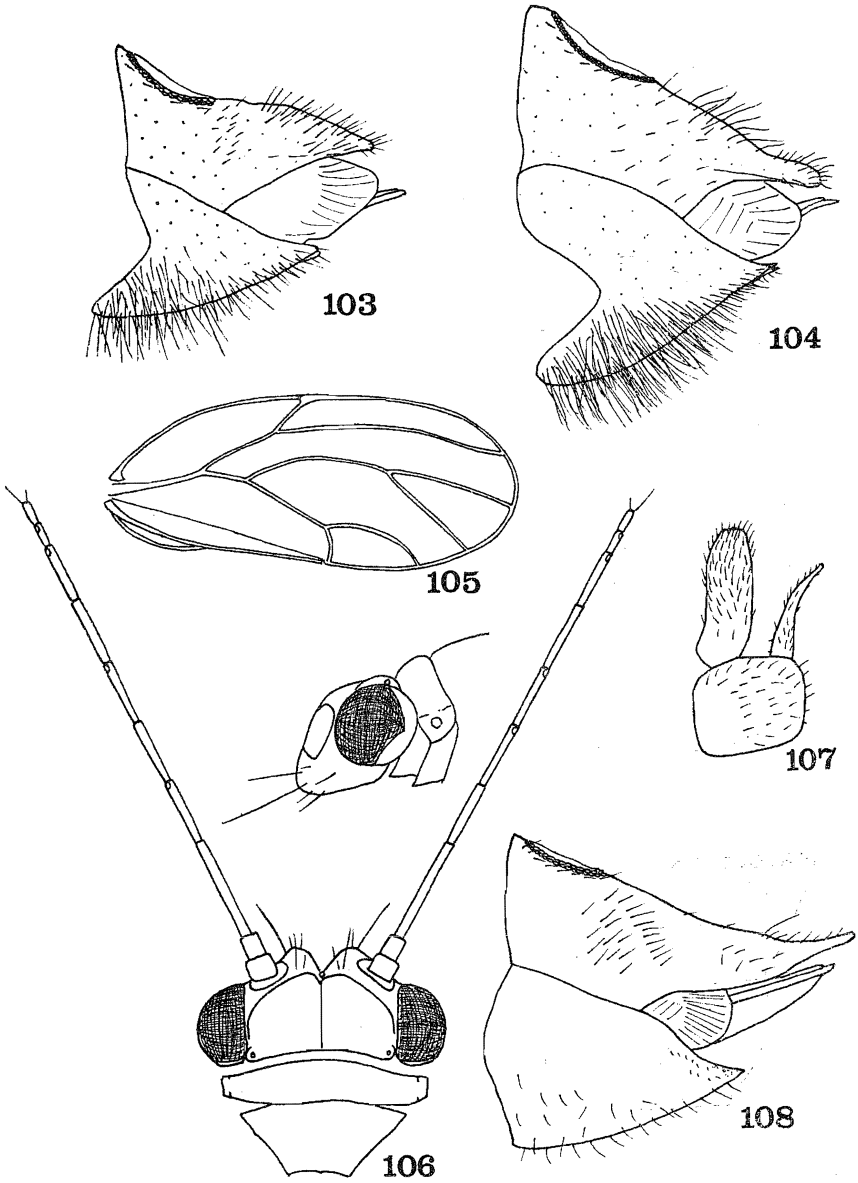
## Genus *Arytainilla* Loginova

A Mediterranean genus containing 18 species associated with shrubs of the family Leguminosae (Loginova, 1972, 1976.) A single species, *Arytainilla spartiophila*, occurs in Britain.

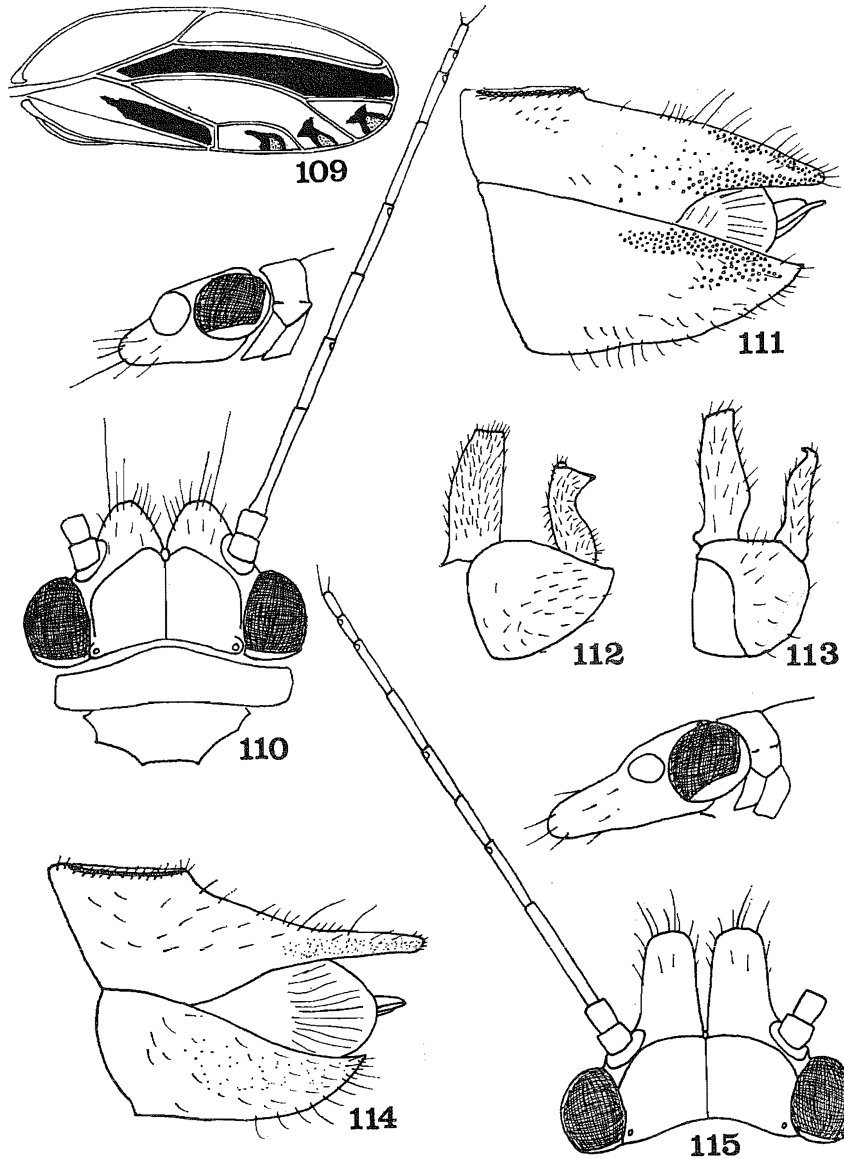
General body coloration pale reddish brown with darker brown markings. Antennae pale brown basally, becoming darker apically. Legs pale brown. Forewing membrane (fig. 105) pale yellow; veins yellow-brown. Abdomen and genitalia often dark brown. HW=0.62–0.71 mm, AHR=2.15–2.3, GCV=0.19–0.25, WL=2.08–




**Figs 94–102.** *Psyllopsis*. 94, *distinguenda* ♂ genitala. 95, *distinguenda* paramere inner view. 96, *distinguenda* parameres posterior view. 97, *fraxini* ♂ genitalia. 98, *fraxini* paramere inner view. 99, *fraxini* parameres posterior view. 100, *fraxini* apex of penis. 101, *fraxinicola* ♀ terminalia. 102, *distinguenda* ♀ terminalia.




**Figs 103–108.** *Psyllopsis* spp. & *Arytainilla spartiophila*. 103, *P. discrepans* ♀ terminalia. 104, *P. fraxini* ♀ terminalia. 105, *A. spartiophila* forewing. 106, head. 107, ♂ genitalia. 108, ♀ terminalia.




**Figs 109–115.** *Arytaina genistae* & *Livilla ulicis*. 109, *A. genistae* forewing. 110, head. 111, ♀ terminalia. 112, ♂ genitalia. 113, *L. ulicis* ♂ genitalia. 114, ♀ terminalia. 115, head.

2.68 mm. Male genitalia fig. 107; female terminalia fig. 108. **spartiophila** (Förster)
*Common and widely distributed throughout Britain. Ireland. West-central and S. Europe. On* Cytisus scoparius.

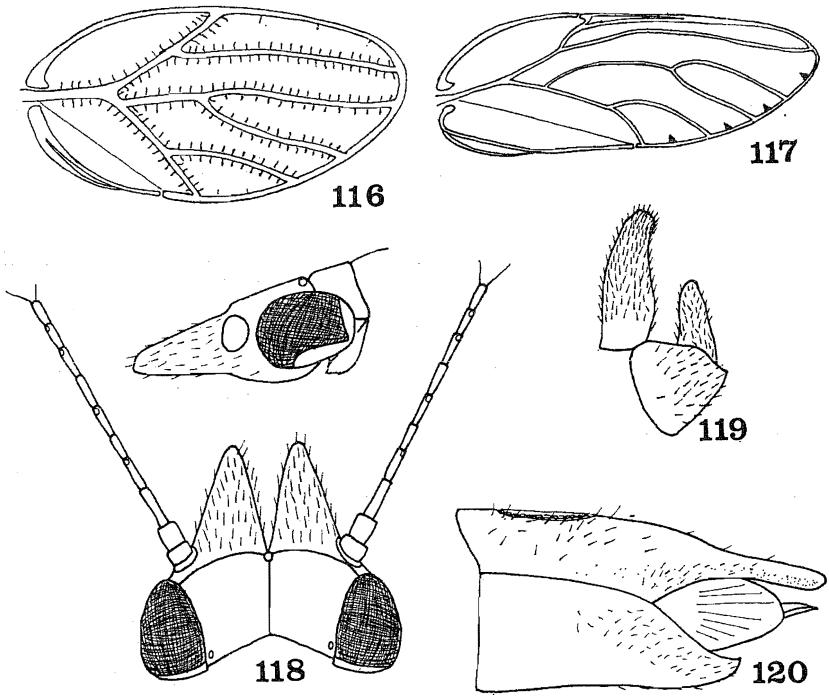
### Genus *Livilla* Curtis

A western palaearctic genus containing two species. The single British species, *Livilla ulicis*, is associated with shrubs of the family Leguminosae.

General body coloration dark brown, genal cones sometimes black. Forewing (fig. 116) unicolorous dark brown. Legs yellow to brown, tarsi darker. HW=0.7–0.78 mm, AHR=1.79–2, GCV=0.92–1.27, WL=1.64–2.1 mm. Male genitalia fig. 113; female terminalia fig.114. **ulicis** Curtis
*Widely distributed throughout Britain but generally uncommon. Ireland. Central and S. Europe. On* Genista, Cytisus and Ulex *spp.*

### Genus *Spanioneura* Förster

A small palaearctic genus containing three described species all associated with box (*Buxus* spp.). A single species *Spanioneura fonscolombii* occurs in Britain.




**Figs 116–120.** *Livilla ulicis* & *Spanioneura fonscolombii*. 116, *L. ulicis* forewing. 117, *S. fonscolombii* forewing. 118, head. 119, ♂ genitalia. 120, ♀ terminalia.

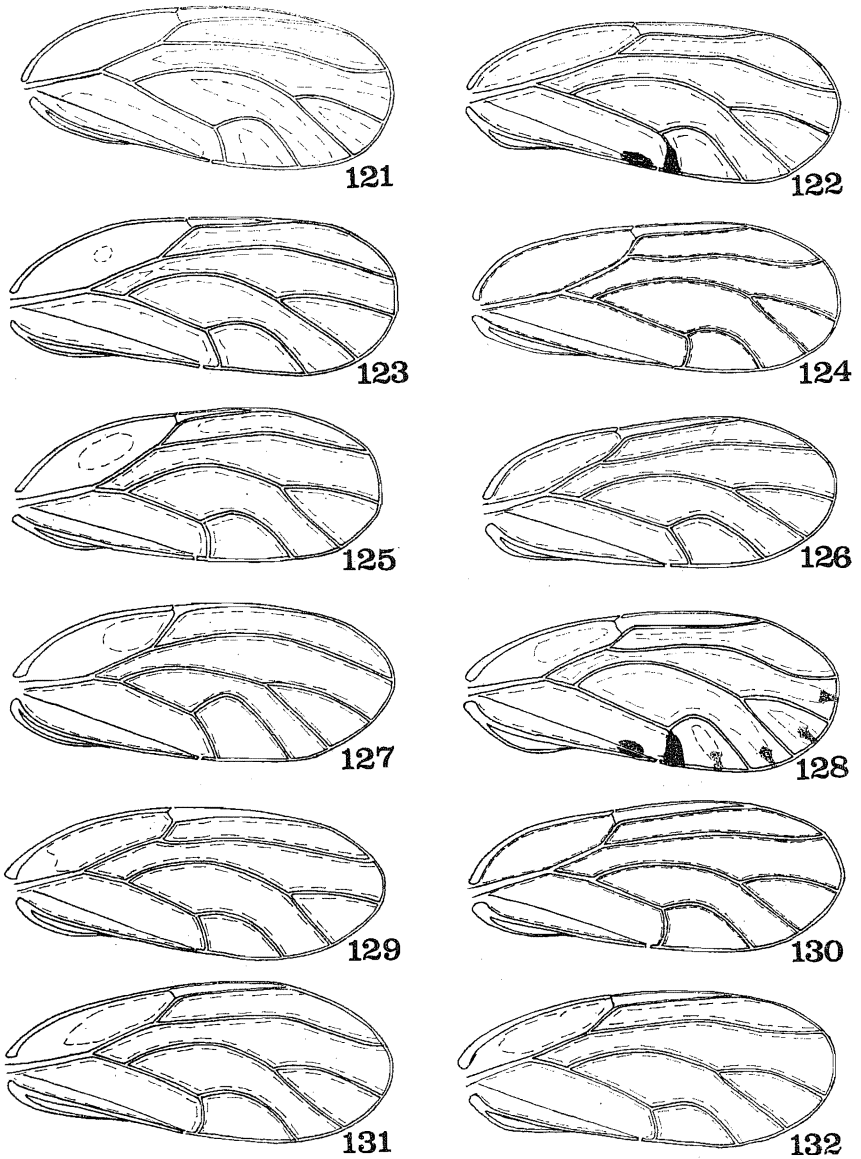
General body coloration pale yellow or green. Legs and antennae concolorous, often darkened apically. Forewing membrane (fig. 117) pale yellow, veins unicolorous; radular spinules dark brown to black. HW=0.68–0.78 mm, AHR=1.09–1.25, GCV=1.22–1.35, WL=2.48–2.76 mm. Male genitalia fig. 119; female terminalia fig. 120 **fonscolombii** Förster
*Uncommon, S. England. Germany, France, Spain, Switzerland, Caucasus.*

## Genus *Psylla* Geoffroy

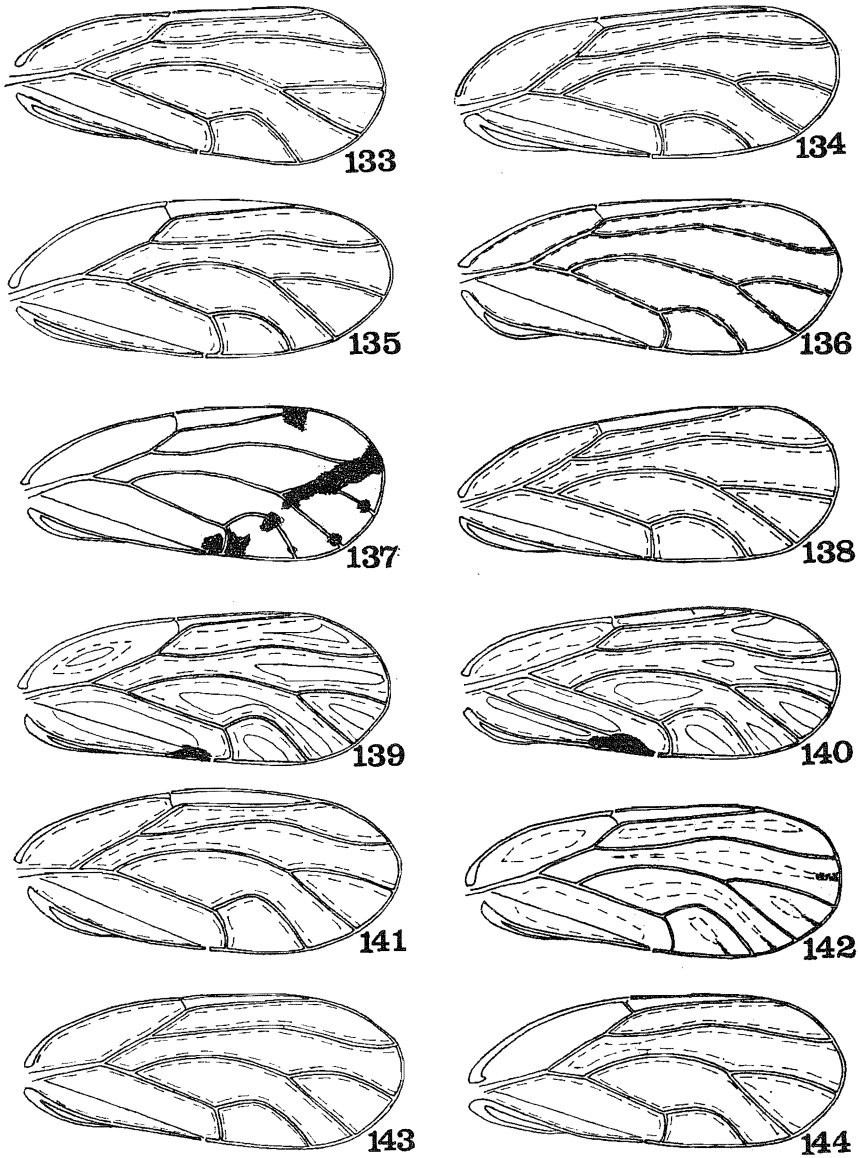
A very large genus having a world-wide distribution on a wide variety of host plants: 28 species occur in Britain. This is a particularly 'difficult' genus, and specimens, once identified, should be checked carefully against the confirmatory description following the key. Particular attention should be paid to the male genitalia. Host plant data given in the key refer to the true host plants: many species will also be found on shelter plants, particularly during the winter. The key will not work, in certain instances, for teneral specimens and these should be identified on the male genitalia. Klimaszewski (1975) has split the genus *Psylla* as presently conceived into *Psylla* sensu stricto and *Cacopsylla* Ossiannilsson but this division does not appear to hold when the world fauna is considered.

### *Key to species*

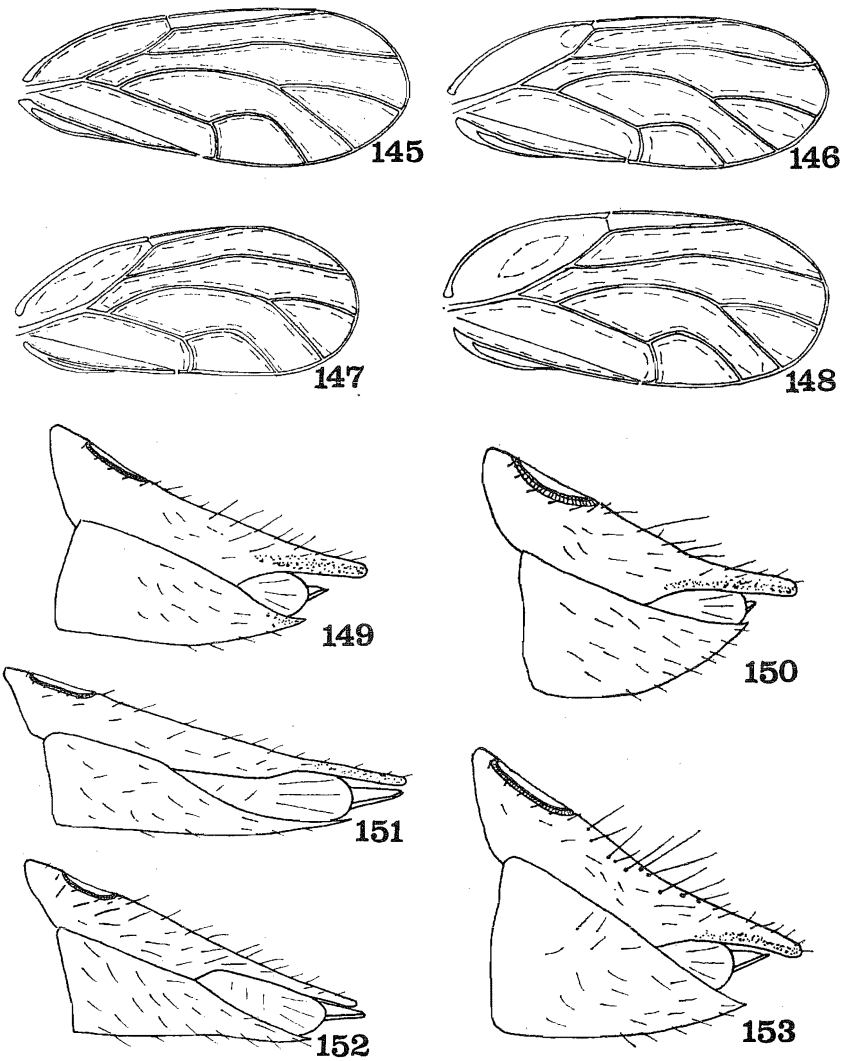
1 Forewing (fig. 137) with a transverse black or brown pattern in apical half. On *Cercis* **pulchella** Löw (p.57)
– Forewing without a transverse black pattern in apical half, clear, yellow or whitish opaque; sometimes with diffuse grey or brown longitudinal clouds in apical cells (fig. 140); occasionally with isolated brown spots around veins $Cu_{1b}$ and $Cu_2$. On other host plants ..... 2
2 Forewing (fig. 127) with a slightly angular apex; cell $cu_1$ very high, basal width to height ratio less than 1.29. Vein $R_s$ strongly convex throughout its length; pterostigma almost obsolete, at most 0.28 times as long as vein $R_s$. Head in dorsal view (fig. 211) with posterior margin deeply excavate; eyes displaced posteriorly from vertex. On *Buxus* **buxi** (L.) (p.56)
– Forewing (fig. 123) with a rounded apex; cell $cu_1$ longer, basal width to height ratio greater than 1.29; vein $R_s$ usually sinuous, if convex then genal cones long and slender, pterostigma at least 0.3 times as long as vein $R_s$ and usually much longer. Head in dorsal view (fig. 212) with posterior margin shallowly excavate, eyes not displaced posteriorly from vertex. On other host plants ..... 3
3 Forewing (figs 122, 128) with dark brown or black spot around vein $Cu_{1b}$ ..... 4
– Forewing without dark spot around vein $Cu_{1b}$, occasionally with dark spot around vein $Cu_2$ (fig. 140) ..... 5
4 Radular spinules forming distinct spots around margin of forewing in cells $r_2$, $m_1$, $m_2$ and $cu_1$ (fig. 128); vein $R_s$ strongly sinuate; vein $Cu_{1a}$ strongly arched. Female terminalia (fig. 156) relatively long; proctiger length: head width ratio greater than 0.86. Male parameres (fig. 184) in dorsal view without an apical process bent anteriorly at right angles. Larger species; head width greater than 0.81 mm in male and 0.84 mm in female. On *Crataegus* **crataegi** (Schrank) (p.56)
– Radular spinules not forming distinct spots (fig. 122), vein $R_s$ moderately sinuate, vein $Cu_{1a}$ moderately arched. Female terminalia (fig. 150) relatively short; proctiger length:head width ratio less than 0.85. Male parameres (fig. 178); in dorsal view with thick apical process bent anteriorly at a right angle. Smaller species; head width less than 0.81 mm in male and 0.84 mm in female. On *Sorbus* **albipes** Flor (p.55)
5 Male paramere in lateral view (fig. 195) sickle-shaped. Female proctiger in lateral view (fig. 167) with dorsal margin deeply concave in apical third; ventral valve appearing truncate, with a distinct lobe at dorso-posterior margin and with only a small short apical point. On *Pyrus* **pyri** (L.) (p.58)
– Male paramere not sickle-shaped. Female proctiger in lateral view with dorsal margin




**Figs 121–132.** *Psylla* forewings. 121, *alaterni*. 122, *albipes*. 123, *alni*. 124, *ambigua*. 125, *betulae*. 126, *brunneipennis*. 127, *buxi*. 128, *crataegi*. 129, *foersteri*. 130, *hartigi*. 131, *hippophaes*. 132, *mali*.




**Figs 133–144.** *Psylla* forewings. 133, *melanoneura*. 134, *moscovita*. 135, *peregrina*. 136, *pruni*. 137, *pulchella*. 138, *pulchra*. 139, *pyri*. 140, *pyricola* f. *simulans*. 141, *pyrisuga*. 142, *rhamnicola*. 143, *saliceti*. 144, *sorbi*.




**Figs 145–153.** *Psylla*. 145–148, forewings. 145, *subferruginea* forewing. 146, *ulmi*. 147, *viburni*. 148, *visci*. 149–153, ♀ terminalia. 149, *alaterni*. 150, *albipes*. 151, *alni*. 152, *betulae*. 153, *ambigua*.

usually straight or weakly concave; if deeply concave (*P. foersteri*) then forewing unicolorous yellow; ventral valve not truncate, without a lobe, appearing approximately triangular (fig. 160).....6

6 Forewing (fig. 140) with black spot around vein $Cu_2$. On *Pyrus* **pyricola** Förster form **typica** (p.58)

– Forewing without black spot around vein $Cu_2$, occasionally with black streak along anal vein.....7

7 Forewing (fig. 142) with radular spinules conspicuous, forming narrow well-defined inwardly directed bands; surface spinules on the membrane sparse and indistinct, occupying only narrow bands in centre of apical cells. On *Rhamnus* **rhamnicola** Scott (p.58)

– Forewing with radular spinules not markedly differentiated from surface spinules which are relatively dense and occupy wide bands in centre of apical cells. On host plants other than *Rhamnus* ..... 8

8 Forewing membrane when viewed against white background bright shining yellow or brown throughout, veins approximately unicolorous with membrane ..... 9

– Forewing membrane clear, or whitish opaque with faint yellow tinge, or clear with grey or pale brown longitudinal clouds in apical cells; veins often much darker than membrane ..... 14

9 Head (fig. 213) short and wide; vertex length:breadth ratio less than 0.36. Genal cones (fig. 213) very short, with broadly rounded apices. Female proctiger in lateral view (fig. 157) with dorsal margin deeply concave, bearing small denticles at apex. Larger species; head width greater than 0.95 mm, antennal length greater than 2.3 mm. On *Alnus* **foersteri** Flor (p.56)

– Head (figs 209, 221) longer, vertex length:breadth ratio greater than 0.38. Genal cones longer, either conical (fig. 209) or conical basally with subcylindrical apices (fig. 230). Female proctiger straight or weakly concave, without small denticles at apex. Smaller species; head width less than 0.95 mm, antennal length less than 2.2 mm. On other host plants ..... 10

10 General body coloration yellow-green. Genal cones (fig. 215) long and slender, at least 1.05 times as long as vertex. Male paramere in lateral view (fig. 187) strongly bowed anteriorly. Ventral valve of female terminalia relatively short, proctiger length: ventral valve length ratio greater than 1.78. On *Hippophae* [SEE PREFACE]. **hippophaes** Förster (p.56)

— General body coloration red, brown or orange. Genal cones either conical (fig. 209) or if slender (fig. 230) less than 1 times as long as vertex. Male paramere not strongly bowed anteriorly. Ventral valve of female terminalia longer, proctiger length:ventral valve length ratio less than 1.76. On other host plants ..... 11

11 Antennal length:head width ratio greater than 2. Forewing (fig. 125) oval; broadest in middle; pterostigma short, at most 0.5 times as long as vein $R_s$. Metatibial length:head width ratio greater than 0.78. Male parameres in lateral view (fig. 181) club-shaped, expanded apically. On *Betula* **betulae** (L.) (p.55)

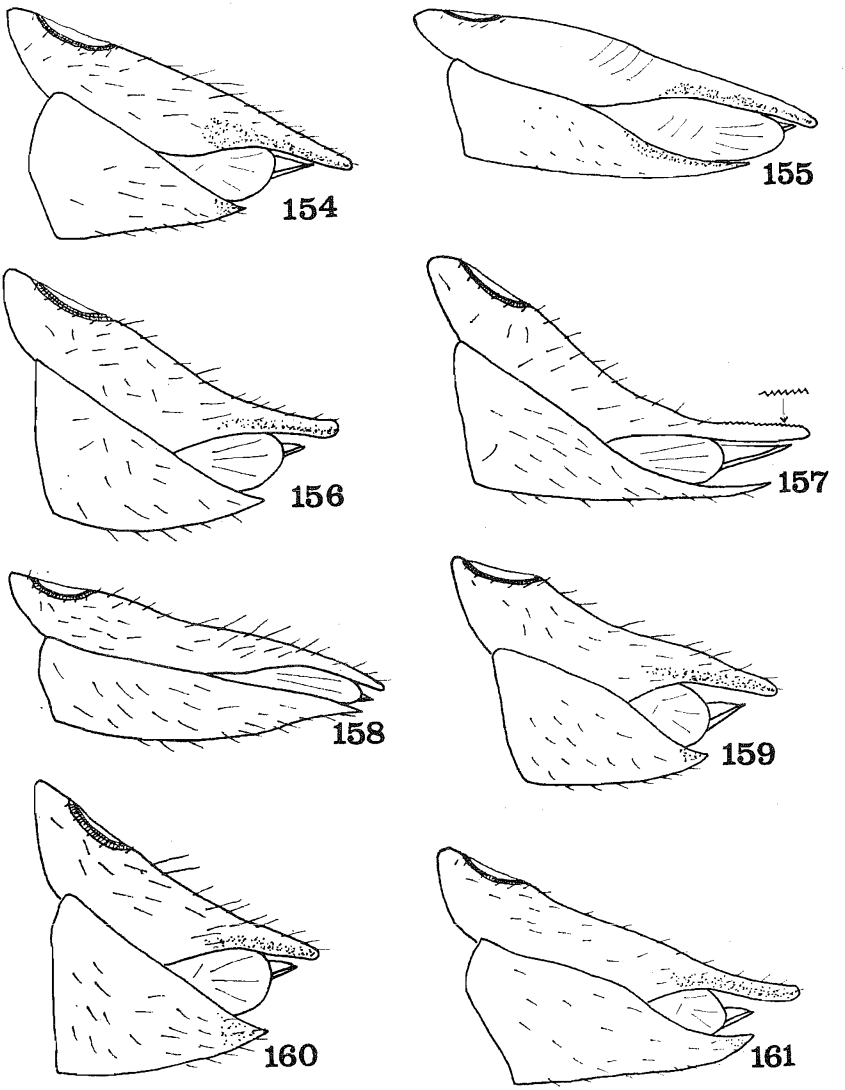
— Antennal length:head width ratio less than 1.96. Forewing (figs 130, 145) oblong-oval, broadest in apical third; pterostigma long, at least 0.5 times as long as vein $R_s$. Metatibia length:head width ratio less than 0.78. Male parameres not club-shaped tapering to the apex ..... 12

12 Spinules of forewing (fig. 145) dark, clearly visible, absent along narrow bands adjacent to the veins, forewing appearing transparent. Genal cones (fig. 230) conical basally, with a subcylindrical apex. General body coloration reddish, mesothoracic praescutum and scutellum with distinct longitudinal white streaks. On *Betula* or *Crataegus* **subferruginea** Edwards (p.61)

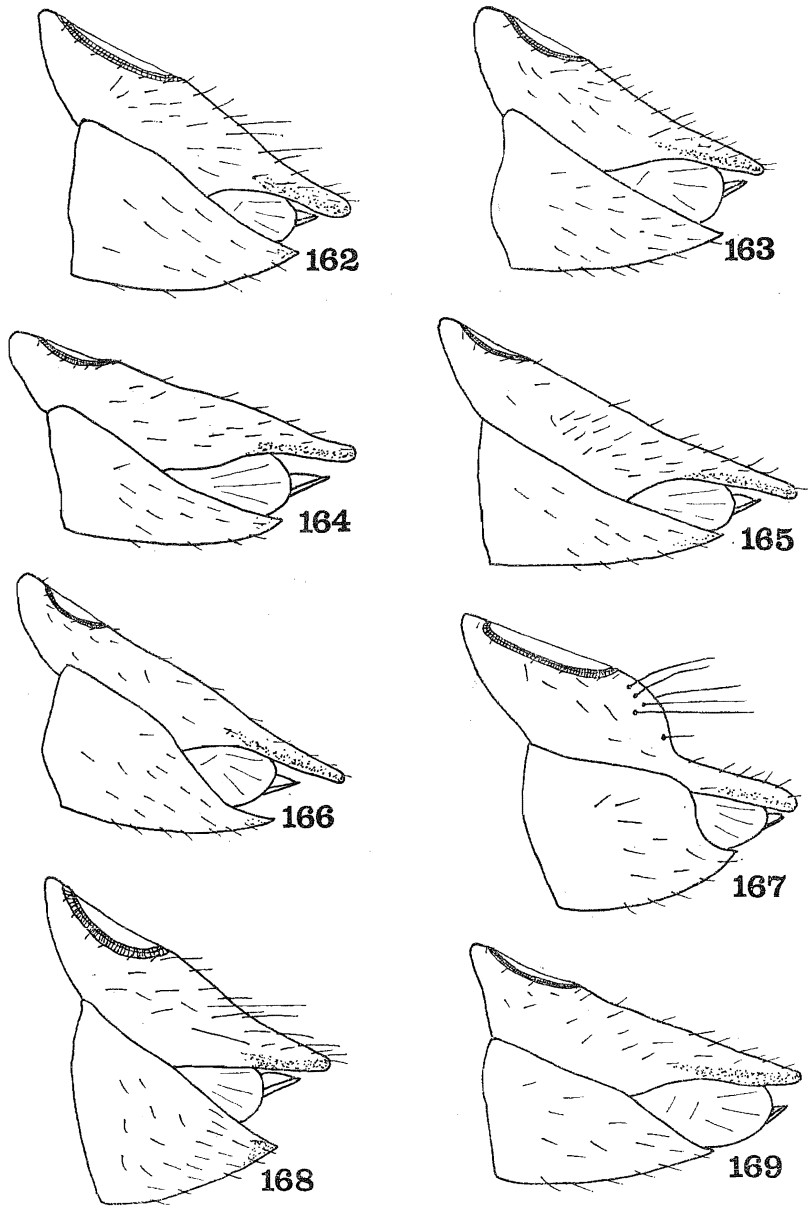
— Spinules of forewing light, very dense, completely covering membrane, not leaving spinule free bands adjacent to the veins, forewing appearing opaque. Genal cones (figs 214, 221) approximately conical. General body coloration dull orange or brown, mesothoracic praescutum and scutellum unicolorous, without longitudinal white streaks ..... 13

13 Antenna relatively long, at least 1.55 times head width. Head (fig. 214) slightly narrower than mesothorax. Forewing (fig. 130) uniformly yellow or orange. Metatibia length: head width ratio greater than 0.7. Abdominal sternites bearing long setae. Female terminalia (fig. 158) very long, proctiger length:head width ratio greater than 1.4. Male paramere (fig. 186) almost three-quarters as long as proctiger; apex without a sharp inwardly directed denticle. On *Betula* **hartigi** Flor (p.56)

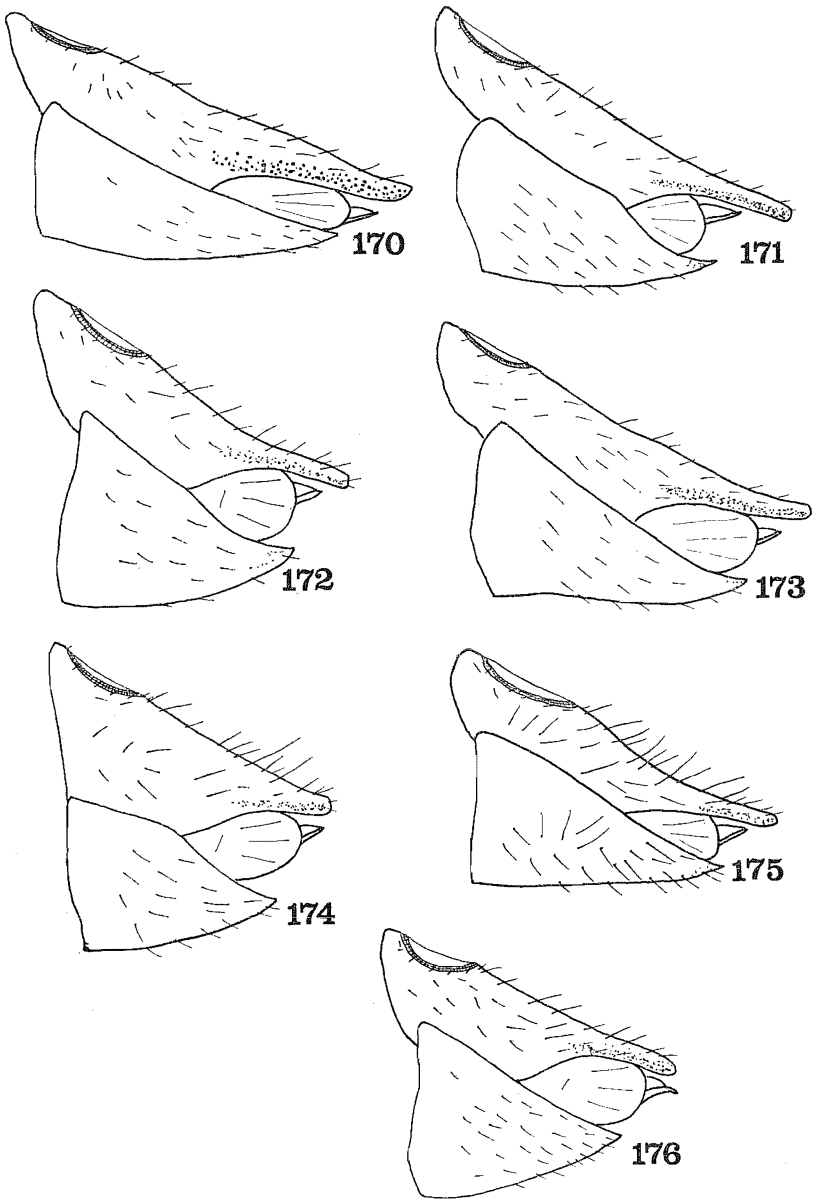
— Antennae relatively short, at most 1.45 times head width. Head (fig. 221) as wide as mesothorax. Forewing often with orange/brown coloration more intense in apical half. Metatibial length:head width ratio less than 0.65. Abdominal sternites almost glabrous. Female terminalia (fig. 163) short, proctiger length:head width ratio less than 0.95. Male paramere (fig. 192) about half as long as proctiger, with a sharp inwardly directed apical denticle. On *Prunus* **pruni** (Scopoli) p.57)




**Figs 154–161.** *Psylla* ♀ terminalia. 154, *brunneipennis*. 155, *buxi*. 156, *crataegi*. 157, *foersteri*. 158, *hartigi*. 159, *hippophaes*. 160, *mali*. 161, *melanoneura*.




**Figs 162–169.** *Psylla* ♀ terminalia. 162, *peregrina*. 163, *pruni*. 164, *pulchella*. 165, *pulchra*. 166, *moscovita*. 167, *pyri*. 168, *pyricola*. 169, *pyrisuga*.




**Figs 170–176.** *Psylla* ♀ terminalia. 170, *rhaminicola*. 171, *saliceti*. 172, *sorbi*. 173, *subferruginea*. 174, *ulmi*. 175, *viburni*. 176, *visci*.

14 Larger species; forewing length greater than 3.8 mm (fig. 123) Antennal length:head width ratio greater than 2.55. Metatibial length: head width ratio greater than 0.95. Male paramere (fig. 179) club shaped; dilated apex bearing 2 small inwardly directed denticles. Female terminalia (fig. 151) very long and slender; proctiger length:head width ratio greater than 1.23. On *Alnus* **alni** (L.) (p.55)

— Smaller species, forewing length less than 3.5 mm. Antennal length:head width ratio less than 2.3. Metatibial length:head width ratio less than 0.91 Male parameres not club shaped, bearing at most a single denticle or projection at the apex. Female terminalia almost invariably shorter, proctiger length:head width ratio usually less than 1.2; if longer (occasionally in *P. melanoneura* and *P. hippophaes*) then genal cones long and slender. On other host plants.....15

15 Forewing (fig. 140) with grey (young post-teneral specimens) or diffuse brown clouds (older mature specimens) present at least in apical cells, forming longitudinal streaks along the centre of the cells.....16

— Forewing clear or opaque whitish.....19

16 Forewing (fig. 148) broad, length:breadth ratio less than 2.28; vein $R_s$ shallowly convex throughout its length. Antennal length:head width ratio greater than 1.82. Male paramere in lateral view (fig. 204) long, straight and narrow, tapering gradually to apex. Head width greater than 0.9 mm. On *Viscum* **visci** Curtis (p.61)

— Forewing narrow, length:breadth ratio greater than 2.28; vein $R_s$ sinuous. Antennal length:head width ratio less than 1.85. Male paramere (figs 182, 194, 196) broader, either bottle shaped or with posterior margin excavate or lobed. Head width usually less than 0.9 mm: if larger (occasional *brunneipennis* females) then female proctiger long (fig. 154), at least 1 times head width. On other host plants.17

17 Female terminalia (fig. 168) relatively short, proctiger length:head width ratio less than 0.85. Male parameres in lateral view (fig. 196) bottle shaped. Metatibia length: head width ratio greater than 0.68. Cell $cu_1$ of forewing (fig. 140) usually short, basal width to height ratio 1.4–1.67. On *Pyrus* **pyricola** Förster form **simulans** (p.58)

— Female terminalia (fig. 154) long, proctiger length:head width ratio greater than 0.94. Male parameres (figs 182, 194) not bottle shaped. Metatibia length:head width ratio less than 0.68. Cell $cu_1$ usually longer, basal width to height ratio 1.6–2.12. On *Salix*.....18

18 Ventral valve of female terminalia (fig. 154) relatively short, proctiger length:ventral valve length ratio greater than 1.9. Male parameres in lateral view as in fig. 182; in posterior view (fig. 182) with subapical, inwardly directed, posterior lobe. Forewing (fig. 126) longer, 2.9–3.2 mm in male, 3.1–3.25 mm in female; surface spinules dark and very dense **brunneipennis** Edwards form **typica** (p56.)

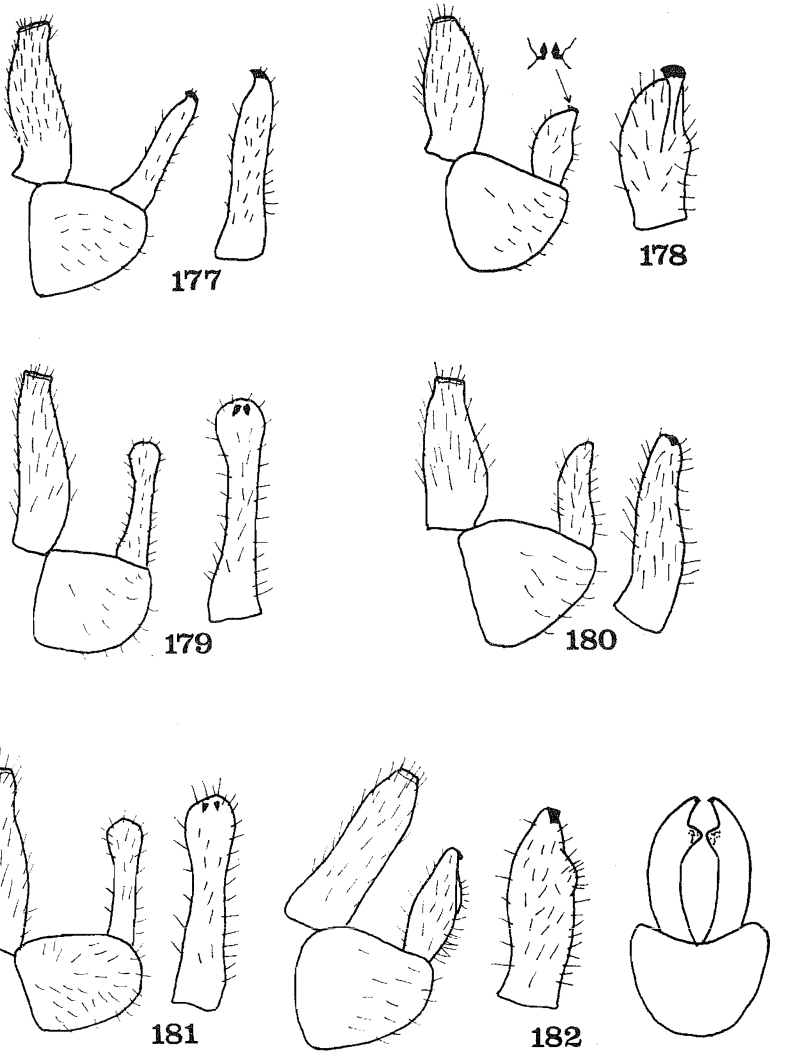
— Ventral valve of female terminalia (fig. 165) longer; proctiger length:ventral valve length ratio less than 1.9. Male paramere (fig. 194) broadly rounded apically; in posterior view without subapical lobe. Forewing (fig. 138) shorter, 2.44–2.9 mm in male, 2.8–3.04 mm in female; surface spinules light and less dense **pulchra** (Zetterstedt) (p.57)

19 Surface spinules of forewing light and very dense, completely covering membrane (fig. 124), not leaving spinule-free bands along margin of veins. Forewing appearing opaque whitish, sometimes with a faint yellow tinge; veins unicolorous. General body coloration pale creamy green with orange markings on thorax. Genal cones (fig. 208) long, thick and blunt. On *Salix* **ambigua** Förster (p.55)

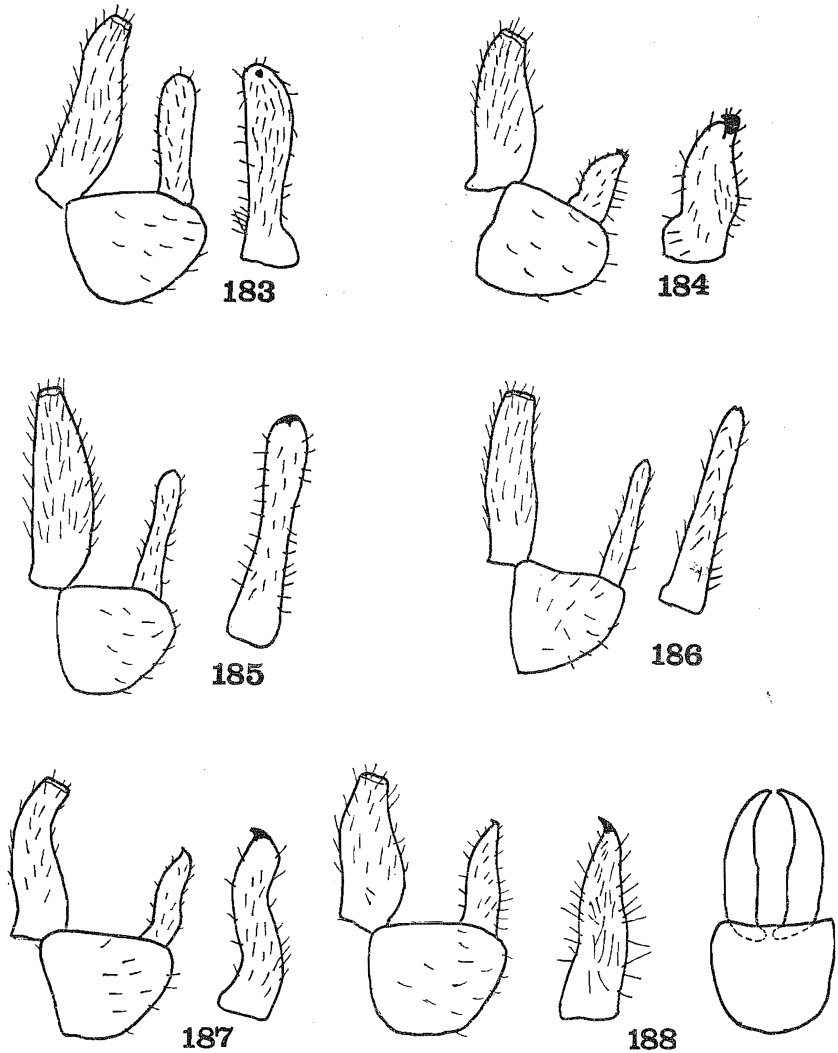
— Surface spinules less dense, often dark, not completely covering membrane, always leaving spinule-free bands along margin of the veins. Forewing usually clear, if slightly opaque (sometimes in *hippophaes* and *viburni*) then antennal segment 3 longer than 0.28 mm; veins often dark. General body coloration bright green, yellow, bright green and yellow, rust-red, red and brown, often with white markings on dorsum of mesothorax. Genal cones either short and conical (fig. 231) or long and slender (fig. 216).....20

20 General body coloration green, green and yellow (spring and summer specimens), occasionally red and chestnut-brown (autumn specimens); if the latter then mesothoracic praescutum and scutellum unicolorous brown, without distinct longitudinal pale streaks.....21

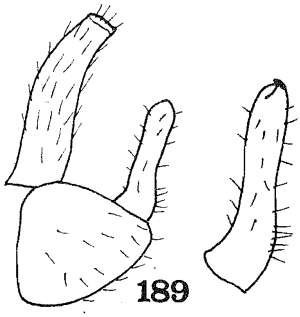
— General body coloration multicoloured; red and brown and deep plum colour, occasionally almost black, with distinct pale longitudinal streaks always present on mesothoracic praescutum and scutellum: occasional young specimens with abdomen green, thorax brick-red with pale longitudinal markings.....27

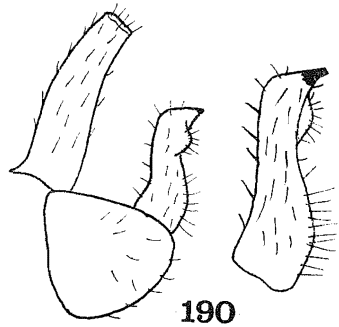


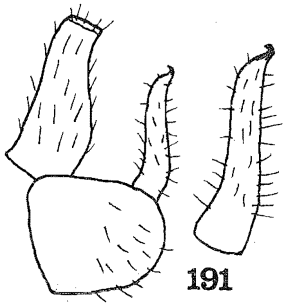

**Figs 177–182.** *Psylla* ♂ genitalia lateral view & right paramere inner view. 177, *alaterni*. 178, *albipes*. 179, *alni*. 180, *ambigua*. 181, *betulae*. 182, *brunneipennis* (also parameres, posterior view).

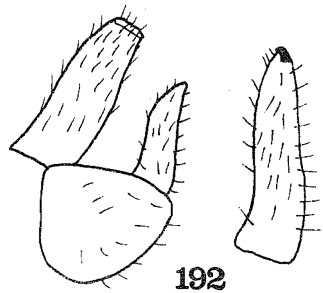


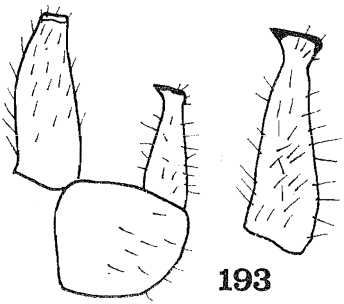

**Figs 183–188.** *Psylla* ♂ genitalia lateral view & right paramere inner view. 183, *buxi*. 184, *crataegi*. 185, *foersteri*. 186, *hartigi*. 187, *hippophaes*. 188, *mali* (also parameres, posterior view).

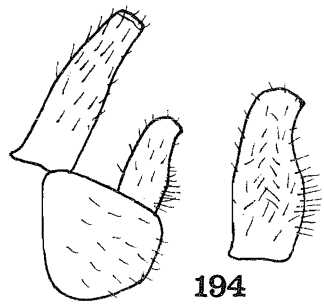


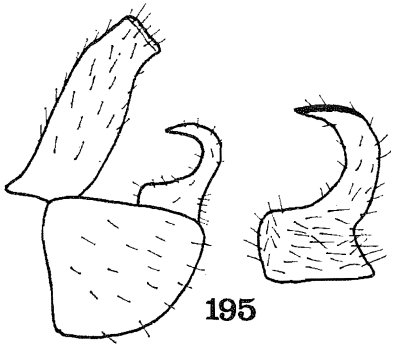



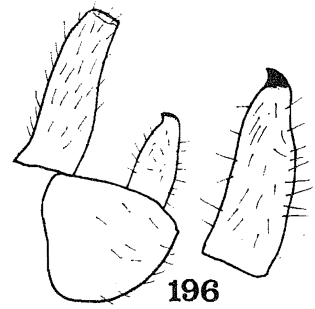



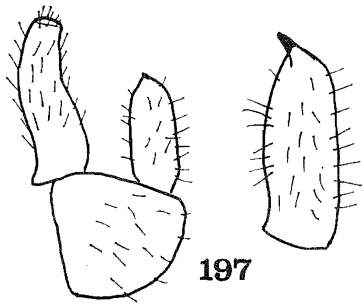



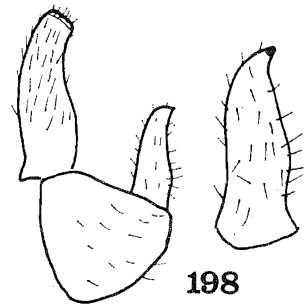



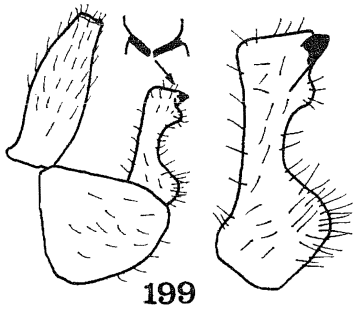

**Figs 189–194.** *Psylla* ♂ genitalia lateral view & right paramere inner view. 189, *melanoneura*. 190, *moscovita*. 191, *peregrina*. 192, *pruni*. 193, *pulchella*. 194, *pulchra*.

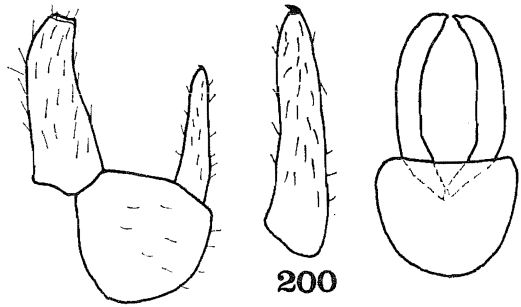


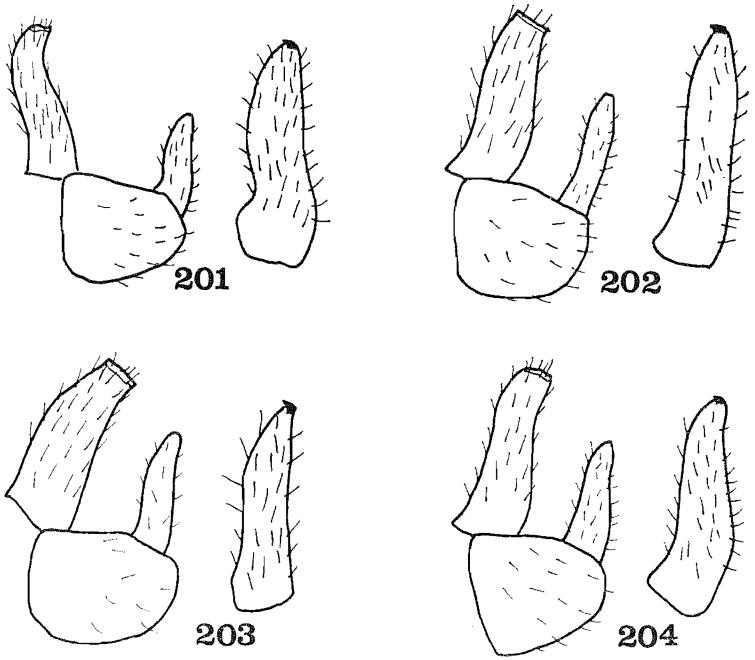




**Figs 195–200.** *Psylla* ♂ genitalia lateral view & right paramere inner view. 195, *pyri.* 196, *pyricola.* 197, *pyrisuga.* 198, *rhamnicola.* 199, *saliceti.* 200, *sorbi* (also parameres posterior view).




**Figs 201–204.** *Psylla* ♂ genitalia lateral view & right paramere inner view. 201, *subferruginea*. 202, *ulmi*. 203, *viburni*. 204, *visci*.

21 Head in dorsal view (figs 220, 226, 231) with genal cones conical or rotund, without slender tapering apices.....22
— Genal cones conical basally but with slender, gently tapering, subcylindrical apices (figs 205, 210, 216, 218, 233).....24
22 Antennae long; antennal length:head width ratio greater than 1.7. Cell $cu_1$ of forewing (fig. 146) long, basal width:height ratio greater than 1.71. Female terminalia (fig. 174) short and stout; proctiger length:head width ratio less than 0.81. Male paramere in lateral view (fig. 202) straight and narrow. On *Ulmus*
**ulmi** Förster (p.61)
— Antennae short; antennal length:head width ratio less than 1.6. Cell $cu_1$ shorter, basal width to height ratio less than 1.71. Female genitalia (figs 162, 169) longer and slenderer, proctiger length:head width ratio greater than 0.84. Male paramere either short and stout (fig. 197) or slender but with apical portion twisted posteriorly (fig. 191). On other host plants.....23
23 Forewing (fig. 135) with a narrowly rounded apex; surface spinules light coloured, absent from cell $c+sc$. Male paramere in lateral view (fig. 191) long and slender with distal portion twisted posteriorly and bearing apically an anteriorly directed, slender, curved tooth. Generally a smaller species; wing length 2.38–2.94 mm. On *Crataegus* **peregrina** Förster (p.57)
— Forewing (fig. 141) with a broadly rounded apex, spinules dark and prominent, completely covering cell $c+sc$. Male paramere (fig. 197) shorter and stouter, bearing apically a blunt inwardly directed tooth. Generally a larger species; wing length greater than 2.88 mm. On *Pyrus* **pyrisuga** Förster (p.58)
24 Forewing (fig. 147) with pterostigma short and narrow, vein $R_1$ cutting costal margin before bifurcation of vein $M$; vein $R_s$ convex, only sinuous apically; costal margin convex throughout its length. On *Viburnum* **viburni** Löw (p.61)

— Forewing (figs 131–134) with pterostigma longer and wider, vein *R* cutting costal margin at or beyond the bifurcation of vein *M*, vein $R_s$ sinuous; costal margin straight in the region of the pterostigma. On other host plants.....25

25 Female terminalia (fig. 159) long, proctiger length:head width ratio greater than 1.25. Male parameres in lateral view (fig. 187) strongly bowed anteriorly. Forewing (fig. 131) slightly opaque, occasionally with yellow tinges. Genal cones (fig. 215) very long and slender, scarcely divergent. On *Hippophae* **hippophaes** Förster (p.56)

— Female terminalia shorter, proctiger length:head width ratio less than 1.1. Male parameres (figs 188, 200) more or less straight. Forewing clear. Genal cones (figs 216, 229) shorter, divergent. On other host plants.....26

26 Male paramere in lateral view (fig. 188) with apical portion twisted posteriorly; in posterior view see fig. 188. Female proctiger length:head width ratio less than 0.9 Antennae with apices of segments III to VII concolorous with remainder of segment. Cell *c+sc* of forewing (fig. 132) with spinules present throughout cell. Genal cones as in fig. 216. Spring specimens usually bright green throughout (autumn specimens red and chestnut-brown). On *Malus* **mali** (Schmidberger (p.56)

— Male parameres in lateral view (fig. 200) straight, in posterior view see fig. 200. Female proctiger length:head width ratio greater than 0.9. Antennal segments III to VII with apices infuscate. Spinules absent from cell *c+sc* (fig. 144). Genal cones as in fig. 229. Spring specimens bright green with orange yellow markings on thorax (autumn specimens red and chestnut brown). On *Sorbus* **sorbi** (L.) (p.58)

27 Forewing (fig. 148) broad, length:breadth ratio less than 2.28; vein $R_s$ shallowly convex throughout its length. Antennal length:head width ratio greater than 1.85. Female terminalia (fig. 176) short, proctiger length:head width ratio less than 0.75 Head width greater than 0.9 mm. On *Viscum* **visci** Curtis (p.61)

— Forewing narrower, length:breadth ratio greater than 2.28, vein $R_s$ sinuous. Antennal length:head width ratio less than 1.85. Female terminalia (figs 149, 154, 161) long, proctiger length:head width ratio greater than 0.9. Head width usually less than 0.9 mm: if larger (occasional *brunneipennis* females) then antennal length:head width ratio less than 1.65. On other host plants.....28

28 Smaller species, forewing length less than 2.17 mm. Head width 0.62–0.66 mm in male, 0.66–0.7 mm in female. Forewing (fig. 121) broadest in middle; cell $cu_1$ high, basal width:height ratio less than 1.46; spinules absent from cell *c+sc*. Genal cones (fig. 205) short, less than 0.8 times as long as vertex. Male parameres (fig. 177) simple, bearing a large anteriorly directed apical tooth On *Rhamnus alaternus* **alaterni** Förster (p.55)

— Larger species; forewing length greater than 2.2 mm. Head width 0.65–0.88 mm in male, 0.68–0.95 mm in female. Forewing (figs 126, 132) usually broadest in apical third; if equally broad in middle and apical third (*moscovita*) then forewing at least 2.3 mm long. Cell $cu_1$ longer, basal width to height ratio greater than 1.5; spinules present in cell *c+sc*. Genal cones (figs 218, 219) longer, at least 0.8 times as long as vertex. Male parameres complex or simple, if the latter then with only a small anteriorly directed apical tooth. On other host plants.....29

29 Female ventral valve relatively short (fig. 154); proctiger length:ventral valve length ratio greater than 1.9. Male paramere in lateral view as in fig. 182; in posterior view (fig. 182) with a subapical inwardly directed posterior lobe. Generally larger species; head width 0.79–0.88 mm in male, 0.8–0.95 mm in female. On *Salix* **brunneipennis** Edwards form **klapaleki** (p.56)

— Female ventral valve (figs 161, 171) relatively long; proctiger length:ventral valve length ratio less than 1.9. Male parameres as in figs 189, 194 & 199; in posterior view without a subapical inwardly directed lobe. Generally smaller species; head width 0.65–0.82 mm in male, 0.68–0.85 mm in female.....30

30 Male paramere in lateral view (fig. 189) simple, long and narrow. Female proctiger (fig. 161) relatively long, in lateral view with dorsal margin sinuate; proctiger length: head width ratio 1.12–1.4. Genal cone (fig. 218) with apex obliquely truncated. On *Crataegus* **melanoneura** Förster (p.57)

— Male paramere (figs 194, 199) shorter and broader or with distinct posterior lobes. Female proctiger (figs 165, 171) generally shorter, in lateral view dorsal margin almost straight; proctiger length:head width ratio 0.9–1.18. Genal cone (figs 223, 228) with apex more or less rounded. On *Salix*.....31

31 Male paramere in lateral view (fig. 194) with anterior margin straight; apex rounded, bearing a small denticle posteriorly; posterior margin with a small lobe in basal

half, slightly excavate in apical half. Antennae generally shorter, antennal length: head width ratio 1.25–1.58 **pulchra** (Zetterstedt) (p.57)

— Male paramere not as above; in lateral view apex truncate (figs 190, 199), in dorsal view apex extended as long inwardly directed finger-like projections (fig. 199); subapical flap-like lobes present on outer face of paramere. Antennae generally longer, antennal length:head width ratio 1.39–1.79 ..... 32

32 Male parameres in lateral view (fig. 199) with posterior margin deeply excavate at mid-length and with large basal posterior lobe. Forewing (fig. 143) broadest in apical third **saliceti** Förster (p.58)

— Male parameres (fig. 190) approximately parallel sided, with small basal posterior lobe. Forewing (fig. 134) equally broad at middle and in apical third **moscovita** Andrianova (p.57)

## Confirmatory descriptions of *Psylla* species

*Psylla alaterni* Förster

Size: HW ♂ 0.62–0.66 mm, ♀ 0.66–0.7 mm; WL ♂ 1.92–2.12 mm, ♀ 2.02–2.14 mm. Genal cones (fig. 205) slender, GCV=0.6–0.7; AHR=~1.6. Forewing (fig. 121) clear, pterostigma long, veins dark, CUR=1.3–1.41. Male genitalia fig. 177, female terminalia fig. 149; FPHW=0.95–1.05. General body coloration multicoloured, red, brown and plum-coloured with white longitudinal streaks on dorsum of thorax. Younger specimens often with a green abdomen.

*Rare, known only from Förster's type material from Ireland. France, Italy. Canaries.*

*Psylla albipes* Flor

Size: HW ♂ 0.6–0.8 mm, ♀ 0.76–0.84 mm; WL ♂ 2.46–2.68 mm, ♀ 2.66–3 mm. Genal cones (fig. 206) conical, GCV=0.7–1; AHR=1.32–1.81. Forewing (fig. 122) clear with brown or black markings around veins $Cu_{1b}$ and anal vein; pterostigma long, veins dark, CUR=1.4–1.75. Male genitalia fig. 178, female terminalia fig. 150; FPHW=0.77–0.83. General body coloration multicoloured, red, brown, deep plum and black, with white longitudinal streaks on dorsum of thorax. Younger specimens often with ground-colour lighter reddish-orange.

*Rare, Box Hill, Surrey. Central and W. Central Europe, Crimea, Georgia.*

*Psylla alni* (L.)

Size: HW ♂ 1–1.1 mm, ♀ 1.08–1.16 mm; WL ♂ 3.8–4.3 mm, ♀ 4.2–4.75 mm. Genal cones (figs 207) conical, GCV=0.57–1; AHR=2.59–3.29. Forewing (fig. 123) clear, pterostigma short, veins dark, CUR=1.52–2.05. Male genitalia fig. 179, female terminalia fig. 151; FPHW= 1.23–1.45. General body coloration bright green in spring, developing brown or red markings towards autumn.

*Common throughout Britain, Ireland. Widely distributed throughout Palaearctic and N. America.*

*Psylla ambigua* Förster

Size: HW ♂ 0.66–0.75 mm, ♀ 0.66–0.75 mm; WL ♂ 2.38–2.72 mm, ♀ 2.47–2.9 mm. Genal cones (fig. 208) long but stout, GCV=0.85–1.17, AHR=1.42–1.87. Forewing (fig. 124) opaque whitish, pterostigma long, veins pale concolorous, CUR=1.65–2.2. Male genitalia fig. 180, female terminalia fig. 152; FPHW=0.9–1.09. General body coloration pale creamy green with orange-yellow markings on thorax, occasional specimens entirely orange-yellow.

*Common throughout Britain. Ireland. Widely distributed throughout Palaearctic.*

*Psylla betulae* (L.)

Size: HW ♂ 0.76–0.86 mm, ♀ 0.81–0.94 mm; WL ♂ 2.86–3.46 mm, ♀ 3.32–3.75 mm. Genal cones (fig. 209) conical, GCV=0.73–1.09; AHR=2.02–2.49. Forewing (fig. 125) yellowish brown, pterostigma short, veins concolorous, CUR=1.55–2. Male genitalia fig. 181, female terminalia very long fig. 153; FPHW=1.29–1.36. General body coloration rust-red, red and brown.

*Widely distributed throughout Britain but local. Ireland. Central and N. Europe to Mongolia and Japan.*

*Psylla brunneipennis* Edwards

A dimorphic species occurring as a clouded wing (*typica*) and a clear wing form (*klapaleki*). Size: HW ♂ 0.79–0.88 mm, ♀ 0.8–0.95 mm; WL ♂ 2.9–3.2 mm, ♀ 3.1–3.25 mm. Genal cones (fig. 210) long and slender, GCV = 0.88–1.29. Forewing (fig. 126) with or without grey or brown clouding, pterostigma long, veins dark, CUR = 1.71–2.08. Male genitalia fig. 182. female terminalia fig. 154; FPHW = 1.01–1.2. General body coloration multicoloured red, brown and plum-colour, with white longitudinal markings on dorsum of thorax.

*Locally common throughout Britain, Ireland. Northern and Central Europe, Caucasus, Ukraine.*

*Psylla buxi* (L.)

Size: HW ♂ 0.9–1.07 mm, ♀ 0.92–1.07 mm; WL ♂ 2.94–3.53 mm, ♀ 3.2–3.7 mm. Genal cones (fig. 211) long and very stout, GCV = 0.81–1.08. AHR = 1.55–1.89. Forewing (fig. 127) shining yellow, pterostigma obsolete, veins concolorous, with membrane, CUR = 1.09–1.29. Male genitalia fig. 183, female terminalia very long fig. 155; FPHW = 1.32–1.53. General body coloration bright green (spring specimens) yellow-green (autumn specimens).

*Locally common throughout Britain, Ireland. Widely distributed throughout Europe, European U.S.S.R., N. America (introduced).*

*Psylla crataegi* (Schrank)

Size: HW ♂ 0.82–0.86 mm, ♀ 0.84–0.94 mm; WL ♂ 2.74–3.06 mm, ♀ 2.9–3.09 mm. Genal cones (fig. 212) short, conical, GCV = 0.62–0.95; AHR = 1.51–1.83. Forewing (fig. 128) clear, brown spots present around veins $Cu_{1b}$ and $Cu_2$, pterostigma long, veins, dark, CUR = 1.31–1.65. Male genitalia fig. 184, female terminalia fig. 156; FPHW = 0.86–0.89. General body coloration multicoloured red, brown and plum-colour with longitudinal markings on dorsum of thorax.

*Uncommon in S. England becoming rarer northwards, reaching Morecambe Bay area in west, Durham in east. Ireland. Europe north to S. Sweden, European U.S.S.R., Georgia, N. India, N. Africa.*

*Psylla foersteri* Flor

Size: HW ♂ 0.96–1.12 mm, ♀ 0.98–1.12 mm; WL ♂ 3.32–3.7 mm, ♀ 3.46–4.16 mm. Genal cones (fig. 213) broadly rounded, very short, GCV = 0.48–0.9; AHR = 2.18–2.92. Forewing (fig. 129) yellow, veins concolorous, pterostigma short, CUR = 1.64–2.1. Male genitalia fig. 185, female terminalia long fig. 157; FPHW = 1.47–1.65. General body coloration usually bright green, occasionally yellow.

*Common throughout Britain. Ireland. Widely distributed across Palaearctic.*

*Psylla hartigi* Flor

Size: HW ♂ 0.62–0.71 mm, ♀ 0.67–0.75 mm; WL ♂ 2–2.69 mm, ♀ 2.48–2.94 mm. Genal cones (fig. 214) conical, GCV = 0.56–1; AHR 1.57–1.94. Forewing (fig. 130) opaque, orange-yellow, veins concolorous, pterostigma long, CUR = 1.68–2.25. Male genitalia fig. 186, female terminalia long fig. 158; FPHW = 1.49–1.6. General body coloration dull orange, abdomen occasionally green.

*Common and widely distributed throughout Britain. Ireland. Throughout Europe, European U.S.S.R., Georgia, Japan, N. America.*

*Psylla hippophaes* Förster

Size: HW ♂ 0.78–0.91 mm; ♀ 0.86–0.91 mm; WL ♂ 2.78–3.06 mm, ♀ 3–3.31 mm. Genal cones (fig. 215) long and slender, GCV = 1–1.25; AHR = 1.59–2.05. Forewing (fig. 131) clear or slightly opaque, occasionally with whitish or yellowish tinges, veins usually darker than membrane, pterostigma intermediate length, CUR = 1.53–1.96. Male genitalia fig. 187, female terminalia fig. 159; FPHW = 1.3–1.5. General body coloration yellow-green, occasionally with light brown markings in autumn specimens.

*Locally common in coastal localities around Britain. Throughout Europe, Caucasus and Middle Asian part of Palaearctic region.*

*Psylla mali* Schmidberger

Size: HW ♂ 0.76–0.83 mm, ♀ 0.76–0.86 mm; WL ♂ 2.62–3 mm, ♀ 2.94–3.66 mm. Gena cones (fig. 216) long and slender, GCV = 0.8–1.13; AHR = 1.67–1.93. Forewing

(fig. 132) clear; veins concolorous (spring specimens) or dark (autumn specimens), pterostigma long, CUR = 1.88–2.17. Male genitalia fig. 188, female terminalia fig. 160; FPHW = 0.79–0.88. General body coloration bright green (spring and summer specimens) or chestnut brown and red (autumn specimens).

*Common and widely distributed throughout Britain. Ireland. Widely distributed throughout Palaearctic region. N. America (introduced).*

*Psylla melanoneura* Förster

Size: HW ♂ 0.65–0.74 mm, ♀ 0.68–0.83 mm; WL ♂ 2.2–2.56 mm, ♀ 2.44–2.68 mm. Genal cones (fig. 218) long and slender, GCV = 0.8–1.07; AHR = 1.28–2.56. Forewing (fig. 133) clear, veins dark, pterostigma long, often dark brown, CUR = 1.58–2. Male genitalia fig. 189, female terminalia fig. 161; FPHW = 1.05–1.39. General body coloration multicoloured, red, brown and plum-coloured, occasionally black, with white longitudinal streaks on dorsum of thorax. Younger specimens often with abdomen green.

*Very common throughout Britain. Ireland. Throughout Europe, Mongolia, Siberia and Japan.*

*Psylla moscovita* Andrianova

Size: HW ♂ 0.68–0.78 mm, ♀ 0.73–0.83 mm; WL ♂ 2.31–3.04 mm, ♀ 2.43–3.1 mm. Genal cones (fig. 219) long and slender, GCV = 0.88–1.21; AHR = 1.39–1.79. Forewing (fig. 134) clear, veins concolorous or dark, pterostigma long, CUR = 1.56–2. Male genitalia fig. 190, female terminalia fig. 162; FPHW = 0.98–1.18. General body coloration multicoloured, red, brown and plum-coloured, with white longitudinal streaks on dorsum of thorax. Younger specimens often more reddish, occasionally with a green abdomen.

*Uncommon, widespread in Scotland and N. England becoming scarcer in S. England. N. Europe, N. European U.S.S.R., Siberia, Georgia.*

*Psylla peregrina* Förster

Size: HW ♂ 0.68–0.82 mm, ♀ 0.72–0.84 mm; WL ♀ 2.38–2.76 mm, ♀ 2.45–2.94 mm. Genal cones (fig. 220) rotund, GCV = 0.73–1; AHR = 1.3–1.59. Forewing (fig. 135) clear, veins yellow, pterostigma long, CUR = 1.39–1.71. Male genitalia fig. 191, female terminalia fig. 163; FPHW = 0.84–0.97. General body coloration bright green (spring and summer specimens) or chestnut-brown and red (autumn specimens).

*Very common throughout Britain. Ireland. Widely distributed throughout Palaearctic region to Japan.*

*Psylla pruni* (Scopoli)

Size: HW ♂ 0.64–0.71 mm, ♀ 0.64–0.75 mm; WL ♂ 2.06–2.26 mm, ♀ 2.16–2.34 mm. Genal cones (fig. 221) short, conical, GCV = 0.7–0.79; AHR = 1.17–1.41. Forewing (fig. 136) orange-brown, opaque, veins concolorous, coloration often more intense towards wing apex, pterostigma long, CUR = 1.59–2. Male genitalia fig. 192, female terminalia fig. 164; FPHW = 0.84–0.89. General body coloration orange-brown to brown.

*Uncommon but widely distributed in Britain, commoner in the south. Ireland. Throughout Europe, Caucasus, Georgia, Irkutsk.*

*Psylla pulchella* Löw

Size: HW ♂ 0.8–0.84 mm, ♀ 0.76–0.84 mm; WL ♂ 2.3–2.41 mm, ♀ 2.3–2.40 mm. Genal cones (fig. 222) short, conical GCV = 0.75–0.88; AHR = 1.31–1.41. Forewing (fig. 137) clear with transverse brown pattern, veins dark, pterostigma long, CUR = 1.43–1.72. Male genitalia fig. 193, female terminalia fig. 165; FPHW = 0.89–1.01. General body coloration multicoloured yellow, orange, brown and plum-coloured with longitudinal white stripes on dorsum of thorax. Young specimens often with underside of abdomen creamy white.

*Known only from a single male taken in Dorset. An introduced species. Austria, France, Greece, Yugoslavia, Crimea, Asia Minor.*

*Psylla pulchra* (Zetterstedt)

Size: HW ♂ 0.7–0.82 mm, ♀ 0.72–0.84 mm; WL ♂ 2.44–2.9 mm, ♀ 2.8–3.04 mm. Genal cones (fig. 223) long and slender, GCV = 0.86–1.1; AHR = 1.25–1.58. Forewing (fig. 138) usually clear, occasionally with grey or brown clouds in apical cells, pterostigma

long, often darkened, CUR = 1.6–2.12. Male genitalia fig. 194, female terminalia fig. 166; FPHW = 0.94–1.04. General body coloration multicoloured, red, brown and plum, occasionally black-coloured, with white longitudinal streaks on dorsum of thorax. In younger specimens, abdomen occasionally green.

*Common and widely distributed in Britain. Ireland. Widely distributed throughout Europe, Caucasus, Japan.*

*Psylla pyri* (L.)

Size: HW ♂ 0.68–0.84 mm, ♀ 0.74–0.87 mm; WL ♂ 2.2–2.9 mm, ♀ 2.3–2.9 mm. Genal cones (fig. 224) conical, GCV = 0.67–0.87; AHR = ~1.6. Forewing (fig. 139) either clear or with longitudinal grey or brown clouds in apical cells, veins dark, pterostigma long, CUR = 1.5–1.64. Male genitalia fig. 195, female terminalia fig. 167; FPHW = 0.69–0.73. General body coloration orange-red with white longitudinal stripes on dorsum of thorax.

*Known only from a single specimen from an unnamed locality. Throughout Europe, Caucasus, Georgia, Middle Asia.*

*Psylla pyricola* Förster

A dimorphic species existing as a clear wing summer form (*typica*) and a clouded wing autumn form (*simulans*). Size: HW ♂ 0.6–0.78 mm, ♀ 0.63–0.8 mm; WL ♀ 1.76–2.53 mm, ♀ 1.96–2.65 mm. Genal cones (fig. 225) somewhat variable in length; GCV = 0.68–1.02; AHR = 1.41–1.9. Forewing (fig. 140) with dark spot around vein $Cu_2$, veins dark, pterostigma long, CUR = 1.4–1.67. Male genitalia fig. 196, female terminalia fig. 168; FPHW = 0.7–0.82. General body coloration multicoloured, red, brown and plum-coloured, with white longitudinal streaks on dorsum of thorax.

*Common in S. England becoming rarer northwards. Widely distributed throughout the Palaearctic to Japan, commoner in the south, N. America (introduced).*

*Psylla pyrisuga* Förster

The few available British examples of this species are somewhat smaller than continental material and in the following description the upper size ranges have been modified to accommodate information from the literature. Size: HW ♂ 0.78–0.95 mm, ♀ 0.76–1 mm, WL ♂ 2.88–3.25 mm, ♀ 2.9–3.35 mm. Genal cones (fig. 226) conical, GCV = 0.75–0.91; AHR = ~1.46–1.5. Forewing (fig. 141) clear, relatively broad, veins dark, pterostigma long, CUR = 1.41–1.6. Male genitalia fig. 197, female terminalia fig. 169; FPHW = ~0.88. General body coloration yellow (spring specimens); rust-red (autumn specimens).

*A single British record from Cambridge. Central and N. Europe, through Russia to Japan.*

*Psylla rhamnicola* Scott

Size: HW ♂ 0.81–0.88 mm, ♀ 0.83–0.92 mm; WL ♂ 2.8–3.01 mm, ♀ 2.8–3.26 mm. Genal cones (fig. 227) usually conical, occasionally with tapering apices; GCV = 0.77–1; AHR = 1.52–1.85. Forewing (fig. 142) clear, veins dark, pterostigma long, CUR = 1.55–1.9. Male genitalia fig. 198, female terminalia long fig. 170; FPHW = 1.27–1.41. General body coloration multicoloured, red, brown and plum-coloured with white longitudinal streaks on dorsum of thorax. Younger specimens with ground-colour more reddish, abdomen often green.

*Uncommon, S. England, Ireland. Throughout Europe, European U.S.S.R., Georgia, Kazakhstan, Bashkir, Caucasus.*

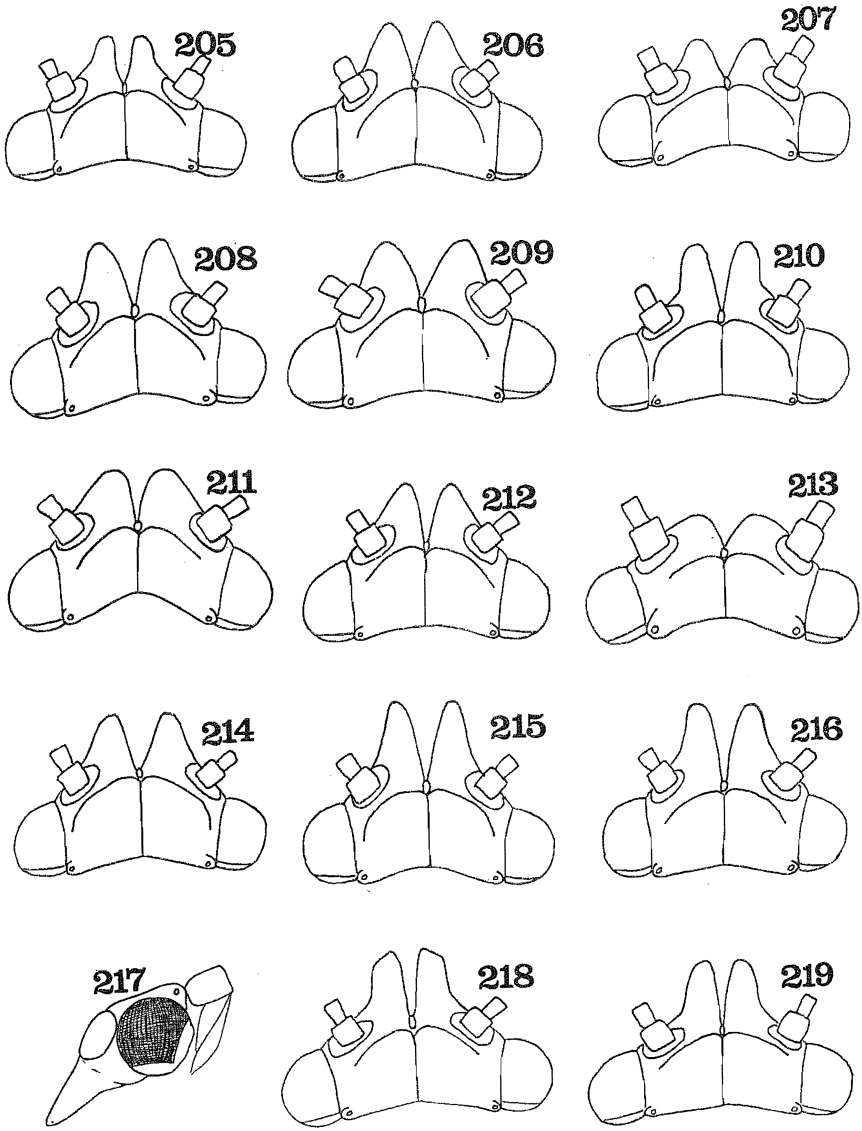
*Psylla saliceti* Förster

Size: HW ♂ 0.75–0.81 mm, ♀ 0.75–0.84 mm; WH ♂ 2 75–2.96 mm, ♀ 2.84–3.12 mm. Genal cones (fig. 228) long and slender, GCV = 0.82–1.25; AHR = 1.43–1.73. Forewing (fig. 143) clear, veins usually dark, pterostigma long, CUR = 1.67–2.05. Male genitalia fig. 199, female terminalia fig. 171; FPHW = 0.9–1.08. Body multicoloured, red, brown and plum-coloured, with white longitudinal streaks on dorsum of thorax.

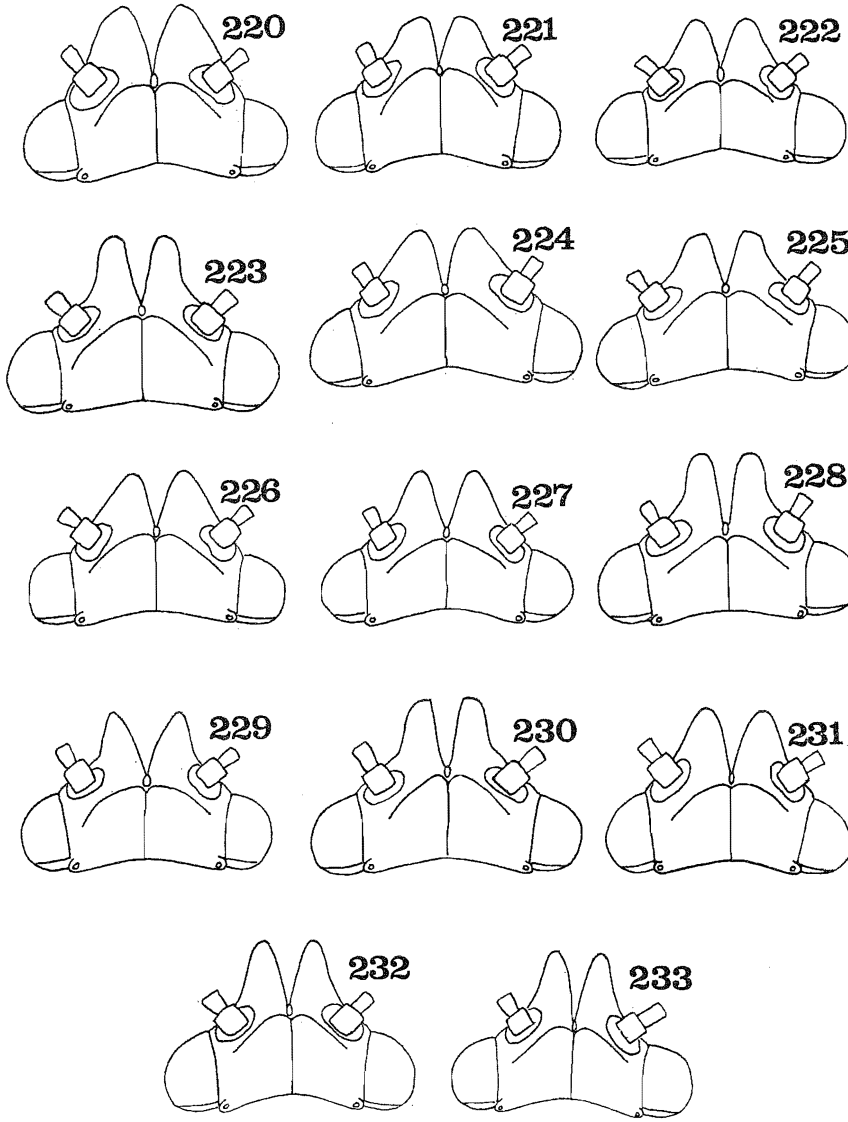
*Uncommon, generally more common in south of England. Ireland. Throughout Europe, Crimea, Georgia, ?Japan.*

*Psylla sorbi* (L.)

Size: HW ♂ 0.74–0.81 mm, ♀ 0.78–0.85 mm; WL ♂ 2.65–2.93 mm, ♀ 2.88–3.14 mm. Genal cones (fig. 229) slender, GCV = 0.88–1; AHR = 1.74–2.1. Forewing (fig. 144)




**Figs 205–219.** *Psylla* heads, dorsal, 205, *alaterni*. 206, *albipes*. 207, *alni*. 208, *ambigua*. 209, *betulae*. 210, *brunneipennis*. 211, *buxi*. 212, *crataegi*. 213, *foersteri*. 214, *hartigi*. 215, *hippophaes*. 216, *mali*. 217, *mali* side view. 218, *melanoneura*. 219, *moscovita*.




**Figs 222–233.** *Psylla* heads, dorsal, 220, *peregrina*. 221, *pruni*. 222, *pulchella*. 223, *pulchra*. 224, *pyri*. 225, *pyricola*. 226, *pyrisuga*. 227, *rhaminicola*. 228, *saliceti*. 229, *sorbi*. 230, *subferruginea*. 231, *ulmi*. 232, *visci*. 233, *viburni*.

clear, veins light (spring specimens) or dark (summer, autumn specimens), pterostigma long, CUR = 1.94–2.43. Male genitalia fig. 200, female terminalia fig. 172; FPHW = 0.9–1.1. General body coloration green with orange-yellow markings (spring specimens) or occasionally red and chestnut-brown (autumn specimens).

*Common and widely distributed in Britain. Ireland. Throughout Europe and the European U.S.S.R. N. America (introduced).*

*Psylla subferruginea* Edwards

Size: HW ♂ 0.69–0.78 mm, ♀ 0.73–0.83 mm; WL ♂ 2.22–2.47 mm, ♀ 2.42–2.8 mm. Genal cones (fig. 230) slender, GCV = 0.74–1; AHR = 1.15–1.39. Forewing (fig. 145) transparent yellow, veins yellow, pterostigma long, CUR = 1.5–1.88. Male genitalia fig. 201, female terminalia fig. 173; FPHW = 1.03–1.24. General body coloration brick-red or orange-red, with white longitudinal markings on dorsum of thorax; abdomen occasionally green (younger specimens).

*Locally common throughout Britain. Rumania, Caucasus, Sweden, Norway.*

*Psylla ulmi* Förster

Size: HW ♂ 0.73–1 mm, ♀ 0.79–1.03 mm; WL ♂ 2.64–3.63 mm, ♀ 3–3.84 mm Genal cones (fig. 231) conical, GCV = 0.83–1.07; AHR = 1.7–2.16. Forewing (fig. 146) clear, veins light, pterostigma long, CUR = 1.65–2.29. Male genitalia fig. 202, female terminalia fig. 174; FPHW = 0.7–0.77. General body coloration green or yellow (spring and summer specimens), occasionally developing reddish tinges (autumn specimens).

*Rare, mainly on introduced elms* (Ulmus) *in S. England. Central and N. Europe. U.S.S.R., Caucasus, Kazakhstan.*

*Psylla viburni* Löw

Size: HW ♂ 0.76–0.84 mm, ♀ 0.72–0.88 mm; WL ♂ 3.08–3.36 mm, ♀ 3.24–3.42 mm. Genal cones (fig. 232) very long and slender, GCV = 1.18–1.29; AHR = 1.95–2.2. Forewing (fig. 147) clear or occasionally slightly opaque yellowish, veins light, pterostigma short, CUR = 1.68–2.05. Male genitalia fig. 203, female terminalia fig. 175; FPHW = 0.91–1.04. General body coloration yellowish green.

*Uncommon, appears to be largely confined to S. England, a single record for Durham. West central and central Europe, Caucasus, Georgia, Moldavia, N. India, Japan.*

*Psylla visci* Curtis

Size: HW ♂ 0.9–0.99 mm, ♀ 0.9–1.06 mm; WL ♂ 2.8–3.08 mm, ♀ 2.9–3.3 mm. Genal cones (fig. 233) slender, GCV = 0.85–1.17; AHR = 1.85–2.28. Forewing (fig. 148) broad, either clear or with longitudinal grey or brown clouds in cells, veins dark, pterostigma long, CUR = 1.51–1.84. Male genitalia fig. 204, female terminalia fig. 176; FPHW = 0.64–0.72. Body multicoloured, red, brown and plum-coloured, with white longitudinal streaks on dorsum of thorax.

*Uncommon, England north to Cheshire. West-central and central Europe, Caucasus, Georgia and Ukraine.*

## Family Triozidae

A very large family of worldwide distribution, occurring on a variety of host plants.

*Key to genera of Triozidae*

1 Dorsal surface of head and thorax covered with light hairs. Genal cones dorsal view (fig. 236) clavate, somewhat constricted at base. Forewing (fig. 234) with brown colour-pattern; costal margin straight to concave in apical third **Trichochermes** Kirkaldy (p.62)

– Dorsal surface of head and thorax glabrous, or with few scattered hairs. Genal cones in dorsal view (fig. 275) not clavate, broadest at base. Forewing (fig. 243) without colour-pattern; costal margin convex in apical third **Trioza** Förster (p.62)

### Genus *Trichochermes* Kirkaldy

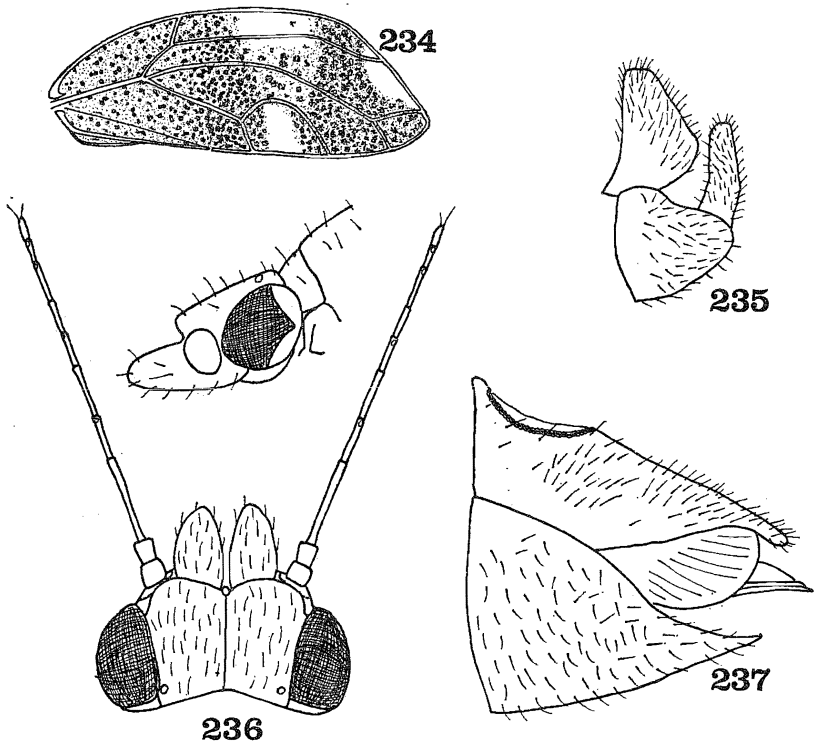
A small palaearctic genus containing five described species, all associated with *Rhamnus* spp. (Rhamnaceae) (Loginova, 1974b). A single species *Trichochermes walkeri* occurs in Britain.

General body coloration reddish brown, with dark brown markings. Antennae and legs brown. Forewing membrane with brown colour-patterning (fig. 234); veins brown. HW = 0.64–0.78 mm, AHR = 1.4–1.6, GCV = 0.58–0.7, WL = 3.44–4.04 mm. Male genitalia fig. 235; female genitalia fig. 237 **walkeri** (Förster)

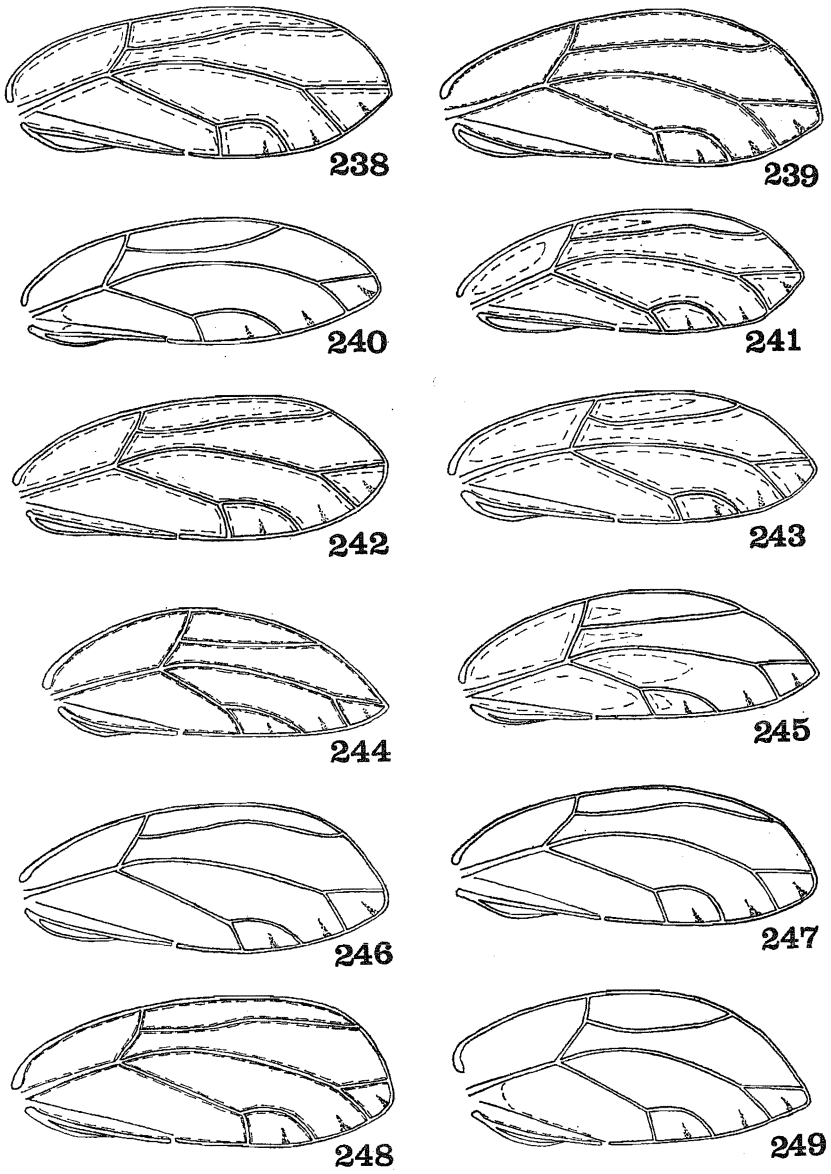
*Locally common in S. England, extending north to Cumbria. Widely distributed throughout Europe and European U.S.S.R.*

### Genus *Trioza* Förster

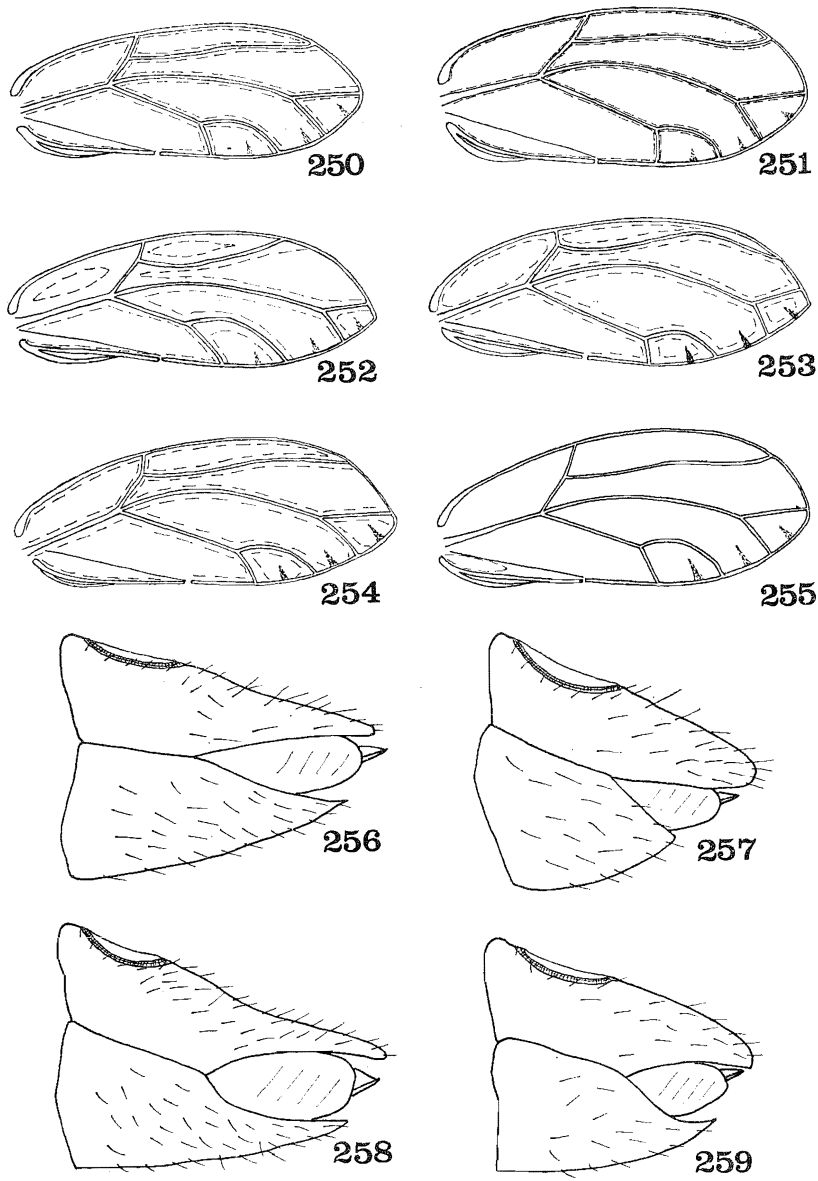
A very large diverse genus distributed throughout the world and associated with a wide variety of host plants. Seventeen species occur in Britain. Males are often required for specific determination. Klimaszewski (1975) split the genus *Trioza* as presently conceived into *Trioza* sensu stricto, *Heterotrioza* and *Bactericera*. Some of the characters he used are of dubious significance and these divisions are not followed here. Confirmatory descriptions of each species follow the key.




**Figs 234–237.** *Trichochermes walkeri*. 234, forewing. 235, ♂ genitalia. 236, head. 237, ♀ terminalia.




**Figs 238–249.** *Trioza* forewings. 238, *abdominalis*. 239, *acutipennis*. 240, *alacris*. 241, *albiventris*. 242, *apicalis*. 243, *centranthi*. 244, *chenopodii* f. *autumnalis*. 245, *chenopodii* f. *aestivalis*. 246, *crithmi*. 247, *curvatinervis*. 248, *flavipennis*. 249, *galii* f. *typica*.




**Figs 250–259.** *Trioza*. 250–255, forewings. 250, *munda*. 251, *proxima*. 252, *remota*. 253, *rhamni*. 254, *salicivora*. 255, *urticae*. 256–259, ♀ terminalia. 256, *abdominalis*. 257, *acutipennis*. 258, *alacris*. 259, *apicalis*.

*Key to species*

1 Forewing (figs 240, 244, 245, 249, 252) with vein $R_s$ short, concave or straight, cutting costal margin proximal to or at the point of branching of vein *M*. Ratio of length vein $R_s$:length vein *M* 0.40–0.73 ..... 2

– Forewing (figs 241, 246, 253) with vein $R_s$ longer, sinuous, cutting costal margin distal to point of branching of vein *M*. Ratio of length vein $R_s$: length vein *M* 0.67–0.92 ... 8

2 Forewing (fig. 240) long and narrow, length:maximum breadth ratio greater than 2.78; surface spinules absent except around vein $Cu_2$. Male paramere in lateral view (fig. 278) simple, parallel sided, almost as long as proctiger. On *Laurus nobilis*.
**alacris** Flor (p.73)

– Forewing (figs 245, 252) broader, length:maximum breadth ratio less than 2.78 (usually much less); surface spinules usually present, if absent (*T. galii* form *typica*) then body coloration shining black. Male paramere in lateral view either not parallel sided (figs 281, 282, 286) or if parallel sided (*T. remota* fig. 289) then approximately half the length of proctiger. On other host plants ..... 3

3 Forewing (figs 244, 249) short and broad; costal margin strongly convex, wing broadest at or before the middle; wing length:head width ratio less than 4.2 ..... 4

– Forewing (figs 243, 252) longer and narrower, costal margin less strongly convex, wing broadest beyond the middle; wing-length: head width ratio greater than 4.2 ..... 6

4 Metatibia with 3 thick black apical spines (arranged 2+1). Antennal length:head width ratio less than 1.7. Forewing (fig. 244) pale dull yellow, with vein $R_s$ more or less straight. Male proctiger in lateral view (fig. 282) with a well-developed posterior lobe; male paramere (fig. 282) without posteriorly directed apical process; apical portion of penis (fig. 282) with highly characteristic sub-apical lobe. Female proctiger (fig. 264) long, proctiger length:head width ratio greater than 0.7. General body coloration dirty yellow or green with brown markings, antennal segments III to VIII more or less unicolorous. On *Atriplex* or *Chenopodium*
**chenopodii** Reuter form **autumnalis** (p.75)
(≡ *chenopodii* sensu stricto)

– Metatibia with 4 (3+1) apical spines. Antennal length:head width ratio greater than 1.75. Forewing (fig. 249) shining yellow with vein $R_s$ concave towards costal margin. Male proctiger (fig. 286) with a weakly developed posterior lobe; male paramere (fig. 286) with posteriorly directed apical process; apex of penis without sub-apical lobe. Female proctiger (fig. 266) shorter, proctiger length:head width ratio less than 0.6. General body coloration shining black; antennal segments III and IV white, remainder shining black. On *Galium* spp. ..... 5

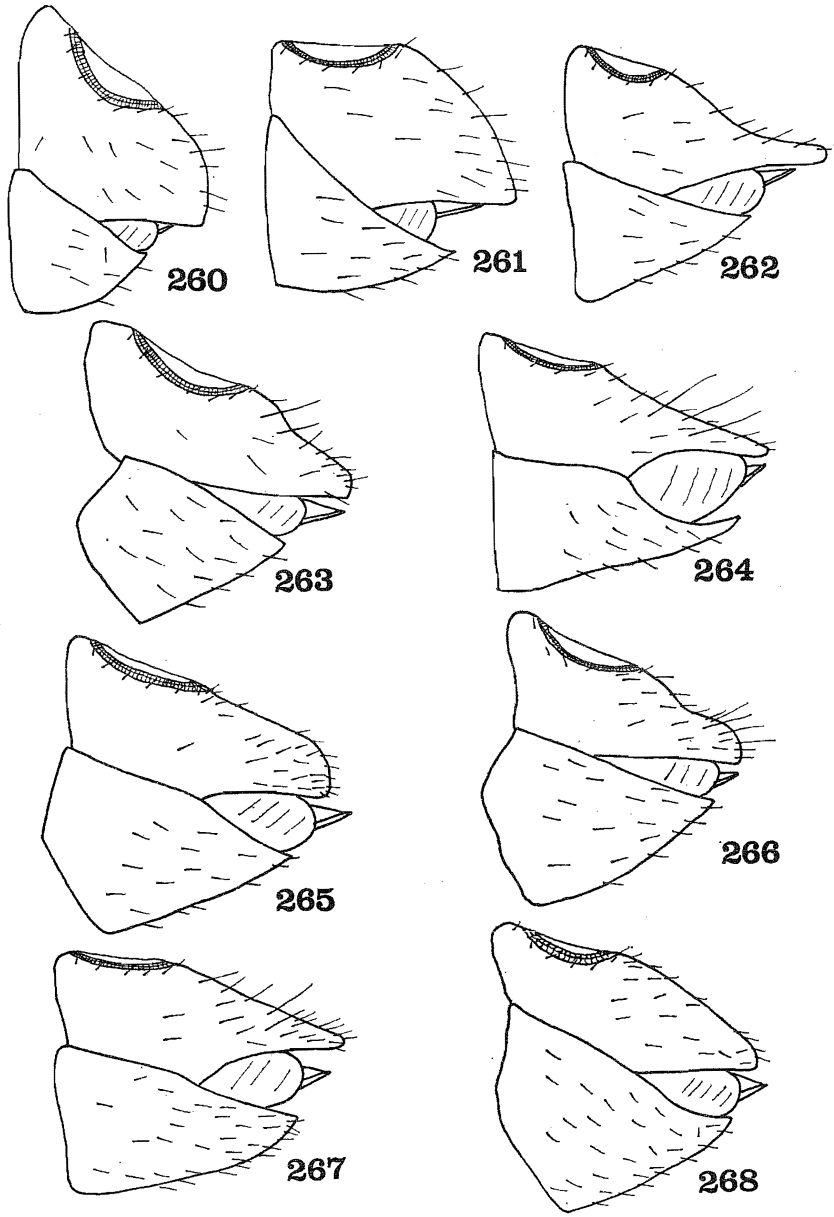
5 Forewing with surface spinules confined to area adjacent to vein $Cu_2$
**galii** Förster form **typica** (p.75)

– Forewing with spinules present throughout apical cells
**galii** Förster form **velutina** (p.75)

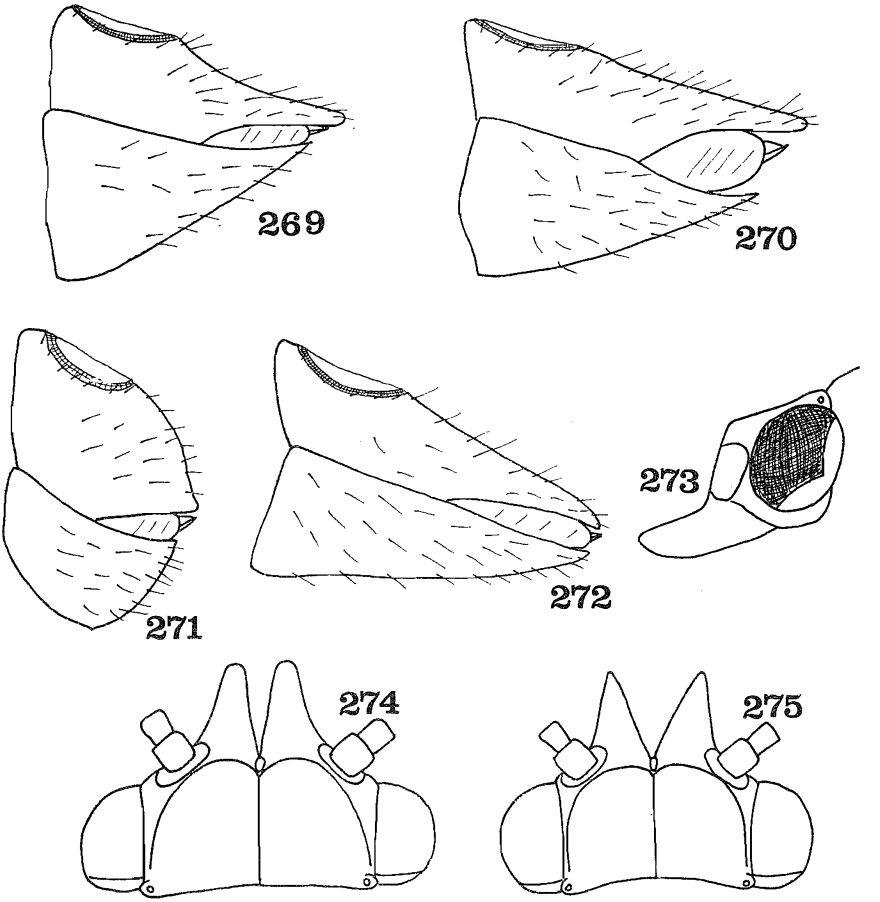
6 Cell $cu_1$ of forewing (fig. 252) short and high, basal width to height ratio less than 1.45. Larger species: forewing length greater than 2.65 mm; head width ♂ 0.52–0.59 mm, ♀ 0.57–0.61 mm. Antennae generally shorter, antennal length:head width ratio 1.46–1.9. Male paramere in lateral view (fig. 289) simple, parallel sided, about half the length of the proctiger. General body coloration reddish with white, brown and black markings. On *Quercus* spp. **remota** Förster (p.75)

– Cell $cu_1$ of forewing (figs 243, 245) longer and lower, basal width to height ratio greater than 1.7. Smaller species; forewing length less than 2.6 mm; head width ♂ 0.4–0.53 mm, ♀ 0.44–0.56 mm. Antennae generally longer, antennal length:head width ratio 1.87–2.23. Male paramere (figs. 281, 282) not parallel sided. General body coloration yellow or yellow-green with brown or black markings. On other host plants ..... 7

7 Metatibia with 3 (arranged 2+1) thick black apical spines. Forewing (fig. 245) with surface spinules largely confined to basal half of wing. Stem of cubitus (vein *Cu*) short; length vein *M*:length vein *Cu* ratio greater than 2.15; vein $R_s$ evenly curved throughout its length. Male proctiger in lateral view (fig. 282) with a well-developed posterior lobe; male paramere in lateral view (fig. 282) tapering to acute apex. Apical portion of penis (fig. 282) with highly characteristic subapical process. Female proctiger (fig. 264) long; proctiger length:head width ratio greater than 0.73; dorsal margin in lateral view approximately straight. On *Chenopodium*, *Atriplex* and *Haliomione* spp. **chenopodii** Reuter form **aestivalis**
(≡ *T. obliqua* Thomson ≡ *T. horvathi* Löw) (p.73)




**Figs 260–268.** *Trioza* ♀ terminalia. 260, *albiventris*. 261, *crithmi*. 262, *curvatinervis*. 263, *centranthi*. 264, *chenopodii*. 265, *flavipennis*. 266, *galii*. 267, *munda*. 268, *proxima*.

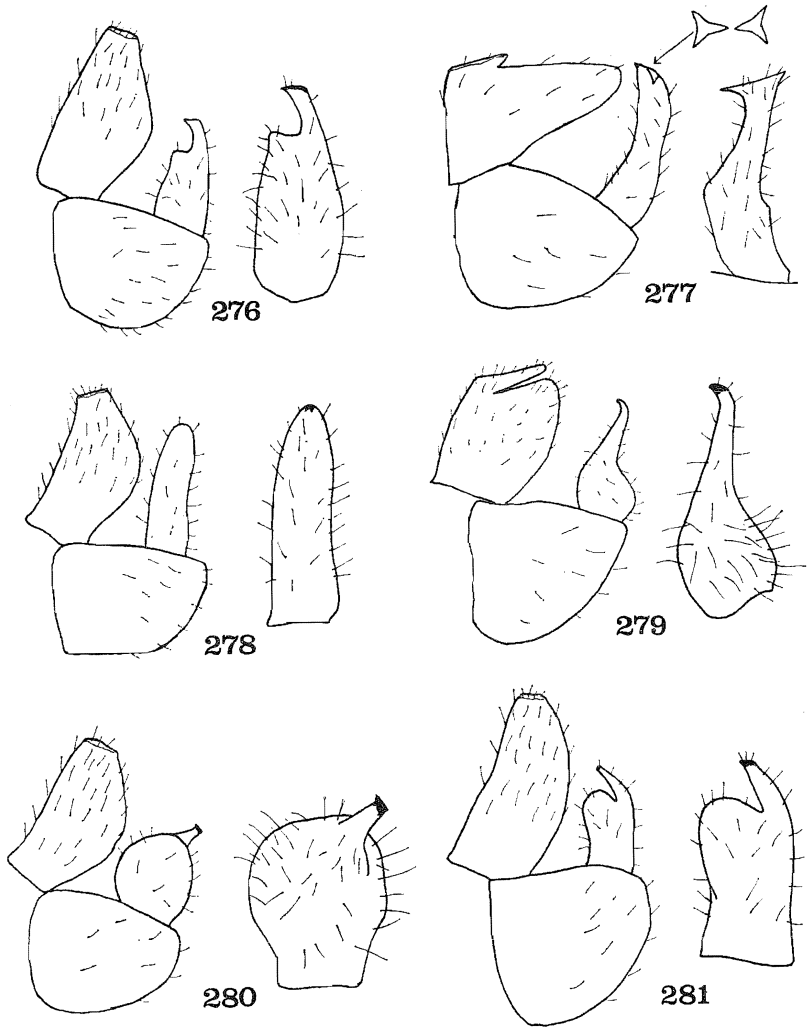



**Figs 269–275.** *Trioza.* 269–272, ♀ terminalia. 269, *remota.* 270, *rhamni.* 271, *salicivora.* 272, *urticae.* 273–275, head. 273, *urticae* lateral. 274, *salicivora.* 275, *urticae.*

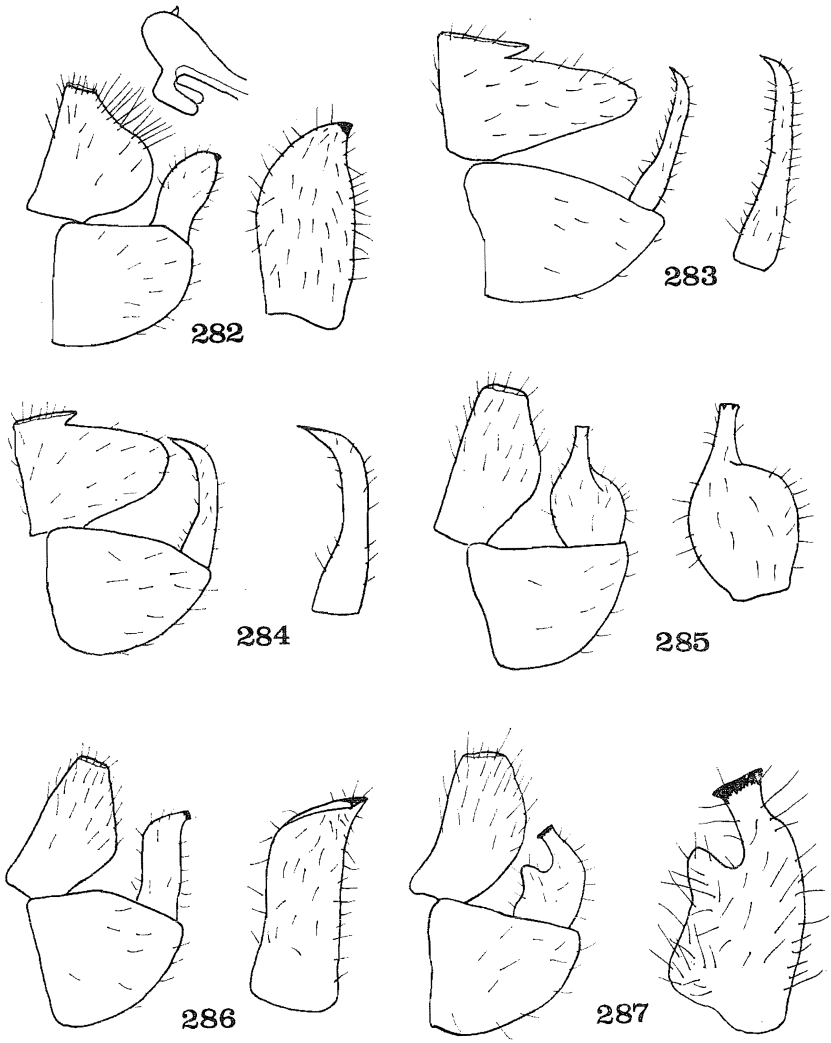
- Metatibia with 4 (3+1) apical spines. Forewing (fig. 243) with surface spinules present throughout; stem of cubitus longer, length vein *M*:length vein *Cu* ratio less than 2.1; vein $R_s$ concave basally, straight apically. Male proctiger (fig. 281) with a weakly developed posterior lobe, male paramere in lateral view (fig. 281) with anterior apex broadly rounded, posterior apex developed into long finger-like process; apical portion of penis without subapical process. Female proctiger (fig. 263) shorter; proctiger length:head width ratio less than 0.72; dorsal margin concave in apical third. On *Valerianella* or *Centranthus* spp. **centranthi** (Vallot) (p.73)

8 Metatibia with 4 thick black apical spines (arranged 3+1).....9
- Metatibia with 3 thick black apical spines (arranged 2+1).....14

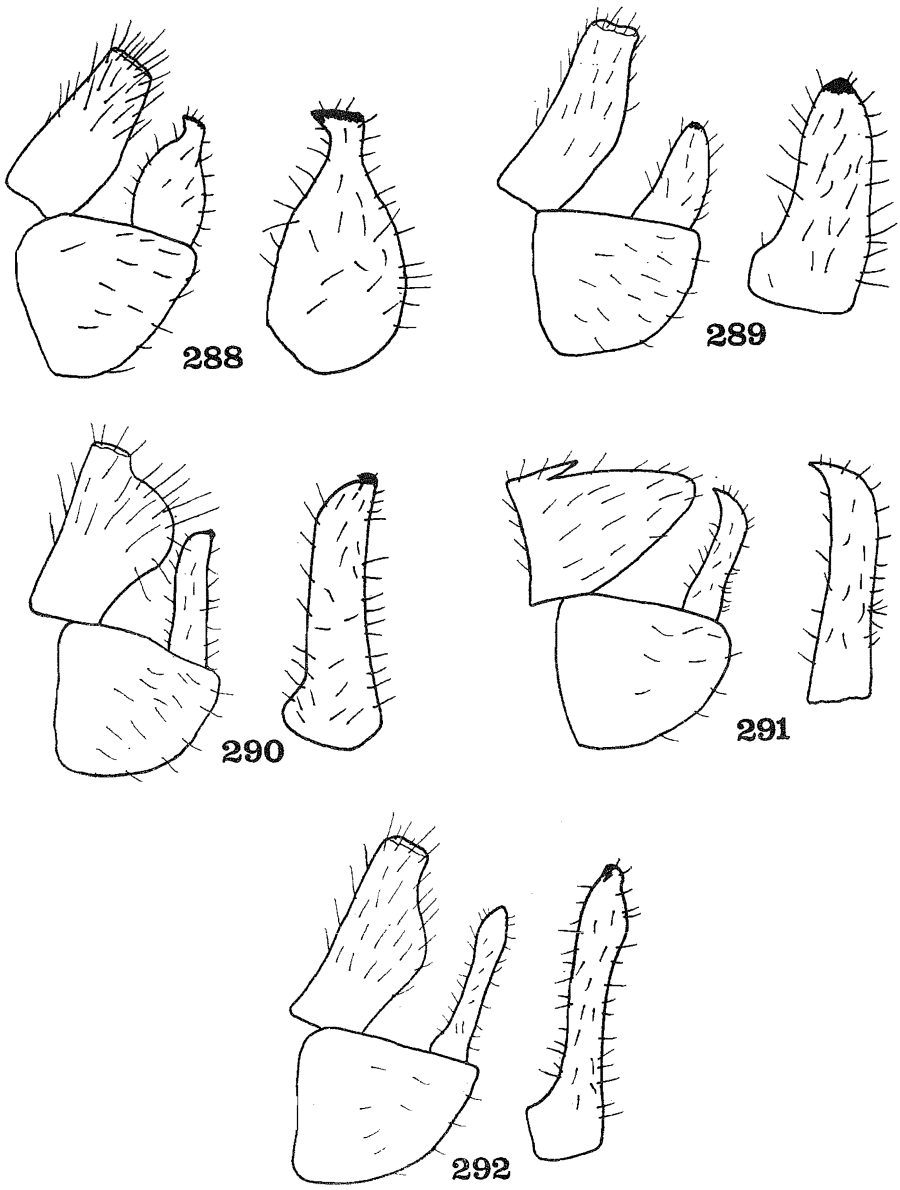
9 Forewing (fig. 255) with surface spinules confined to base of vein $Cu_2$. Antenna long antennal length:head width ratio greater than 1.64, antennal segment III length: head width ratio greater than 0.45. Metatibia long, metatibial length:head width ratio greater than 1.2. Genal cones (fig. 275) widely divergent. Male paramere in lateral




**Figs 276–281.** *Trioza* ♂ genitalia lateral view & right paramere inner view (except *acutipennis*). 276, *abdominalis*. 277, *acutipennis* paramere, posterior view. 278, *alacris*. 279, *albiventris*. 280, *apicalis*. 281, *centranthi*.




**Figs 282–287.** *Trioza* ♂ genitalia lateral view & right paramere inner view. 282, *chenopodii* (apex of penis inset). 283, *crithmi*. 284, *curvatinervis*. 285, *flavipennis*. 286, *galii*. 287, *munda*.




**Figs 288–292.** *Trioza* ♂ genitalia lateral view & right paramere inner view. 288, *proxima*. 289, *remota*. 290, *rhamni*. 291, *salicivora*. 292, *urticae*.

view (fig. 292) long straight and narrow, subequal to length of proctiger, bearing 2 short inwardly directed spines at apex. Female terminalia (fig. 272) relatively long: proctiger length:head width ratio greater than 1.05. On *Urtica* spp.
**urticae** (L.) (p.77)

– Forewing (figs 238, 248, 253) with surface spinules present in all cells. Antennae shorter; antennal length:head width ratio less than 1.64, antennal segment III length: head width ratio less than 0.44. Metatibia shorter, metatibial length:head width ratio less than 1.05. Genal cones (figs 293, 302) not widely divergent. Male paramere (figs 276, 287, 290) either broad basally with a thinner apical projection or short and narrow at most two-thirds the length of proctiger, apex bearing at most a single denticle. Female terminalia shorter; female proctiger length:head width ratio less than 1. On other host plants ..... 10

10 Forewing membrane yellow-orange; surface spinules completely covering membrane, not leaving spinule-free stripes along vein margins (figs 248, 251). General body coloration, rust-red or orange-red. Female proctiger in lateral view (figs. 265, 268) with convex dorsal margin ..... 11

— Forewing membrane clear; surface spinules absent from narrow bands adjacent to veins (figs 238, 253). General body coloration yellow, green, chocolate-brown, occasionally with waxy bloom (*T. rhamni*). Female proctiger in lateral view (figs 256, 270) with approximately straight dorsal margin ..... 12

11 Forewing (fig. 248) with apex angular. Antennae longer, antennal length:head width ratio greater than 1.35. Male paramere in lateral view (fig. 285) with anterior apex developed as finger-like process. On *Aegopodium*
**flavipennis** Förster (p.75)

— Forewing (fig. 251) with apex rounded, not angular. Antennae shorter, antennal length: head width ratio less than 1.35. Male paramere in lateral view (fig. 288) with apex formed by anteriorly directed beaklike process. On *Hieracium*
**proxima** Flor (p.76)

12 Forewing (fig. 253) with vein $R_s$ strongly sinuous, and curved distally towards vein $M_{1+2}$; length vein $R_s$:length vein $M$ ratio greater than 0.79; radular spinules prominent, dark brown or black; cell $m_2$ short, length of vein $M_{1+2}$:length vein $M$ ratio less than 0.36; wings long, greater than 2.41 mm in ♂ zr 2.56 mm in ♀. Antennae short, antennal length:head width ratio less than 1.29, antennal segment III length: head width ratio less than 0.28. Male paramere in lateral view (fig. 290) slender, approximately parallel sided, without large apical processes. Body often with waxy bloom. On *Rhamnus*
**rhamni** (Schrank) (p.76)

— Forewing (figs 238, 250) with vein $R_s$ weakly sinuous, not markedly curved distally towards vein $M_1{}^+{}_2$; length vein $R_s$:length vein $M$ ratio less than 0.79; radular spinules not prominent, scarcely darker than surrounding membrane; cell $m_2$ longer, length vein $M_{1+2}$:length vein $M$ ratio greater than 0.37; wings shorter, less than 2.4 mm in ♂ or 2.5 mm in ♀. Antennae longer, antennal length:head width ratio greater than 1.29, antennal segment III length:head width ratio greater than 0.3. Male parameres in lateral view (figs 276, 287) broad basally, with conspicuous apical processes. Body without waxy bloom. On other host plants ..... 13

13 Male paramere in lateral view (fig. 287) with large subapical anterior lobe. On *Knautia*, *Succisa*, and *Scabiosa* spp.
**munda** Förster (p.76)

— Male paramere in lateral view (fig. 276) without anterior lobe, apex forming anteriorly directed, beak-like process. On *Chrysanthemum* spp. or *Alchemilla vulgaris* agg.
**abdominalis** Flor (p. 72)

14 Forewing (fig. 239) with membrane bright shining yellow-orange; costal margin strongly convex throughout; surface spinules completely covering the membrane, not leaving spinule free stripes along veins. Male paramere in lateral view (fig. 277) long, apex not markedly curved anteriorly; in dorsal view (fig. 277) apex forming tri-radiate star. Outer apical angle of antennal segments IV and VI dilated in region of rhinaria. General body coloration dark brown or black. on *Potentilla palustris* or *Alchemilla* spp.
**acutipennis** (Zetterstedt (p.73)

— Forewing (figs 241, 247, 254) with membrane clear or at most with pale yellow tinges (*T. salicivora*); costal margin less strongly convex; surface spinules when present leaving spinule free bands along the veins. Male parameres in lateral view either short and rounded (fig. 280), broad basally with long anterior process (fig. 279) or long with apex curved anteriorly (fig. 284); in dorsal view apex not forming tri-radiate star. Outer apical angle of antennal segments IV and VI not dilated.

General body coloration green or yellow, often with brown markings, or multicoloured brown, cream, rust-red and black. On other host plants.....15

15 Forewing membrane (figs 246, 247) with surface spinules absent.....16

— Forewing membrane (figs 241, 242, 254) with surface spinules present in all cells....17

16 Genal cones (fig. 300) short, less than 0.65 times length of vertex. Forewing (fig. 246) relatively short, less than 2.77 mm; wing length:head width ratio less than 4.5. Male proctiger lateral view narrowly triangular (fig. 283), paramere with apex weakly curved anteriorly (fig. 283). Female proctiger (fig. 261) with dorsal margin becoming almost vertical in apical half. General body coloration yellow to pale orange, with brown markings on dorsal sclerites in older specimens. On *Crithmum maritimum* **crithmi** Löw (p.75)

— Genal cones (fig. 301) longer, greater than 0.65 times length of vertex. Forewing (fig. 247) relatively longer, greater than 2.8 mm; wing length:head width ratio greater than 4.8. Male proctiger in lateral view (fig. 284) broadly triangular, male paramere (fig. 284) with apex strongly curved anteriorly. Female proctiger (fig. 262) with dorsal margin sinuous not vertical. Body multicoloured, creamy white, rust red, orange-brown and black. *On Salix* spp. **curvatinervis** Förster (p.75)

17 General body coloration green or yellow-green, occasionally with light brown markings; antennae pale, with apices of segments darkened. Genal cones pale, less than 0.7 times length of vertex. Vertex long, length:width ratio greater than 0.64. Forewing (fig. 242) with surface spinules dense, leaving only narrow spinule free stripes along margin of veins. Male proctiger in lateral view (fig. 280) simple; male paramere (fig. 280) small and round with short, posteriorly directed, inner apical process. Female proctiger in lateral view (fig. 259) longer, dorsal margin weakly convex. Smaller species: head width ♂ 0.48–0.52 mm, ♀ 0.49–0.54 mm; wing length less than 2.5 mm. On Umbelliferae **apicalis** Förster (p.73)

— General body coloration multicoloured; creamy white, brown, rust-red, orange and black; antennae with segments I–III creamy white, remainder black. Genal cones black, at least 0.75 times length of vertex. Vertex relatively short, length:width ratio less than 0.64. Forewing (figs 241, 254) with surface spinules relatively sparse and scattered, leaving broad spinule-free stripes along margins of veins. Male proctiger in lateral view (figs 279, 291) with posterior margin lobed; male paramere (figs 279, 291) either rounded basally with apex drawn out as a long sinuous processor long or slender with anteriorly curved apex. Female proctiger in lateral view (figs 260, 271) short, dorsal margin strongly convex. Larger species, head width ♂ 0.52–0.61 mm, ♀ 0.56–0.63 mm; wing length greater than 2.7 mm. On *Salix* spp.....18

18 Male proctiger in lateral view (fig. 291) broadly triangular, without deep subapical cleft in posterior margin; male paramere in lateral view (fig. 291) long, and narrow approximately parallel sided, apex curved anteriorly. Female proctiger in lateral view (fig. 271) not markedly overhanging ventral valve; length of anus shorter than remainder of proctiger. Ventral sclerites of abdomen usually brown or black, only very occasionally creamy white. On broad leaved Salices **salicivora** Reuter (p.76)

— Male proctiger in lateral view (fig. 279) with posterior lobe broadly rounded and with a deep subapical cleft in posterior margin; male paramere in lateral view (fig. 279) rounded basally with apex drawn out as a long sinuous process. Female proctiger in lateral view (fig. 260) overhanging the ventral valve; length of anus approximately equal to remainder of proctiger. Ventral abdominal segments invariably creamy white. On narrow leaved Salices **albiventris** Förster (p.73)

## Confirmatory descriptions of *Trioza* species

*Trioza abdominalis* Flor

Size: HW ♂ 0.46–0.51 mm, ♀ 0.44–0.52 mm; WL ♂ 1.84–2.16 mm, ♀ 1.94–2.19 mm. Genal cones (fig. 293) short, conical, GCV=0.5–0.79; AHR=1.15–1.57. Forewing membrane (fig. 238) clear or slightly yellow, veins yellow; vein $R_s$ long, CUR=1.37–1.61, WLHW=3.69–4.91. Male genitalia fig. 276; female terminalia fig. 256; FPHW=~0.83. General body coloration: young specimens with head and dorsum of thorax orange-red with pale markings; abdomen green; antennae pale yellow, three apical segments dark brown; in older specimens body brown with yellow or pale orange markings.

*Rare, Aviemore Scotland, Northumbria. Northern and west-central Europe, European U.S.S.R.*

*Trioza acutipennis* (Zetterstedt)

Size: HW ♂ 0.56–0.61 mm, ♀ 0.57–0.63 mm; WL ♂ 2.34–2.66 mm, ♀ 2.44–2.64 mm. Genal cones (fig. 294) slender, GCV = 0.6–0.83, AHR = 1.59–1.85. Forewing membrane (fig. 239) amber, veins concolorous, vein $R_s$ long, CUR = 1.46–2, WLHW = 3.97–4.8. Male genitalia fig. 277; female terminalia fig. 257. General body coloration: young specimens dark orange-red with brown or black markings; older specimens black dorsally with orange patches on lateral extremities of pronotum and around wing bases, orange-red to black ventrally. Antennae with segments I, II, VII, IX and X black, remainder largely pale.

*Uncommon but widely distributed in Britain. Throughout northern and central Europe, Siberia.*

*Trioza alacris* Flor

Size: HW ♂ 0.46–0.56 mm, ♀ 0.52–0.56 mm; WL ♂ 2.38–2.99 mm, ♀ 2.63–3.12 mm. Genal cones (fig. 295) short, conical, GCV = 0.41–0.63; AHR = 1.33–1.62. Forewing (fig. 240) long and narrow, membrane clear or occasionally slightly yellow, veins yellow; radular spinules dark brown, prominent; vein $R_s$ short, CUR = 1.91–2.43, WLHW = 4.78–6.26. Metatibia with 2+1 apical spines. Male genitalia fig. 278, female terminalia fig. 258; FPHW = 0.84–0.92. General body coloration: young specimens orange-yellow with darker orange markings; older specimens yellow or orange-yellow with brown markings. Antennae orange-yellow with two apical segments black.

*An introduced species locally common in nurseries and gardens in S. England, extending northwards to N. Wales. Widely distributed throughout Europe, Crimea, Georgia, N. America (introduced), Chile (introduced), Argentina (introduced).*

*Trioza albiventris* Förster

Size: HW ♂ 0.56–0.61 mm, ♀ 0.57–0.63 mm; WL ♂ 2.81–3.03 mm, ♀ 2.95–3.11 mm. Genal cones (fig. 296) black long, slender, not divergent, GCV = 0.76–1, AHR = 1.45–1.81. Forewing membrane (fig. 241) clear to faint yellow, veins yellow; vein $R_s$ long, CUR = 1.18–1.89, WLHW = 4.76–5.3. Male genitalia fig. 279; female terminalia fig. 259, FPHW = 0.53–0.63. Body multicoloured, orange, red, yellow-brown and black, abdomen dark above, creamy white beneath. Antennal segments I–III creamy white, remainder black. Older specimens often have whole dorsal surface black.

*Common throughout Britain. Widely distributed in Europe, Anatolia, Mongolia, Caucasus, Turkmenia, Siberia.*

*Trioza apicalis* Förster

Size: HW ♂ 0.48–0.52 mm, ♀ 0.49–0.54 mm; WL ♂ 2.06–2.32 mm, ♀ 2.25–2.4 mm. Genal cones (fig. 297) short, conical, GCV = 0.3–0.62, AHR = 1.3–1.54. Forewing membrane (fig. 242) clear to faint yellow, veins yellow; vein $R_s$ long, CUR = 1.19–1.35, WLHW = 4.15–4.88. Male genitalia fig. 280, female terminalia fig. 260. FPHW = 0.6–0.81. General body coloration green or yellow-green, occasionally with light brown markings in older specimens. Antennae concolorous with body except segments VIII–X which are black.

*Uncommon, appears to be more abundant in S. England. Northern and central Europe, European U.S.S.R., Caucasus.*

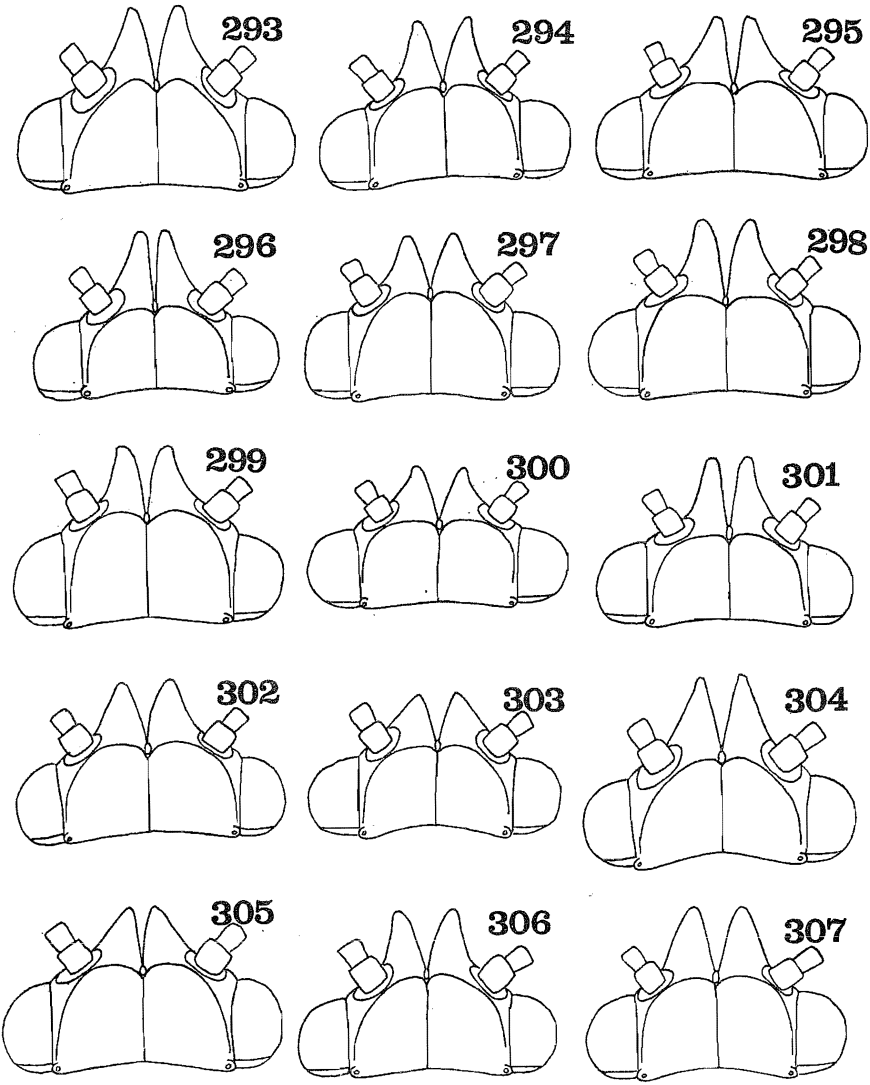
*Trioza centranthi* (Vallot)

Size: HW ♂ 0.49–0.52 mm, ♀ 0.51–0.56 mm; WL ♂ 1.97–2.46 mm, ♀ 2.2–2.6 mm. Genal cones (fig. 298) slender, GCV = 0.6–0.75, AHR = 1.87–2.23. Forewing membrane (fig. 243) clear, veins yellow, vein $R_s$ short, CUR = 1.75–2.03, WLHW = 4.2–4.82. Male genitalia fig. 281, female terminalia fig. 261, FPHW = ~0.68. General body coloration: young specimens yellow-orange with pale markings, abdomen with brown markings dorsally; older specimens yellow with light to dark brown markings on dorsal surfaces. Antennae with segments I–III yellow, remainder brown.

*Rare and local throughout Britain. Widely distributed in Europe, Caucasus, Transcaucasus, Moldavia.*

*Trioza chenopodii* Reuter

A dimorphic species existing as a long wing summer form (*aestivalis*) and a short wing autumn-winter form (*autumnalis*).




**Figs 293–307.** *Trioza* heads, dorsal. 293, *abdominalis*. 294, *acutipennis*. 295, *alacris*. 296, *albiventris*. 297, *apicalis*. 298, *centranthi*. 299, *chenopodii*. 300, *crithmi*. 301, *curvatinervis*. 302, *flavipennis*. 303, *galii*. 304, *munda*. 305, *proxima*. 306, *remota*. 307, *rhamni*.

Form *aestivalis*. Size: HW ♂ 0.4–0.52 mm, ♀ 0.44–0.51 mm; WL ♂ 1.72–2.24 mm, ♀ 2.06–3.32 mm. Genal cones (fig. 299) short, GCV=0.52–0.79, AHR=1.87–2.04. Forewing (fig. 245) relatively long membrane, slightly yellow, veins concolorous, vein $R_s$ short, CUR=1.71–2.26, WLHW=4.15–5.16. Male genitalia fig. 282, female terminalia fig. 262; FPHW=0.73–0.85. General body coloration: young specimens yellow or yellow-green with brown markings abdomen often green; in older specimens the dorsum is often uniformly dark brown. Antennal segments II–V pale, remainder brown or black.

Form *autumnalis*. Size: HW ♂ 0.45–0.53 mm, ♀ 0.47–0.52 mm; WL ♂ 1.41–1.6 mm, ♀ 1.5–1.62 mm. Genal cones as in *aestivalis*, AHR=1.43–1.66. Forewing (fig. 244) relatively short, membrane slightly yellow, veins concolorous, vein $R_s$ short, CUR=1.41–2.2, WLHW=2.83–3.51. Genitalia as in *aestivalis*. General body coloration similar to *aestivalis* but abdomen rarely green.

*Uncommon, England north to Northumbria. Throughout Europe, Canaries, Moldavia, Japan, N. India.*

*Trioza crithmi* Löw

Size: HW ♂ 0.56–0.63 mm, ♀ 0.58–0.63 mm; WL ♂ 2.19–2.62 mm, ♀ 2.5–2.75 mm. Genal cones (fig. 300) short, conical, GCV=0.45–0.5, AHR=1.69–2.16. Forewing (fig. 246) with membrane clear, veins yellow, vein $R_s$ long, CUR=1.35–1.82, WLHW=3.97–4.48. Male genitalia fig. 283; female terminalia fig. 263; FPHW=0.56–0.66. General body coloration: younger specimens yellow with orange or pale brown markings, abdomen occasionally green; older specimens orange-yellow with dark brown markings. Antennal segments I–III pale, remainder dark brown to black.

*Uncommon, a coastal species, mainly confined to S. England but extending northwards to Anglesey. Ireland. France, Yugoslavia, Turkey.*

*Trioza curvatinervis* Förster

Size: HW ♂ 0.54–0.59 mm, ♀ 0.54–0.6 mm; WL ♂ 2.8–3.11 mm, ♀ 2.84–3.19 mm. Genal cones (fig. 301) somewhat variable, in English and Irish specimens invariably black, in N. Scottish specimens white, GCV=0.71–1, AHR=1.61–2.28. Forewing (fig. 247) with membrane clear, veins yellow to brown, vein $R_s$ long, CUR=1.22–1.7, WLHW=4.97–5.7. Male genitalia fig. 284, female terminalia fig. 264; FPHW=0.6–0.78. General body coloration: younger specimens creamy white with orange, rust-brown and black markings; older specimens multicoloured orange-yellow, brown, rust-red, brown, creamy white and black. Antennal segments I–III creamy white, remainder black. Hodkinson (1974a) described the British form of this species as a distinct subspecies *silvarnis*, based on the fact that British specimens had long, proximate, black genal cones whereas the European form had short, white, conical genal processes. We recently collected specimens of *T. curvatinervis* from Glen Affric, Scotland, which have genal cones somewhat intermediate between the two designated subspecies. Furthermore, these specimens have broader forewings than is normal for the species.

*Uncommon, throughout Britain, Ireland. Throughout Europe except in extreme south, Georgia, Japan.*

*Trioza flavipennis* Förster

Size: HW ♂ 0.47–0.56 mm, ♀ 0.51–0.55 mm; WL ♂ 1.97–2.65 mm, ♀ 2.3–2.35 mm. Genal cones (fig. 302) short, conical, GCV=0.48–0.65, AHR=1.48–1.6. Forewing (fig. 248) membrane amber-coloured, veins concolorous, veins $R_s$ long, CUR=1.24–1.5, WLHW=3.58–4.33. Male genitalia fig. 285. Female terminalia fig. 265; FPHW=~0.65. General body coloration reddish orange throughout, abdomen occasionally green. In older specimens dorsum or thorax may become orange-brown. Antennal segments IX, X and apex of VIII black to dark brown, remainder yellow-orange.

*Rare, known only from Stocksfield, Northumbria, and Blundellsands, Merseyside (galls only). Throughout Europe, Baltic regions of European U.S.S.R.*

*Trioza galii* Förster

A dimorphic species with form *velutina* having surface spinules present on the forewing and form *typica* having spinules absent. Size: HW ♂ 0.49–0.57 mm, ♀ 0.5–0.63 mm; WL ♂ 1.86–2.22 mm, ♀ 1.66–2.3 mm. Genal cones (fig. 303) short, conical, GCV=0.5–0.79, AHR=1.78–2.11. Forewing (fig. 249) short, membrane shining yellow

veins concolorous, vein $R_s$ short, CUR=1.52–2, WLHW=3.25–4.26. Male genitalia fig. 286, female terminalia fig. 266; FPHW=0.53–0.57. General body coloration: young specimens brown throughout; older specimens shining black throughout. Antennal segment III creamy white, remainder black.

*Locally common in Britain. Widely distributed throughout Europe, Caucasus, Kazakhstan, Turkmenia, Siberia, Japan.*

*Trioza munda* Förster

Size: HW ♂ 0.47–0.55 mm, ♀ 0.48–0.55 mm; WL ♂ 2.09–2.4 mm, ♀ 2.2–2.48 mm. Genal cones (fig. 304) long and slender, GCV=0.5–0.75, AHR=1.31–1.7. Forewing (fig. 250) membrane clear or faintly yellow, veins yellow, vein $R_s$ long, CUR=1.29–1.64, WLHW=4.2–4.77. Male genitalia fig. 287, female terminalia fig. 267; FPHW=0.77–0.93. General body coloration: young specimens yellow-orange with darker orange markings, abdomen green or yellow; older specimens yellow orange with brown markings on dorsum. Antennal segments I, apex of VIII, IX and X brown to black, remainder yellow.

*Rare, all available records are from Scotland and N. England. Northern and central Europe, Mongolia, Japan.*

*Trioza proxima* Flor

Size: HW ♂ 0.46–0.49 mm, ♀ 0.45–0.57 mm; WL ♂ 1.69–2.1 mm, ♀ 1.64–2.34 mm. Genal cones (fig. 305) short, conical, GCV=0.32–0.67, AHR=0.98–1.23. Forewing (fig. 251) with membrane yellow to amber, veins concolorous, vein $R_s$ long, CUR=1.13–1.5, WLHW=3.22–4.5. Male genitalia fig. 288, female terminalia fig. 268; FPHW=0.65–0.83. General body coloration reddish orange throughout. In older specimens dorsum of thorax may become orange-brown. Antennal segments IX, X and apex of VIII dark brown to black, remainder yellow orange.

*Rare, known only from a single nymph taken at Penshaw Hill, Durham. Northern and Central Europe, Spain, north-western region of European U.S.S.R.*

*Trioza remota* Förster

Size: HW ♂ 0.52–0.59 mm, ♀ 0.55–0.61 mm; WL ♂ 2.69–3.03 mm, ♀ 2.8–3.28 mm. Genal cones (fig. 306) black, slender, GCV=0.61–0.85, AHR=1.46–1.9. Forewing (fig. 252) long, membrane clear or slightly fumate, veins yellow to brown, vein $R_s$ short, CUR=1.18–1.44, WLHW=4.71–5.71. Male genitalia fig. 289, female terminalia fig. 269; FPHW=0.66–0.86. General body coloration brownish red with creamy markings; abdomen occasionally dark brown above in older specimens. Antennal segments II and III dirty yellow, remainder brown or black.

*Common and widely distributed throughout Britain. Widely distributed throughout Europe, European U.S.S.R., Georgia, Algeria, Japan.*

*Trioza rhamni* (Schrank)

Size: HW ♂ 0.5–0.57 mm, ♀ 0.5–0.57 mm; WL ♂ 2.44–2.7 mm, ♀ 2.6–2.76 mm. Genal cones (fig. 307) slender, yellow, GCV=0.56–0.81, AHR=0.98–1.29. Forewing (fig. 253) with membrane clear, veins yellow, radular spinules dark brown to black, conspicuous, forming distinct spots round margin of wing, vein $R_s$ long, CUR=1.5–2.09, WLHW=4.44–5.41. Male genitalia fig. 290, female terminalia fig. 270; FPHW=0.88–0.96. General body coloration: young specimens green to orange green; older specimens orange with dorsum of head, thorax and abdomen chocolate-brown. The true coloration is often obscured by a waxy bloom. Antennal segments IX, X, and apex of VIII black, remainder yellow.

*Locally common in S. England becoming scarcer in the north. The northern limit appears to be the Morecambe Bay area. Central and N. Europe, N. European U.S.S.R., Caucasus.*

*Trioza salicivora* Reuter

Size: HW ♂ 0.52–0.57 mm, ♀ 0.55–0.6 mm; WL ♂ 2.7–2.91 mm, ♀ 2.72–3.05 mm. Genal cones (fig. 274) black, long and slender, GCV=0.75–1, AHR=1.49–1.64. Forewing (fig. 254) with membrane yellowish, veins yellow to brown, vein $R_s$, long CUR=1.28–1.53, WLHW=4.73–5.27. Male genitalia fig. 291, female terminalia fig. 271. FPHW=0.49–0.63. General body coloration orange-red with creamy white and

brown markings on dorsum; abdomen often uniformly dark brown above. Antennal segments I–III creamy white, remainder brown to black.

*Rare, only two adult records, Balmuto, Fife, and Ennerdale, Cumbria. Northern Europe, European U.S.S.R. Ukraine, Irkutsk, Mongolia, Japan, N. America.*

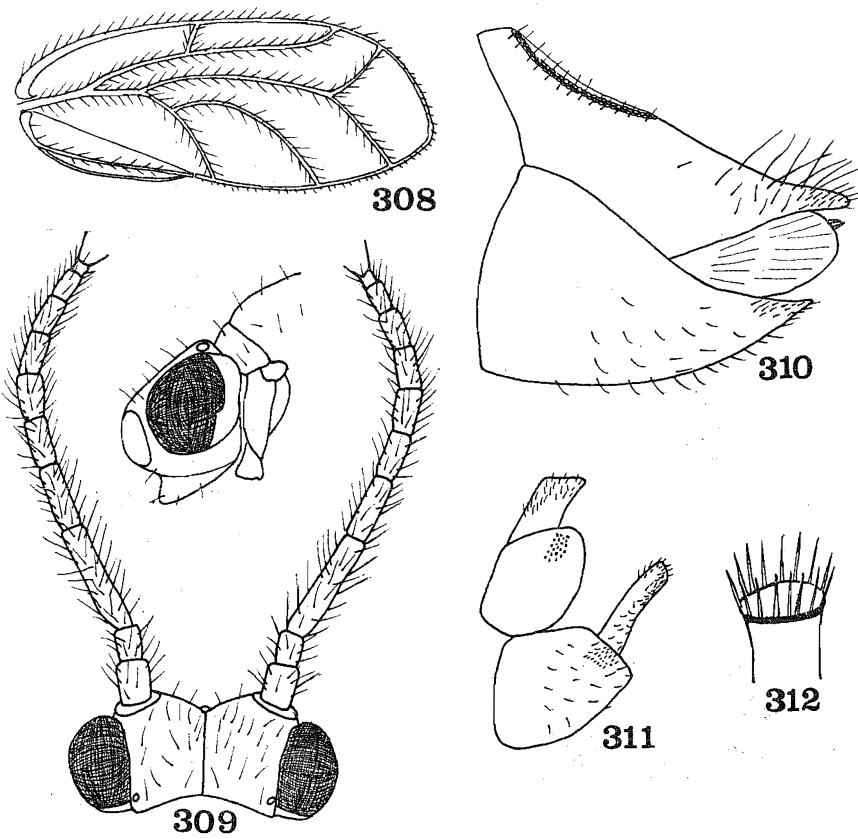
*Trioza urticae* (L.)

Size: HW ♂ 0.49–0.53 mm, ♀ 0.51–0.55 mm; WL ♂ 2.41–2.69 mm, ♀ 2.66–2.88 mm. Genal cones (fig. 275) black, long, slender, divergent. GCV = 0.63–0.92, AHR = 1.64–2.19. Forewing (fig. 255) with membrane pale yellow, veins concolorous, vein $R_s$ long, CUR = 1.38–2.05, WLHW = 4.12–5.51. Male genitalia fig. 292, female terminalia fig. 272; FPHW = 1.05–1.29. General body coloration highly variable. Young specimens yellow or green, with brown and cream markings. Older specimens cream, with brown and black markings.

*Very common throughout Britain. Ireland. Widely distributed across the Palaearctic region but unknown from Japan, N. India, Canaries.*

## Family Carsidaridae

A large family having a mainly tropical distribution. A single species *Homotoma ficus* has been introduced into Britain on fig trees (*Ficus* spp.).




**Figs 308–312.** *Homotoma ficus*. 308, forewing. 309, head. 310, ♀ terminalia. 311, ♂ genitalia. 312, apex of tibia.

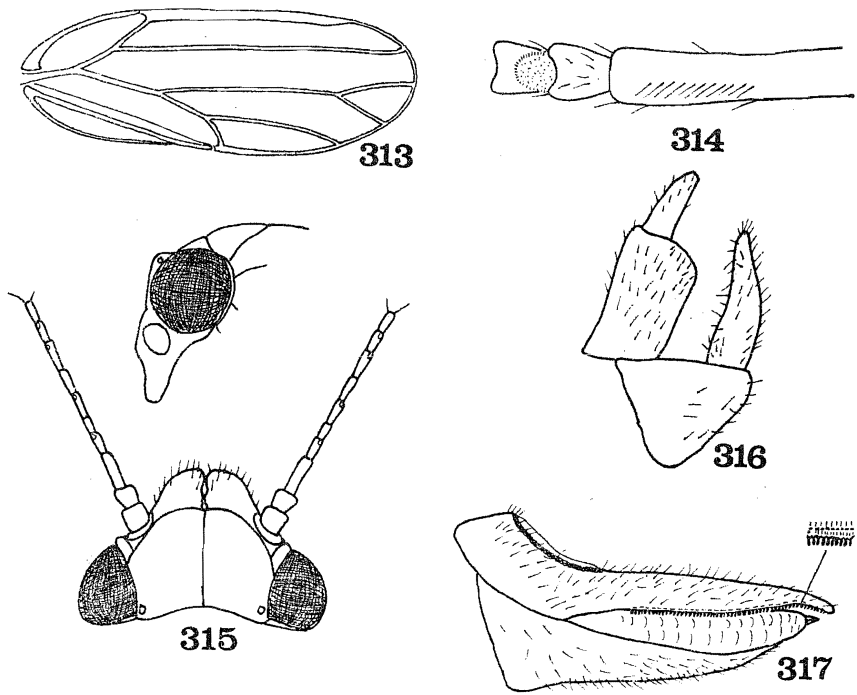
(General body coloration yellow-brown with dark brown markings. Antennae brown basally, becoming black apically. Forewing membrane (fig. 308) transparent but often with faint brown clouds around veins in the apical half of wing; veins generally yellow, costa and ambient vein often with intermittent darker brown markings. Legs yellow brown, apex of tarsi often darkened. HW=0.7–0.96 mm, AHR= 1.8–2.01, WL=3.4–4.3 mm. Male genitalia fig. 311, female terminalia fig. 310

**ficus** (L.)

*Uncommon, appears to be confined to S. England. Jersey. Southern Europe, Austria, France, Switzerland, Albania, Caucasus, Georgia.*

## Family Spondyliaspidae

A large family indigenous to Australasia. A single species *Ctenarytaina eucalypti*, associated with *Eucalyptus* spp., has been introduced into Britain. The genus *Ctenarytaina* Ferris Klyver has previously been placed in the family Psyllidae by Tuthill (1952) but the possession of certain basic characters warrants its inclusion in the Spondyliaspidae (see Helslop-Harrison, 1954; Tuthill & Taylor, 1955). These characters include the bipartite male proctiger, the open pterostigma and the well-developed pre-occipital lobes.




Figs 313–317. *Ctenarytaina eucalypti*. 313, forewing. 314, mesotibia. 315, head. 316, ♂ genitalia. 317, ♀ terminalia.

(General body coloration dark chocolate brown, the humeral regions of the thorax often orange. Antennae pale yellow with apical segment darkened. Forewing membrane (fig. 313) whitish, with a waxy bloom; veins yellow. Legs pale brown. HW= 0.5–0.62 mm, AHR=1–1.05, GCV=0.32–0.45, WL=1.32–1.88 mm. Male genitalia fig. 316, female terminalia fig. 317, with conspicuous denticles on apical part of proctiger) **eucalypti** (Maskell)

*Uncommon on ornamental eucalypts in S. England and Channel Islands. Ireland. Native to Australasia but transported around the world on cultivated* Eucalyptus.

## Appendix I

### A list of psyllid host plants together with references to biology and nymphal descriptions

Nomenclature of host plants follows Tutin *et al.* (1964) (*Flora Europaea*). No distinction has been made between native and non-native host plants as many of the latter have been introduced into this country as ornamentals (see Bean, 1973). Only the main references which make a substantial contribution to our knowledge of the biology of the species are listed: much additional information of a mainly anecdotal nature can be found in many of the references listed in the bibliography. A vast literature has accumulated on the economically important species and the relevant references have been selected. Biological information on certain species (indicated*) given by Lal (1934a) is open to question, as he appears to have confused closely related forms. In the list of nymphal descriptions the letters D, I and S are used to indicate respectively a description, an illustration, and a note on sex determination.

| Species | Host plants | Biology | Nymphal description |
|---|---|---|---|
| *Livia crefeldensis* | *Carex* spp. | — | |
| *Livia juncorum* | *Juncus articulatus* L.<br>*J. conglomeratus* L.<br>*J. gerardii* Lois<br>*J. capitatus* Weigel<br>*J. acutiflorus* Ehrh. ex Hoffm.<br>*J. bulbosus* L.<br>*J. bufonius* L. | Vervier, 1929; Heslop-Harrison, G., 1949a | Heslop-Harrison, G., 1949a (I) |
| *Strophingia cinereae* | *Erica cinerea* L.<br>*Erica arborea* L. | — | Hodkinson, 1973b (D) |
| *Strophingia ericae* | *Calluna vulgaris* (L.) Hull<br>*Erica cinerea* L. | Hodkinson, 1973a, b<br>Parkinson & Whittaker, 1975 | Klimaszewski, 1964 (DI)<br>Hodkinson, 1973b (DIS) |
| *Aphorma bagnalli* | ? | — | — |
| *Camarotoscena speciosa* | *Populus alba* L.<br>*P. nigra* L.<br>*P. tremula* L. | Loginova & Parfentiev, 1958 | — |
| *Rhinocola aceris* | *Acer campestre* L.<br>*A. platanoides* L.<br>*A. tataricum* L. | — | Klimaszewski, 1975 (I) |
| *Aphalara borealis* | *Polygonum tomentosum* Schrank<br>*P. amphibium* L.<br>*P. lapathifolium* L. | — | — |
| *Aphalara exilis* | *Rumex acetosella* L.<br>*R. acetosa* L.<br>*R. scutatus* L. | — | Mally, 1894 (DI); Heslop-Harrison, G., 1949b (I) |
| *Aphalara maculipennis* | *Polygonum aviculare* L.<br>*P. lapathifolium* | — | Mathur, 1975 (DI) |
| *Aphalara polygoni* | *Polygonum aviculare* L.<br>*P. amphibium* L. | — | Mally, 1894 (DI); Heslop-Harrison, G., |

| Species | Host plants | Biology | Nymphal description |
|---|---|---|---|
| | *P. hydropiper* L.<br>*P. persicaria* L.<br>*P. tomentosum* Schrank<br>*Rumex acetosella* L.<br>*R. obtusifolius* L.<br>*R. conglomeratus* Murr. | | 1949 (I); Klimaszewski, 1964, 1975 (I) |
| *Craspedolepta flavipennis* | *Chrysanthemum* spp.<br>*Crepis* spp.<br>*Hypochoeris* spp.<br>*Leontodon* spp. | — | — |
| *Craspedolepta malachitica* | *Artemesia absinthium* L.<br>*A. maritima* L. | — | — |
| *Craspedolepta nebulosa* | *Chamaenerion angustifolium* (L.) Scop. | Lal, 1934a | Lal, 1937 |
| *Craspedolepta nervosa* | *Achillea millefolium* L.<br>*A. ptarmica* L.<br>*A. gerberi*<br>*Artemesia vulgaris* L.? | — | — |
| *Craspedolepta pilosa* | *Artemesia maritima* L.<br>*A. nitrosa* | — | — |
| *Craspedolepta sonchi* | *Sonchus asper* (L.) Hill<br>*Sonchus oleraceous* L.<br>*Leontodon autumnalis* L.<br>*Chrysanthemum leucanthemum* L.<br>*Crepis paludosa* (L.) Moench<br>*Hypochoeris radicata* L.<br>*Senecio aquaticus* Hill<br>*Hieracium* spp. | — | — |
| *Craspedolepta subpunctata* | *Chamaenerion angustifolium* (L.) Scop. | Lauterer & Baudys, 1968 | — |
| *Calophya rhois* | *Cotinus coggygria* Scop.<br>*Rhus coriaria* L. | — | Loginova, 1964 (I); Loginova, 1968 (DI); Klimaszewski, 1964 (D) |
| *Psyllopsis discrepans* | *Fraxinus excelsior* L.<br>*F. ornus* L. | Lal, 1934a*; Heslop-Harrison, G., 1942 | Lal, 1937* (DI); Loginova, 1964 (I) |
| *Psyllopsis distinguenda* | *Fraxinus excelsior* L.<br>*F. angustifolia* Vahl | — | — |
| *Psyllopsis fraxini* | *Fraxinus excelsior* L. | Nguyen, 1970a; Heslop-Harrison, G., 1942; Loginova, 1954 | Nguyen, 1969a (S); Nguyen, 1970 (DI) |
| *Psyllopsis fraxinicola* | *Fraxinus excelsior* L. | Felt, 1911; Lal, 1934*; Heslop-Harrison, G., 1942; Loginova, 1954 | Scott, 1886b (D); Ferris, 1923 (DI) Lal, 1937* (DI) |
| *Arytaina genistae* | *Cytisus scoparius* (L.) Link<br>*Cytisus austriacus* L.<br>*Genista tinctoria* L. | Watmough, 1968a, b | Scott, 1880 (D); Heslop-Harrison, G., 1951b (I); Loginova, 1976a (I) |
| *Arytainilla spartiophila* | *Cytisus scoparius* (L.) Link | Watmough, 1968a, b | — |

| Species | Host plants | Biology | Nymphal description |
|---|---|---|---|
| *Livilla ulicis* | *Genista tinctoria* L.<br>*Ulex europaeus* L.?<br>*Cytisus scoparius* (L.) Link | — | Loginova, 1976a (I) |
| *Psylla alaterni* | *Rhamnus alaternus* L. | — | — |
| *Psylla albipes* | *Sorbus aria* (L.) Crantz<br>*S. aucuparia* L.?<br>*S. caucasigena* | — | — |
| *Psylla alni* | *Alnus glutinosa* (L.) Gaertn.<br>*A. incana* (L.) Moench<br>*A. viridis* DC<br>*A. japonica* Steud<br>*A. hirsuta* Turcz | Lal, 1934a | Ferris, 1925 (DI); Lal, 1937 (DI); Ossiannilsson, 1970 (DS) |
| *Psylla ambigua* | *Salix cinerea* L.<br>*S. caprea* L.<br>*S. aurita* L.<br>*S. incana* Schrank?<br>*S. viminalis* L.? | Lal, 1934a | Lal, 1937 (DI); Ossiannilsson, 1970 (DS) |
| *Psylla bagnalli* | *Juncus* spp.?<br>*Scirpus maritimus* L.? | — | — |
| *Psylla betulae* | *Betula pendula* Roth | — | Ossiannilsson, 1970 (DS) |
| *Psylla brunneipennis* | *Salix caprea* L.<br>*S. aurita* L.<br>*S. cinerea* L.<br>*S. glauca* L.<br>*S. lapponum* L.<br>*S. phylicifolia* L.<br>*S. pentandra* L.?<br>*S. fragilis* L.? | — | Ossiannilsson, 1970 (DS) (as *P. klapaleki*) |
| *Psylla buxi* | *Buxus sempervirens* L.<br>*B. balearica* Lam.<br>*B. macrophylla* Sieb & Zucc. | Lal, 1934a<br>Wilcke, 1941<br>Nguyen, 1963, 1965, 1968, 1969b | Scott, 1881b, (D)<br>Ferris, 1926 (DI)<br>Lal, 1937 (DI); Ramirez-Gomez, 1956a (D); Loginova, 1964 (I); Loginova, 1968 (DI); Nguyen, 1969a (S) |
| *Psylla crataegi* | *Crataegus oxycanthoides* Thuill. | Nguyen, 1963 | Loginova, 1964 (I); Loginova, 1968 (DI); Ossiannilsson, 1970 (DS) |
| *Psylla foersteri* | *Alnus glutinosa* (L) Gaertn.<br>*A. incana* (L.) Moench | Lal, 1934a | Lal, 1937 (DI)<br>Klimaszewski, 1969 (I); Ossiannilsson, 1970 (DIS) |
| *Psylla hartigi* | *Betula pendula* Roth.<br>*B. pubescens* Ehrh.<br>*B. platyphylla* | Koponen, 1973 | Ossiannilsson, 1970 (DS) |
| *Psylla hippophaes* | *Hippophaë rhamnoides* L. | — | Ossiannilsson, 1970 (DS) |
| *Psylla mali* | *Malus sylvestris* Mill. | Awati, 1915; Speyer, 1929a; Przybylski, | Scott, 1886a (D); Speyer, 1929b (D); |

| Species | Host plants | Biology | Nymphal description |
|---|---|---|---|
| | | 1971 | Klyver, 1931 (DI); Lal, 1937 (DI); Ossiannilsson, 1970 (DS) |
| *Psylla melanoneura* | *Crataegus monogyna* Jacq. | Lal, 1934a | Lal, 1937 (DI) |
| | *C. oxycanthoides* Thuill. | Nguyen, 1963; form *taurica* – Lazarev, 1972b | Ossiannilsson, 1970 (DS); Lazarev, 1972a (DI) |
| *Psylla moscovita* | *Salix repens* L.<br>*S. caprea* L.<br>*S. cinerea* L.<br>*S. aurita* L. | — | Ossiannilsson, 1970 (DS) |
| *Psylla peregrina* | *Crataegus monogyna* Jacq. | Missonier, 1956 | Scott, 1880 (D) |
| | *C. oxycanthoides* Thuill. | Nguyen, 1963 | Lal, 1937 (DI); Ossiannilsson, 1970 (DS) |
| *Psylla pruni* | *Prunus spinosa* L.<br>*Prunus domestica* ssp. *insititia* (L.), C. K. Schneid | — | Ossiannilsson, 1970 (DS) |
| *Psylla pulchella* | *Cercis siliquastrum* L. | — | — |
| *Psylla pulchra* | *Salix caprea* L.<br>*S. cinerea* L.<br>*S. purpurea* L.<br>*S. integria* Thunb. | — | Ossiannilsson, 1970 (DS) |
| *Psylla pyri* | *Pyrus communis* L. | Nguyen, 1962, 1964, 1967a, b, 1970b, 1971, 1972a, b, 1973; Lazarev, 1974 | Nguyen, 1969a (S); Ossiannilsson, 1970 (DS) |
| *Psylla pyricola* | *Pyrus communis* L.<br>*Mespilus* sp. | Awati, 1915 Schaefer, 1949b; Swirski, 1954; Wilde, 1965; Burts & Fischer, 1967; McMullen & Jong, 1972 | Scott, 1883b (D); Crawford, 1914 (D); Ramirez-Gomez, 1956a (D); Klyver, 1931 (DI); Lal 1937, (DI); Ball & Jensen, 1966 (IS); Klimaszewski, 1964 (D); Kilmaszewski, 1969, 1975 (I); Ossiannilsson, 1970 (DS) |
| *Psylla pyrisuga* | *Pyrus communis* L. | Brocher, 1926; Wojnarowska, 1962; Lazarev, 1974 | Ossiannilsson, 1970 (DS) |
| *Psylla rhamnicola* | *Rhamnus catharticus* L. | — | Scott, 1878 (D); Ossiannilsson, 1970 (DS) |
| *Psylla saliceti* | *Salix caprea L.*<br>*S. aurita* L.<br>*S. cinerea* L.<br>*S. purpurea* L.<br>*S. incana* Schrank<br>*S. alba* L.?<br>*S. fragilis* L.? | — | — |
| *Psylla sorbi* | *Sorbus aucuparia* L. | — | Ossiannilsson, 1970 (DS) |

| Species | Host plants | Biology | Nymphal description |
|---|---|---|---|
| *Psylla subferruginea* | *Crataegus monogyna* Jacq.<br>*Betula* sp.? | — | Ossiannilsson, 1970 (DS) |
| *Psylla ulmi* | *Ulmus laevis* Pall.<br>*U. glabra* Huds<br>*U. pendunculata* Foug. | — | Klimaszewski, 1964 (I) |
| *Psylla viburni* | *Viburnum lantana* L.<br>*V. dilatatum* Thunb.<br>*V. furcatum* Blume | — | Mathur, 1975 (DI) |
| *Psylla visci* | *Viscum album* L. | — | — |
| *Psylla zetterstedti* | *Hippophaë rhamnoides* L. | — | Ossiannilsson, 1970 (DS) |
| *Spanioneura fonscolombii* | *Buxus sempervirens* L. | — | Scott, 1879 (D) |
| *Trichochermes walkeri* | *Rhamnus catharticus* L.<br>*R. alpinus* L.<br>*R. erythroxylon*<br>*Frangula alnus* Mill. | — | Lal, 1937 (DI); Klimaszewski, 1964, 1967 (I) |
| *Trioza abdominalis* | *Chrysanthemum* sp.<br>*Alchemilla vulgaris* agg. | — | — |
| *Trioza acutipennis* | *Potentilla palustris* (L.) Scop.<br>*Alchemilla xanthoclora* Rothm. | — | Löw, 1887 (D) |
| *Trioza alacris* | *Laurus nobilis* L.<br>*Persea indica* (L.) Sprengel<br>*L. camphora*? | Miles, 1928; Lizer, 1918 | Ramirez-Gomez, 1960 (D); Loginova, 1964, 1968 (I); Lizer, 1918 (DI) |
| *Trioza albiventris* | *Salix alba* L.<br>*S. fragilis* L.<br>*S. triandra*<br>*S. crysostella* | — | — |
| *Trioza apicalis* | *Daucus carota* L.<br>*Peucedanum ostruthium* (L.) Koch<br>*Pastinaca sativa* L.<br>*Anthriscus silvestris* (L.) Hoffm.<br>*Heracleum sphondylium* L.<br>*Laserpitium latifolium* L. | Laska, 1964; Markkula & Laurema, 1971 | — |
| *Trioza centranthi* | *Centranthus ruber* (L.) DC<br>*C. angustifolius* (Miller) DC<br>*C. calcitrapa* Dufresne<br>*Valerianella dentata* (L.) Poll.<br>*V. carinata* Lois<br>*V. rimosa* Bast<br>*V. locusta* (L.) Betcke<br>*Fedia cornucopiae* (L.) Gaertn | André, 1878 | — |
| *Trioza chenopodii* | *Atriplex patula* L.<br>*A. hortensis* L. | — | Mathur, 1975 (as *T. obliqua*) |

| Species | Host plants | Biology | Nymphal description |
|---|---|---|---|
| | *A. littoralis* L.<br>*A. nitens* Schkuhr<br>*A. tatarica* L.<br>*Chenopodium* sp.<br>*Halimione portulacoides* (L.) Aellen | | |
| *Trioza crithmi* | *Crithmum maritimum* L. | — | — |
| *Trioza curvatinervis* | *Salix caprea* L.<br>*S. cinerea* L.<br>*S. purpurea* L. | — | — |
| *Trioza flavipennis* | *Aegopodium podagraria* L. | — | — |
| *Trioza galii* | *Galium palustre* L.<br>*G. verum* L.<br>*G. mollugo* L.<br>*G. uliginosum* L.<br>*G. austriacum* Jacq.<br>*G. aparine* L.<br>*G. parisiense* L. | Boselli, 1929b | Boselli, 1929b, (DI) |
| *Trioza munda* | *Knautia sylvatica* (L.) Duby<br>*Scabiosa lucida* Vill<br>*Succisa pratensis* Moench<br>*Potentilla fruticosa* L.? | — | — |
| *Trioza proxima* | *Hieracium pilosella* L.<br>*H. praealtum* Vill.<br>*Mycelis muralis* (L.) Dum. | — | — |
| *Trioza remota* | *Quercus robur* L.<br>*Q. petraea* (Mattuschka) Liebl. | Sorin, 1959 | Scott, 1886c (D); Vondracek, 1957 (I); Sorin, 1959 (DI); Klimaszewski, 1967 (I) |
| *Trioza rhamni* | *Rhamnus catharticus* L.<br>*R. pallasii* | — | — |
| *Trioza salicivora* | *Salix caprea* L.<br>*S. purpurea* L.<br>*S. nigricans* Sm<br>*S. rosmarinifolia* Gouan<br>*S. babylonica* L.<br>*S. aurita* L. | — | — |
| *Trioza urticae* | *Urtica dioica* L.<br>*U. urens* L.<br>*U. dubia* Forskål | Lal, 1394a; Nguyen, 1963; Onillon, 1969; Davis, 1973 | Ferris, 1925 (DI); Klyver, 1930 (DI); Lal, 1937 (DI); Klimaszewski, 1967, 1969, 1975 (I) |
| *Homotoma ficus* | *Ficus carica* L. | — | Boselli, 1929a (DI); Heslop-Harrison, G., 1949d (I); Loginova, 1964, 1968 (I) |
| *Ctenarytaina eucalypti* | *Eucalyptus globulus* Labill.<br>*E. nitens*<br>*E. perrinearia* Rodway<br>*E. gunnii* Hook | — | Lal, 1937 (DI) |

## Appendix II

Life-history data for the British psyllid species

A detailed summary of the four main types of life-cycle will be found on page 2. The time of adult appearance is based on all available British records. The following symbols have been used: '—' psyllid occurring only on host plant, '+' psyllid occurring on both the host plant and on shelter plants, '0' overwintering psyllid occurring shelter plants alone.

| Psyllid species | Number of generations per year | Overwintering stage A = adult N = nymph E = egg | Type of life-cycle | Time of adult appearance | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | i Jan | ii F | iii M | iv A | v M | vi J | vii J | viii A | ix S | x O | xi N | xii Dec |
| *L. crefeldensis* | ? | ? | ? | | | | | | | | | — | | | |
| *L. juncorum* | ? | A | 3 | — | — | — | | — | — | — | — | — | | — | — |
| *R. aceris* | 1 | N | 2 | | | | | — | — | — | | | | | |
| *C. speciosa* | 1 | A | ? | ? | | | | | | | | | | | |
| *S. cinereae* | 1 | N | 2 | | | | | — | — | — | — | | | | |
| *S. ericae* | 1 or 0.5 | N | 2 | | | | — | — | — | — | — | — | | | |
| *A. bagnalli* | ? | ? | ? | | | | | | | — | — | | — | | |
| *A. borealis* | 1 | A | 4 | | | 0 | 0 | | | | | | | | |
| *A. exilis* | 1 | A | 4 | 0 | 0 | 0 | — | — | — | + | + | + | + | 0 | 0 |
| *A. maculipennis* | 1 | A | 4 | | | | | | | | | | | 0 | |
| *A. polygoni* | 1 | A | 4 | 0 | 0 | 0 | 0 | + | — | — | — | 0 | 0 | 0 | 0 |
| *C. flavipennis* | 1 | N | 2 | ? | | | | | | | | | | | |
| *C. malachitica* | 1 | N | 2 | | | | | — | — | — | — | | | | |
| *C. nebulosa* | 1 | N | 2 | | | | | — | — | — | | | | | |
| *C. nervosa* | 1 | N | 2 | | | | — | — | — | — | — | — | | | |
| *C. pilosa* | 1 | N? | 2 | | | | | | | — | — | — | | | |
| *C. sonchi* | 1 | N | 2 | | | | | | — | — | — | | | | |
| *C. subpunctata* | 1 | N | 2 | | | | — | — | — | | | | | | |
| *C. rhois* | 1 | A? | 3? | ? | | | | | | | | | | | |
| *P. discrepans* | 1 | E | 1 | | | | | | — | — | — | — | — | | |
| *P. distinguenda* | 1 | E | 1 | | | | | | — | — | — | — | — | | |
| *P. fraxini* | 1 | E | 1 | | | | | | — | — | — | — | — | | |
| *P. fraxinicola* | 1 | E | 1 | | | | | | | — | — | — | — | | |
| *A. genistae* | 2 or 3 | A+E | 3 | — | — | — | — | — | — | — | — | — | — | — | — |
| *A. spartiophila* | 1 | E | 1 | | | | — | — | — | — | — | | | | |
| *L. ucilis* | 1 | E? | 1? | | | | | | — | — | | — | | | |
| *P. alaterni* | ? | ? | ? | ? | | | | | | | | | | | |
| *P. albipes* | 1 | E? | 1? | | | | | | — | — | | | | | |
| *P. alni* | 1 | E | 1 | | | | | | — | — | — | — | — | | |
| *P. ambigua* | 1 | N | 2 | | | | — | — | — | — | — | | | | |
| *P. bagnalli* | ? | ? | ? | ? | | | | | | | | | | | |
| *P. betulae* | 1 | E | 1 | | | | | | — | — | — | — | | | |
| *P. brunneipennis* | 1 | A | 4 | | | | | — | — | — | — | + | + | 0 | |
| *P. buxi* | 1 | E | 1 | | | | — | — | — | — | — | | | | |
| *P. crataegi* | 1 | A | 4 | 0 | 0 | 0 | 0 | — | | — | — | | 0 | 0 | 0 |
| *P. foersteri* | 1 | E | 1 | | | | | | — | — | — | — | | | |
| *P. hartigi* | 1 | E | 1 | | | | | — | — | — | — | | | | |
| *P. hippophaes* | 1 | E | 1 | | | | | — | — | — | — | | | | |
| *P. mali* | 1 | E | 1 | | | | — | — | — | — | — | — | — | | |
| *P. melanoneura* | 1 | A | 4 & 3 | + | + | + | + | — | — | + | + | + | + | + | + |
| *P. moscovita* | 1 | A | 3 | — | — | — | — | — | | — | — | — | — | — | — |
| *P. peregrina* | 1 | E | 1 | | | | | — | — | — | — | — | — | | |
| *P. pruni* | 1 | A | 4 | 0 | 0 | | — | — | — | — | | 0 | 0 | 0 | 0 |
| *P. pulchella* | ? | ? | ? | ? | | | | | | | | | | | |
| *P. pulchra* | 1 | A | 4 | 0 | 0 | 0 | + | — | — | — | + | 0 | 0 | 0 | 0 |
| *P. pyri* | 2 or 3? | A | 3 | ? | | | | | | | | | | | |

| Psyllid species | Number of generations per year | Overwintering stage A = adult N = nymph E = egg | Type of life-cycle | Time of adult appearance i Jan | ii F | iii M | iv A | v M | vi J | vii J | viii A | ix S | x O | xi N | xii Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *P. pyricola* | 3 | A | 3 | — | — | — | | | — | — | | — | — | — | — |
| *P. pyrisuga* | 1 | A | 3 | | | | | | | — | | | | | |
| *P. rhamnicola* | 1 | A? | 4? | | | | | | — | — | — | — | — | | 0 |
| *P. saliceti* | 1 | A | 4 | 0 | | | — | — | — | — | — | + | | | 0 |
| *P. sorbi* | 1 | E | 1 | | | | | | — | — | — | — | — | | |
| *P. subferruginea* | 1 | A | 4 | 0 | 0 | 0 | 0 | + | + | | + | 0 | 0 | 0 | 0 |
| *P. ulmi* | 1 | E | 1 | | | | | — | — | — | | | | | |
| *P. virburni* | 1 | E | 1 | | | | | | — | — | — | | | | |
| *P. visci* | 1 | N | 2 | | | | | | — | — | | — | — | | |
| *S. fonscolombii* | 1? | ? | ? | | | | — | | | — | — | — | — | | |
| *T. walkeri* | 1 | A? | 3? | | | | | | — | | — | — | — | | |
| *T. abdominalis* | 1 | ? | ? | | | | | | | — | — | — | | | |
| *T. acutipennis* | 1 | A | 4 & 3 | | | | — | — | | | | — | — | — | 0 |
| *T. alacris* | 1 or 2? | A | 3 | — | — | — | — | — | | — | — | — | — | — | — |
| *T. albiventris* | 1 | A | 4 | 0 | 0 | 0 | 0 | — | — | — | — | | — | + | 0 |
| *T. apicalis* | 1? | A | 4 | 0 | 0 | 0 | | — | — | — | — | 0 | 0 | 0 | 0 |
| *T. centranthi* | 1 | A | 4 | 0 | | | | | | | — | | — | | |
| *T. chenopodii* | 2 | A | 3 | | | | | | — | — | — | — | — | | — |
| *T. crithmi* | 1 | A? | ? | | | | — | | | | — | — | — | | |
| *T. curvatinervis* | 1 | A | 4 | 0 | 0 | 0 | + | — | — | — | | — | — | 0 | 0 |
| *T. flavipennis* | 1? | A? | ? | ? | | | | | | | | | | | |
| *T. galii* | 1 | E or N | ? | | | — | — | — | — | — | — | | | | |
| *T. munda* | 1 | A | 4 | | | 0 | | | | | — | — | | | 0 |
| *T. proxima* | 1? | A? | ? | ? | | | | | | | | | | | |
| *T. remota* | 1 | A | 4 | 0 | 0 | 0 | 0 | — | | | | — | + | 0 | 0 |
| *T. rhamni* | 1 | A | 4 | 0 | 0 | 0 | 0 | — | | — | — | | 0 | 0 | 0 |
| *T. salicivora* | 1 | A | 4 | | | | | | | | — | | | | |
| *T. urticae* | 4 | A | 4 & 3 | + | + | + | + | — | — | — | — | — | — | + | + |
| *H. ficus* | 1 | E | 1 | | | | | | — | — | — | | | | |
| *C. eucalypti* | ? | A | 3 | | — | — | — | | | | — | | — | — | — |

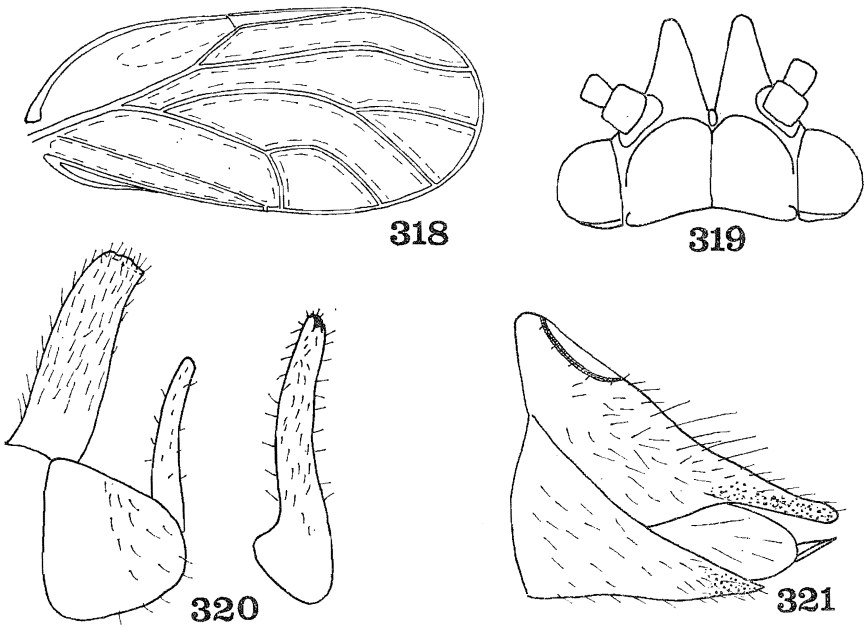
## Appendix III

### Description and separation of *Psylla zetterstedti*

*Psylla zetterstedti* is close to *P. hippophaes* and keys out satisfactorily as far as the second alternative in couplet 9 (p.44). In common with *P. hippophaes* (couplet 10) *zetterstedti* possesses both the bowed paramere (fig. 320) and the long genal cones (fig. 319) and these characters should be used to differentiate it from *P. betulae*, *P. subferruginea*, *P. hartigi* and *P. pruni* (couplets 11–13). However, the general body coloration is red, brown and dirty white and the female proctiger length:ventral valve length ratio is less than 1.76 and this may lead to confusion. Hence the following additional list of *P. zetterstedti* characters should facilitate separation from those species contained in couplets 11–13. Forewing (fig. 318) broad, oblong-oval; pterostigma short spinules absent from narrow bands adjacent to veins, cell $cu_1$ relatively high. Larger species; head width greater than 0.86 mm.

The following couplet will separate *zetterstedti* from *hippophaes:*

1 Forewing (fig. 318) relatively broad basally, cell $c+sc$ large; cell $cu_1$ high, basal width to height ratio less than 1.55; orange-yellow coloration of wing more intense towards apex. Antennal length:head width ratio less than 1.6. Male paramere long and slender




**Figs 318–321.** *Psylla zetterstedti*. 318, forewing. 319, head. 320, ♂ genitalia. 321, ♀ terminalia.

(fig. 320). Ventral valve of female terminalia (fig. 321) relatively long, proctiger length: ventral valve length ratio less than 1.76. General body coloration red and brown, on dirty white to yellow background **zetterstedti** (Thomson)
(HW ♂ 0.86–0.9 mm, ♀ 0.88–0.94 mm; WL ♂ 2.72–2.95 mm, ♀ 3.11–3.34 mm; GCV = 1.08–1.28; AHR = 1.38–1.59; FPHW = 1.36–1.51. Host plant *Hippophae rhamnoides*. Adults appear June and July.)
*Rare. Sandwich Bay, Kent; St Helens, Isle of Wight. Central and N. Europe, Caucasus, Georgia.*

– Forewing (fig. 131) constricted basally, cell $c+sc$ narrower; cell $cu_1$ lower, basal width to height ratio greater than 1.56; yellow coloration usually uniform throughout. Antennal length: head width ratio greater than 1.6. Male paramere (fig. 187) shorter and broader. Ventral valve of female terminalia (fig. 159) relatively short; proctiger length: ventral valve length ratio less than 1.76. General body coloration yellow-green
**hippophaes** Förster

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