

XVI. *Monograph of the British species belonging to the Hemiptera-Homoptera, family Psyllidæ; together with the description of a genus which may be expected to occur in Britain.* By JOHN SCOTT.

[Read 1st March, 1876.]

I HAVE been induced to undertake the present Monograph for two reasons, viz.: first, because such a thing has not previously been attempted, and I therefore thought it desirable for the sake of science to bring together and describe all those species in my own collection as well as those in the collections of others which have been kindly lent for this purpose; secondly, because the Catalogue now in course of publication by the Entomological Society of London will thus be rendered more complete. I have also added translations of the original descriptions of some species which I have not seen, but which were taken by Messrs. Haliday and Walker, and forwarded to Dr. Förster at Aix, where they appeared in the “*Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande*” for 1848. That author’s generic divisions are natural and easy of recognition, but his diagnoses of the various species are meagre in the extreme, and, in many instances, not sufficient to lead to their identity. The same remarks also apply to the descriptions of Meyer-Dür, published in the “*Mittheilungen der schweizerischen entomologischen Gesellschaft*,” vol. iii. On the other hand, Dr. Flor, in his “*Rhynchoten Livlands*,” vol. ii., and in a paper published at Moscow in 1861, under the title “*Zur Kenntniss der Rhynchoten*,” has more than compensated for the incompleteness of the others by the elaborate descriptions he there gives. He is pre-eminently *the* man in this group, and his works have afforded me valuable assistance in determining between species where I had any doubt. I have followed other authors by placing this group where it now stands, but I am not prepared to say that this is its true position, as it possesses some points in common with the true *Cicadidæ*.

The best methods I have found for the capture of these tiny creatures is by sweeping and by beating trees and bushes into a sweeping-net or inverted umbrella. I then put such species as I have found on a particular tree or bush or plant into a small glass tube, of which I carry a quantity ready labelled on which to write with a pencil the name of such tree, bush or plant, so that when I come to set them I am at no loss to know where they came from; and although three or four species may be found on one tree, yet I believe this is accidental, or for the purpose which I shall mention presently, as each species, like the *Aphidæ*, seems to have its special food plant. Dr. Flor and M. Lethierry give many species as found by them upon firs, and these are generally taken in early spring or very late in the season. May they not have assembled there for the purpose of hibernation, as these trees would afford them an excellent retreat? The two seasons would seem to point to this.

In conclusion I may add that I shall be glad to examine and name to the best of my ability any species which may be sent to me for this purpose, as I feel certain I have not yet exhausted the riches of the group.

Family PSYLLIDÆ.

Head, including the eyes, generally broader than long. *Crown* horizontal, or more or less deflected. *Ocelli* three, placed one in front and one near each eye, close to or almost on the posterior margin. *Face* with or without lobes. *Antennæ* 10-jointed, inserted before the eyes; two basal joints stout, generally shortish; remainder filiform; apex of the last joint furnished with two projecting hairs of unequal length. *Eyes* globose, placed on the side of the head.

Thorax: *pronotum* small, collar-shaped; *mesonotum* large, exposed, very convex, divided laterally into three unequal portions; anterior portion more or less shuttle-shaped, posterior portion largest, broad, with a scutelliform process attached to the posterior margin. *Scutellum* minute, rounded posteriorly. *Elytra* fully developed in both sexes; longer than the abdomen, and either acute or rounded at the apex; costal margin with or without a stigma; from the nerve of the external basal cell, whose apex reaches the costal margin before the middle, proceed the following nerves, viz., the radius, generally running

almost parallel with the costal margin to the apex; the cubitus divided into two arms, each of which is bifurcate before reaching the apical and dorsal margin; cubitus with or without a petiole. *Legs* formed for springing; 3rd pair; *coxæ* with a long spine on the underside. *Tibiæ*; 3rd pair with a fringe of very short stout spines at the apex. *Tarsi* 2-jointed, subequal. *Claws* two.

Abdomen with six segments visible from above; genital processes of the ♂ generally pincers-shaped, such as those used by a smith; ♀ with a long, projecting, stout, pointed, ovipositor.

Primary characters of the various genera.

1. Face produced into two lobes of greater or less length. Antennæ 10-jointed; 1st and 2nd joints (except in *Livia*) short, stout, remainder filiform; 3rd generally longest.

Cubitus always divided into two arms, each of which becomes bifurcate before reaching the apex.

<div> <div>Elytra coriaceous, costa without a stigma, cubitus petiolate . . . 1. <i>Livilla</i>.</div> <div> <div>Elytra membranaceous</div> <div>apex rounded</div> <div>lanceolate</div> </div> </div>	{	costa without a stigma, cubitus petiolate . . . 1. <i>Livilla</i> .
		costa with a stigma, cubitus petiolate . . . 2. <i>Arytæna</i> .
		costa with a stigma, cubitus petiolate . . . 3. <i>Psylla</i> .
		costa with a stigma, cubitus petiolate . . . 4. <i>Spanioneura</i> .*
		costa without a stigma, cubitus not petiolate 5. <i>Trioza</i> .

2. Face not lobate.

{	Elytra membranaceous, apex rounded.	{	costa without a stigma, cubitus petiolate . . . 6. <i>Aphalara</i> .
			7. <i>Euphyllura</i> .*
{	Elytra coriaceous, more or less lanceolate.	{	costa with a stigma, cubitus petiolate . . . 8. <i>Rhinocola</i> .
			costa without a stigma, cubitus petiolate . . . 9. <i>Livia</i> .

Genus LIVILLA, Curt.

Head: crown divided into two lobes by a central longitudinal channel; anterior margin of the lobes rounded; disk with a deep fovea on each side. *Ocelli* three, placed one on the posterior margin close to each eye, and one in

* Not a British genus.

front, at the base of the cleft. *Face*: lobes long, stout, almost cylindrical. *Antennæ* longer than the head and thorax; 1—2 joints short, stout; remainder filiform; 3rd about twice as long as the 4th.

Thorax: *pronotum* narrow, collar-shaped, with two foveæ on each side near the lateral margin; *mesonotum* large, exposed, flattish convex, divided into three irregular portions by two transverse channels. *Elytra* coriaceous; longitudinally ovate, convex; transversely very convex; costa without a stigma.

Species 1. *Livilla ulicis*.

Livilla Ulicis, Curt. B. E. 625, and pl.; Först. Verh. Ver. Rheinl. v. 68, 1; *Livilla coleoptrata*, Klug, Isis, 277 (1837).

Deep pitchy-brown, shining.

Head: *crown* deep chestnut or black, divided longitudinally into two lobes by a central channel; anterior margin of the lobes rounded, posterior margin concave. *Face*: lobes long, stout, almost cylindrical to the slightly narrowed and rounded apex; clothed with very fine hairs. *Antennæ* black; 1—4 joints yellow or yellowish-white; apex of the 4th frequently brown.

Thorax: *pro-* and *meso-notum* and *scutellum* black. *Elytra* coriaceous, deep pitchy-brown; finely wrinkled transversely; nerves black; costa without a stigma. *Wings* small, fuscous. *Legs* yellow. *Thighs*: 3rd pair brown, apex pale. *Claws* dark brown.

Abdomen above black.

Length 1—1 $\frac{1}{4}$ line.

A perfect anomaly, and when at rest more resembling a seed of some plant than an insect.

Curtis has omitted the external basal cell of the elytra in his figure. I have old specimens taken by Mr. Wollaston, and more recent ones captured by Dr. B. White.

It occurs upon furze bushes (*Ulex Europæus*), in June, but appears to be local.

Genus ARYTÆNA.

Arytaina, Först.

Head much broader than long. *Crown* slightly deflected; without the eyes almost pentagonal, with two foveæ almost in the centre; width between the eyes more than twice the length, measured down the centre, which

is divided by a channel, leaving a small notch in front; posterior margin angulate. *Ocelli* three, placed one in the frontal notch, and one adjoining each eye, almost on the posterior margin. *Face* lobate. *Antennæ* 10-jointed; two basal joints short, stout, somewhat obconic; remainder filiform; 3rd longest. *Eyes* large, placed on the sides of the head; viewed from above, the outer margin very convex; inner margin *straight*, almost parallel with the central channel.

Thorax: *pronotum* collar-shaped; lateral margins contracted posteriorly; on each side two foveæ; *mesonotum*, anterior portion shuttle-shaped; posterior portion at its greatest breadth about equal to the width of the head *without the eyes*. *Scutellum* minute, apex rounded. *Elytra* almost uniform in width from in a line with the base of the cubitus; *corium*, costal margin without a stigma; cubitus petiolate.

Species 1. *Arytæna ulicis*.

Psylla Ulicis, Curt. B. E. 565, 22 a (1835); *Psylla Spartii*, Hartig, Germ. Zeits. iii. 375, 9 (1841); Leth. Hém. Nord, ed. ii. 88, 3 (1874); *Arytaina Spartii*, Först. Verh. Ver. Rheinl. v. 69.

Green, dusky yellow or red. *Mesonotum* posteriorly with five longitudinal, brown or black streaks. *Elytra* transparent, with a black or brown longitudinal streak between the radius and cubitus, and three others at the margin alternating with the nerves.

Head: *crown*, foveæ and generally a small spot in front of each dark brown or black. *Ocelli* bright red. *Face* variable in colour; lobes clothed with fine, pale hairs; apex of each lobe with a long, fine, pale hair. *Antennæ* dark brown or black, 2—5 yellow, apex of 3—5 narrowly brown.

Thorax: *pro-* and *meso-notum* green, dusky yellow or red; foveæ on the former dark brown, and five longitudinal streaks on the posterior portion of the latter dark brown or black. *Scutellum* generally yellow. *Elytra* transparent; *corium*, nerves frequently pale, except the radius and the bifurcations of the cubitus; between the radius and the cubitus a broad brown or black streak extending from the base of the former to the apex; alternating with the nerves round the apex, three small patches attached to the marginal nerve by a fine line; claval suture with a

fuscous-black or brown margin. Frequently these characters are more or less indistinct. *Legs* generally yellowish. *Thighs* more or less dark brown.

Abdomen black, posterior margin of the segments narrowly yellowish or orange; genital processes yellow, apex black.

Length $1\frac{1}{2}$ line.

I have restored Curtis's name for this insect as it is some years older than that of Hartig.

A very common species on furze bushes from May to August.

Genus PSYLLA.

Head broader than long. *Crown* considerably deflected; without the eyes broader than long; divided down the centre by a channel, and with a fovea on each side; the space between the foveæ and the inner margin of the eyes much elevated or callus-formed; posterior margin more or less concave. *Ocelli* three, placed one in the frontal notch and one near each eye, adjoining the posterior margin on the summit of the elevated portion. *Face* lobate; lobes variform. *Antennæ* 10-jointed; two basal joints short, stout, somewhat obconic; 3—10 filiform; 3rd longest, 9—10 together about equal to the 8th; 10th with two projecting fine hairs of unequal length. *Eyes* large, placed on the side of the head; viewed from above the outer margin very convex, inner margin slightly convex and lying at an angle to the central channel.

Thorax: *pronotum* narrow, collar-shaped, with two foveæ near the lateral margins, which last are incrassated; posterior margin concave; *mesonotum*, anterior portion more or less obtuse, shuttle-shaped; base generally dentiform at its extremities; posterior portion across the middle as broad as or broader than the head and eyes together. *Scutellum* minute, apex rounded. *Elytra* generally transparent, rounded at the apex; costal margin at the base very convex, from thence straight or slightly convex, with a stigma sometimes almost obsolete. *Cubitus* petiolate.

Differs from the genus *Arytæna* by having a smaller and more deflected crown, the two basal ocelli placed on a callus-formed elevation, the eyes lying at an angle to the central channel, and more particularly by its greater breadth of mesonotum, in which respect it approaches the genus *Trioza*.

Species with the costal stigma obsolete or almost obsolete:

- Försteri*, *alni*, *buxi*, *spartiophila*, *hippophaës*.
 „ with the elytra more or less yellowish or testaceous: *Försteri*, *buxi*, *hippophaës*, *spartiophila*, *sylvicola*, *Löwii*.
 „ with brown elytra: *pruni*.
 „ with dark clouds or patches between the nerves: *pyri*.
 „ with a black or dark streak along the dorsal margin next the apex of the clavus: *salicicola*, *ramnicola*.
 „ spotted round the apex: *costatopunctata*, *ferruginea*.
 „ with a black band before the apex: *fraxini*.

Species 1. *Psylla Försteri*.

Psylla Försteri, Flor, Rhyn. Livl. ii. 458, 2; Leth. Hém. Nord, ed. ii. 88, 2; *Psylla Alni*, Förster, Verh. Ver. Rheinl. v. 70, 1.

Pale green, yellow or greenish-yellow. *Face*: lobes short, sparingly clothed with fine pale hairs, and with one long one projecting from the apex. *Antennæ* very long, 4—8 joints gradually growing more broadly black at the apex; 9—10 black. *Elytra* faintly testaceous or almost clear, transparent; costal nerve frequently bright green.

Head: crown very broad, posterior margin deeply concave. *Face*: lobes short, sparingly clothed with fine pale hairs; about as long as the crown down the centre; cone-shaped, with a long, stoutish hair projecting from the apex; base broad. *Antennæ* very long, clothed with very short somewhat erect hairs; 4—8 joints gradually growing more broadly black at the apex; 9—10 black; 4th about two-thirds the length of the 3rd; 5—6 subequal; 7th longer than the 3rd.

Thorax: pro- and meso-notum pale green, yellow or greenish-yellow. *Elytra* faintly testaceous, sometimes almost clear, transparent; nerves entirely yellow or with the costal margin bright green; stigma almost obsolete. *Legs* pale green or yellow. *Tarsi*: 2nd joint brownish. *Claws* dark brown.

Abdomen pale green, or greenish-yellow.

Length ♂ $1\frac{3}{4}$, ♀ $2\frac{1}{4}$ lines.

This species stands next in size to *P. Alni*, from which

it may be distinguished by the want of the black spot at the base of the tibiae and the faintly-coloured elytra, as well as the difference in the form of the genitalia.

Exceedingly abundant on alders (*Alnus glutinosa*), from June to the end of October.

Species 2. *Psylla alni*.

Chermes Alni, Lin. F. S. 262, 1008; S. N. ii. 738, 10; Fab. E. S. iv. 222, 12; Scop. Ent. Carn. 140, 417; De Geer, Mém. iii. 96, 3, t. 10, fig. 8; *Psylla Alni*, Burm. Hdb. ii. 98, 1; Flor, Rhyn. Livl. ii. 460, 3; Leth. Hém. Nord, ed. ii. 90, 8; *Psylla fuscinervis* and *Heydeni*, Först. Verh. Ver. Rheinl. v. 20, 2 & 81, 32.

Green, yellowish, red or reddish. *Face*: lobes short, stumpy, conical, diverging towards the apex. *Mesonotum* frequently with two longitudinal, oval, light or dark-brown patches on the posterior portion; costal stigma narrow, somewhat short. *Tibiae* with a small black spot exteriorly at the base.

Head: *face*, lobes conical, short, stumpy, base broad, about equal to the length, divergence at the apex about equal to the base of either. *Antennæ* yellow, reaching almost to the base of the stigma; 1st joint broadly black at the base, 3—7 brown at the apex, 8—10 brown, 3rd and 7th almost equal in length, 4—6 subequal.

Thorax: *mesonotum* in yellow or green examples with or without two light-brown, oval patches on the posterior portion; in red or reddish examples these characters are darker. *Elytra* clear, transparent or slightly dimmed, as if having been breathed upon; nerves dark brown or black from the base of the cubitus to the apex; costal nerve bright green, ciliate, the hairs very minute; stigma green, narrow, somewhat short. *Legs* yellowish or green. *Thighs*: 1st and 2nd pairs frequently with a short, more or less distinct, brown streak on the upper side before the apex. *Tibiae* with a small black spot exteriorly at the base.

Abdomen generally green.

Length $2\frac{1}{2}$ lines.

One of the largest European species and most easily recognized by the black spot on the tibiae.

Not common. The only examples I have seen, in addition to my own, were taken by Dr. Power and Mr.

Douglas. It occurs on alders (*Alnus glutinosa*) in August.

Species 3. *Psylla spartiophila*.

Psylla spartiophila, Först. Verh. Ver. Rheinl. v. 75, 18;
Psylla torifrons, Flor, Kennt. Rhyn. 30, 2.

Orange yellow or somewhat reddish, with red-brown streaks on the mesonotum more or less distinct in different individuals. *Face*: lobes extremely short. *Antennæ* yellow or slightly reddish, reaching beyond the apex of the external basal cell; 4th joint, apex broadly black, 5—10 black. *Elytra* faintly testaceous, darker towards the apex, transparent; base generally clear as far as the apex of the external basal cell; nerves yellow; costal stigma almost obsolete, sometimes the nerves are finely dark brown, and apparently very narrowly margined with brownish-testaceous.

Head orange yellow or reddish. *Crown* between the eyes more than twice the length down the centre; posterior margin concave, foveæ dark brown. *Face*: lobes very short, about half the length of the crown down the centre; base very broad; apex bluntly rounded. *Antennæ* yellow or slightly reddish, long, reaching beyond the apex of the external basal cell; 4th joint, apex broadly black, 5—10 black, 4th about three-quarters the length of the 3rd.

Thorax: *pronotum* generally pale yellowish-white, foveæ dark brown; *mesonotum* orange yellow or reddish, posterior portion with a broad yellowish-white stripe down the centre, or with four red-brown longitudinal streaks, more or less distinct, or partly or entirely wanting in different individuals. *Elytra* faintly testaceous, darker towards the apex, moderately rounded, transparent; base generally clear as far as the apex of the external basal cell; nerves yellow, stoutish, sometimes slightly darker towards the apex; distance between the apices of the nerves of the lower or dorsal bifurcation of the arm of the cubitus almost equal to twice the length of the inner branch of the same; costal stigma almost obsolete. *Legs* yellow or somewhat orange. *Tarsi*: 2nd joint and *claws* black.

Abdomen above generally black, posterior margin of the segments more or less broadly yellow; ♂ genital segments yellow; processes long, yellow; apex brown, exteriorly clothed with very short, fine, pale hairs.

Length $1\frac{1}{4}$ line.

This insect belongs to the same section as *P. Försteri*, *Buxi*, &c., owing to the shortness of the frontal lobes, and the almost total absence of a costal stigma; but from its smaller and more delicate appearance, independent of the form of the genitalia, it is easily distinguished.

Apparently not uncommon in May and June on broom (*Spartium scoparium*). It is in the collections of Mr. Douglas, Dr. Power, and my own.

Species 4. *Psylla buxi*.

Chermes Buxi, L. S. N. ii. 738, 7; Reaumur, Ins. iii. t. 19, fig. 1—14; Fab. E. S. iv. 221, 5; S. R. 304, 5; *Psylla Buxi*, Först. Verh. Ver. Rheinl. v. 71, 3; Leth. Hém. Nord, ed. ii. 90, 10.

Green or yellowish-green. *Face*: lobes short, divergence at the apex small, outer margin much more rapidly inclined than the inner one. *Mesonotum* not unfrequently with two triangular orange patches on the anterior portion and four others of the same colour on the posterior portion. *Elytra* and nerves testaceous, the former shining; costal stigma wanting. *Thighs* frequently brown.

Head: crown pale green or dark brown, or the base dark brown. *Face* pale green or yellowish or greenish-white, clothed with fine, pale hairs; lobes short, slightly divergent at the apex, outer margin much more rapidly inclined than the inner one. *Antennæ* yellow, reaching to about in a line with the apex of the petiole of the cubitus; 3rd joint about as long as the 4th and 5th together; 4—8 narrowly brown at the apex, 9—10 dark brown.

Thorax: *pro-* and *meso-notum* greenish or yellowish-green; anterior portion of the latter generally with two triangular orange-coloured patches in front, posterior portion with four orange-coloured patches; the two interior oval, the two exterior somewhat trapezoidal. *Elytra* and nerves testaceous; costal stigma wanting. *Legs* dusky yellow. *Thighs* sometimes dark brown, apex dusky yellow.

Abdomen generally green.

Length $1\frac{3}{4}$ line.

Not unfrequently the crown, *pro-* and *meso-notum* are entirely dark brown or piceous, the posterior portion of the latter on the sides with two or three short, pale, longitudinal lines.

An extremely common species on box trees (*Buxus sempervirens*); everywhere from May to October.

Species 5. *Psylla hippophaës*.

Psylla Hippophaës, Först. Verh. Ver. Rheinl. v. 73, 12; Leth. Hém. Nord, ed. ii. 91, 14; *Psylla Alaterni*, Först. Verh. Ver. Rheinl. v. 97, 5; *Psylla Hartigii*, Flor, Rhyn. Livl. ii. 469, 8.

Pale yellow or greenish-white. *Face*: lobes very long, clothed with fine, pale hairs; base broad; exterior margin concave, inner margin straight. *Antennæ* yellow; 4—8 joints narrowly dark brown at the apex, 9—10 dark brown or black. *Elytra* very pale testaceous, transparent, nerves pale; costal stigma almost obsolete.

Head pale yellow or greenish-white. *Crown*: posterior margin concave. *Face*: lobes very long, clothed with fine pale hairs; base broad; exterior margin concave; inner margin straight, from the middle to the slightly narrowed and rounded apex almost cylindrical. *Antennæ* yellow, reaching to beyond the base of the stigma; 4—8 joints at the apex narrowly dark brown, 9—10 dark brown or black.

Thorax: *pro-* and *meso-notum* pale yellow or greenish-white sometimes intermixed. *Elytra* very pale testaceous; nerves fine, pale; external basal cell clear; costal stigma almost obsolete. *Legs* yellow. *Claws* brown.

Abdomen pale green.

Length $1\frac{1}{2}$ line.

An easily-distinguished species from the shape of the frontal lobes and the almost obsolete stigma.

Not uncommon on the sea buckthorn (*Hippophaë rhamnoides*), at Deal, in August.

Förster received the above insect from Mr. Haliday under the name of *Alaterni*, and so described it. In his foot-note, Förster says he has doubts as to whether this species may not be the *Psylla Rhamni*, Schrank. That it is impossible to say, I give that author's description from the "Fauna Boica," ii. 141, 1249 (1861):—

"*Chermes Rhamni*.

"Wohnort am Kreugbeerstrauche.

"Im Junius.

"Anmerk. Die Larve grün, flachgedrückt, schildformig, mit durchscheinigen Leibe, der Rand der Flügelscheiden und des gerundeten Hinterleibes gefranzet. *Das vollendete Insect konnte ich nicht.*"

Species 6. *Psylla pyri*.

Chermes Pyri, Lin. F. S. 262, 1004; S. N. ii. 737, 4; Fab. E. S. iv. 221, 3; S. R. 303, 3; De Geer, Mém. iii. 91, 2, t. 9, fig. 1—16; *Psylla Pyri*, Curt. B. E. xii. 565, 5; Först. Verh. Ver. Rheinl. v. 77, 24; Flor, Rhyn. Livl. ii. 463, 5; *Psylla apiophila*, Först. Verh. Ver. Rheinl. v. 78, 26.

Dusky red or reddish-yellow, with dark brown streaks on the mesonotum. *Face*: lobes about as long as the crown down the centre, exterior and interior margins tapering towards the narrow apex, where the divergence from each other is about equal to the base of either of them. *Antennæ* yellow; 1st joint frequently dusky red; 3—5 black at the apex, 6—10 dark brown or black. *Elytra* clear, transparent; nerves fine, dark brown or black, spaces enclosed between them more or less distinctly stained with fuscous; costal marginal nerve and stigma yellow or pale red, the latter wide and long.

Head dusky red. *Crown*: posterior margin slightly but distinctly concave; foveæ dark brown; margins of the central channel more or less yellowish-white. *Face*: lobes dusky or reddish-yellow, with the apex sometimes pale, about as long as the crown down the centre, base somewhat broad, exterior and inner margins tapering towards the narrow apex, divergence at the latter about equal to the base of either of them. *Antennæ* yellow, not reaching to the base of the stigma; 1st joint frequently dusky red, 3—5 black at the apex, 6—10 dark brown or black; 4th about two-thirds the length of the 3rd.

Thorax.—*Pronotum* dusky yellowish-white. *Mesonotum* dusky reddish-yellow, anterior portion in front broadly dark brown or black, with a central, longitudinal line and posterior margin yellowish-white; posterior portion with a fine central, longitudinal, dark-brown line; an almost oval patch on each side dark brown, and beyond this a broad streak of the same colour. *Elytra* clear, transparent; nerves fine, dark brown or black, spaces enclosed between them more or less distinctly stained with fuscous down the centre; costal marginal nerve and stigma yellow or pale red, the latter wide and long; claval suture on both sides more or less broadly and distinctly margined with fuscous; apex of the clavus with a short black streak. *Wings* clear, transparent, costal margin and nerves of the

appendix blackish. *Legs* yellow or brownish-yellow. *Thighs* black, apex yellow. *Tarsi*: 1st and 2nd joints, or the 2nd only, and *claws* black.

Abdomen dark brown or black; posterior margin of the segments narrowly reddish or yellow.

Length $1\frac{1}{4}$ line.

The markings on the elytra are a peculiar characteristic of this species. It lives on pear trees, and is to be found from June to October. Of its mode of life, Curtis gives a short account in his B. E. xi. 565, 5. I have only seen old examples taken by the late Mr. J. C. Dale.

Species 7. *Psylla salicicola*.

Psylla salicicola, Först. Verh. Ver. Rheinl. v. 72, 7; Flor, Rhyn. Livl. ii. 467, 7; Leth. Hém. Nord, ed. ii. 89, 7.

Green, or yellow intermixed with green, or orange intermixed with streaks of yellowish-white. *Face*: lobes longish, about equal in length to the crown down the centre; base very slightly broader than in the middle, where the outer margin runs off obliquely towards the apex, which is more or less broadly rounded. *Antennæ* yellow; 3—7 joints black at the apex; 9—10 and sometimes the 8th dark brown or black. *Elytra* clear, transparent; nerves, according to the colour of the mesosternum, pale or dark; dorsal marginal nerve next the apex of the clavus with a dark brown or black streak; costal stigma somewhat broad and long.

Head green or orange. *Crown*: posterior margin distinctly concave. *Face*: lobes longish, about equal in length to the crown down the centre; inner margin almost straight, scarcely diverging; base very slightly broader than in the middle, where the outer margin runs off obliquely to the apex, which is more or less broadly rounded. *Antennæ* yellow, reaching to or beyond the base of the stigma; 3—7 joints black at the apex, 9—10 and sometimes the 8th dark brown or black; 4th about three-fourths the length of the 3rd.

Thorax: *pronotum* pale greenish or greenish-white; *mesonotum* in yellow examples with the anterior portion more or less pale green; posterior portion generally with four longitudinal greenish-white lines; in orange-coloured specimens the anterior portion with a narrow longitudinal central line, and the lateral points pale yellowish-white;

posterior with a narrow pale yellowish-white line down each side of the centre, and two others of the same colour exterior. *Elytra* clear, transparent; nerves pale yellow, clear, or dark brown, according as the insect is coloured. Costal stigma somewhat broad and long; dorsal marginal nerve next the clavus with a short dark brown or black streak. *Legs* pale yellow. *Tarsi*: 2nd joint and *claws* generally dark brown.

Abdomen green or brown; in the latter case the margins of the segments are pale.

Length $1\frac{1}{4}$ — $1\frac{1}{2}$ line.

Allied to *P. cratægicola*, which insect differs from the above in the want of the streak on the margin at the apex of the clavus, the different form of the face-lobes and the colouration of the antennæ.

Not uncommon on sallows from June to September. I have also beaten it from larch (*Larix communis*) in August.

Species 8. *Psylla pineti*.

Psylla pineti, Flor, Rhyn. Livl. ii. 471, 10; Leth. Hém. Nord, ed. ii. 91, 15; *Psylla ornata*, Meyer, Mitth. schw. ent. Ges. iii. 393.

Red, or brown-red, with lighter or darker streaks on the mesonotum. *Face*: lobes as long as the crown down the centre, base somewhat narrow, exterior margin sloping gently from the base to the middle, afterwards to the apex almost straight; inner margin straight; divergence moderate. *Antennæ* short, yellowish or reddish-yellow; 1st joint blackish, 4—5 at the apex black, 6—10 black. *Elytra* with an extremely faint testaceous tinge, transparent; nerves fine, light or dark brown; costal stigma wide and long.

Head reddish or brown-red. *Crown*: posterior margin concave. *Face*: lobes red or red-brown, as long as the crown down the centre, base somewhat narrow, exterior margin sloping gently from the base to the middle, from thence to the apex almost straight; inner margin straight, apical half almost cylindrical. *Antennæ* yellowish or reddish-yellow, short, not reaching to the base of the stigma; 1st joint blackish, 4—5 black at the apex, 6—10 black; 4th about three-fourths the length of the 3rd.

Thorax: *pronotum* red; *mesonotum* red or brown-red; posterior portion with four pale or red longitudinal streaks placed one on each side of the centre, and another,

curved, more remote; in dark examples these are sometimes almost obsolete. *Elytra* with an extremely faint testaceous tinge, transparent; nerves fine, pale or dark brown; costal stigma wide, long. *Legs* yellowish or reddish, or brownish-yellow. *Thighs* pitchy brown; apex pale or frequently reddish, with a pitchy-black line on the inside near the upper margin. *Tarsi*: 2nd joint and *claws* brown.

Abdomen, in pale examples, bright green or reddish-yellow; in dark ones black; side margins narrowly bright red.

Length $1\frac{1}{2}$ line barely.

Extremely variable in colour on the body; and according to the colour there, so are all the other portions of the insect.

Mr. Douglas has taken it somewhat commonly on Scotch fir (*Pinus sylvestris*), and Dr. Power has also met with it at Holm Bush, Mickleham, &c., from May to November.

Species 9. *Psylla sylvicola*.

Psylla sylvicola, Leth. Hém. Nord, ed. ii. 90, 11 (1).

Orange yellow. *Face*: lobes about as long as the crown down the centre; apex narrow; divergence less than the base of either of them. *Antennæ* somewhat short, not reaching to the base of the stigma; 3—7 black at the apex; 8—10 black. *Elytra*: pale brownish-testaceous, transparent; nerves yellow, somewhat fine; costal stigma wide, gradually tapering to the apex.

Head orange yellow. *Crown*: posterior margin concave. *Face*: lobes orange yellow, or sometimes pale green, about as long as the crown down the centre; base somewhat broad; exterior and interior margin sloping gradually to the narrow apex; divergence at the latter less than the base of either of them. *Antennæ* somewhat short, not reaching to the base of the stigma; 3—7 at the apex black; 8—10 black; 4—5 together a little longer than the 3rd.

Thorax: *pro-* and *meso-notum* orange yellow, without paler or darker streaks.

Elytra pale brownish-testaceous, transparent; nerves yellow, somewhat fine; costal stigma wide, gradually tapering to the apex. *Legs* testaceous. *Tarsi*: 2nd joint and sometimes the 1st also brown. *Claws* brown.

Abdomen above yellow; ♂ four basal segments with a

very fine transverse black line before the pale posterior margin; genital segments yellow; processes yellow; extreme apex brown.

Length ♂ $1\frac{1}{4}$, ♀ $1\frac{1}{2}$ line.

The sexes are alike in colouring in every respect. It differs from *P. pruni* in being larger and paler than that species, difference in the shape of the frontal lobes and colouration of the elytra.

I have one specimen, taken either at Eltham or Bexley, in May, 1863; and Dr. Power has taken a few specimens at Weybridge on birch (*Betula verrucosa*). M. Lethierry has seen the insect, and determined it to be his species.

Species 10. *Psylla pruni*.

Chermes Pruni, Scop. Ent. Car. 140, 14; *Psylla fumipennis* and *Pruni*, Först. Verh. Ver. Rheinl. v. 76, 22, and 77, 23; Flor, Kennt. Rhyn. 40, 8.

Dark red, somewhat dusky. *Face*: lobes shorter than the crown down the centre; base broad, exterior margin sloping to the somewhat narrow apex more rapidly than the inner one, divergence moderate. *Antennæ* short, brownish-yellow; 5—6 joints at the apex very narrowly black, 9—10 black. *Elytra* semitransparent, brown, external basal cell pale; costal stigma wide, long, gradually tapering from the base to the apex.

Head dark red. *Crown*: posterior margin slightly concave. *Face*: lobes dark red, shorter than the crown down the centre; base broad, exterior margin sloping to the somewhat narrow apex more rapidly than the inner one, divergence moderate. *Antennæ* short, brownish-yellow, reaching to or a little beyond the middle of the external basal cell, 5—6 joints at the apex very narrowly black, 9—10 black; 4th about three-fourths the length of the 3rd.

Thorax: *pro-* and *meso-notum* dark red, somewhat dusky. *Elytra* semitransparent, brown, external basal cell pale; nerves stout; costal stigma wide, long, gradually tapering from the base to the apex. *Legs* brownish-yellow. *Thighs* black, apex brownish-yellow. *Tibiæ* brownish-yellow, apex sometimes darker.

Abdomen black, side margins narrowly red.

Length $1\frac{1}{4}$ line barely.

Apparently a very scarce species, as I have only seen a specimen taken by Dr. Power at Esher, May 19th. It is said by Förster to live on the black thorn (*Prunus spinosa*).

Species 11. *Psylla Löwii*.

Red or somewhat brownish-red, generally with pale streaks on the mesonotum. *Face*: lobes as long as the crown down the centre; base broad, rapidly narrowing to the middle, from thence to the apex almost parallel, where they become somewhat divergent. *Antennæ* short, barely reaching to the base of the stigma. *Elytra* smoky testaceous, or almost clear, transparent; nerves, in fresh examples, yellow, inclining to orange, in others dark brown; stigma moderate, almost regularly narrowed from the base to the apex; upper arm of the cubitus long, very convex.

Head: crown red, posterior margin distinctly concave. *Face*: lobes reddish or yellowish; base broad, rapidly narrowing to the middle, from thence to the apex almost parallel; apex rounded or slightly acute, somewhat divergent. *Antennæ* reddish-yellow, short, barely reaching to the base of the stigma; 3rd joint short, scarcely longer than the 1st and 2nd together; 4th about four-fifths of the 3rd; 1st frequently black, or base of 1—2 black; 4—8 at the apex narrowly brown; 9—10 black.

Thorax: pronotum generally yellowish; mesonotum red or brownish-red; in the latter case the posterior portion with four slightly indistinct pale longitudinal lines, the two exterior curving round and enclosing the inner, which are on each side of the centre. *Elytra* smoky testaceous, or almost clear, transparent; greatest breadth before the apex of the stigma, length equal to about two and a half times the breadth; nerves yellow, inclining to orange or dark brown; stigma moderate, almost regularly narrowed from the base to the apex; upper arm of the cubitus long, twice the length of the bifurcation, very convex and approaching the base of the radius. *Legs* reddish-yellow. *Thighs*: 3rd pair sometimes brown at the base. *Tibiæ* yellowish. *Tarsi*: apex of the 2nd joint very narrowly and *claws* dark brown.

Abdomen above, in both sexes, deep pitchy-brown, shining; posterior margin of the segments very narrowly red, or sometimes the ♀ reddish, with a dark band across the segments; ♂ genitalia pale chestnut; ♀ frequently green.

Length $1\frac{1}{4}$ — $1\frac{1}{2}$ line nearly.

Taken abundantly by Mr. Douglas beginning of November, at Addington, on fir and birch, and by Dr. Power in February, at Esher. The latter are, no doubt, overwintered examples.

Species 12. *Psylla cratægicola*.

Psylla cratægicola, Först. Verh. Ver. Rheinl. v. 72, 6; Flor, Rhyn. Livl. ii. 474, 12; Leth. Hém. Nord, ed. ii. 91, 14.

Green or pale yellow, or yellow and green irregularly intermixed. *Face*: lobes somewhat elongate, stoutish at the base, and narrowing gradually to the slightly stumpy apex; length about equal to the crown down the centre. *Pro-* and *meso-notum* yellow, or intermixed with green. *Elytra* clear, transparent, glassy; costal stigma distinct, whitish.

Head: crown pale green or yellow, posterior margin gently concave. *Face*: lobes generally pale green, somewhat elongate, proportionately stout at the base, and tapering gradually to the slightly stumpy apex, where they somewhat diverge; length about equal to the crown down the centre. *Antennæ* yellow, reaching almost to the base of the stigma; two last joints always, and sometimes the apex of the 7th and 8th, black; 4th about three-fourths the length of the 3rd.

Thorax: *pro-* and *meso-notum* yellow, or the latter with the anterior portion more or less green, and the posterior portion with a broad green space down the centre. *Elytra* clear, transparent, glassy; nerves fine, pale yellow; costal stigma distinct, whitish. *Legs* pale green or yellowish-green; *claws* frequently dark brown or black.

Abdomen greenish or yellowish.

Length $1\frac{1}{2}$ line.

A very delicate species, and somewhat resembling pale specimens of *P. salicicola*, to which it is related, but the different form of the face-lobes, colouring of the antennæ, and want of the dark streak at the apex of the clavus, will at once separate them.

Very common in May and June on hawthorn (*Cratægus oxyacantha*).

Species 13. *Psylla mali*.

Psylla Mali, Först. Verh. Ver. Rheinl. v. 72, 8; Flor, Rhyn. Livl. ii. 476, 13; Leth. Hém. Nord, ed. ii. 91, 16; *Psylla rubida*, Meyer, Mitth. schw. ent. Ges. iii. 393.

Green, yellow, red or brown-red. *Face*: lobes somewhat long, divergent at the apex, about as long as the

crown down the centre; base broad, sides sloping to the middle; from thence to the apex gently inclined. *Antennæ* yellow; 9—10 joints black, or sometimes the last four dark brown. *Elytra* transparent, very faintly testaceous; nerves pale; costal stigma whitish at the base, and terminating about in a line with the apex of the upper arm of the cubitus.

Head: crown, posterior margin slightly concave. *Face*: lobes somewhat long, divergent at the apex, about as long as the crown down the centre; base broad, sides sloping to the middle, from thence to the stumpy or slightly rounded apex gently inclined, inner margin somewhat straight. *Antennæ* yellow, reaching to about the base of the radius; 9—10 joints black, or sometimes the last four dark brown, 4th about two-thirds the length of the third.

Thorax: pro- and meso-notum green, yellow, red or brown-red, sometimes the latter, with very indistinct indications of pale longitudinal lines. *Elytra* transparent, with a very faint testaceous tinge; nerves pale, varying slightly in depth of colour, according to that of the individual; costal stigma whitish at the base, and terminating about in a line with the apex of the upper arm of the cubitus. *Legs* yellow; in dark coloured examples sometimes the thighs brownish; *tibiæ*, apex and *tarsi* brown.

Abdomen above green or red, or brown-red; in the latter case generally the posterior margins of the segments pale, sometimes the entire abdomen black.

Length $1\frac{1}{4}$ line.

The var. *rubida*, Meyer-Dür, somewhat resembles *P. salicicola*, but it is smaller in size than the last-named, which has, in addition to the differences in the antennæ and frontal lobes, a short dark streak at the apex of the clavus.

Not uncommon from June to the end of August on various trees; amongst others I have taken it on birch and whitethorn.

Species 14. *Psylla viridissima*.

Bright green. *Face*: lobes longer than the crown down the centre; base broadish; apex somewhat acute; outer margin concave; divergence at the apex about equal to the base of either. *Elytra* clear, transparent, $2\frac{1}{2}$ times as long as broad; nerves fine; costal stigma moderate.

Head bright green. *Crown*: posterior margin concave. *Ocelli* reddish or orange red. *Face*: lobes bright green,

longer than the crown down the centre; base broadish; apex somewhat acute; outer margin concave; divergence at the apex about equal to the base of either. *Antennæ* somewhat brownish; 1—2 joints green, or the latter yellow, 9—10 black.

Thorax: *pro-* and *meso-notum* green; after death more or less yellow. *Elytra* clear, transparent, at least $2\frac{1}{2}$ times as long as broad; greatest breadth beyond the middle; nerves fine, white or slightly clouded towards the apex; costal stigma pale green, changing to whitish after death, wide at the base, and gradually tapering to the apex, which is a little beyond, in a line with the apex of the upper arm of the cubitus; radius concave in the middle, at which point it is slightly nearest to the stigma. *Legs* green. *Claws* brownish.

Abdomen bright green.

Length $1\frac{1}{2}$ line.

This species belongs to the same group as *P. mali* and *P. fraxinicola*. It is larger than the first of these species, and about the size of the latter, and may at once be distinguished from either by its bright green colour. A few specimens have been taken by Mr. Douglas on the common buckthorn (*Rhamnus catharticus*) or apple (he is not certain which), at Lee, in September; probably a form of *P. mali*.

Species 15. *Psylla fraxinicola*.

Psylla fraxinicola, Först. Verh. Ver. Rheinl. v. 76, 20; Leth. Hém. Nord, ed. ii. 89, 5; *Psylla unicolor*, Flor, Rhyn. Livl. ii. 479, 15.

Green or yellowish. *Face*: lobes shorter than the crown down the centre, exterior margin sloping rapidly to the stumpy apex. *Antennæ* yellow, 3—8 joints at the apex narrowly dark brown, 9—10 dark brown. *Elytra* clear, transparent; apex almost imperceptibly fuscous; nerves brownish-yellow towards the apex; petiole of the cubitus and the lower arm subequal or nearly so; costal stigma long, wide at the base, diminishing gradually to the apex.

Head green or yellow. *Crown*: posterior margin almost straight. *Face*: lobes shorter than the crown down the centre, exterior margin sloping rapidly to the stumpy apex. *Antennæ* yellow, 3—8 joints at the apex narrowly dark brown, 9—10 dark brown or black, sometimes from the 4th to the apex dusky; 4th and 5th together a little longer than the 3rd.

Thorax: *pro-* and *meso-notum* green or yellow, without paler longitudinal lines. *Elytra* clear, transparent; apex almost imperceptibly fuscous; nerves from the base to the apex of the petiole yellow, from thence to the apex brownish-yellow; petiole of the cubitus and the lower arm subequal or nearly so. Costal stigma sometimes greenish, long, wide at the base, diminishing gradually to the apex. *Legs* yellow. *Claws* frequently brown.

Abdomen entirely green or yellow.

Length $1\frac{1}{2}$ line.

A good character for the identification of this from other green species, as pointed out by Förster, is the shortness of the lower arm of the cubitus, which is only a little longer than the petiole. I have met with this species in the Isle of Wight in July, and in this neighbourhood, on ash trees (*Fraxinus excelsior*), in August and September, but not commonly. M. Lethierry says he finds it on elm. Dr. Power has taken it at Balmuto (Fifeshire).

Species 16. *Psylla fraxini*.

Chermes Fraxini, Lin. F. S. 264, 1013; S. N. ii. 739, 15; Fab. E. S. iv. 223, 15; S. R. 305, 15; Scop. Ent. Carn. 140, 415; *Psylla Fraxini*, Curt, B. E. xii. 565 and pl.; Först. Verh. Ver. Rheinl. v. 80, 31; Flor, Rhyn. Livl. ii. 481, 16; Leth. Hém. Nord, ed. ii. 89, 5.

Yellow, or sometimes slightly orange. *Head* and *mesonotum* with black patches and streaks. *Face*: lobes much shorter than the crown down the centre, in outline somewhat pyramidal. *Antennæ* yellow, 4—6 joints black at the apex, 7—10 black. *Elytra* clear, transparent; nerves and costal stigma yellow, except when intercepted by the fuscous black-markings.

Head: *crown* generally black, side margins yellow or orange, posterior margin lightly concave. *Face*: lobes frequently black, much shorter than the crown down the middle; in outline somewhat pyramidal. *Antennæ*: yellow, reaching to beyond the base of the stigma, 4—6 joints black at the apex, 7—10 black, 4th about half as long as the third.

Thorax: *pronotum* pale yellow; *mesonotum* yellow or orange; anterior portion with two black triangular patches in front, and a somewhat square spot on the sides posteriorly, in the channel; posterior portion with four longitudinal, broad, black streaks, not unfrequently joined

in front and forming a Π -shaped character. *Elytra* clear, transparent; nerves fine, pale yellow, except where they are intercepted by the fuscous-black markings, when they become black; costal stigma moderate, its inner nerve very finely margined with black exteriorly; dorsal margin at the base with a short black streak, from thence to the apex of the clavus yellow, nerve adjoining the latter margined with fuscous-black on each side; round the apex a broad, irregular fuscous-black band, frequently more or less interrupted or entirely wanting. *Wings* clear, transparent; dorsal margin at the base fuscous-black. *Legs* yellow. *Thighs* with a black line along the upper margin. *Tarsi*: 2nd joint at the apex and *claws* black.

Abdomen black; posterior margin of the segments more or less broadly yellow.

Length $1\frac{1}{2}$ line.

Unlike any other species known to me in its markings.

A common species on ash-trees (*Fraxinus excelsior*) from June to September.

Species 17. *Psylla ferruginea*.

Psylla ferruginea, Först. Verh. Ver. Rheinl. v. 79, 29.

Reddish or pale brownish-red, with dark red-brown streaks on the mesonotum. *Face*: lobes nearly as long as the crown down the centre; base broad, exterior and inner margin sloping to the somewhat stumpy apex, where the divergence is about equal to half the base of either of them. *Antennæ* yellow; 4—7 joints black at the apex, 8th obscure, 9—10 black. *Elytra* clear, transparent, nerves and costal stigma clear chocolate-brown; apex of the nerves and the spaces enclosed by them on the pale dorsal margin to round the apex with dark-brown spots.

Head reddish. *Crown*: posterior margin concave. *Face*: lobes dark red, nearly as long as the head, sparingly clothed with pale hairs, base broad, exterior and inner margin sloping to the somewhat stumpy apex, the latter when seen from the side is more acuminate; divergence at the apex about equal to half the base of either of them. *Antennæ* yellow, reaching to the base of the stigma; 4—7 joints black at the apex, 8th obscure, 9—10 black, 4th about two-thirds the length of the 3rd.

Thorax: *pro-* and *meso-notum* pale brownish-red; posterior portion of the latter with four dark red-brown, longitudinal streaks, the two interior somewhat oval in shape. *Elytra* clear, transparent, nerves and costal stigma gene-

rally clear chocolate-brown, sometimes the costal marginal nerve and stigma pale red or rose-pink; dorsal margin from the base to the apex of the clavus brown, terminating in a short black streak, from thence to round the apex yellowish-white; nerve adjoining the apex of the clavus margined with brown on both sides; apex of the other nerves and an elongate spot in the spaces enclosed by them on the marginal nerve pitchy brown. *Wings* clear, transparent; costal margin dark fuscous. *Legs* reddish or reddish-brown. *Thighs*: 1st and 2nd pairs brown at the base, 3rd entirely dark brown. *Tibiæ* reddish, slightly darker at the apex. *Tarsi* pale red. *Claws* brown.

Abdomen above black; posterior margin of the segments narrowly and sides broadly bright red.

Length $1\frac{1}{2}$ line.

The only species with which the above can be confounded is *P. costatopunctata*, which it resembles very much in the markings along the dorsal margin of the elytra. The last-named, however, is narrower, paler and has different formed face-lobes. Dr. Puton, in the Ann. Soc. Fr. for 1871, p. 437, refers *P. pyrisuga*, Först. to this species as being only a variety. This appears to me to be a decided mistake, as Förster does not make mention in his description of any spots on the dorsal margin of that species; he simply says: "Die Flügel ziemlich wasserhell, mit röthlichem Stigma und ähnlich gefärbten Adern," and specimens I have from Meyer-Dür fully bear this out.

It would appear to be rare with us, as I have only seen a single example taken by Dr. Power at Cowfold (Sussex) in May, another by Mr. B. Cooke, and two others by Mr. Douglas, beginning of November, on beech (*Fagus sylvatica*).

Species 18. *Psylla costatopunctata*.

Psylla costatopunctata, Forst. Verh. Ver. Rheinl. v. 76, 20.

Reddish-yellow, with pale yellowish-white streaks. *Face*: lobes slightly clothed with pale hairs; shorter than the crown down the centre, base broad, exterior margin sloping to the bluntly-rounded apex, inner margin straight. *Antennæ* yellow; 4—8 joints at the apex black, 9—10 black. *Elytra* somewhat clear and transparent, nerves pale yellow; costal stigma yellow, wide and long; apex of the clavus and adjoining nerve with a black dash, apex

of the other nerves and the spaces between with a black spot.

Head reddish-yellow. *Crown*: posterior margin somewhat deeply concave, margins of the central channel and a space round the ocelli pale yellowish-white. *Face*: lobes entirely pale yellowish-white, or the apex reddish-yellow, shorter than the crown down the centre, and slightly divergent at the apex; base broad; exterior margin sloping to the bluntly-rounded apex, inner margin straight. *Antennæ* yellow, reaching beyond the base of the stigma; 3rd joint faintly, 4—8 distinctly black at the apex, 9—10 black; 4—6 of almost equal length, and each a little shorter than the 3rd.

Thorax: pronotum pale yellowish-white, with a small reddish-yellow spot on each side behind the ocelli; *mesonotum* reddish-yellow; anterior portion with a longitudinal central line, posterior margin and a transverse line before the same pale yellowish-white; posterior portion with a broadish longitudinal line on each side of the centre, a finer curved one exterior, and the lateral margins pale yellowish-white; the curved lines appear to form a circle enclosing two I-shaped characters. *Elytra* somewhat clear and transparent, nerves pale yellow; costal stigma yellow, wide and long; apex of the clavus and the adjoining nerve with a broad black dash; apex of the remaining nerves with a small black spot, and alternating with these are four short, black streaks proceeding from the marginal nerve. *Legs* yellow, or faintly reddish-yellow. *Tarsi*: 2nd joint at the apex narrowly and *claws* brown.

Abdomen above in the ♀ red, down the centre broadly dark brown, sides broadly pale yellowish-white.

Length $1\frac{1}{2}$ line.

I met with two ♀ examples, in July and September, 1862, which I suppose must have been captured by sweeping. Dr. Power has also taken a single specimen at Mickleham in October. Förster records having received it from the late Mr. Walker, and there is a specimen in the British Museum confirming this statement.

Species 19. *Psylla rhamnicola*.

Red or orange red with red-brown streaks on the mesonotum. *Face*: lobes as long as or a little longer than the crown down the centre; base broad; exterior margin sloping rapidly for two-thirds its length, inner margin

sloping gently; from thence to the apex knoblike; divergence about equal to one-half the base of either of them. *Antennæ* yellow; 4—5 at the apex broadly black, 6—10 black. *Elytra* clear, transparent; nerves somewhat brownish-yellow, or frequently rose-pink; apex darker; costal stigma wide, long.

Head: crown red or orange; apex narrowly pale yellowish-white; posterior margin concave. *Face*: lobes yellowish-white or white, sparingly clothed with pale hairs; exterior margin sloping rapidly for two-thirds its length; inner margin sloping gently for the same distance; from thence to the apex knoblike, white; round the base of the contraction is a fuscous ring. *Antennæ* yellow, reaching to the base of the stigma; 4—5 broadly black at the apex, 6—10 black; 4th three-fourths the length of the 3rd.

Thorax: *pronotum* pale yellow or yellowish-white, frequently with a fine, more or less interrupted, red line across the middle; *mesonotum* red or orange; anterior portion with a more or less distinct pale central line; posterior portion with four broad, longitudinal, red-brown streaks narrowly margined with pale yellowish-white. *Elytra* clear, transparent; nerves somewhat brownish-yellow or rose-pink as far as the bifurcation of the arms of the cubitus, from thence to the apex darker; costal stigma wide, long; dorsal margin at the base brownish-yellow, prolonged into a black streak which terminates at the apex of the clavus; within the spaces enclosed by the nerves and adjoining the apical margin is a small, almost obsolete fuscous-stain. *Legs* yellow. *Tarsi* and *claws*: 1st and 2nd pairs fuscous-brown; 3rd, second joint only and claws fuscous-brown.

Abdomen above more or less red or orange, with a broad dark streak down the middle in some examples; ♂ genital segments greenish-yellow; plate above brownish; processes yellow; apex narrowly brown.

Length $1\frac{3}{4}$ line.

This species belongs to the group in which are *P. costatopunctata* and *P. ferruginea*, but it is larger than either of these species, has different formed face-lobes and genitalia, as also much less defined markings round the apex of the elytra.

The only specimens I have seen were taken by Mr. Douglas and myself on the common buckthorn (*Rhamnus catharticus*), at Sanderstead, in August.

Species 20. *Psylla visci*.

Psylla Visci, Curt. B. E. xii. 565, 5a; Först. Verh. Ver. Rheinl. v. 71, 4?

“Breadth $2\frac{2}{3}$ lines: pale green, becoming ochreous after death; antennæ as long as the body, black at the apex, each joint, excepting the two basal ones, tipped with the same colour; superior wings slightly tinged with brown, with a darker undefined spot on the inferior margin.”

“This I bred in the middle of May from pupæ found on the mistletoe at Rougham by Mr. Ralph Bennet.”

Genus SPANIONEURA, Först.*

Head vertical. *Crown* without the eyes pentagonal, with a central longitudinal channel and a fovea on each side; about twice as broad as the length down the centre; two anterior sides slightly convex. *Face*: lobes long, stout, conic, scarcely diverging at the apex. *Antennæ* short, 10-jointed; 1—2 joints short, stout; remainder filiform, very fine; 3—4 almost of equal length. *Ocelli* three, placed as in the other genera.

Thorax: *pronotum* narrow, deflected, with a fovea on each side near the lateral margin; *mesonotum* as in the other genera. *Elytra* lanceolate, radius terminating in the apex; costal stigma distinct, widest at the mouth and suddenly narrowed; dorsal margin without nervelets.

Species 1. *Spanioneura Fonscolombi*.*

Spanioneura Fonscolombii, Först. Verh. Ver. Rheinl. v. 94.

Pale green or reddish-yellow. *Face*: lobes long, conical, very finely clothed with short pale hairs. *Elytra* lanceolate, transparent, with four small black granules on the dorsal margin in the spaces enclosed by the nerves; cubitus petiolate.

Head pale green or reddish-yellow. *Crown* pentagonal. *Ocelli* placed as in the other genera. *Antennæ* yellowish, slightly browner towards the apex; 10th joint brown. *Eyes* reddish-brown.

Thorax: *pro-* and *meso-notum* pale green or reddish-yellow; the former narrow, deflected, with a fovea on each side near the lateral margin. *Elytra* clear, transparent;

* Not yet known to be British.

nerves pale greenish or yellowish; dorsal margin with four small black granules in the spaces enclosed by the nerves. *Legs* pale green.

Abdomen green.

Length $1\frac{1}{4}$ line.

This genus seems to unite *Psylla* with *Trioza*, but differs from both in the shortness and fineness of the antennæ and the length of the face-lobes. Like *Psylla* it has a costal stigma, but the elytra are shaped like those of *Trioza*, from which genus it also differs in having the cubitus petiolate and the nervelets replaced by small granules on the dorsal margin. Förster says there are only three, but my specimens distinctly have four. Baron de Fonscolombe, who gave to Förster the insects from which his description is made, says he believes he obtained them from box (*Buxus sempervirens*), and also from other plants near Aix. Förster throws doubt upon the box theory, and perhaps correctly; but if the insect was found at Aix, I see no reason against its occurrence here.

The specimens which I possess were kindly presented to me by M. Lethierry, and are from St. Giron (Ariège), a department of France bordering on the Pyrenees.

Genus TRIOZA, Först.

Head broader than long. *Crown* considerably deflected, divided down the centre by a channel and with a fovea on each side between the eyes; the space between the former and the latter slightly raised; anterior margin more or less M-shaped; posterior margin more or less concave. *Ocelli* placed as in *Psylla*. *Face* lobate; lobes moderately long, generally triangular in outline, acute at the apex where the divergence is great. *Antennæ* 10-jointed, formed as in *Psylla*, but shorter.

Thorax: *pronotum* very narrow, collar-shaped, deflected; sides with a depression causing the lateral margins to become more or less lobate. *Mesonotum* and *scutellum* as in *Psylla*. *Elytra* generally transparent, lanceolate, more or less acute at the apex; costal margin convex, without a stigma; spaces enclosed by the nerves along the dorsal margin with three nervelets; upper branch of the upper arm of the cubitus terminating almost in the apex; cubitus not petiolate.

The lanceolate form of the elytra with the three nerve-

lets, the cubitus without a petiole, and the short antennæ, sufficiently indicate the difference between this genus and that of *Psylla*.

Species 1. *Trioza Walkeri*.

Trioza Walkeri, Först. Verh. Ver. Rheinl. v. 88, 23 ;
Flor, Rhyn. Livl. ii. 496, 1.

Long and narrow, entirely brown, or more frequently with a more or less interrupted white band across the middle of the elytra, and before the apex a somewhat triangular white patch.

Head pale or dark brown, clothed with short, semi-erect pale hairs. *Crown* less deflected than ordinary. *Face*: lobes dark brown, not so long as the crown down the centre; base broad; apex stumpy; exterior margin convex, only slightly divergent at the apex. *Antennæ* yellow; 1st joint entirely, 2nd at the base dark brown; 4th and 6th, apex narrowly black; 9—10, or sometimes 8—10, black, 4th about three-fourths the length of the 3rd.

Thorax: *pronotum* generally pale brown; *mesonotum* dark brown, clothed with short, semi-erect, pale hairs; anterior portion generally with a central longitudinal line, and the lateral margins pale; posterior portion with four pale longitudinal lines, placed one on each side of the centre, somewhat broad, and one narrower, a little more remote. *Elytra* brown, semi-transparent, wrinkled transversely, and thickly powdered with dark-brown atoms; across the middle a more or less interrupted irregular white band, very broad on the costal margin, sometimes almost obsolete between the radius and cubitus, but always distinct between the nerves adjoining the apex of the clavus, sometimes the entire elytra are brown; costal margin very convex from the base to almost the apex of the radius, where it is suddenly cut off obliquely to the acute apex, before which is a somewhat triangular white patch. *Legs* yellow. *Thighs* generally dark brown at the base. *Tarsi*: 2nd joint sometimes at the apex red. *Claws* brown.

Abdomen above black; posterior margin of the segments very narrowly and sides red.

Length $1\frac{3}{4}$ —2 lines.

The colour and peculiar manner in which the costal margin is cut off towards the apex is sufficient to separate the above from all other species.

Taken by Mr. Douglas and myself somewhat abundantly on blackthorn (*Prunus spinosus*), on Mickleham Downs in August, and by Dr. Power on the spindle tree (*Euonymus europæus*), near Addington, in October. Dr. Flor has taken it on the common buckthorn (*Rhamnus catharticus*).

In the collection of Mr. B. Cooke are two ♀ examples of a remarkable variety of this species, in which the elytra are entirely pale, almost white, with only a few fuscous atoms scattered across the middle of the disk, and for which I propose the name *albipennis*. They were taken by him at the same time and place as the others.

Species 2. *Trioza urticæ*.

Chermes Urticæ, Lin. F. S. 263, 1006; S. N. ii. 738, 8; De Geer, Mém. iii. 87, 1, t. 9, fig. 17—26, and t. 10, fig. 1—7; Zett. I. L. 308, 4; *Psylla Urticæ*, Burm. Handb. ii. 98, 3; *Psylla eupoda*, Hartig, Zeits. iii. 374, 8; *Trioza Urticæ*, *eupoda*, *protensa* and *forcipata*, Först. Verh. Ver. Rheinl. v. 82, 1, 3, 4 and 84, 10; *Trioza Urticæ*, Flor, Rhyn. Livl. ii. 505, 7; *Trioza bicolor*, Meyer, Mitth. schw. ent. Ges. iii. 391.

Fuscous-yellow, yellow, orange, red or black, with brown or black streaks on the mesonotum in the first and third forms. *Face*: lobes black; base more or less broadly pale, longer than the crown down the centre. *Elytra* somewhat elongate, clear, transparent or sometimes very faintly testaceous; apex obtuse; nerves pale yellow; distance of the radius at its base from the costal nerve about equal to that from the cubitus.

Head: crown yellow or dark brown; in the latter case generally with the anterior margin pale or fuscous-yellow; posterior margin almost straight. *Face*: lobes black, base more or less broadly yellow, rarely entirely black, or sometimes yellow with the apex black, longer than the crown down the centre, acuminate, considerably divergent at the apex. *Antennæ* black; 2—3 joints white, 4th brownish, base white; 4th barely half the length of the 3rd.

Thorax: *pronotum* fuscous-yellow or yellow; *mesonotum* fuscous-yellow, yellow, orange, red or black; in the last case with the sides broadly red; in the 1st and 3rd with four brown or black longitudinal streaks on the

posterior portion, placed one in a line with each extremity of the scutelliform process, and another generally broader than the last nearer the lateral margin. *Elytra* somewhat elongate, clear, transparent, or sometimes very faintly testaceous; apex obtuse or sometimes bluntly rounded; nerves pale yellow; radius at the base about equidistant from the costal margin and the cubitus, its apical half slightly convex towards the anterior margin. *Legs* fuscous-yellow. *Thighs* yellow, with a broad black longitudinal line somewhat on the inside, near the upper margin, generally extending to the apex. *Tibiæ*: apex frequently brown. *Tarsi* and *claws* pitchy brown.

Abdomen above brown or black, posterior margin of the segments narrowly greenish or yellowish-green; beneath generally green.

Length $1\frac{1}{4}$ — $1\frac{1}{2}$ line.

Var. *bicolor*, Meyer-Dür. *Head* and *thorax* deep yellow. *Abdomen* green; all the other characters as above. Types in my possession.

Allied to *T. albiventris*, from which it may be recognized by the difference in colour and divergence of the face-lobes, and more particularly by the radius, which is almost one-half further distant from the costal nerve.

Perhaps the most common and variable species of the genus, and may be swept from nettles (*Urtica dioica*, &c.) from May to October.

Species 3. *Trioza viridula*.

Chermes viridula, Zett. I. L. 309, 7; *Psylla simplex*, Hartig, Zeits. iii. 374, 6? *Trioza apicalis*, Först. Verh. Ver. Rheinl. v. 82, 2; *Trioza viridula*, Flor, Rhyn. Livl. ii. 499, 3.

Pale green. *Elytra* clear, with a glassy or crystalline transparency.

Head pale green. *Face*: lobes at the apex brown or black, shorter than the crown down the centre, moderately divergent; apex acuminate. *Antennæ* whitish or yellowish-white; apex of the 8th joint and 9—10 entirely black; 3rd twice as long as the 4th.

Thorax pale green. *Elytra* clear, with a glassy or crystal transparency; costal margin convex, somewhat abruptly curved from and at the greatest breadth of the corium, which lies a little before the apex of the radius, to the stumpy, almost acute apex; nerves clear. *Legs* pale

green or greenish-yellow. *Tarsi*: 2nd joint entirely, or apex only, and *claws* brown.

Abdomen pale green.

Length $1\frac{1}{2}$ line.

The delicacy and transparency of this species will separate it from all others.

Flor says that it is not uncommon with him from June to October, upon the spruce fir (*Pinus abies*). I have only met with two examples; one in the August of this year, amongst rubbish at the bottom of a hedge, and the other in September, 1869, in the Sallow Pit, Lee.

Species 4. *Trioza galii*.

Trioza Galii, Först. Verh. Ver. Rheinl. v. 87, 19; Flor, Rhyn. Livl. ii. 511, 9; Leth. Hém. Nord, ed. ii. 92, 2; *Trioza velutina*, Först. Verh. Ver. Rheinl. v. 87, 20?; Flor, Rhyn. Livl. ii. 513, 10?; Leth. Hém. Nord, ed. ii. 92, 2?; *Trioza thoracica*, Flor, Rhyn. Livl. ii. 514.

Black, shining. *Face*: lobes short, outline somewhat pyramidal. *Antennæ* black; 2nd joint at the apex and 3rd entirely white. *Elytra* very pale brownish-testaceous, transparent; apex not acuminate.

Head black, shining. *Face*: lobes not so long as the crown down the centre; base broad; outline somewhat pyramidal. *Antennæ* black; 2nd joint at the apex and 3rd entirely white; 4th not half as long as the third.

Thorax: *pro-* and *meso-notum* black, shining; the latter at the insertion of the elytra brownish-yellow. *Elytra* very pale, brownish-testaceous, transparent, a little more than twice as long as broad; apex not acuminate; dorsal margin and *wings* at the base with a small black dash. *Legs* black. *Thighs*: apex brownish-yellow. *Tibiæ* white, base entirely fuscous, apex slightly brownish. *Tarsi*: 2nd joint at the apex and *claws* fuscous.

Abdomen black; base reddish; posterior margin of the segments very narrowly red.

Length $1\frac{1}{4}$ line nearly.

After carefully reading and comparing the description of *T. galii* and *velutina*, as set forth both by Förster and Flor, I have come to the conclusion that the differences are more imaginary than real, and I have therefore ranked them as one species only, until I have examined more specimens.

Haliday had collected this species in Ireland, as men-

tioned by Förster; and the only specimens of recent capture I have seen are one taken by Dr. Power at Darenth, in June, another at Lee, in August, and a third by Mr. Douglas. According to Haliday, he found *T. galii* on the yellow ladies' bed-straw (*Galium verum*); and Lethierry says he takes *T. velutina* very commonly upon the same plant in August and September.

Species 5. *Trioza acutipennis*.

Chermes acutipennis, Zett. I. L. 308, 5; *Trioza acutipennis*, Flor, Rhyn. Livl. ii. 516, 12; *nec* Först. *Trioza Saundersi*, Meyer, Mitth. schw. ent. Ges. ii. 390.

Black. *Face*: lobes black, somewhat broad at the base, not longer than the crown down the centre. *Antennæ* yellowish-white; 1—2 joints black, 4th, 6th and 8th narrowly brown at the apex, 9—10 black. *Elytra* pale brownish-testaceous, transparent; apex acute; nerves pale.

Head black, shining. *Crown*: posterior margin straight. *Face*: lobes black, somewhat broad at the base, not longer than the crown down the centre; exterior and inner margins gradually sloping to the somewhat acute apex, where the divergence is less than the base of either of them. *Antennæ* yellowish-white, 1—2 joints black, 4th, 6th and 8th narrowly brown at the apex, 9—10 black; 4th about $\frac{3}{4}$ the length of the 3rd, apex slightly thicker than the base of the 5th.

Thorax: *pronotum* black; lobate side margins yellow; *mesonotum* black; at the base of the elytra red. *Elytra* pale brownish-testaceous, transparent; apex acute; nerves pale; radius straight, or very slightly bent before the apex; *pro-* and *meso-sternum* black; *metasternum* generally red. *Legs* yellow or brownish-yellow. *Thighs* pitchy black; apex yellow or brownish-yellow. *Tarsi*: 2nd joint more or less dark brown. *Claws* dark brown.

Abdomen above black; ♂ genital segments pale brownish-yellow.

Length $1\frac{1}{4}$ line.

I have hesitated to refer the *T. acutipennis*, Först., to this species, as the differences he points out in the antennæ and elytra are so much at variance with that of Zetterstedt. There is no doubt, however, but that the *T. Saundersi*, Meyer-Dür, belongs here, as I possess the specimens which he sent to Mr. Saunders, with his own label attached.

I have only seen a few specimens, although on the Continent it is said to be common in damp places from May to October.

Species 6. *Trioza hæmatodes*.

Trioza hæmatodes, Först. Verh. Ver. Rheinl. v. 85, 13;
Leth. Hém. Nord, ed. ii. 93, 5.

Elongate, brown-red, with paler streaks upon the mesonotum. *Face*: lobes brownish-yellow. *Antennæ* black; 1st and 2nd joints brown, 3rd yellow. *Elytra* clear, transparent; nerves pale brown; radius short, space enclosed between it and the costal nerve lanceolate.

Head: crown orange reddish. *Face*: lobes brownish-yellow, as long as the crown down the centre; base moderate; inner margin diverging from about the middle to the somewhat acute apex. *Antennæ* black; 1st and 2nd joints brown, 3rd yellow, 4th not $\frac{1}{2}$ the length of the 3rd.

Thorax: pronotum pale; mesonotum brown-red, posterior portion with four somewhat brownish-yellow longitudinal streaks; scutelliform appendage yellow, with a faint reddish hue. *Elytra* elongate, clear, transparent, nerves pale brown; costal and dorsal margin almost equally rounded towards the somewhat acute apex; radius short, about equal in length to the costal margin of the basal cell; enclosed space lanceolate. *Legs* slightly dusky yellow. *Thighs* with a dark streak along the inside near to the upper margin. *Tarsi*: 1st joint dusky, 2nd and claws black.

Abdomen above brown; posterior margin of the segments narrowly paler; beneath yellowish, ♂ genital segments and processes yellow, apex of the latter narrowly brown.

Length $1\frac{1}{2}$ line.

Somewhat resembling *T. Urticæ* in some points, but differing from that species in the shape of the elytra, the short, almost straight radius and enclosed lanceolate space, and as also frequently having a slight fuscous shade along the dorsal margin before the apex of the clavus.

The insects ticketed *T. forcipata* by Meyer-Dür, which are in my possession, belong to the above species.

Taken both by Dr. Power and Mr. Douglas; by the latter at Addington, end of October, on fir, and by the former in February at Esher.

Species 7. *Trioza salicivora*.*Trioza salicivora*, Reuter (MS.).

Orange red. *Elytra* clear, pale brownish-testaceous, transparent; costal margin curved somewhat regularly from beyond the external basal cell to the somewhat acute apex.

Head: crown orange red. *Face*: lobes orange yellow, scarcely as long as the crown down the centre; base broad; apex somewhat acuminate; divergence about equal to $\frac{2}{3}$ of the base of either. *Antennæ* white; 1st and 2nd joints somewhat fuscous at the base, 3rd and 4th slightly clavate; apex narrowly brown; 8—10 black, 4th about $\frac{3}{4}$ the length of the 3rd.

Thorax orange red. *Elytra* clear, pale brownish-testaceous, transparent; costal margin curved somewhat regularly from beyond the external basal cell to the somewhat acute apex. *Legs* pale orange yellow. *Tarsi*: 2nd joint, apex and *claws* fuscous-black.

Abdomen, ♂, above somewhat orange yellow; base orange red.

Length $1\frac{1}{4}$ line.

We have no other British species for which it is likely to be mistaken.

I have only seen a single ♂ example taken by Dr. Power at Balmuto, Fifeshire.

Species 8. *Trioza albiventris*.

Trioza albiventris, Först. Verh. Ver. Rheinl. v. 84, 8; Flor, Rhyn. Livl. ii. 503, 6.

Reddish-yellow or yellow-reddish, with two generally n-shaped characters on the mesonotum. *Face*: lobes black, longer than the crown down the centre, slightly divergent at the apex. *Elytra* clear, transparent, apex acute; dorsal margin for about $\frac{2}{3}$ its length from the base somewhat moderately and regularly curved, from thence to the apex more abrupt; radius long, apical half curved and running parallel with the costal margin.

Head: crown black, margin yellowish-red; posterior margin very slightly concave. *Face* black; lobes black, longer than the crown down the centre, regularly tapering from the base to the somewhat acute apex; divergence trifling. *Antennæ* black; 1—3 joints bone white, 4th about half the length of the 3rd.

Thorax: pronotum yellow-reddish, with a short, transverse, fine, black line posteriorly next the lateral margin;

mesonotum reddish-yellow, or yellowish-red; anterior portion with a large more or less dark red-brown streak on each side, not reaching the posterior margin; posterior portion with two more or less dark red-brown Ω -shaped characters; scutelliform process usually yellowish, with a more or less distinct brown or reddish-brown spot in the middle. *Elytra* clear, transparent, apex acute; dorsal margin for about $\frac{2}{3}$ its length from the base somewhat moderately and regularly curved or slightly flattened in the middle, from thence to the apex more abrupt; radius long, basal half almost straight, from thence curving round towards, and running parallel with, the costal margin, until just before its termination, when it suddenly recurves; nerves at the base white, apical half yellowish or brownish. *Legs* yellow. *Thighs* along the upper margin with a broadish black streak, not reaching to the base. *Tibiæ*: 1st and 2nd pairs fuscous-yellow or dark brown, 3rd pale yellow. *Tarsi*: 1st and 2nd pairs more or less dark brown, 3rd yellow; 2nd joint at the apex frequently brownish.

Abdomen above black, beneath pale yellowish-green or green, becoming white or bone white after death.

Length $1\frac{1}{2}$ line.

This insect stands nearer to *T. urticæ* than any other of our at present known to me British species, but differs from it in the colouration of the antennæ, in having entirely black face-lobes, a long and peculiarly-formed radius much nearer to the dorsal margin throughout its entire length than is usual, of itself an excellent distinguishing character, and the abdomen beneath white after death, apart from other differences in the genitalia.

I have only seen a few examples taken by Mr. Douglas at Addington in October, both on fir and birch.

Genus APHALARA.

Head much broader than long. *Crown* considerably deflected, divided down the centre by a channel and with a deep fovea on each side; anterior margin more or less Ω -shaped; posterior margin more or less angulate. *Ocelli* minute, placed as in the other genera, the frontal one not perceptible from above. *Face* without lobes. *Antennæ* 10-jointed, short; 9—10 slightly thickened; all the others as in *Psylla*. *Eyes* placed on the side of the head; inner margin almost parallel with the central channel; outer margin very convex.

Thorax: pronotum narrow, more or less deflected or almost horizontal, with two foveæ on each side frequently connected by a channel; lateral margins rounded, almost in a line with the outer margin of the eyes. *Mesonotum* as in *Psylla* and *Trioza*. *Elytra* semi-transparent, rounded at the apex; cubitus petiolate, the petiole about $\frac{1}{2}$ the length of the lower arm; stigma obsolete.

Resembles *Psylla* through having a rounded apex to the elytra and the cubitus petiolate, and *Trioza* through its having no stigma; and it differs from both in the shape of the head and the two slightly thickened terminal joints of the antennæ.

Species 1. *Aphalara exilis*.

Tettigonia exilis, Weber et Mohr, Nat. Reise, 65, t. 1, fig. 2 (1804); *Chermes exilis*, Fallén, Hem. Suec. ii. 80; *Aphalara exilis*, Först. Verh. Ver. Rheinl. v. 89, 2; Flor, Rhyn. Livl. ii. 532, 1; Leth. Hém. Nord, ed. ii. 94, 1.

Greyish-yellow, orange or reddish-yellow, with paler streaks on the mesonotum. *Antennæ* pale yellow or sometimes whitish; 1—2 and 9—10 joints black. *Elytra* white, transparent, more or less thickly sprinkled with fuscous or fuscous-black spots, which are more or less confluent; before the apex a broad transverse fuscous-black band more or less interrupted.

Head: crown in front on each side of the channel slightly produced into a lobe with rounded top. *Antennæ* pale yellow or sometimes whitish; 1st joint entirely and base of the 2nd black; 9—10 black.

Thorax: pronotum pale; *mesonotum* greyish-yellow or reddish-yellow; posterior portion with four pale, more or less distinct in certain individuals, longitudinal lines. *Elytra* white, transparent, with a somewhat frosted appearance when the insect is in repose, more or less thickly sprinkled with fuscous or fuscous-black spots, which are more or less confluent; before the apex a broad transverse fuscous-black band, generally more or less interrupted and spotted with the ground colour; dorsal margin with three fuscous or fuscous-black patches, placed, one a short distance from the base, one a short distance from the apex of the clavus, and the 3rd margining the nerve adjoining the latter; nerves white or yellow. *Legs* yellow. *Thighs* in the middle broadly dark brown or black. *Claws* dark brown.

Abdomen black; sides and posterior margin of the segments narrowly yellow; genital segments of both sexes yellow. Length 1 line.

The broad appearance of this species, its white elytra, with the dark atoms and band before the apex, render it unmistakeable.

Flor gives its size as greater than *A. polygoni*, but this is evidently an error. Dr. Power has taken it somewhat commonly at Weybridge from June to October, and I have an old example from Mr. T. Wilkinson, taken near Scarborough.

Species 2. *Aphalara polygoni*.

Aphalara polygoni, Först. Verh. Ver. Rheinl. v. 90, 3; Flor, Rhyn. Livl. ii. 534, 2; Leth. Hém. Nord, ed. ii. 95, 4.

Orange red or reddish-yellow, with pale streaks on the mesonotum. *Antennæ* somewhat dusky yellow; 1st joint entirely, and 2nd at the base, reddish-brown or brown; 9—10 black. *Elytra* pale testaceous or yellowish; apex generally somewhat fuscous; dorsal margin with a short streak before the apex of the clavus, and margin of the adjoining nerve, black.

Head: crown red or orange red; margin of the central channel at the base frequently whitish. *Antennæ* somewhat dusky yellow; 1st joint entirely, and 2nd at the base, reddish-brown or brown; 9—10 black.

Thorax: pronotum generally pale; frequently with a small red or brownish spot in the middle, and the foveæ brown; mesonotum orange red or reddish-yellow; anterior portion with a longitudinal central line, and the sides whitish or yellowish-white; posterior portion with four whitish or yellowish-white longitudinal lines; lateral margin whitish or yellowish-white. *Elytra* pale testaceous or yellowish, apex generally somewhat fuscous; nerves pale or dark brown in certain positions, appearing as though margined with yellowish; dorsal margin, before the apex of the clavus, with a short black streak, and the adjoining nerve margined on both sides with black; sometimes these last characters are obsolete; clavus, apex frequently white. *Legs* pale brownish-yellow or yellow. *Thighs* on the inside, near the upper margin, generally with a brownish or blackish longitudinal streak. *Tarsi*: 2nd joint at the apex fuscous. *Claws* brown.

Abdomen dark brown or black; posterior margin of the segments narrowly yellow.

Length 1—1 $\frac{1}{4}$ line.

The black streak on the clavus will serve to distinguish this species from either of the other two.

Dr. Power has taken it somewhat commonly on birch, at Birch Wood, in May and June; Mr. Douglas, two or three examples, on fir, in October; and I have also one from Esher. Messrs. Walker and Haliday also met with it, the latter on the sorrel (*Rumex acetosella*). It occurs from May to the end of October.

Species 3. *Aphalara radiata*.

Yellow or yellowish-green, with darker longitudinal streaks on the mesonotum. *Antennæ* yellowish; 1st and 2nd joints, except the apex of the latter, dark brown; 9—10 black. *Elytra* white, almost transparent, about two and a half times as long as broad; nerves yellowish or brownish-yellow; internal basal cell with a fuscous-brown spot in the middle; the four branches of the arms of the cubitus and base and apex of the radius margined with fuscous-brown.

Head: crown yellowish or yellowish-green; posterior margin slightly concave. *Antennæ* yellowish; 1st and 2nd joints dark brown, apex of the latter pale; 9—10 black.

Thorax: pronotum pale; mesonotum yellow or yellowish-green; posterior portion with two broad, longitudinal dark-brown streaks on either side. *Elytra* white, almost transparent, about two and a half times as long as broad; nerves yellowish or brownish-yellow; internal basal cell with a fuscous-brown spot in the middle; base and apex of the radius with a large fuscous-brown spot, the latter divided by a white streak next the costal margin; the four branches of the arms of the cubitus margined with fuscous-brown, widest at the marginal nerve, and joined internally by an irregular transverse fuscous-brown band, thereby giving a somewhat radiated character to the markings; base of the cell between the arms of the cubitus with a fuscous-brown spot. *Legs* yellow. *Claws* brown.

Abdomen dark brown or blackish; posterior margin of the segments narrowly yellow; ♂ genital processes yellow; apex black.

Length 1—1 $\frac{1}{5}$ line.

Very similar to *A. nervosa*, Först., but distinguishable

from that species by the spot in the internal basal cell, the irregular transverse band connecting the fuscous-brown margins of the branches of the cubitus, and the spot at the base of the cell of the latter.

As regards the colouring of the pro- and meso-notum, the description may be found hereafter to be defective, because the specimens from which the foregoing has been drawn up are very old, and have been submerged along with the other valuables of the Rev. T. A. Marshall. There are four or five specimens in his collection taken at Cheltenham.

Species 4. *Aphalara picta*.

Chermes picta, Zett. I. L. 308, 3; *Aphalara flavipennis*, Först. Verh. Ver. Rheinl. v. 89, 1; Leth. Hém. Nord, ed. ii. 95, 4; *Aphalara Sonchi*, Först. Verh. Ver. Rheinl. v. 96, 2; *Aphalara picta*, Flor, Rhyn. Livl. ii. 539, 6.

Greenish-yellow or dusky yellow, with darker streaks on the mesonotum. *Antennæ* yellowish; 1st and 2nd joints underneath brown; 9—10 black. *Elytra* clear, or sometimes faintly yellowish and sprinkled with pale brown towards the apex.

Head greenish-yellow, or dusky yellow. *Antennæ* yellowish; 1st and 2nd joints underneath more or less brown; 4—8 very narrowly brown at the apex; 9—10 black.

Thorax: pronotum pale greenish-yellow; *mesonotum* pale yellowish-green or dusky yellowish; anterior portion with two small reddish-brown triangular patches in front; posterior portion with four broad, pale brown or yellowish-brown longitudinal streaks. *Elytra* clear, or sometimes faintly yellowish, transparent; nerves yellow, their margins and the spaces enclosed by them more or less thickly sprinkled with pale brown, the particles more or less confluent; sometimes the nerves towards, and at the apex, brown. *Legs* greenish or dusky yellowish. *Tarsi*: 2nd joint sometimes brownish. *Claws* brown.

Abdomen above fuscous-black; posterior margin of the segments narrowly, and sides broadly, green; underneath green.

Length $1\frac{3}{4}$ —2 lines. The largest of all the known European species.

It appears to be a very common species on the Continent, occurring in damp meadows from June to the

end of August. I have only seen two examples, one taken by Dr. Power, the other by Mr. Douglas. Förster mentions having received it both from Messrs. Haliday and Walker.

Genus RHINOCOLA.

Head much broader than long. *Crown* deflected, with a shallow fovea on each side; central channel obsolete; anterior margin convex; posterior margin faintly concave. *Ocelli* as in *Aphalara*. *Face* without lobes. *Antennæ* 10-jointed, very short; 9—10 slightly thickened, 3rd elongate, 4—10 about equal in length. *Eyes* placed on the side of the head; outer margin convex.

Thorax: pronotum narrow, somewhat deflected or horizontal; lateral margins about in a line with the outer margin of the eyes. *Elytra* not transparent, somewhat lanceolate; apex rounded; costal margin more convex than the dorsal one; stigma distinct.

In this and the preceding genus the crown and face appear as continuous, and not separated as in *Psylla* and *Trioza*.

Differs from *Aphalara* in the shape of the head and the elytra, and moreover possesses a stigma.

The species of this genus are minute.

Species 1. *Rhinocola ericæ*.

Psylla Ericæ, Curt. B. E. xii. 565, 25; *Rhinocola Ericæ*, Först. Verh. Ver. Rheinl. v. 91, 2; Flor, Rhyn. Livl. ii. 527, 2.

Green, greenish-yellow or yellow. *Antennæ* yellow; three terminal joints frequently brown. *Elytra* testaceous, semitransparent, finely wrinkled transversely.

Head: crown, posterior margin straight. *Antennæ* yellow; 8—10 joints frequently brown.

Thorax: pro- and meso-notum green, greenish-yellow or yellow. *Elytra* testaceous, semitransparent, finely wrinkled transversely, narrowed towards the apex; disk with or without minute brownish particles. *Legs* greenish-yellow or yellow. *Claws* brown.

Abdomen green; genital segments of both sexes yellow, or sometimes in the ♀ faintly brownish-yellow.

Length $\frac{3}{4}$ line.

The small size and more broadly-rounded apex of the elytra will at once establish the difference between this and the following species. Messrs. Walker and Haliday

both knew it as mentioned by Förster, but I have seen no recent specimens, except those taken by myself by sweeping heather in a portion of the New Forest near Fawley, in June last.

Species 2. *Rhinocola aceris*.

Chermes Aceris, Lin. F. S. 264, 1014; S. N. ii. 739, 16.

Green or yellow. *Antennæ* pale green or yellow, apical joint brown. *Elytra* testaceous, scarcely transparent, finely wrinkled transversely. *Head*: *crown* almost horizontal; much broader than long; posterior margin straight. *Antennæ* pale green or yellow, apical joint brown.

Thorax: *pro-* and *meso-notum* green or yellow. *Elytra* testaceous, scarcely transparent, finely wrinkled transversely; radius extending to the middle of the narrowly-rounded apex. *Legs* pale green or yellow. *Claws* brown.

Abdomen green; ♀ genital segments yellow.

Length $1\frac{1}{8}$ line.

Nearly one-half as large again as *R. ericæ*; without brown particles on the elytra, and with the apex much more narrowly rounded.

I have only seen a single ♀ example taken by Dr. Power. Mr. Douglas informs me that on Monday evening last, 12th June, he met with it plentifully in Farm Lane, Lee, on the common maple (*Acer campestre*).

Genus LIVIA, Latr.

Head horizontal; as long as the breadth on the posterior margin. *Crown* in front divided into two lobes by a deep valley, with a channel down the centre. *Face* not lobate. *Antennæ* short, 10-jointed; 2nd joint somewhat pyriform or conate, apex truncate, much longer than the 1st; 3rd stouter than the remainder, which are filiform.

Thorax: *pronotum* lemniscular. *Elytra* longish oval, coriaceous; radius reaching the apex above the middle; upper branch of the bifurcation of the cubitus adjoining the radius terminating in the middle.

Species 1. *Livia juncorum*.

Livia Juncorum, Latr. Gen. Crust. et Ins. iii. 170, 399, 1;
Enc. Méth. x. 225, 1; Germ. F. E. fasc. vi. t. 21;
Burm. Hdb. ii. 97, 1; Cuv. R. A. t. 99 bis, fig. 2;

Curt. B. E. xi. 492 and pl.; Zett. I. L. 306, 1; Am. et Serv. Hém. 596, 1; Först. Verh. Ver. Rheinl. v. 91; Flor, Rhyn. Livl. ii. 542, 1; Leth. Hém. Nord, ed. ii. 95.

Brownish or reddish-pink. *Elytra* pale fuscous-testaceous; very finely wrinkled transversely.

Head: crown brownish or reddish-pink. *Antennæ* red or reddish-pink; 4—8 joints white, 9—10 black; 2nd somewhat pyriform or conate, apex truncate, at least three times longer than the 1st.

Thorax: *pro-* and *meso-notum* brownish or brownish-red. *Elytra* pale fuscous-testaceous, semitransparent, very finely wrinkled transversely; nerves concolorous; dorsal marginal nerve whitish, with minute fuscous spots at somewhat regular intervals between the apex of the clavus and that of the radius. *Legs* pale yellow. *Claws* brownish.

Abdomen above fuscous-yellow or brownish, sometimes with the posterior margin of the segments very narrowly pale reddish; underneath yellow.

Length 1 line.

On rushes (*Juncus conglomeratus*), &c. everywhere from June to the end of August.

The following descriptions are extracted from Förster's Monograph, so copiously referred to in this paper. All the species had been taken either by Mr. Haliday or Mr. Walker, or sometimes by both, and were sent to and determined by Dr. Förster. Specimens of none of these have come under my notice.

Species 21. *Psylla ulmi*.

Chermes ulmi, Lin. F. S. 262, 1002; S. N. ii. 737, 2; Fab. E. S. iv. 221, 2; S. R. 303, 2; *Psylla Ulmi*, Först. Verh. Ver. Rheinl. v. 71, 5.

Green, with a slight mixture of yellow; extreme tip of the antennæ brown,—♂ sometimes the last joint, ♀ the two last (or the antennæ are entirely yellowish). *Face*: lobes somewhat long, broad from the base to the middle, but from there to the apex perceptibly smaller. *Elytra* clear, transparent; nerves pale yellow.

Note.—Nothing is said about the stigma.

This species was taken by Mr. Walker.

Species 22. *Psylla melanoneura*.

Psylla melanoneura, Först. Verh. Ver. Rheinl. v. 75, 17.

Reddish-yellow. *Mesonotum* posteriorly with pale markings. *Abdomen* above with brown bands, beneath pale. *Antennæ*: 3—6 joints at the apex and the remainder almost entirely brown. *Face*: lobes long, strongly narrowed to the apex. *Elytra* clear, transparent; nerves pale at the base, from the middle deep brown; inner margin, almost as far as the nerve adjoining the apex of the *clavus*, pale brownish (in one example the stigma is similarly coloured).

A single ♂ received from Mr. Walker.

Species 23. *Psylla æruginosa*.

Psylla æruginosa, Först. Verh. Ver. Rheinl. v. 97, 6.

Green. *Mesonotum* posteriorly with reddish-yellow markings. *Antennæ* and *legs* yellow, the former from the 3—8 joints brown at the apex; 9—10 brown, the latter more or less green. *Elytra* clear, transparent; nerves pale at the base, towards the apex reddish or almost brownish.

Through the colour of the nerves *P. æruginosa* may be distinguished at first sight from all other green species.

Note.—Nothing is said about the stigma.

Eight specimens received from Mr. Haliday.

Species 24. *Psylla occulta*.

Psylla occulta, Först. Verh. Ver. Rheinl. v. 98, 7.

Reddish-yellow. *Mesosternum* posteriorly with somewhat darker-coloured streaks. *Abdomen* above with brownish bands; underneath green. *Antennæ* and *legs* yellow; the former from the 3—8 joints brown at the apex, 9—10 brown. *Face*: lobes long; base broad; apex acute, widely divergent. *Elytra* clear, transparent; nerves at the base yellow, towards the apex reddish and somewhat darker.

Note.—Nothing is said about the stigma.

Two ♂s and three ♀s received from Mr. Haliday.

Species 9. *Trioza munda*.

Trioza munda, Först. Verh. Ver. Rheinl. v. 88, 22;
Flor, Rhyn. Livl. ii. 515, 11.

Green or yellowish. *Mesonotum* brown. *Antennæ*: 1st and three terminal joints brown. *Abdomen* yellow-green. *Legs* yellow. *Face*: lobes somewhat long and moderately pointed. *Elytra* clear, transparent, radius reaching the costal margin at some distance from the apex.

One ♂ received from Mr. Walker and another from Mr. Haliday.

Flor says he meets with this species commonly in July and August on *Urtica*.

Species 10. *Trioza abieticola*.

Trioza abieticola, Först. Verh. Ver. Rheinl. v. 88, 21;
Flor, Rhyn. Livl. ii. 496, 2; *Trioza argyrea*, Meyer,
Mitth. schw. ent. Ges. iii. 390.

Sordid yellow. *Mesonotum* with confluent brown streaks. *Abdomen* with brown bands. *Antennæ* yellow; 9—10 joints brown. *Face*: lobes somewhat short and stout, moderately pointed. *Elytra* clear, transparent; 2nd forked cell very small, radius very near to the costal margin posteriorly, terminating near the apex; costal margin near the base with a black-brown streak, whereby this species may be easily recognized from *T. curvatinervis*.

A ♀ sent by Walker as *Psylla Abietis*; but as there was already a species bearing that name, Förster described it under the one now given. Flor takes it not uncommonly on the spindle tree (*Euonymus europæus*), and also on the spruce fir (*Pinus abies*), in May and August.

CORRIGENDA.

Page 543, Species 14. *Psylla viridissima*, add name and description to that of *P. Mali*, of which it is only a form.

Note.

Psylla fumipennis, Först., sp. 11, p. 92 of the Catalogue of British Hemiptera, has been altered in this Monograph to *P. Löwii*, n. sp., the former being synonymous with *P. Pruni*, Först., and the one described at p. 541 being new to science.

DESCRIPTION OF PLATES.

PLATE VIII.

- Fig. 1. *Arytæna ulicis*, Curt.
 1a. Head of do., front view.
 1b. Elytron and wing of do.
 1c. Abdomen of ♂, side view.
 1d. Genitalia of ♂, as seen from behind.
 1e. Abdomen of ♀, side view.
 1f. Do. of ♀, underneath.
 2. Elytron of *Psylla spartiophila*, Först.
 3. Do. „ *salicicola*, Först.
 4. Do. „ *fraxinicola*, Först.
 5. Do. „ *rhamnicola*, n. sp.
 6. Do. „ *pyri*, L.
 7. Do. „ *ferruginea*, Först.
 8. Do. „ *costato-punctata*, Först.
 9. Do. „ *Löwii*, Scott.
 10. Do. „ *pruni*, Scop.

PLATE IX.

- Fig. 1. Elytron and wing of *Trioza Walkeri*, Först.
 2. Elytron of *Trioza urticæ*, L.
 3. Do. „ *acutipennis*, Zett.
 4. Do. „ *galii*, Först.
 5. Do. „ *albiventris*, Först.
 6. Do. „ *hæmatodes*, Först.
 7. Do. „ *salicivora*, Reuter, MS.
 8. Do. *Spanioneura Fonscolombei*, Först.
 9. Do. *Aphalara picta*, Zett.
 10. Do. „ *exilis*, Weber et Mohr.
 11. Do. „ *polygoni*, Först.
 12. Do. „ *radiata*, n. sp.
 13. Do. *Rhinocola aceris*, L.



