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THE PSYLLIDAE OF BRITISH COLUMBIA WITH A KEY TO SPECIES

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ABSTRACT

A list is presented of the 38 plant-lice or Psyllidae recorded from British Columbia. Keys to the species are given with locality records, together with an additional 28 species recorded from adjacent areas of Alberta, Washington and Alaska. The keys are adapted from those given in monographs by Crawford (1914), Caldwell (1938a) and Tuthill (1943) with the addition of ten species not included in their keys.

INTRODUCTION

The Psyllidae (=Chermidae) of British Columbia have been neglected as a group and no comprehensive check-list has been published since Downes' (1927) list which consisted of eight species only. Two monographs on the group for the whole of North America have been produced, namely those of Crawford (1914) and Tuthill (1943), but the latter work covered the sub-families Triozinae and Psyllinae only. Other writers, notably Klyver (1932b), Caldwell (1936, 1937, 1940), Strickland (1938, 1939) and Jensen (1956), have described species and published records of the occurrence of psyllids from British Columbia and adjacent areas and the list of Hemiptera of North America by Van Duzee (1917) also contains some records for the region. The list given below is based upon these works and upon the collection of the late W. Downes preserved in the Spencer Entomological Museum of

the University of British Columbia and brought to my attention by Dr. G. G. E. Scudder.

CHECK-LIST OF THE PSYLLIDAE RECORDED FROM BRITISH COLUMBIA

In this list the nomenclature follows Crawford (1914) and Tuthill (1943) and, therefore, conflicts to some extent with that of Caldwell (1938a). I base this choice on what appears to be the most common modern usage both in North America and among European workers (eg. Kloet and Hincks, 1964). The reference following the author and date of each species gives the source of my record which is a published work except when drawn from the Downes' collection ('Downes coll.') or from the notes of Downes preserved with the collection ('Downes notes'). I have given the oldest reference I could find in each case although I do not claim that these are the earliest records of the occurrence of each species in the province.

Subfamily: LIVIINAE

Genus: *Livia* Latreille

Species: *caricis* Crawford 1914

Crawford 1914

Genus: *Aphalara* Förster

Species: ²*calthae* (Linnaeus 1861)

Downes coll.

rumicis Mally 1894

Klyver 1932b

angustipennis Crawford 1911

Downes 1927

veaziei Patch 1911

Downes coll.

nebulosa kincaidi Ashmead 1910

Klyver 1932b

vancouverensis Klyver 1932

Klyver 1932b

²*persicaria* Caldwell 1937

Waddell 1952

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² *Calthae* is not accepted by Caldwell (1937) as a North American species and he has described several further species including *persicaria* from North American material previously ascribable to *calthae* (see keys and notes below).

Subfamily: TRIOZINAE

Genus: *Trioza* Förster

Species:	<i>maura</i> Förster 1848	Klyver 1932b
	<i>quadripunctata</i> Crawford 1910	Downes' notes
	<i>albifrons</i> Crawford 1910	Tuthill 1943
	<i>frontalis</i> Crawford 1910	Klyver 1932b
	<i>inversa</i> Tuthill 1939	Tuthill 1939
	<i>varians</i> Crawford 1910	Van Duzee 1917
	<i>incerta</i> Tuthill 1943	Tuthill 1943
	<i>occidentalis</i> Tuthill 1939	Tuthill 1939
	<i>longicornis</i> Crawford 1914	Crawford 1914

Subfamily: PSYLLINAE

Genus: *Psylla* Geoffroy

Species:	<i>alni</i> (Linnaeus 1758)	Downes 1927
	<i>caudata</i> Crawford 1914	Klyver 1932b
	<i>galeaformis</i> Patch 1911	Downes coll.
	<i>floccosa</i> Patch 1909	Downes coll.
	<i>trimaculata</i> Crawford 1914	Klyver 1932b
	<i>striata</i> Patch 1911	Tuthill 1943
	<i>coryli</i> Patch 1912	Tuthill 1943
	³ <i>stricklandi</i> (Caldwell 1939)	Downes' notes
	<i>magnicauda</i> Crawford 1914	Tuthill 1943
	<i>buxi</i> (Linnaeus 1758)	Downes coll.
	<i>pyricola</i> Förster 1848	Downing, Morgan & Proverbs 1956
	<i>parallela</i> Crawford 1914	Klyver 1932b
	<i>minor</i> Crawford 1914	Crawford 1914
	³ <i>latiforceps</i> Tuthill 1943	Downes' notes

Genus: *Arytaina* Förster

Species:	<i>fuscipennis</i> Crawford 1914	Crawford 1914
	<i>robusta</i> Crawford 1914	Tuthill 1943
	<i>pubescens</i> Crawford 1914	Downes coll.
	<i>spartiophila</i> (Förster 1848)	Downes 1957

Genus: *Psyllopsis* Löw

Species:	<i>fraxinicola</i> (Förster 1848)	Downes coll.
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Genus: *Euphyllura* Förster

Species:	<i>arbuti</i> Schwartz 1904	Klyver 1932b
	<i>arctostaphyli</i> Schwartz 1904	Klyver 1932b

KEYS TO THE SPECIES OF PSYLLIDAE RECORDED FROM BRITISH COLUMBIA AND ADJACENT AREAS

The keys that follow include all the species listed above together with additional species recorded from Alberta, Washington State and Alaska south of the 63° N parallel. I include these because the list above cannot claim to be complete and species recorded from adjacent areas may well be found within the borders of the province. The keys are based upon those of Crawford (1914), Caldwell (1938a) and Tuthill (1943) suitably abridged and added to. I have added eight species of *Aphalara* and one of *Psylla* that were not included in these works although none of the nine is recorded yet from British

³ These two species of *Psylla* are marked with a question mark in Downes' notes and I can locate no further records for them. I retain them as records needing confirmation.

Columbia. The keys to these additional species are based on the published descriptions and exact references are given. Except where otherwise stated, place names in parentheses represent records within British Columbia.

KEY TO SUB-FAMILIES OF THE PSYLLIDAE (AFTER CRAWFORD 1914)

1. Frons not covered by genae; genae not produced into conical processes; front ocellus at extremity of frons. 2
- Frons covered by genae; genae usually produced into conical processes ('genal cones'); front ocellus embedded between vertex and genae. 3
2. Vertex flat and horizontal, with frons beneath it in the form of a narrow (usually elongate) sclerite from clypeus to front ocellus; wings often more or less thickened and maculated. LIVIINAE

- Vertex rounded downward in front, not horizontal, with frons as a distinct sclerite usually forming a uniformly smooth surface with vertex and genae; wings usually membranous. PAUROPSYLLINAE
- 3. Basal tarsal segment of hind-legs without a pair of black claw-like spines at their tip; radius, media and cubitus usually diverging at same point from basal vein; wings usually angulate at apex. TRIOZINAE
- Basal tarsal segment of hind-legs with two black claw-like spines at tip; the three veins not diverging at the same point from basal vein but media and cubitus with a common stem; wings rarely angulate at apex. PSYLLINAE

One other sub-family of psyllids, the CARSIDARINAE, is recorded from North America but I have found no records for farther north than Ohio (Caldwell 1938a). This sub-family is distinguished from all others by having 'a head deeply cleft in front, with the antennae attached to the truncate anterior ends on each side of the cleft' (Crawford, 1914).

KEY TO GENERA OF THE LIVIINAE (AFTER CRAWFORD 1914)

- 1. Eyes greatly flattened, not hemispherical; vertex longer than broad; pronotum extending far down laterally toward coxae; wings thickened. *Livia* Latreille
- Eyes more or less hemispherical; vertex not longer than broad. *Aphalara* Förster

KEY TO SPECIES OF THE LIVIINAE

Genus: *Livia*

Only one species of *Livia*, *caricis* Crawford, is recorded from the region and is characterised by Crawford as follows: 'length seldom more than 3mm., often less, vertex not deeply emarginate in front, scarcely raised on margins, flagellum of antennae usually about two and a half times as long as segment II; forceps of male usually short, stout, not pyriform, truncate at apex; wings not maculated, semi-transparent, thick and transversely wrinkled.' (Glacier, Duncan, Riske Creek and Kamloops).

Genus: *Aphalara*

- 1. Clypeus much elongated, more or less cylindrical, rounded or truncate at apex extending down and forward. 'calthae' group . . . 8
(Recorded as *calthae* L. from Quesnel, Stanley and Soda Creek).
- Clypeus sub-globose or pyriform, not elongated, more or less adpressed to face. 2
- 2. Wings distinctly maculated or banded. 3
- Wings not distinctly maculated or banded. . . 7
- 3. Forceps of male clavate, with inwardly directed tooth or inner anterior margin, subapically. . . 4

- Forceps of male not clavate at apex, without inner subapical tooth. 6
- 4. Wings clear with an irregular brown band running diagonally across their apices; colour of body reddish to flavous. *rumicis* Mally (Chilliwack).
- Wings opaque, whitish, covered more or less densely with brown spots. 5
- 5. Wing spots running together to form maculae, more numerous distally; general colour grey with yellowish or brownish tinge on head and thorax and dark transverse stripes on dorsum of abdomen. *vancouverensis* Klyver (Recorded and described from Duncan).
- Wing spots small, round; general colour greenish yellow with whitish stripes on dorsum of thorax. *angustipennis* Crawford (Vernon, Quesnel and Soda Creek).
- 6. Posterior process of male anal valve tapering uniformly to apex, not lanceolate; forceps deeply bifurcate with two long, thin processes; antennae one and a half times as long as head width. *alaskensis* Ashmead (Recorded from Fox Point, Alaska and Easton, Washington (Crawford 1914)).
- Posterior process of male anal valve conspicuously lanceolate, petiolate at base; forceps T-shaped; antennae $1\frac{1}{4}$ times head width. *nebulosa kincaidi* Ashmead (Chilliwack and Triangle Island).
- 7. Forceps of male with caudal margins appearing straight or slightly concave; dorsal valve of female genital segment relatively straight with rather abruptly upturned apex; antennae varying in length, at least as long as head width. *veaziei* Patch (Victoria, Quesnel and Prince George).
- Forceps of male with caudal margins distinctly sinuate or convex in lateral aspects; female genital segment with dorsal valve sinuate or, if appearing straight, apex not upturned; antennae almost twice as long as head width. *fumida* Caldwell (Recorded by Strickland (1939) from several localities in Alberta).
- 8. Body entirely black. *manitobaensis* Caldwell (Recorded by Strickland (1939) from Wabumun, Alberta).
- Body orange to red but not entirely black . . . 9
- 9. Fore-wings not hyaline often with dark areas, bands or spots 10
- Fore-wings hyaline. 11
- 10. Fore-wings with a sub-apical brown band and spot on the commissural margin; membrane yellowish. *dentata* Caldwell

¹ The key to this and the following six species of *Aphalara* is constructed from Caldwell's original descriptions (1937, 1938b) of the species previously designated as *calthae*. I was restricted, therefore, to the characters included in his descriptions. The four species, *confusa*, *simila*, *persicaria* and *loca*, will be found difficult to separate, especially the females, and this should not be attempted without Caldwell's (1937) diagrams of the genitalia to hand (e.g. the females of *confusa* and *simila* are separated on the length of the proboscis-like extension of their dorsal valves).

(Records from Medicine Hat, Alberta in Strickland (1938)).

- Fore-wings with no bands or spots, terminations of all veins usually have surrounding dark areas, sub-apical faint brown cloud may be present. *curta* Caldwell

(Recorded by Strickland (1938) from Beaverlodge, Alberta).

- 11. Males. 12

- Females. 15

- 12. Forceps of genitalia having relatively long anterior-mesal processes widely separated at their tips from the apices of the forceps 13

- Anterior-mesal processes of forceps relatively short and not widely separated from the apices of the forceps at their tips. 14

- 13. Tips of forceps squarely truncate.

..... *confusa* Caldwell

(Recorded from several localities in Alberta by Strickland (1938)).

- Tips of forceps tapering and rounded.

..... *loca* Caldwell

(Recorded from several localities in Alberta by Strickland (1938)).

- 14. Anterior-mesal processes short and closely adpressed to bodies of forceps with tip not quite reaching apices of forceps, forcep tip more or less square. *persicaria* Caldwell

(Creston).

- Anterior-mesal processes short but not closely adpressed to bodies of forceps, forcep tip oblique. *simila* Caldwell

(Recorded by Strickland (1938) from Wabamun, Alberta).

- 15. Dorsal valve of genitalia with a proboscis-like, downward pointing extension, circum-anal ring of even width all round. 16

- Dorsal valve with no proboscis-like extension; circum-anal ring with an apron-like distal extension. 17

- 16. Head greatly deflexed. *confusa* Caldwell

- Head not greatly deflexed. *simila* Caldwell

- 17. Dorsum of dorsal valve sinuate beyond anal opening, apex of this valve narrowing to a nose-like apex; anal vein finely serrate.

..... *persicaria* Caldwell

- No nose-like apex to the dorsal valve; anal vein not finely serrate.

..... *loca* Caldwell

A further species, *Aphalara hebecephala*, described by Caldwell in 1936 is recorded by Strickland from Alberta but I found Caldwell's description too incomplete to include the species in this key.

One final word on the 'calthae group' and that is that if Caldwell's supposition holds, that the North American 'calthae' are, in fact, several closely related species, then we may expect that more species will be described and determination to a particular species at this stage must be made with cir-

cumspection which will be removed only after further work on the group.

THE PAUOPSYLLINAE

Only one species of this sub-family, namely *Calophya triozmima* Schwartz, is recorded from the region, by Strickland (1939) from Medicine Hat, Alberta. Crawford (1914) characterises the species as follows: 'genal cones not longer than broad, usually much reduced; wings more or less angulate at apex, hyaline, transparent, shining, pterostigma short and small; prescutum long'.

KEY TO GENERA OF THE TRIOZINAE

(AFTER TUTHILL 1943)

- 1. Radius, media and cubitus arising from basal vein at same point. 2

- Radius, media and cubitus not arising at same point, radius and media or media and cubitus with a short, common petiole.

..... *Hemitrioza* Crawford

- 2. Genae produced as usually conical processes at least moderately long (usually half as long as vertex or longer). *Trioza* Förster

- Genal processes, if present, very short, conical or pad-like, sometimes lacking, or genae smoothly, spherically swollen.

..... *Paratrioza* Crawford

KEY TO SPECIES OF THE TRIOZINAE (AFTER TUTHILL 1943)

Genus: *Trioza*

- 1. Hind tibiae with two inner apical spines. 2

- Hind tibiae with three inner apical spines. 9

- 2. Genal processes longer than vertex

..... *pulla* Tuthill

(Recorded by Tuthill (1943) from Washington).

- Genal processes not longer than vertex (usually distinctly shorter). 3

- 3. Antennae at least twice as long as width of head. *longicornis* Crawford

(Vancouver)

- Antennae less than twice as long as width of head (rarely over $1\frac{3}{4}$ times as long). 4

- 4. Marginal cells of fore-wings very small; female genital segment over half as long as rest of abdomen. 5

- Marginal cells typical size for *Trioza*; female genital segment less than half as long as rest of abdomen. 6

- 5. Dorsal valve of female genital segment straight and acute apically; length about 4 mm.

..... *occidentalis* Tuthill

(Recorded and described from Kaslo Creek).

- Dorsal valve of female genital segment up-turned and blunt apically; length about 3.5 mm. *rubicola* Tuthill

(Described by Tuthill (1943) from Tacoma, Washington).

6. Antennae $1\frac{1}{2}$ times as long as width of head. 7
- Antennae at least $1\frac{3}{4}$ times width of head
..... **varians** Crawford
(From British Columbia (Van Duzee, 1917)).
7. General colour black; female genital segment straight and acute. **incerta** Tuthill
(From British Columbia (Tuthill, 1943)).
- General colour green to orange, head often black; female genital segment shorter, strongly curved ventrally. 8
8. Vertex strongly bulging anteriorly; caudal lobes of male proctiger short, only half as long as axial portion **minuta** Crawford
(Recorded by Strickland (1938) from several localities in Alberta and by Tuthill (1943) from Washington).
- Vertex not strongly bulging; caudal lobes of male proctiger as long as axial portion.
..... **maura** Förster
(Thormanby Island).
9. Thorax very strongly arched; male proctiger arcuate caudally but not produced into an extended lobe; both valves of female genital segment straight, about equal in length, ventral valve not upcurved to meet dorsal valve. 10
- Thorax moderately arched; male proctiger with a prominent caudal lobe (either apical or basal); female genital segment with at least the ventral valve strongly upcurved. 11
10. Fore-wings with four dark spots on posterior margin. **quadripunctata** Crawford
(Quesnel and Soda Creek).
- Fore-wings immaculate. **albifrons** Crawford
(From British Columbia (Tuthill, 1943)).
11. Male proctiger with caudal lobes as long as axial portion, lobe never entirely basal; antennae $1\frac{1}{2}$ or more than $1\frac{1}{2}$ times as long as width of head. 12
- Caudal lobe of male proctiger much shorter than axial portion, lobe basal in origin; antennae $1\frac{1}{3}$ times as long as width of head.
..... **inversa** Tuthill
(From British Columbia (Tuthill, 1943)).
12. Forceps of male in lateral view parallel sided, not enlarged apically; species about 3 mm. in length; colour typically orange with black tarsi and antennae but may be much darker with brown markings. **sulcata** Crawford
(Recorded by Strickland (1938) from Edmonton, Alberta).
- Forceps of male in lateral view slender basally, enlarged apically; species about 3.5 mm. in length; colour orange-red to brown with darker antennae, genal processes and abdomen.
..... **frontalis** Crawford
(Victoria).

Genus: **Paratrioza**

A single species of this genus, **cockerelli** (Sulc) is

recorded from the region, from several localities in Alberta by Strickland (1938, 1939). The species is characterised by Tuthill (1943) as follows: 'a small (3 mm. to tip of folded wings) species with hyaline fore-wings and having genae produced as small but distinct conical processes'.

Genus: **Hemitrioza**

Again a single species of this genus, **washingtonia** Klyver, is recorded from the area. The species was described from a single individual from Toppenish, Washington by Klyver (1932b). Tuthill (1943) characterised it as follows: 'species with costal margins of fore-wings not strongly arched, Rs long, straight, extending beyond furcation of media; general colour brown, forewings immaculate'.

KEY TO GENERA OF THE PSYLLINAE (AFTER TUTHILL 1943)

1. Genal processes large, flattened, contiguous, on same plane as vertex; fore-wings thickened, rugose, rhomboidal. **Euphyllura** Förster
- Genal processes not flattened, rarely contiguous; fore-wings usually membranous, sometimes thickened and rugose but not rhomboidal. 2
2. Pleural suture of prothorax extending to middle of lateral margin of pronotum, propleurites equal dorsally. 3
- Pleural suture of prothorax oblique, propleurites not equal dorsally.
..... **Psylla** Geoffroy
3. Genal processes sharply depressed from plane of vertex parallel to it **Arytaina** Förster
- Genal processes not depressed from plane of vertex. **Psyllopsis** Löw

KEY TO SPECIES OF THE PSYLLINAE (MODIFIED FROM TUTHILL 1943)

Genus: **Psylla**

1. Eyes borne on prominent stalk-like portion of the head **negudinis** Mally
(Recorded by Strickland (1938) from Edmonton, Alberta).
- Eyes not borne on prominent stalk-like portion. 2
2. Antennae twice as long as width of head or longer. 3
- Antennae distinctly less than twice as long as width of head 8
3. Smaller (up to 3.5 mm. to tip of folded wings) species; yellowish green wings, not clear or hyaline; distal third of antennae dark, segments without dark annuli. **striata** Patch
(From British Columbia (Tuthill, 1943)).
- Larger (more than 4.5 mm. to tip of folded

- wings) species; without above combination of characters. 4
4. Pterostigma present, prominent. 5
- Pterostigma obsolete or nearly obsolete. 7
5. Genal processes no longer than basal width, typically rounded apically. *alni* (Linnaeus) (Sooke and Victoria). 6
- Genal processes longer than basal width, sharper apically. 6
6. Female genital segment $3/4$ as long as rest of body; male forceps enlarged apically. *caudata* Crawford (Vancouver (Klyver, 1932b)). 6
- Female genital segment not over $1/2$ as long as rest of body; male forceps nearly parallel, margined to apices. *galeaformis* Patch (Quesnel and Soda Creek). 7
7. Female genital segment larger than rest of abdomen, slender, styliform, abruptly enlarged basally; male forceps not notched apically. *floccosa* Patch (Quesnel and Soda Creek). 7
- Female genital segment shorter than rest of abdomen, stout; male forceps notched apically. *trimaculata* Crawford (From Thormanby Island and Esquimalt, by Klyver (1932b) who regarded the variety *astigmata* Crawford as a separate species). 8
8. Small (2-2.5 mm.) species; genal processes separate basally, strongly divergent; fore-wings more or less fumate. 9
- Larger (more than 2.5 mm.) species; genal processes separate basally, less strongly divergent; fore-wings not usually fumate (except in *pyricola* and *alaskensis*). 10
9. Head and thorax very prominently pubescent. *hirsuta* Tuthill (From Satus Creek, Washington (Tuthill, 1943)). 10
- Head and thorax not pubescent. *coryli* Patch (From British Columbia (Tuthill, 1943)). 10
10. Female genital segment distinctly longer than rest of abdomen and male forceps simple. 11
- Female genital segment at most as long as rest of abdomen or, if longer, male forceps not simple. 15
11. Antennae $1\frac{2}{3}$ times as long as width of head or more. 12
- Antennae $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as width of head. *buxi* (Linnaeus) (Vancouver). 12
12. Apex of dorsal valve of female genital segment curved ventrally. *hartigii* Flor (Recorded from Edmonton, Alberta). 13
- Apex of dorsal valve of female genital segment upcurved. 13
13. Ventral valve of female genital segment with sharp apex; large species (4-4.5 mm.). *stricklandi* Caldwell (Recorded from several localities in Alberta by Strickland (1939)). 14
- Ventral valve of female genital segment with blunt apex. 14
14. Ventral valve of female genital segment distinctly shorter than dorsal valve, latter evenly upcurved; male forceps arched to black, blunt apices. *magnicauda* Crawford (From British Columbia (Tuthill, 1943)). 14
- Ventral valve of female genital segment nearly as long as dorsal valve, latter very abruptly upturned apically; male forceps slender, gradually narrowing to apices. *tuthilli* (Caldwell) (Recorded by Strickland (1939) from Medicine Hat, Alberta). 15
15. Antennae slightly longer than width of head. *parallela* Crawford (Chilliwack, Chilcotin and Nicola Lake, (Klyver 1932b)). 15
- (see also couplet 22 below).
- Antennae at least $1\frac{1}{3}$ times as long as width of head (sometimes slightly less in *alaskensis*). 16
16. Male forceps simple, blunt to acute apically (not truncate); greenish white. 17
- Male forceps not simple. 20
17. Genal processes almost as long as vertex; light green species. *alba* Crawford (Recorded by Tuthill (1943) from Washington). 18
- Genal processes not over $2/3$ as long as vertex; dark coloured species. 18
18. Fore-wings with a black spot at apex of clavus, often somewhat fumate. 19
- Fore-wings immaculate. *americana* Crawford (Recorded by Tuthill (1943) from Banff Springs, Alberta). 19
19. Pterostigma narrow. *pararibesiae* Jensen (Recorded by Jensen (1956) from Ellensburg, Washington). 20
- (see also couplet 20).
- Pterostigma large. *pyricola* Förster (Interior of British Columbia (Downing et al., 1956)). 20
20. Fore-wings with a prominent dark spot at apex of clavus. *pararibesiae* Jensen (see couplet 19 above). 21
- Fore-wings immaculate (except pterostigma may be dark, more or less fumate in *alaskensis*). 21
21. Male forceps narrowed before apex, then enlarged and truncate, somewhat T-shaped in appearance. 22

³The species, *pararibesiae*, was described and separated from *ribesiae* (Crawford) by Jensen (1956) along with *notapennis* Jensen. Of these three only one, *pararibesiae*, is recorded from the area of interest; *ribesiae* being recorded from no nearer than Oregon and *notapennis* being restricted to California. From Jensen's descriptions I surmise that the complex of all three species would key out as *ribesiae* in Tuthill's (1943) key. I have therefore retained Tuthill's method of determination as a means of identifying *pararibesiae* in the region being considered here.

- , Male forceps not T-shaped. 23
- 22. Length to tip of folded wings 3 mm.
..... *parallela* Crawford
(see couplet 15 above).
- , Length to tip of folded wings 3.5 to 4 mm.
..... *minor* Crawford
(Victoria and Vancouver (Crawford, 1914)).
(note that *americana flava* = *minor flava* —
see Tuthill, 1943).
- 23. Male forceps broad, apices very broadly
truncate and heavily sclerotised.
..... *latiforceps* Tuthill
(Quesnel (Downes, but with a question mark
against the determination), recorded by Tuthill
(1943) from Easton, Washington).
- , Male forceps otherwise. 24
- 24. Male forceps strongly sinuate on caudal
margin. *sinuata* Crawford
(Recorded from Edmonton and Nordegg,
Alberta by Strickland (1938)).
- , Male forceps otherwise. 25
- 25. Entire apical portion of forceps hooked, heavily
pubescent; female genital segment shorter than
rest of abdomen. *uncata* Tuthill
(Recorded by Tuthill (1943) from Banff
Springs, Alberta).
- , Forceps bearing a small apical hook, scarcely
visible in lateral view; female genital segment
as long as or longer than rest of abdomen.
..... *alaskensis* Ashmead
(Recorded from Fox Point and Seldovia,
Alaska by Tuthill (1943)).

Genus: *Arytaina*

- 1. Fore-wings conspicuously maculate, spotted or
entirely dark. 2
- , Fore-wings not conspicuously maculate, often
more or less evenly fumate. 4
- 2. Fore-wings with prominent pterostigma.
..... *pubescens* Crawford
(Penticton).
- , Fore-wings with pterostigma almost or com-
pletely obsolete. 3

- 3. Fore-wings entirely dark; male forceps
bilobate. *fuscipennis* Crawford
(North Bend).
- , Fore-wings white with brown spots or maculae;
male forceps not bilobate.
..... *robusta* Crawford
(From British Columbia (Tuthill, 1943)).
- 4. Pterostigma lacking. *spartiophila* (Förster)
(Victoria).
- , Pterostigma prominent. *ceanothi* Crawford
(Recorded from Easton, Washington by
Tuthill (1943)).

Genus: *Psyllopsis*

A single species of this genus is recorded from this region. This is *fraxinicola* (Förster) from Victoria. Tuthill (1943) characterises the species as follows: 'unicolourous, including wings, greenish yellow, wings hyaline'.

Genus: *Euphyllura*

- 1. Veins Rs and M (including branches) of fore-
wings very strongly sinuate; wings brown
basally, light apically. *arbuti* Schwartz
(Galiano).
- , Veins Rs and M not or only very slightly
sinuate; wings generally brownish with red
veins. *arctostaphyli* Schwartz
(Merritt).

Note that in the above keys the most exact localities recorded for the species from British Columbia are given. Species occurring in adjacent areas but not within the province are included only when a definite record has been published.

Acknowledgments

I am most grateful to Dr. G. G. Scudder for suggesting the area of this study and for reading an early draft of this paper. I thank, also, Miss Kathleen Stuart of the Spencer Entomological Museum who ran checks on my keys.

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