

**Studies on the Canadian and Alaskan Fulgoromorpha (Hemiptera).  
I. The Genera *Achrotile* Fieber and *Laccocera* Van Duzee  
(Delphacidae)**

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This is the first of a series of papers which will consider the systematics of the Canadian and Alaskan Fulgoromorpha. The aim is to produce eventually a work on the Fulgoromorpha similar to that on the Cicadellidae of the same area by Beirne (1956).

The two Delphacid genera *Achrotile* Fieber and *Laccocera* Van Duzee can be recognized by the presence of distinct pits on the frons, notum and abdominal dorsum. The frons in *Achrotile* has two median parallel carinae whilst only one is present in *Laccocera*.

***Achrotile* Fieber**

*Achrotile* Fieber 1866, Verh. Zool. Bot. Ges. Wien 16:521 [original description]

*Achrotile* Metcalfe 1943, Gen. Cat. Hemiptera 4(3):129 [bibliography]

*Achrotile* Beamer 1954, J. Kansas ent. Soc. 27: 143 [key to North American species]

Type species: *Delphax albosignata* Dahlbom.

Species in this genus are somewhat uniform black to ferruginous-brown and have usually the vertex, two parallel longitudinal lines on the pronotum and scutellum, and two transverse stripes on the anterior abdominal terga, whitish-ochraceous. Most species appear very similar in general shape and form and at the moment it is not possible to identify females.

In this paper four species are noted from Canada and Alaska, and of these, three are described as new.

**Key to the Canadian and Alaskan *Achrotile***

1. Male insects with head and thoracic nota more or less completely ochraceous-flavescent; male with a short bifid process on genital capsule ventrally (Fig. 2c), anal processes distinctly curved (Fig. 2b) and aedeagus short but neither sickle-shaped nor with spinose 'head' (Fig. 6); British Columbia & Alberta ..... *distincta* n. sp.  
Male insects with head and thoracic nota not more or less completely ochraceous-flavescent, but usually black with vertex and two parallel line on pronotum and scutellum only, ochraceous; male with process on genital capsule not short and bifid; aedeagus either sickle-shaped or with a spinose 'head' ..... 2
2. Aedeagus sickle-shaped (Fig. 5); anal processes slender, tapering and almost straight (Fig. 4b); process on ventral margin of genital capsule as in Fig. 4c; Alaska, Northwest Territories, northern British Columbia, northern Alberta .....  
..... *subarctica* n. sp.  
Aedeagus not sickle-shaped; anal processes not slender, tapering and almost straight; process on venter of genital capsule not as in Fig. 4c. .... 3
3. Process on ventral margin of genital capsule acutely pointed (Fig. 1c); aedeagus with a distinct spinose 'head' (Fig. 8); east of Rocky Mts. .... *acuta* n. sp.  
Process on ventral margin of genital capsule not acutely pointed, but apically bifid and slightly recurved (Fig. 3c); aedeagus with apex somewhat spinose and slightly hooked, but without a distinct swollen 'head' (Fig. 7); British Columbia .....  
..... *stylata* Beamer

***Achrotile acuta*, new species**

(Figs. 1 a-c, 8)

Colour: Male black with vertex between carinae and pits, ochraceous; pronotum and scutellum with a pair of median parallel longitudinal pale streaks; abdominal dorsum with two ochraceous-white transverse streaks anteriorly. Female, similar to male, but paler; centre of pronotum and scutellum more or less completely

pale; hemelytra brownish. Structure: Total length ♂ macropterous 3.6 mm., brachypterous 2.2 mm.; ♀ macropterous 3.75 mm., brachypterous 2.7 mm.

Genitalia of male: In side view, aedeagus curved ventrally in distal third and with apex slightly but distinctly swollen; apical third with retrorse teeth; basal part of aedeagus widest, the middle with ventral outline conspicuously concave. Parameres long, slender, slightly sinuate and tapering gradually to apex. Anal processes elongate, slender, tapering distally and bent at right angle near apex. Process on ventral margin of genital capsule, acutely pointed.

Type: ♂, SASKATCHEWAN, Prince Albert, 15.vi.1951 (A. R. Brooks). In the Canadian National Collection, Ottawa.

Paratypes: 21 ♂♂ 38 ♀♀. SASKATCHEWAN: Prince Albert, 15.vi.1951 (A. R. Brooks; L. A. Konotopetz); Christopher Lake, 11.vii.1959, 15.vii.1959 (A. & J. Brooks); Big River, 5.vii.1959 (A. & J. Brooks). ALBERTA: Elkwater Park, 22.v.1952, 31.v.1952 (L. A. Konotopetz), 13.vii.1952 (A. R. Brooks); Lethbridge, 2.vi.1930 (J. H. Pepper); Drumheller, 18.vi.1957 (Brooks, MacNay); Grand Prairie, 11.vi.1961 (A. R. Brooks); Valleyview, 6.vi.1961 (A. R. Brooks). QUEBEC: Gt. Whale R., 24.vi.1949 (J. R. Vockeroth). In the Canadian National Collection, University of British Columbia, University of Kansas, and author's collection.

This species is similar to *A. curvata* Beamer in general colour, form of aedeagus and shape of process on genital capsule. It differs however in the shape of the anal processes and parameres.

#### *Achrotile distincta*, new species

(Figs. 2 a-c, 6)

Colour: Male black with whole of head, pronotum and scutellum ochraceous-flavescent; legs and thoracic venter ochraceous; abdominal dorsum without distinct transverse pale streaks anteriorly. Female brownish-ochraceous with markings similar to male, but with distinct transverse ochraceous transverse streaks on anterior terga of abdomen. Structure: Total length ♂ macropterous 3.6 mm., brachypterous 2.5 mm.; ♀ macropterous 3.8 mm., brachypterous 2.75 mm. Genitalia of male: In side view aedeagus short and tapering, neither sickle-shaped nor with a swollen spinose 'head'. Parameres short and robust, broad basally and tapering apically. Anal processes distinctly curved and tapering apically. Process on ventral margin of genital capsule short, broad and apically bifid.

Type: ♂, BRITISH COLUMBIA, Cariboo, Westwick Lake, 25.v.1959 (G. G. E. Scudder). In the collections of the University of British Columbia.

Paratypes: 79 ♂♂ 47 ♀♀. BRITISH COLUMBIA: Cariboo, Westwick Lake, various dates (G. G. E. Scudder); Cariboo, Springhouse, 28.v.1959 (G. G. E. Scudder); Cariboo, near Mt. Pablo, 4.vi.1959 (G. G. E. Scudder); Cariboo Hwy., 40 mile, 18.vi.1959 (G. G. E. Scudder); Chilcotin, Riske Creek Ranges, 30.v.1959 (G. G. E. Scudder) Chilcotin, Sheep Creek Hill, 1.vi.1959 (G. G. E. Scudder); Lac la Hache, 12.vi.1961 (G. G. E. Scudder); Clinton, 11.vi.1938 (J. K. Jacob). ALBERTA: Banff, 3.vii.1924 (E. Hearle), 19.vi.1950 (B. P. Beirne). In the Canadian National Collection, University of British Columbia, University of Kansas, British Museum (Nat. Hist.), United States National Museum, California Academy of Sciences and author's collection.

This species seems to be quite unlike other species and can be separated from them by the colour and structure of the aedeagus. The shape of the process on the genital capsule is also distinctive. *A. distincta* in British Columbia so far has only been obtained by sweeping Pinegrass (*Calamagrostis rubescens* Buckl.) under conifers.

***Achrotile stylata* Beamer**

(Figs. 3 a-c, 7)

*Achrotile stylata* Beamer 1954, J. Kansas ent. Soc. 27: 147.

Colour: Male black with pale markings as in *A. acuta*. Female paler and browner than male.

Structure: Total length ♂ macropterous 3.75 mm., brachypterous 2.25 mm.; ♀ macropterous 3.85 mm., brachypterous 2.55 mm.

Genitalia of male: In side view, aedeagus curved ventrally in distal third and with retrorse teeth; apex slightly swollen and ventral side with a projection. Parameres slender, widest in middle and with apex bent, but not distinctly pediform. Anal processes tapering distally and bent slightly ventrally at apex. Process on ventral margin of genital capsule slender and slightly bifid and recurved at apex.

Material examined: 197 ♂♂ 100 ♀♀. BRITISH COLUMBIA: East of Osoyoos, Beaver Creek, Salmo, Hall Creek, Galloway, Manning Park and Sunday Summit, Grand Forks, Cranbrook, Dutch Creek, Kimberley, Wycliffe, Radium, Wardner, Pavilion, Lac la Hache, Williams Lake, Cariboo, Chilcotin (G. G. E. Scudder); Phililoo Lake (E. Adams); Quesnel (G. J. Spencer); Barkerville (H. R. MacCarthy); Dease Lake (I. Stirling); Victoria, Goldstream (W. Downes); Saanich (W. H. A. Preece) [U.B.C.]: Atlin, 2200 feet (B. A. Gibbard) [C.N.C.]: Top of Moyie Mtn., 6868 feet (H. B. Leech) [C.A.S.].

This species is very similar to *A. pediforma* Beamer, in colour, structure of aedeagus, process of genital capsule and anal processes. However, the apex of the parameres in *A. stylata* are not distinctly pediform, whereas they are in *A. pediforma*. The British Columbia material of *A. stylata* has been compared with paratype material from Colokum Pass, Wyoming. In British Columbia, this species is taken most often by sweeping Kentucky Bluegrass (*Poa pratensis* L.) growing under conifers, especially in parkland habitats.

***Achrotile subarctica*, new species**

(Figs. 4 a-c, 5)

Colour: Male black with vertex between carinae and pits, ochraceous; centre of pronotum ochraceous, scutellum sometimes with two white streaks in centre and abdominal dorsum sometimes with transverse white streaks anteriorly.

Structure: Total length ♂ macropterous 4.3 mm., brachypterous 2.00 mm.; ♀ macropterous 4.4 mm., brachypterous 2.5 mm.

Genitalia of male: In side view aedeagus sickle-shaped, with apex without retrorse teeth and not swollen. Parameres short, broad basally and narrowing apically; without expanded or sharply curved apex. Anal processes elongate, slender, tapering apically and more or less straight. Ventral margin of genital capsule with a trilobate blunt process.

Type: ♂, ALASKA, Kenai Penn., Lawing, 22.vii.1951 (W. J. Brown). In the Canadian National Collection, Ottawa.

Paratypes: 7 ♂♂ 5 ♀♀. ALASKA: data as type; Big Delta, Donnelly Dome, 25.vi.1951 (Mason). NORTHWEST TERRITORIES: Victoria Is., Holman, 8.vii.1952 (D. P. Gray); Muskox L., 64°45' N. 108°10' W., 17-21.vii.1953, 2-6.viii.1953 (J. G. Chillcott). ALBERTA: Prince Albert, 1.vii.1954 (Brooks-Wallis). BRITISH COLUMBIA: Stoner (just south of Prince George), 16.vi.1962 (G. G. E. Scudder). In the Canadian National Collection and University of British Columbia.

This species is similar to the type species, *A. albosignata*, but differs in the shape of the anal processes, parameres and process of the genital capsule. The anal processes in *A. subarctica* are straight and very narrow, whereas in *A. albosignata* and *A. coloradensis* Beamer they are broader and somewhat curved. The process of the genital capsule also is quite different in outline.

I have compared this new species with *A. albosignata* from Sweden, kindly given me by Dr. F. Ossiannilsson: they are quite distinct. It would seem that the type species in the genus does not occur in the Nearctic, because one would expect it to be found in the arctic or subarctic areas. I have not seen male specimens of *A. longicornis* Sahlberg, but I do not think this is the same as *A. subarctica*: two female specimens of *A. longicornis* examined in the University Museum at Helsinki, have antennae conspicuously longer than in *A. subarctica*.

The record of *A. albosignata* from Alberta (Strickland, 1953) seems incorrect.

### *Laccocera* Van Duzee

*Laccocera* Van Duzee 1897, Bull. Buffalo Soc. Nat. Sci. 5:241 [original description]

*Laccocera*, Metcalf 1943, Gen. Cat. Hemiptera 4(3):126 [bibliography]

*Laccocera*, Penner 1945, J. Kansas ent. Soc. 18:30 [new species and key to North American species].

*Laccocera*, Beirne 1950, Canad. Ent. 82:173 [Canadian records and a new species]

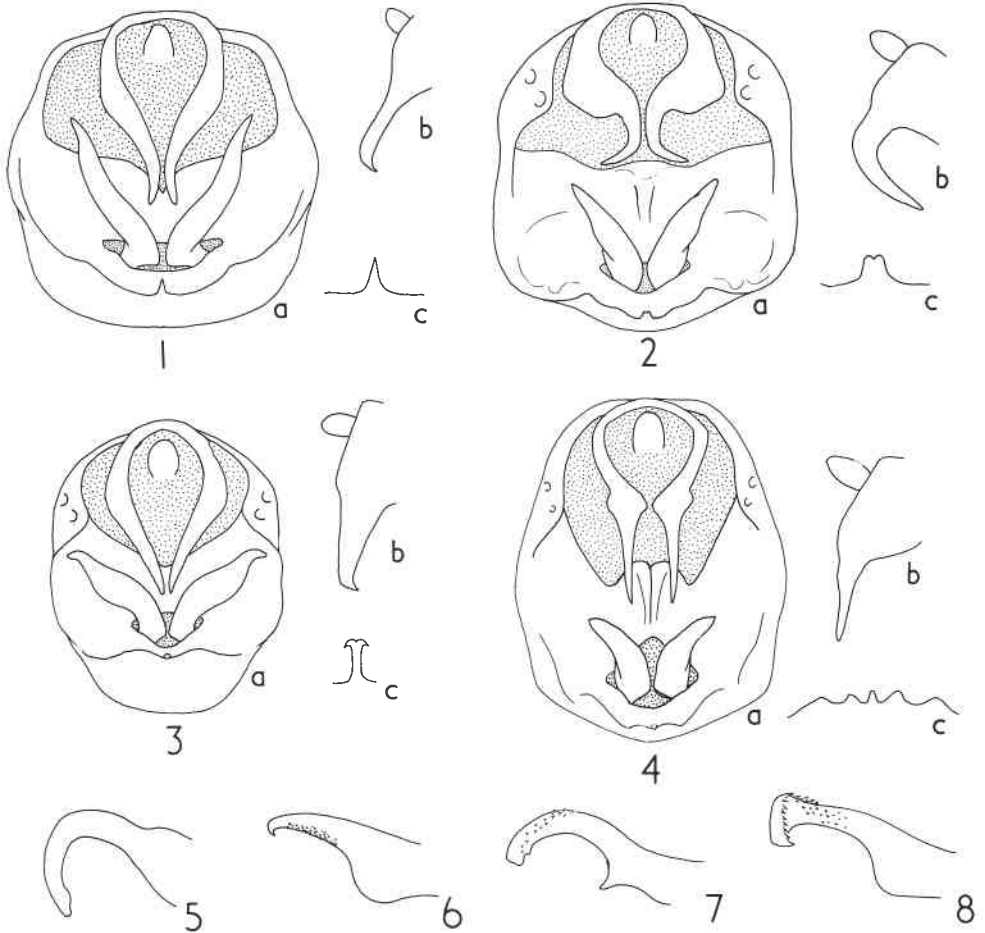
Type species: *Laccocera vittipennis* Van Duzee

As noted by Penner (1945), two distinct groups can be distinguished within this genus: one group with conspicuously marked insects — insects marked with red and/or yellow and black, the other with insects not very highly coloured. The first group which contains *obesa* Van Duzee, *zonata* Van Duzee, *flava* Crawford and *oregonensis* Penner has the sexes usually coloured quite differently, whilst the latter group, with *vittipennis* Van Duzee, *vanduzeei* Penner and *canadensis* Beirne, has the males and females looking very much alike.

Beirne (1950) records five species of *Laccocera* in Canada, and I have been able to add two more, one of which is new. The genus has not been recorded from Alaska.

### Key to the Canadian species of *Laccocera*

1. Males conspicuously marked with red and/or yellow and black; females usually somewhat uniform yellowish-ochraceous, and usually without distinct dark markings; aedeagus of male elaborate. .... 2
- Males not conspicuously marked with red and/or yellow and black, but appearing greyish marked with ochraceous; female coloration similar to male; aedeagus of male not elaborate. .... 4
2. Males with ventral processes bent sharply under anal segment; parameres straight; outline of genital capsule from behind without lateral swellings and concavities; aedeagus blunt and barbed; median carinae of head meeting below apex of head; Saskatchewan. .... *obesa* Van Duzee
- Males with ventral processes not sharply bent under anal segment; parameres long, not straight but apically bent and rather flattened; outline of genital capsule from behind with lateral swellings and concavities. .... 3
3. Aedeagus hooked at tip, with about four serrations on ventral margin in front of hook; British Columbia. .... *oregonensis* Penner
- Aedeagus not hooked at tip, but slightly swollen with retrorse teeth on two sides; Alberta, Saskatchewan. .... *flava* Crawford
4. Vertex considerably broader than long and rather flattened anteriorly; median cell of vertex not angulate anteriorly, and lateral margins of median cell hardly convergent anteriorly; outline of genital capsule from behind with ventro-lateral projections. .... 5
- Vertex square or but slightly broader than long, and anteriorly somewhat angulate; median cell of vertex sharply angled anteriorly, the lateral margins of median cell thus conspicuously convergent anteriorly; outline of genital capsule from behind without ventrolateral projections. .... 6



Figs. 1-8. Male genitalia of *Achrotile*. a, terminal view of genital capsule; b, side view of anal process; c, ventral view of ventral process of capsule; 1, *A. acuta* Scudd.; 2, *A. distincta* Scudd.; 3, *A. stylata* Beam.; 4, *A. subarctica* Scudd. 5-8. Side view of terminal part of aedeagus: 5, *A. subarctica*; 6, *A. distincta*; 7, *A. stylata*; 8, *A. acuta*. Comparable structures to same scale, but all drawings not so.

- 5. Anal segment with short ventral processes; parameres robust, somewhat sinuate and with a hooked apex; west of Rocky Mts. .... *vanduzeei* Penner
- Anal segment with long ventral processes; parameres long, slender, hardly tapering apically and almost straight, but with a slightly hooked tip; east of Rocky Mts. .... *vittipennis* Van Duzee
- 6. Anal segment with conspicuous, very robust ventral processes; parameres rather small and short, not reaching latero-dorsal margin of genital capsule when viewed from behind; Alberta, Saskatchewan. .... *canadensis* Beirne
- Anal segment with very short, slender ventral processes; parameres long, slender and reaching latero-dorsal margin of genital capsule when viewed from behind; British Columbia. .... *lineata* n. sp.

***Laccocera canadensis* Beirne**

(Figs. 11 a-c)

*Laccocera canadensis* Beirne 1950, Canad. Ent. 82: 173.

Colour: Male with vertex, pronotum and scutellum dusky yellowish-ochraceous; legs brownish-ochraceous with coxae brown; abdomen dark brown to black with

pits and posterior margins of terga slightly pale. Female somewhat paler than male, especially on the abdomen.

Structure: Each compartment of frons with seven pits. Vertex as long as wide and with median cell angulate anteriorly, the lateral sides of median cell being strongly convergent anteriorly. Total length ♂ brachypterous 2.0 mm.; ♀ macropterous 3.45 mm., brachypterous 2.5 mm. Genitalia of male: In side view, anal processes short, broad and bent ventrally. Aedeagus expanded at apex, with a short terminal process and expanded portion with retrorse teeth. Parameres broad basally, tapering apically, sinuate and with apex slightly hooked. Outline of genital capsule from behind with lateral margins broadly explanate.

Material examined: 30 ♂ ♂ 24 ♀ ♀. SASKATCHEWAN: Saskatoon (K. M. King); Redberry (L. A. Konotopetz); Cypress Hills (A. R. Brooks); Glaslyn (A. R. Brooks); Christopher Lake (A. & J. Brooks) [C.N.C.]. ALBERTA: Elkwater (A. R. Brooks; L. A. Konotopetz) [C.N.C.]. Captures from April to July.

In general appearance this species is similar to the species described herein as *L. lineata*, but differs in the shape of the parameres, anal processes and aedeagus. *L. canadensis* was described originally from Saskatchewan and until the present has been reported only from that Province.

### *Laccocera flava* Crawford

(Figs. 13 a-c)

*Laccocera zonata* var. *flava* Crawford 1914, Proc. U. S. Nat. Mus. 46:581.

*Laccocera zonata* var. *flava*, Metcalf 1943, Gen. Cat. Hemiptera 4(3):129.

*Laccocera flava*, Penner 1945, J. Kansas ent. Soc. 18: 40.

*Laccocera flava*, Beirne 1950, Canad. Ent. 82: 174.

Colour: Male black with vertex, pronotum and scutellum creamy-white; abdominal dorsum with a whitish transverse band anteriorly; legs reddish-orange with coxae brownish. Female creamy-white with abdominal terga laterally marked with brownish-black marks in form of vague median spots and a short streak along hind border.

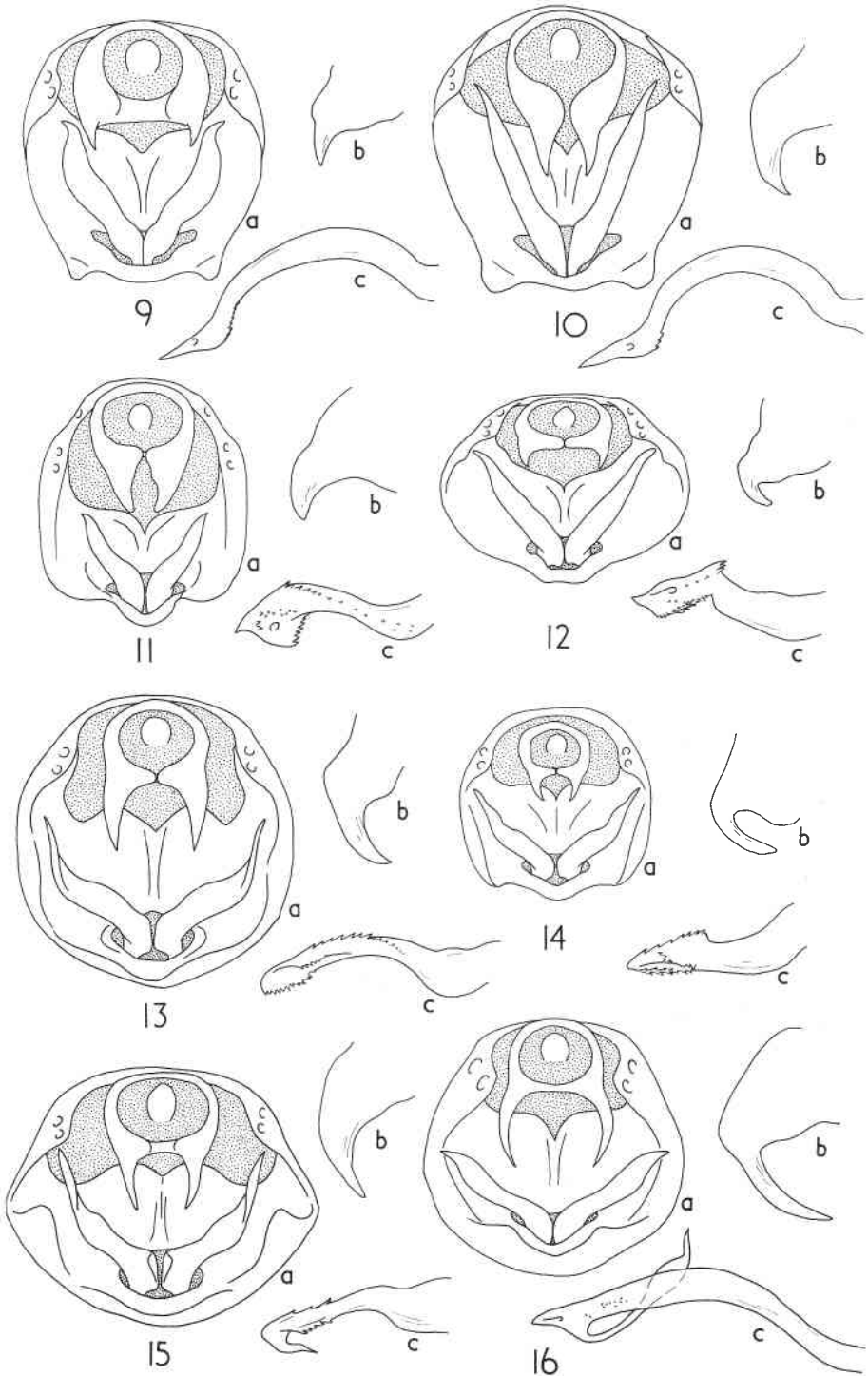
Structure: Each compartment of frons with six distinct pits and a seventh pit just above upper margin; vertex about as long as wide with median cell angulate anteriorly, the lateral margins of cell strongly convergent anteriorly. Total length ♂ brachypterous 2.25 mm.; ♀ macropterous 3.65 mm., brachypterous 2.7 mm.

Genitalia of male: In side view, anal processes fairly long and curved ventrally, especially near tip. Aedeagus with a slightly expanded apex with rows of retrorse teeth on two sides; base of aedeagus somewhat swollen. Parameres elongate, somewhat flattened and with terminal, narrower portion somewhat reflexed. Outline of genital capsule from behind, laterally somewhat sinuate.

Material examined: 28 ♂ ♂ 19 ♀ ♀. ALBERTA: Empress (Brooks, MacNay); Stevesville (A. R. & J. E. Brooks); Lethbridge (J. H. Pepper); Medicine Hat (K. M. King; R. Glen); Milk River, 48°8'. 110°48' (J. R. Vockeroth); Orion, 49°28'. 110°50' (J. R. Vockeroth); Onefour (O. Peck) [C.N.C.]. SASKATCHEWAN: Elbow (Brooks, Wallis) [C.N.C.]. Captured May to June.

This species with brightly coloured males, is similar to *L. obesa* which also occurs in the Prairie Provinces. The two species can be distinguished by the genitalia, especially the aedeagus: the aedeagus will also separate both species from the related *L. zonata* Van Duzee (Fig. 16a-c).

The Saskatchewan and Alberta material has been compared with material from California and Nevada. In Canada, *L. flava* has previously only been reported from Alberta (Beirne, 1950; Strickland, 1953).



Figs. 9-16. Male genitalia of *Laccocera*. a, Terminal view of genital capsule; b, side view of anal process; c, side view of terminal part of aedeagus: 9, *L. vanduzeei* Penner; 10, *L. vittipennis* V-D.; 11, *L. canadensis* Beirne; 12, *L. lineatus* Scudd.; 13, *L. flava* Crawf.; 14, *L. obesa* V-D.; 15, *L. oregonensis* Penner; 16, *L. zonata* V-D. Comparable structures to same scale, but all drawings not so.

***Laccocera lineata*, new species**

(Figs. 12 a-c)

Colour: Male and female black with vertex, centre of pronotum and scutellum and a central longitudinal streak on abdominal dorsum white with yellowish-ochraceous areas to each side; frons yellowish-ochraceous with carinae margined with black; legs ochraceous with black longitudinal streaks; hemielytra ochraceous.

Structure: Vertex as long as wide, the anterior margin angulate and the median cell anteriorly angled, the lateral sides of median cell strongly convergent anteriorly; each compartment of frons with seven pits. Total length ♂ brachypterous 2.2 mm.; ♀ brachypterous 2.5 mm.

Genitalia of male: In side view anal processes very short and bent sharply under anal segment. Aedeagus rather short and robust with apical third bent, with retrorse teeth and with a distinct angulate corner dorsally. Parameres elongate, tapering distally and apically slightly bent. Outline of genital capsule from behind with lateral margins roundly convex.

Type: ♂, BRITISH COLUMBIA, Chilcotin, 30.v.1959 (G. G. E. Scudder). In the collections of the University of British Columbia.

Paratypes: 20 ♂♂ 24 ♀♀. BRITISH COLUMBIA: Cariboo (Westwick Lake, Boitano Lake, Springhouse, 149 mile), Chilcotin (Sheep Creek Hill, Riske Creek Ranges), Soda Creek (G. G. E. Scudder); Cummings Lake (E. Adams); Riske Creek (E. Adams). In the University of British Columbia, Canadian National Collection, University of Kansas, California Academy of Sciences, British Museum (Nat. Hist.) and author's collection.

*L. lineata* is similar to *L. canadensis*, but can be distinguished by the distinct white line down centre of dorsum, the short and sharply recurved anal processes and the distinctive aedeagus. The paratype material was taken by sweeping in open range land in May and June.

***Laccocera obesa* Van Duzee**

(Figs. 14 a-c)

*Laccocera obesa* Van Duzee 1897, Bull. Buffalo Soc. Nat. Sci. 5: 244.

*Laccocera obesa*, Metcalf 1943, Gen. Cat. Hemiptera 4(3): 127.

*Laccocera obesa*, Penner 1945, J. Kansas ent. Soc. 18: 36.

*Laccocera obesa*, Beirne 1950, Canad. Ent. 82: 174.

Colour: Male black with pale markings as in *L. flava*, but legs yellowish-orange rather than reddish-orange. Female coloured as in *L. flava*. The pale brachypterous form of the male, described by Penner (1945) has not been noticed in the Canadian material studied.

Structure: Vertex a little broader than long; median carinae of head meeting abruptly just below apex of head and carinae on vertex not strongly convergent anteriorly; each compartment of frons with six pits. Total length ♂ brachypterous 2.0 mm.; ♀ brachypterous 2.5 mm.

Genitalia of male: In side view, anal processes sharply bent back on anal segment and in terminal view looking short. Aedeagus short and with a half-spear-shaped apex and retrorse teeth dorsally and ventrally at apex. Parameres rather short, tapering in apical third, slightly bent or recurved apically. Outline of genital capsule from behind gently curved in lateral areas.

Material examined: 43 ♂♂ 29 ♀♀. SASKATCHEWAN: Saskatoon (K. M. King, A. R. Brooks); Fox Valley (K. M. King); Val. Marie, 49°15'. 107°44' (J. R. Vockeroth) [C.N.C.]. ALBERTA: Onefour (A. R. Brooks); Irvine (A. R.



Brooks); Medicine Hat (J. H. Pepper); Lethbridge (J. H. Pepper); Manyberries (A. R. Brooks; L. A. Konotopetz); Orion, 49°28'. 110°50' (J. R. Vockeroth) [C.N.C.]. Males captured May to June.

*L. obesa* is similar to *L. flava*, *L. zonata* and *L. oregonensis*, and is distinguished by the greatly recurved anal processes and the half-spear-shaped terminal part to the aedeagus. The Canadian material has been compared with material from Arizona. In Canada, *L. obesa* previously has been reported only from Saskatchewan (Beirne, 1950).

### ***Laccocera oregonensis* Penner**

(Figs. 15 a-c)

*Laccocera oregonensis* Penner 1945, J. Kansas ent. Soc. 18: 44.

*Laccocera oregonensis*, Beirne 1950, Canad. Ent. 82: 174.

Colour: Male black with head, pronotum and scutellum yellowish-white and abdominal dorsum with a transverse ivory streak basally; legs usually orange to red. Female yellowish-ochraceous and similar to *L. flava*.

Structure: Vertex wider than long, with median cell angulate anteriorly, the lateral sides of cell strongly convergent anteriorly; each compartment of frons with six pits. Total length ♂ brachypterous 2.55 mm.; ♀ macropterous 3.85 mm., brachypterous 3.0 mm.

Genitalia of male: In side view, anal processes rather broad and slightly curved. Aedeagus basally swollen and apically with a characteristic recurved tip, and proximally two rows of retrorse teeth. Parameres similar to *L. flava* being flattened and somewhat reflexed distally. Outline of genital capsule from behind with a distinctly and deeply sinuate margin.

Material examined: 43 ♂♂ 22 ♀♀. BRITISH COLUMBIA: Fraser Canyon at Chilcotin Bridge, Soda Creek, Cariboo (Sorenson Lake), Radium, Ta Ta Creek, Wardner (G. G. E. Scudder); Vernon (W. Downes); Kamloops, Summerland (B. P. Beirne) [C.N.C.; U.B.C.]. Males taken in May, June and July.

This species in general appearance is similar to *L. flava*, *L. obesa* and *L. zonata*, but can be recognized by the characteristic shape of the aedeagus with its recurved tip. The British Columbia specimens have been compared with paratype material from Criterion, Oregon. It has previously been reported from Kamloops and Summerland by Beirne (1950). In British Columbia, it seems to be restricted to the Dry Belt areas of the Province, where it is obtained by sweeping grassy slopes, especially ones with a southern aspect.

### ***Laccocera vanduzeei* Penner**

(Figs. 9 a-c)

*Laccocera vanduzeei* Penner 1945, J. Kansas ent. Soc. 18: 34.

Colour: Male and female black with vertex, centre of pronotum and scutellum, a central longitudinal streak on abdominal dorsum, and alveolus round pits, yellowish-ochraceous; frons mostly black; legs mostly ochraceous with black streaks; hemielytra ochraceous.

Structure: Vertex more or less square, with anterior margin not flat and median cell with sides not strongly convergent anteriorly; each compartment of frons with seven pits. Total length ♂ macropterous 3.75 mm., brachypterous 2.35 mm.; ♀ macropterous 3.75 mm., brachypterous 2.55 mm.

Genitalia of male: In side view, anal processes very short and curved slightly ventrally. Aedeagus more or less of equal width along most of length, gently curved, but at apex sharply bent and suddenly tapering, with spines to one side.

Parameres rather broad and flattened, not conspicuously tapering distally, but at apex suddenly and sharply bent and tapered, almost hook-like. Outline of genital capsule from behind with ventro-lateral lobes.

Material examined: 196 ♂♂ 112 ♀♀. BRITISH COLUMBIA: Alexandria, Watson Lake (Lillooet Distr.), Cariboo, Chilcotin, Kamloops, Prince George, Manning Park, East of Osoyoos, Pavilion, Cranbrook (G. G. E. Scudder); Lac la Hache, Goldstream, Gordon Head (W. Downes); Merritt (D. Finlayson); Soda Creek, Chimney Creek (G. J. Spencer); Riske Creek (R. Stace-Smith); Pavilion Lake (B. P. Beirne); Osoyoos (J. R. McGillis) [U.B.C.; C.N.C.]. Males most common May to July. This species was taken on potatoes at Soda Creek by Prof. G. J. Spencer in 1950.

*L. vanduzeei* is very similar to *L. vittipennis*, but can be recognized by the short anal processes, the more robust and sharply bent parameres and by the fact that the aedeagus has the shaft more gently curved than in *L. vittipennis*. The species does not appear to have been recorded in Canada previously: the British Columbia specimens have been compared with paratype material from Grand Canyon, Arizona. The species is frequently abundant on open range grassland areas.

### *Laccocera vittipennis* Van Duzee

(Figs. 10 a-c)

*Laccocera vittipennis*, Van Duzee 1897, Bull. Buffalo Soc. Nat. Sci. 5: 242.

*Laccocera vittipennis*, Metcalf 1943, Gen. Cat. Hemiptera 4(3): 128.

*Laccocera vittipennis*, Penner 1945, J. Kansas ent. Soc. 18: 35.

*Laccocera vittipennis*, Beirne 1950, Canad. Ent. 82: 174.

*Laccocera vittipennis*, Moore 1950, Contr. Inst. Biol. Univ. Montreal 26: 31.

*Laccocera vittipennis*, Strickland 1953, Canad. Ent. 85: 209.

*Laccocera vittipennis*, Kontkanen 1958, Ann. ent. fenn. 24: 141.

Colour: Male and female black with yellowish-ochraceous markings similar to *L. vanduzeei*.

Structure: Vertex wider than long, anteriorly somewhat flat and median cell rather hexagonal; each compartment of frons with seven pits. Total length ♂ macropterous 3.65 mm., brachypterous 2.3 mm.; ♀ macropterous 3.65 mm., brachypterous 3.0 mm.

Genitalia of male: In side view, anal processes rather long, gradually tapering and curved ventrally. Aedeagus similar to *L. vanduzeei*, but more distinctly curved. Parameres long and gradually tapering distally and not sharply bent or hook-like at apex. Outline of genital capsule from behind similar to *L. vanduzeei*.

Material examined: 248 ♂♂ 221 ♀♀. BRITISH COLUMBIA: Fort St. John (G. G. E. Scudder); Cecil Lake (A. R. Brooks). ALBERTA: Lethbridge (R. W. Salt; B. P. Beirne; O. Peck; J. H. Pepper; E. H. Strickland); Medicine Hat (J. H. Pepper; O. Peck); Glenwood (R. W. Salt); Elkwater (O. Peck); Onefour (E. E. Sterns; O. Peck); Scandia (O. Peck); Manyberries, Peace River, Grande Prairie, Rycroft (A. R. Brooks); Drumheller (Brooks, MacNay).

SASKATCHEWAN: Rutland, Pipestone Creek, Elbow, Altons Lake, Cut Knife (A. R. Brooks); Big River (A. & J. Brooks); Saskatoon (K. M. King; A. R. Brooks); Roadene, Fish Creek (K. M. King); Pike Lake (B. P. Beirne); Rock Glen (C. D. Miller); Elbow, Prince Albert, Redberry (L. A. Konotopetz); Val. Marie (49°15'. 107°44'), Wood Mt. (49°20'. 106°0'), St. Victor (49°20'. 105°54') (J. R. Vockeroth); Beaver Creek (A. P. Arnason); Indian Head (K. Stewart). MANITOBA: Carberry (Brooks-Kelton); Goodlands (R. H. Handford); Ninette (A. R. Brooks).

ONTARIO: Bell's Corner (E. G. Lester); Fisher Glen, Ottawa (G. S. Walley).  
QUEBEC: Kazabazua, Covey Hill, Wright (G. S. Walley); Norway Point  
(Lake of Bays) (J. McDunnough); Gatineau Park (Harrington Lake) (R. Mc-  
Conachie); Mt. Albert (W. J. Brown); Mt. Jacques Cartier (J. E. H. Martin);  
Ladysmith (B. P. Beirne) [U.B.C.; C.N.C.]

Males taken May to July.

This species is very similar to *L. vanduzeei*, but can be distinguished by the shape of the parameres and the curvature of the aedeagus. Material from Canada has been compared with specimens from New Hampshire, New York, North Dakota, Michigan, Colorado, Utah, California and Oregon. Specimens taken by R. W. Salt at Glenwood, Alta. in 1938 were captured on alfalfa. In British Columbia this species has not been recorded previously. Prior records have been published for Saskatchewan (Penner, 1945), Alberta (Strickland, 1953), Quebec (Moore, 1950; Kontkanen, 1958), whilst Beirne (1950) gives records for all Provinces west of Quebec.

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#### References

- Beirne, B. P., 1950. A new species of *Laccocera* from Canada and records of other Canadian species (Homoptera : Araeopidae), *Canad. Ent.* 82: 173-174.
- Beirne, B. P., 1956. Leafhoppers (Homoptera : Cicadellidae) of Canada and Alaska, *Canad. Ent. Suppl.* 2: 180 pp.
- Kontkanen, P., 1958. Notes on some Fulgorids collected in Canada by Professor Hakan Lindberg during the summer of 1956 (Homoptera, Fulgoroidea), *Ann. ent. fenn.* 24(3): 141-145.
- Moore, G. A., 1950. Check-list of Hemiptera of the Province of Quebec, *Contr. Inst. Biol. Univ. Montreal* 26: 1-49.
- Penner, L. R., 1945. The genus *Laccocera* Van Duzee (Homoptera : Delphacidae), *J. Kansas ent. Soc.* 18: 30-47.
- Strickland, E. H., 1953. An annotated list of the Hemiptera (s.l.) of Alberta, *Canad. Ent.* 85: 193-214.

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