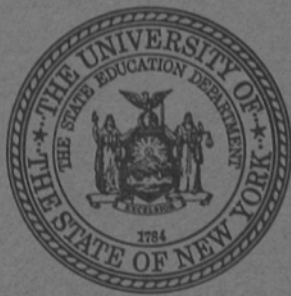


A Review of the
North American Chrysomeline Leaf Beetles
(Coleoptera: Chrysomelidae)

by JOHN A. WILCOX

Senior Scientist (Entomology)

BULLETIN 421



*The University of the State of New York/THE STATE EDUCATION DEPARTMENT
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1984

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A Review of the North American Chrysomeline Leaf Beetles (Coleoptera: Chrysomelidae)¹

by JOHN A. WILCOX²

Introduction

This publication, a review of the Chrysomelinae of the United States and Canada, includes a checklist and compilation of keys to the 136 species. One new species, *Leptinotarsa collinsi*, is described. This is one of the larger subfamilies with about 3,000 species represented in all areas of the world. The North American species are here grouped into seven tribes, although Entomoscelini, Prasocurini, and Phratorini are of doubtful validity. I follow Crowson and Arnett in using the subfamily name Chrysomelinae in the broad sense, equal in rank to Chriocerinae and Eumolpinae which I leave in Chrysomelidae.

Both larvae and adults live openly on plants, feeding on leaves or flowers. The larvae enter the ground for pupation, or sometimes remain attached to their food plant, the pupa then being attached at its posterior extremity.

A number of species in this subfamily, Chrysomelinae, are of economic importance, including the Colorado potato beetle (*Leptinotarsa decemlineata*), the poplar leaf beetle (*Chrysomela scripta*), the imported willow leaf beetle (*Plagioderma versicolor*), the red turnip beetle (*Entomoscelis americana*), and the yellow-margined leaf beetle (*Microtheca ochroloma*). On the other hand, two species of *Chrysolina* (*quadrigemina* and *hyperici*) have been well established in America to help control Klamath weed in the Pacific Northwest.

These typical members of the family Chrysomelidae are 3 to 16 mm. long; broadly oval to elongate; often

brightly colored. Head inserted into the prothorax to the eyes, only partly visible dorsally. Antennae with 11 segments, moderately long, the apical segments somewhat enlarged. Antennal insertions widely separated, between eye and mandible, not on tubercles. Prothorax usually broad and somewhat convex; side margins well defined; frequently emarginate in front. Front coxae transverse, widely separated. Elytra convex, covering the abdomen; epipleura well defined. Tarsal formula apparently 4-4-4 but actually 5-5-5, the fourth segment minute and hidden in the bilobed third segment.

Labrum distinct. Mandibles short, stout, curved; apices acute, blunt, or dentate. Maxillary palpi four-segmented, the segments usually enlarged, but not strongly dilated or elongate. Gular sutures usually absent. Labial palpi three-segmented, the segments short, apically acute. Eyes lateral, moderate, round or emarginate on the inner side. Pronotum broader than the head, quadrate or oval; lateral borders margined; pleural region broad. Legs usually short to moderately long; trochantins not exposed. Metacoxae transverse. Trochanters small, triangular. Femora usually without apical spurs. Wing venation with the basal part of the anal area reduced; folding pattern with the fold below Cu approaching the Haplogastra type. Abdomen with five visible sternites. Male genitalia with the aedeagus stout, curved; parameres distinct or absent; pars basalis ring-shaped, with long slender basal struts, ventrally fused. Female genitalia with the paraprocts and valvifers with baculi closely articulating; coxite simple, sometimes very large.

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Subfamily Chrysomelinae

Key to the North American genera of Chrysomelinae

1. Front coxal cavities closed behind (figure 2) 2
- Front coxal cavities open behind (figure 17) 3
2. Upper surface uniformly brown, bronze or black (figure 1); prosternum, between coxae, longer than metasternum (figure 2); British Columbia—California *Timarcha* Latr.
- Upper surface bicolored, at least elytra with pale margin; prosternum, between coxae, shorter than metasternum (figure 17); on Cruciferae 14
3. Tarsal claws appendiculate (figure 23); on willow, poplar, and birch 15
- Tarsal claws simple (figures 9, 25) 4
4. Claws connate, that is parallel and contiguous at base (figure 4); elytra striped or spotted (figures 5, 72–80, 88–91) *Zygogramma* Chev.
- Claws divergent or at least separated at base (figure 9) 5
5. Last segment of maxillary palp attenuate toward apex, cylindrical or oval (figure 83); third tarsal segment usually bilobed or emarginate (figure 8), sometimes simple (figure 7) 14
- Apical segment of maxillary palp broadly truncate at tip, subquadrangular or dilated (figures 3, 14); third tarsal segment entire or slightly emarginate (figure 7) 6
6. Apical segment of maxillary palp shorter than the preceding, truncate (figures 81, 82) 7
- Apical segment of maxillary palp as long as or longer than the preceding, dilated, truncate (figure 14) 8
7. Front femur of male strongly toothed (figure 10), normal in female; mesosternum forming a blunt tubercle between the middle coxae, raised above the level of the prosternum; (figure 11) [Species in key to *Leptinotarsa* also] *Labidomera* Chev.
- Front femur of male and female normal; mesosternum not raised above the level of the prosternum; (figure 6) *Leptinotarsa* Stal
8. Elytra with spots or stripes delimited by punctures (figures 12–13, 35–71); pronotum not thickened at sides, without distinct longitudinal impressions *Calligrapha* Chev.
- Elytra entirely dark or dark with pale lateral margins (figure 15); elytral punctures usually in irregular rows; sides of pronotum thickened, the thickened portion separated from disc by a longitudinal impression *Chrysolina* Motsch.
9. Shining black, usually with bronze or green luster; lateral margins of pronotum and elytra and a narrow discal stripe on each elytron pale yellow (figures 27, 28) 13
- Color pattern of pronotum and elytra different from that described above; elytral stripes, if present, very short 10
10. Larger elytral punctures in regular rows which are separated by a distance equal to at least four times the diameter of the punctures in them; upper surface entirely dark blue, green, bronze, purple or black; 3–4.3 mm. long; on water cress or other Cruciferae; (figure 20) *Phaedon* Latr.
- Elytral punctation confused, or if in rows then the rows are separated by a distance not greater than two times the diameter of the punctures 11
11. Pronotum with a distinct longitudinal impression on each side (figures 16, 18); elytra usually pale with dark markings but may be entirely dark in some species; 4.3–9.5 mm. long; on willow, poplar or alder *Chrysomela* L.
- Pronotum without distinct longitudinal impressions; elytra brown with pale margins or entirely dark blue, green, or purple 12
12. Prosternum, between coxae, narrower than third antennal segment; body strongly convex, hemispherical in cross section; sides of elytra nearly parallel (figure 19); elytra entirely dark although some species may have strong coppery or golden luster; 4–6.2 mm. long; on Polygonaceae (*Rumex* or *Polygonum*) *Gastrophysa* Chev.
- Prosternum, between coxae, much broader than the third antennal segment; body less convex, not hemispherical in cross section; sides of elytra strongly curved; elytra brown with pale margins or entirely dark blue, green, or purple; 3.5–5 mm. long; on willow (*Salix*); (figure 21) *Plagiodera* Chev.
13. Basal margin of pronotum with a fine elevated bead; sutural dark stripe not much wider around scutellum (figure 27); form very elongate; length at least 2.5 times width; Quebec-Ohio-Colorado-British Columbia; on water parsnip (*Sium*) [*P. phelandrii* (L.)] *Prasocuris* Latr.
- Basal margin of pronotum without such a bead; form broader, length less than 2.5 times width; sutural dark stripe abruptly widened around scutellum (figure 28); on *Ranunculus* *Hydrothassa* Thoms.

14. Elytral punctation confused; pronotum black with pale margins; each elytron red with suture and a discal stripe black (figure 22); 6.5-10 mm. long; Minnesota-Washington-Alaska [*E. americana* Brown] *Entomoscelis* Chev.
- Punctures of each elytron in four regular rows; pronotum entirely dark; elytra dark brown except for pale margins (figure 26); 4.5 mm. long; Alabama-Louisiana [*M. ochroloma* Stal].....
.....*Microtheca* Stal
15. Tibiae dilated and toothed near apex (figure 30); upper surface usually partly pale, never with metallic luster (figure 29); on willow and poplar *Gonioctena* Chev.
- Tibiae not dilated nor toothed near apex; upper surface entirely dark with metallic blue, green, bronze, or purple luster (figure 24); on willow, poplar, and birch.....*Phratora* Chev.

Tribe Timarchini

Genus *Timarcha* Latreille 1829:150

(Subgenus *Americanotimarcha* Jolivet 1948:4)

<i>vandykei</i> Jolivet 1948:6	Wash.	Key to the North American species of <i>Timarcha</i> Latr. (Translated from Jolivet 1948:5) 1. Upper surface of body smooth, not wrinkled, feebly punctuate; bronze; 7-9 mm. long; Wash. (figures 1, 2)..... <i>vandykei</i> Jolivet — Upper surface of body strongly alutaceous.....2 2. Size large, 7-11 mm. long; color generally black; California to British Columbia.... <i>intricata</i> Hald. — Size small, 5-8 mm. long; color reddish or coppery brown, shining in general; Calif.-B.C... <i>cerdo</i> Stal
<i>intricata</i> Haldeman 1853:363	B.C.-Idaho-Calif.	
<i>violacea</i> Jolivet 1948:7		
<i>adusta</i> Jolivet 1948:7		
<i>viridis</i> Jolivet 1948:7		
s. <i>intertexta</i> Haldeman 1853:364	Oreg.	
<i>yvettae</i> Jolivet 1948:7		
<i>cerdo</i> Stal 1863:8	Wash.-Oreg.	
<i>intenta</i> Jolivet 1948:8		
<i>nigra</i> Jolivet 1948:6		
<i>weira</i> Jolivet 1948:8		
s. <i>leechi</i> Jolivet 1948:8	Oreg.	

Tribe Doryphorini

Zygogrammini

Genus *Zygogramma* Chevrolat 1837:422

Zygospila Achard 1923:53

<i>exclamationis</i> (Fabricius) 1798:86	Dak.-Utah-Ariz.-Tex.
<i>conjuncta</i> (Rogers) 1856:34	Minn.-Kans.-Mont.-Ariz.
<i>s. pallida</i> (Bland) 1864:71 ? <i>stolata</i> (Suffrian) 1858:271	
<i>amoena</i> : (Sturm) 1843:288	
<i>continua</i> (Leconte) 1868:57 <i>fasciatipennis</i> Jacoby 1891:249	Ariz.-Utah-Tex.
<i>suturalis</i> (Fabricius) 1775:95	Me.-N.C.-Colo.-Canada
<i>pulchra</i> (Fabricius) 1792:313	
<i>s. casta</i> (Rogers) 1856:33 ? <i>festiva</i> (Fabricius) 1775:100	Mich.-Nebr.-N.Dak.
<i>pulchra</i> : (Coquebert) 1804:123	
<i>disrupta</i> (Rogers) 1856:34 <i>heterothecae</i> Linell 1896:197	Kans.-Ariz.-Tex. Tex.-Colo.-Ariz.
<i>tortuosa</i> (Rogers) 1856:32	Tex.-Ariz.
<i>malvae</i> (Stal) 1859:322 <i>signifera</i> : (Sturm) 1843:288	Tex.-Ariz.-Mex.
<i>opifera</i> (Stal) 1860:460 <i>piceicollis</i> (Stal) 1859:322 <i>aggregata</i> (Stal) 1860:461	Tex.-Ariz.-Mex. Tex.-Ariz.
<i>signatipennis</i> (Stal) 1859:321	Ariz.-Mex.
<i>arizonica</i> Schaeffer 1906:240	Ariz.
<i>estriata</i> Schaeffer 1919:322	Ariz.

Key to the North American species of
Zygogramma Chev.

(Modified from Linell 1896:196)

1. Pronotum brown with anterior angles pale or entirely pale2
- Pronotum unicolorous, brown, or aeneous.....5
2. Fourth discal vitta absent, vittae wide and regular; subsutural and sutural vittae confluent (figure 72); 6.3-7.3 mm. long; Ariz.....*continua* (Lec.)
- Fourth discal vitta present though not extending much beyond the middle.....3
3. Suture and subsutural vittae dark, reaching apex (figure 89); larger, 7 mm. long; Kans.-Mont.-Ariz.*exclamationis* (Fab.)
- Suture and subsutural vittae pale, becoming obsolete behind the middle; smaller, 6 mm. long; Kans.-Mont.-Ariz.4
4. Vittae entire (figure 90).....*conjuncta conjuncta* (Rogers)
- Vittae broken into spots (figure 86).....*conjuncta pallida* (Bland)
5. Elytral vittae sinuous, interrupted, or irregular...7
- Elytral vittae regular, more or less entire.....6
6. Each elytron with a single broad vitta on the disc (figure 73); N.H.-N.C.-Colo.....*suturalis suturalis* (Fab.)
- Each elytron with two narrow vittae on the disc (figure 74); Mich.-Nebr. *suturalis casta* (Rogers)
7. Subsutural vittae free, narrow.....8
- Subsutural and sutural vittae confluent, at least in apical third9
8. Second vitta twice interrupted, fourth represented by a spot only (figure 88); 4-6 mm. long; Tex.-Colo.; on *Heterotheca scabra*. *heterothecae* Linell

- **Second vitta not interrupted; fourth short, confluent at base with third (figure 91); 5-7 mm. long; Kans.-Ariz. *disrupta* (Rogers)**
9. **Epipleura of elytra pale.....10**
- **Epipleura of elytra dark.....12**
10. **Each elytron with a very sinuous stripe; Tex.-Ariz.11**
- **Elytra with numerous spots, not forming stripes (figure 77); body and dark markings reddish brown; 6 mm. long; Ariz. *estriata* Schaeff.**
11. **Rusty red-brown; epipleura margined with brown; subsutural stripe free for at least half the length; 6 mm. long; Tex.-Ariz. (figure 78)..... *tortuosa* (Rogers)**
- **Dark brassy or golden green; elytral epipleura entirely pale; sutural stripe trifid at base; 6 mm. long; Tex.-Ariz. (may not be distinct from *tortuosa*) *malvac* (Stal)**
12. **Lateral margin of elytra dark in posterior half..14**
- **Lateral margin pale in posterior half, epipleura may be dark.....13**
13. **Elytra with an elongate spot on lateral margin behind middle; discal stripe very sinuous, margins regular (figure 75); 6.3-6.8 mm. long; Ariz..... *opifera* (Stal)**
- **Lateral margin of elytra without spots; discal stripe more or less straight, margins of stripe very irregular (figure 76); 5.7-6.5 mm. long; Ariz. *arsonica* Schaeff.**
14. **Head and pronotum greenish black; humeral stripe confluent with sutural stripe at middle (figure 80); body elongate oval, moderately convex; 2.5-7.3 mm. long; Ariz.-Mex..... *signatipennis* (Stal)**
- **Head and pronotum brown, may be slightly bronzed.....15**
15. **Humeral and sutural stripes not confluent (figure 79); body elongate oval, moderately convex; 6.5 mm. long; Tex.-Ariz.-Mex..... *piceicollis* (Stal)**
- **Humeral and sutural vittae confluent at middle (figure 5); body oval, more strongly convex; 6.2-6.8 mm. long; Ariz. (figures 3, 4, 98)..... *opifera* (Stal)**
- mediorupta* (Achard) 1923:69
medionota Schaeffer 1933:478
bowditchi (Achard) 1923:69
s. *hybrida* (Say) 1824:449 Mo.-Colo.-Manit.-Alta.
lativittata (Achard) 1923:69
lativittis Schaeffer 1933:478
- Subgenus *Bidensomela* Monros 1955:54
bidenticola Brown 1945:122 N.B.-Fla.-Colo.-Tex.
similis (Rogers) 1856:35
intermedia (Achard) 1923:69
hilaris (Achard) 1923:69
s. *meridionalis* (Monros) Fla.
1955:54
- Subgenus *Calligramma* Monros 1955:56
cephalanthi Schwarz 1878:366 Fla.
cephalanti: Monros 1955:56
- Subgenus *Acalligrapha* Monros 1955:55
praecelsis (Rogers) 1856:35 Ohio-Nebr.-Kans.
- Subgenus *Corcopsomela* Monros 1955:55
californica Linell 1896:198 Calif.-B.C.
s. *corcopsivora* Brown Me.-Dak.
1945:122
elegans (Olivier) 1808:532
- Subgenus *Calligrapha* Chevrolat 1837:422
Polyspila Hope 1840:165
Metallographa Motschulsky 1860:198
Boliographa Motschulsky 1860:198
incisa (Rogers) 1856:34 Kans.-Manit.-Ill.
verrucosa (Suffrian) Mo.-Manit.-B.C.
1858:266
multipunctata (Say) 1824:451 Conn.-Ga.-Alta.-Wash.
v. *bigbyana* (Kirby) N.S.-Ga.-B.C.-Oreg.
1837:212
v. *suturella* Schaeffer N.H.
1933:478
philadelphica (Linnaeus) N.B.-Ga.-Nebr.-B.C.
1758:372
decipiens (Weber) 1801:52
ruficornis (Olivier) 1791:703
vicina Schaeffer 1933:476 N.Y.
alni Schaeffer 1928:290 N.S.-W.Va.-Mich.
confinis (Kirby) 1837:211
alnicola Brown 1945:124 Que.-Ont.
- Genus *Calligrapha* Chevrolat 1837:422**
- Subgenus *Graphicallo* Monros 1955:57
lunata (Fabricius) 1787:69 Me.-Mass.-Colo.
brunnea (Thunberg) 1787:43

<i>apicalis</i> Notman 1919:139	Que.-N.Y.-Mich.
<i>spiraeae</i> (Say) 1826:297	Me.-Pa.-Mich.
<i>rowena</i> Knab 1909:85	Que.-Ga.-Mich.
<i>knabi</i> Brown 1940:166	Que.
<i>rhoda</i> Knab 1909:83	N.H.-Md.-Wis.-Kans.
<i>v. walshiana</i> Blatch. 1910:1157	Ind.-Mo.
<i>amelia</i> Knab 1909:86	N.J.-Va.-Ohio
<i>confluens</i> Schaeff. 1928:290	N.S.-Mass.
<i>dolosa</i> Brown 1945:126	Ont.
<i>ostryae</i> Brown 1945:126	Ont.-N.Y.-Mich.
<i>ignota</i> Brown 1945:127	N.S.-Minn.-Tenn.
<i>pruni</i> Brown 1945:127	Ont.-Ohio
<i>scalaris</i> (Leconte) 1824:173	Que.-Ga.-Tex.
<i>multiguttis</i> Stal 1865:261	
<i>floridana</i> Schaeffer 1933:476	Fla.
<i>virginica</i> Brown 1945:130	Que.-Ont.
<i>tiliae</i> Brown 1945:130	Ont.
<i>amator</i> Brown 1945:132	Ont.
<i>pirsa</i> (Stal) 1860:462	Que.-Minn.-N.C.-Ind.
<i>labyrinthica</i> : Horn 1884:128	
<i>dislocata</i> (Rogers) 1856:32	Tex.-Calif.-Mex.
<i>sigmoidea</i> (Leconte) 1859:285	Nebr.-Utah-Calif.
<i>serpentina</i> (Rogers) 1856:32	Tex.-Ariz.-Mex.
<i>mexicana</i> (Stal) 1859:323	
<i>multiguttata</i> (Stal) 1859:326	Kans.-Ariz.-Mex.
<i>sylvia</i> (Stal) 1860:462	Ariz.-Mex.
<i>fulvipes</i> (Stal) 1859:323	Tex.-Mex.
<i>wickhami</i> Bowditch 1911:325	Tex.

Key to the North American species of *Calligrapha* Chev.
(Modified from Monros 1955, Brown 1945, and
Linell 1896)

1. Elytra with longitudinal dark stripes, without numerous spots.....2
- Elytra pale with numerous small dark spots (figure 12); spots may rarely form irregular stripes but these forms also have separate spots; spots may also coalesce, in which case the elytra are black with pale spots; aedeagus with lateral apical spines and without apical truncate projection (figure 94) (subgenus *Calligrapha*)10
2. Elytra with a scutellar row of punctures.....3
- Elytra without a scutellar row of punctures; pronotum entirely brown, each elytron with a sutural

- and two regular brown stripes (figures 38, 94); Florida: on *Cephalanthus*.....(subgenus *Calligranma* Monros).....*cephalanthi* (Schwarz)
3. Pronotum entirely dark; apex of aedeagus with small lateral spines.....4
 - Pronotum with pale lateral and apical margins; apex of aedeagus without small lateral spines.....7
 4. Length 7-9 mm.; elytral epipleura at least partly pale; lateral margin of discal stripe not notched; color of the stripes usually reddish brown; aedeagus with small spines on apical projection... (subgenus *Graphicallo* Monros).....5
 - Length 4-6.5 mm.; elytral epipleura dark; lateral margin of discal dark stripe with a notch near the middle (figure 13); stripes usually dark brown; apical spines on aedeagus itself..... (subgenus *Bidensomela* Monros).....6
 5. Discal brown stripe of elytra with a single yellow longitudinal stripe immediately outside 4th row of punctures; punctures between rows 4 and 9 completely irregular; Me.-Mass.-Colo.; on *Rosa* (figure 95).....*lunata lunata* (Fab.)
 - Discal brown pattern consisting of three more or less longitudinal stripes separated by pale ones (figure 36); punctures between rows 4 and 9 tending to be arranged in rows; Mo.-Colo.-Manit.-Alta. on *Rosa*.....*lunata hybrida* (Say)
 6. Discal elytral dark stripe entire, not divided by a longitudinal stripe.....7
 - Discal elytral dark stripe divided by a pale longitudinal stripe in the space between the 4th and 5th rows of punctures; Fla.....*bidenticola meridionalis* (Monros)
 7. Apex of aedeagus with a small, truncate, apical lobe (figure 96); sutural dark stripe not distinctly widened at apex; N.B.-Ala.-Colo.-Tex.; on *Bidens*, *Corcopsis*, *Ambrosia*.....*bidenticola bidenticola* Brown
 - Apex of aedeagus broadly, evenly rounded, without an apical lobe (figure 99); sutural dark stripe abruptly, distinctly widened near apex of elytra (figure 40); Kans.-Ill.-Manit.....*incisa* (Rogers)
 8. Basal margin of pronotum dark; with a small tooth between the claws; elytra more convex than the pronotum; elytra yellowish white with suture and a broad discal stripe brown (figures 37, 92)... (subgenus *Acalligrapha* Monros)..*praeclsis* (Rogers)
 - Basal margin of pronotum usually pale (figure 35); without a tooth between the claws; elytral

- convexity follows that of pronotum.....(subgenus *Coreopsomela* Monros)9
9. Dark discal stripe of elytra entire or weakly notched (figure 35); 5-6.5 mm. long; Atlantic to Pacific; on *Coreopsis*, *Bidens*, *Ambrosia*.....
.....*californica coreopsivora* Brown
- Dark discal stripe of elytra divided by an oblique pale transverse band (figure 93); Calif.-B.C.....
.....*californica californica* Linell
10. Pronotum at least partly pale.....11
- Pronotum entirely dark.....17
11. Subsutural stripe of elytra confluent with sutural one12
- Subsutural stripe of elytra free from sutural one13
12. Dark markings of elytra black with metallic green or bronze luster.....15
- Dark markings of elytra and pronotum reddish brown, same color as legs (figure 43); 7.5 mm. long; Tex.....*wickhami* Bowd.
13. Sutural and subsutural stripes pale reddish brown, much lighter in color than other elytral markings (figure 41); 8-9 mm. long; Mo.-Manit.-B.C.-Oreg.; on willow (*Salix*).....*verrucosa* (Suff.)
- Subsutural and usually sutural stripes as dark as other elytral marking.....14
14. Dark markings of pronotum reddish brown, without green luster (figure 42); 6.5-8 mm. long; Conn.-Ga.-Alta.-Wash.; on willow (*Salix*).....
.....*multipunctata multipunctata* (Say)
- Dark markings of pronotum with distinct green luster; 6.5-8 mm. long; N.S.-Ga.-Oreg.; on willow (*Salix*) and aspen (*Populus*).....
.....*multipunctata bigsbyana* (Kirby)
15. Anterior margin of pronotum pale; elytra without midlateral spot; 7.5 mm. long; N.H.; on willow (*Salix*).....*multipunctata suturella* Schaeef.
- Anterior margin of pronotum dark; pale pronotal areas limited to sides and apical angles; elytra with a mid lateral spot.....16
16. On Alder (*Alnus*); 7.5-9.5 mm. long; Que.-N.Y.-Mich. (figure 45).....*apicalis* Notm.
- On hawthorn (*Crataegus*); 9-9.3 mm. long; Ont.
.....*dolosa* Brown
17. Legs black or dark metallic.....18
- Legs red22
18. Elytral epipleura black or dark metallic.....20
- Elytral epipleura pale.....19
19. Subsutural stripe confluent with sutural stripe (figure 68); 8.5-10 mm. long; Nebr.-Alta.-B.C.-Calif.; on mallow (*Malva*) and hollyhock (*Althaea*)*sigmoidea* (Lec.)
- Subsutural stripe free from sutural one (figure 39); 9 mm. long; Tex.-Ariz.-Mex.....
.....*dislocata* (Rogers)
20. Humeral lunule confluent with arcuate band and the spot enclosed by lunule (figure 65).....21
- Humeral lunule not confluent with arcuate band or the spot enclosed by lunule; color pattern as in *scalaris* group (figure 71); 8.5 mm. long;? Ariz.-Mex.
.....*sylvia* (Stal)
21. Large, 7.5-9 mm. long; color pattern basically as in *scalaris* group but with most spots confluent (figure 69); Que.-Minn.-N.C.-Ind.; on basswood (*Tilia*)*pnirsa* (Stal)
- Small, 6.5 mm. long; color pattern very irregular, variable (figure 44); Kans.-Ariz.-Mex.....
.....*multiguttata* (Stal)
22. Elytral epipleura black or dark metallic.....23
- Elytral epipleura pale or reddish brown.....25
23. Arcuate band free from subsutural stripe, may be greatly reduced to one or two small spots (figure 65); found in the arid southwest.....24
- Arcuate band confluent with sutural and subsutural stripes (figure 62); 7.8-9 mm. long; N.S.-Pa.; on birch (*Betula*).....*ignota* Brown
24. Arcuate band entire, joined to lunule anteriorly and to lateral spots posteriorly, forming a long sinuous stripe (figure 70); 10-12 mm. long; Ariz.-N.Mex.-Mex.
.....*serpentina* (Rogers)
- Arcuate band interrupted, absent or reduced to small spots (figure 46); 7-9 mm. long; Tex.-Mex.
.....*fulvipes* (Stal)
25. Elytral epipleura, in large part, as pale as the palest areas on elytra.....26
- Elytral epipleura reddish brown, distinctly darker than the palest areas of elytra.....27
26. Subsutural elytral stripe free from the sutural one (figure 65) (*philadelphica* group).....30
- Subsutural elytral stripe confluent with the sutural one (figure 59) (*scalaris* group).....31
27. Subsutural stripe free from the sutural one (figure 65)28
- Sutural and subsutural stripes confluent (figure 60)29

28. Much of the pale elytral area darkened, reddish brown; 7-8.5 mm. long; on alder (*Alnus*) (figure 49) *alni* Schaeff.
- Pale areas of elytra without or with very little reddish brown color; 7.5-8.5 mm. long; Que.-Ont.; on alder (*Alnus*) (figure 143) ... *alnicola* Brown
29. On nine-bark (*Physocarpus*); 6.2-7 mm. long; Conn.-Pa.-Mich. (figure 50) *spiracae* (Say)
- On hop-hornbeam (*Ostrya*); 6.6-9.5 mm. long; Ont.-N.Y.-Mich. (figure 60) *ostryac* Brown
30. On dogwood (*Cornus*); 7-9 mm. long; N.B.-Ga.-Nebr.-B.C. (figure 47) *philadelphica* (L.)
- On dogwood (*Cornus*); 8 mm. long; N.Y. (figure 48) *vicina* Schaeff.
- On alder (*Alnus*); 7-8.5 mm. long; N.S.-N.J.-Mich. (figure 49) *alni* Schaeff.
- On alder (*Alnus*); 7.5-8.5 mm. long; Que.-Ont. (figure 12) *alnicola* Brown
- On alder (*Alnus*); 6.5-9 mm. long; N.Y.-Va.-Ohio (figure 54) *amelia* Knab
31. Food plant elm, *Ulmus americana* L.; body and elytral markings blue-green; subsutural spot of the apical declivity of each elytron nearly always joined to the sutural stripe; the latter, except rarely, strongly and abruptly narrowed immediately before the apex; posterior portion of the arcuate band seldom strongly angulate on its hind margin (figures 56, 59); 7.4-9.3 mm. long; Que.-Ga.-Tex. *scalaris* (Lec.)
- Food plant basswood, *Tilia americana* L.; body and elytral markings blue-green; subsutural spot of the apical declivity seldom joined to the sutural stripe, the latter always gradually narrowed before the apex; posterior portion of the arcuate band nearly always strongly angulate on its hind margin (figures 58, 61); 8.6-10 mm. long; Que.-Ont. *virginica* Brown
- Food plant basswood, *Tilia americana* L.; body and elytral markings green; subsutural spot of the apical declivity usually joined to the sutural stripe, the latter always gradually narrowed before the apex; posterior portion of the arcuate band usually strongly angulate on its hind margin (figure 67) 8-9.2 mm. long; Ont. *tiliae* Brown
- Food plant basswood, *Tilia americana* L.; body and elytral markings blue-green; subsutural spot of the apical declivity usually free but frequently joined to the sutural stripe, the latter usually gradually, sometimes abruptly, narrowed before the apex; posterior portion of the arcuate band variable, sometimes strongly angled on its hind margin (figure 64); 6.7-9.2 mm. long; Ont. *amator* Brown
- Food plant cherry, *Prunus americana* Marsh.; body and elytral markings green, bluish reflections usually feeble or lacking; posterior markings of the elytra extremely variable (figure 63); body slightly less elongate and averaging much smaller than in any of the other species; 6-7.7 mm. long; Ont.-Ohio *pruni* Brown
- Florida; on (?) star anise (*Illicium*); 7-8.2 mm. long (figure 66) *floridana* Schaeff.
- On alder (*Alnus*); 8 mm. long; N.Y. (figure 48) *vicina* Schaeff.
- On alder (*Alnus*); 7-8 mm. long; N.S.-Mass. (figure 55) *confluens* Schaeff.
- On hawthorn (*Crataegus*); 9-9.3 mm. long; Ont. (figure 57) *dolosa* Brown
- On nine-bark (*Physocarpus*); 6.2-7 mm. long; Conn.-Pa.-Mich. (figure 50) *spiracae* (Say)
- On dogwood (*Cornus*); 6.5-8.5 mm. long; Que.-Ga.-Mich. (figure 51) *rowena* Knab
- On dogwood (*Cornus*); 6.3-8 mm. long; Que. (figure 52) *knabi* Brown
- On hazel (*Corylus*); 7-8 mm. long; N.H.-Wis.-Kans. (figure 53) *rhoda* Knab
- Host unknown; 7-8 mm. long; *rhoda* v. *walshiana* Blatch.

Genus *Leptinotarsa* Stal 1858:475*Polygramma* Chevrolat 1837:421*Mycoryna* Stal 1858:475

<i>collinsi</i> , new species	Ariz.
<i>dahtbomi</i> (Stal) 1859:317	Tex.-Mex.
<i>haldemani</i> (Rogers) 1856:30	Tex.-Mex.
<i>libatrix</i> (Suffrian) 1858:248	Ariz.-Guat.
<i>violascens</i> (Stal) 1859:317	
<i>violacea</i> : (Sturm) 1843:287	
<i>behrensi</i> (Harold) 1877:16	Calif.-Mex.
<i>modesta</i> Jacoby 1883:229	
<i>puncticollis</i> Jacoby 1883:228	
<i>rubiginosa</i> (Rogers) 1856:30	Tex.-Ariz.-Mex.
<i>lineolata</i> (Stal) 1863:159	Tex.-Ariz.-Mex.
<i>peninsularis</i> (Horn) 1894:407	Ariz.-Mex.

- juncta* (Germar) 1824:590 Pa.-Ohio-La.-Fla.
s. texana (Schaeffer) 1906:239 Tex.-Ariz.
tumamoca Tower 1918:68
defecta: Linell 1896:196
defecta (Stal) 1859:317 Tex.
decemlineata (Say) 1824:453 N. Amer., Europe
albida Tower 1918:64
melanicum Tower 1918:63
minuta Tower 1918:64
pallida Tower 1918:62
rubrivittata Tower 1918:63
tortuosa Tower 1918:64
s. multitaeniata (Stal) 1859:317 Tex.-Mex.
intermedia Tower 1903:7
obscura Tower 1918:50
melanothorax (Stal) 1859:317
tacubayaensis Tower 1918:48
variabilis Tower 1918:52
multilineata (Stal) 1859:316
undecimlineata (Stal) 1859:316 Mex.-?Calif.

Key to the North American species of *Leptinotarsa*
 Stal

1. Elytra unicolorous 2
- Elytra with stripes or spots 5
2. Elytra red or yellowish brown; antennae, palpi, legs, and scutellum black; Tex.-Ariz.-Mex.
rubiginosa (Rogers)
- Elytra dark green, blue or black 3
3. Dark coppery green; very large, 13-16 mm. long; Calif.-Mex. *behrensii* (Harold)
- Black; elytra dark blue or green 4
4. Head and pronotum dull black; form less convex; Tex.-Mex. *haldemani* (Rogers)
- Head and pronotum dark metallic green; form more convex; Ariz.-Mex. *libatrix* (Suff.)
5. Pronotum without markings 6
- Pronotum with distinct markings; on *Solanum* spp. 10
6. Dark markings of elytra consist of unbroken stripes; the humeral stripe may be very short but there are no separate spots 8
- At least some of the elytral stripes broken; small dark spots also present on elytra 7
7. Each elytron with four longitudinal stripes, all of which are broken just before the middle; 7-7.7 mm. long; Tex.-Ariz.-Mex. *lineolata* (Stal)
- First two elytral stripes (counting from suture) unbroken; lateral half of elytron marked with irregular spots; 6.2 mm. long; Arizona (figures 81, 87, 100) *collinsi*, new species
8. Each elytron black with two narrow, pale, longitudinal stripes; Tex.-Mex. *dahlbomi* (Stal)
- Each elytron pale with four or more dark stripes. . . 9
9. Each elytron with suture and five complete stripes black; pronotum black; 6-13 mm. long. 12
- Each elytron with suture, three complete discal stripes and a very short humeral stripe dark brown; The first discal stripe is joined to the dark sutural marking and the short humeral stripe is joined to the third discal stripe; pronotum brown (figure 6); 7 mm. long; Ariz.-Mex. *peninsularis* (Horn)
10. Ventral surface of body entirely dark metallic green or black; Calif.-Mex. *undecimlineata* (Stal)
- Ventral surface of body at least partly pale. . . 11
11. Elytral markings bordered by a single, regular row of punctures 13
- Elytral markings bordered by an irregular double row of punctures 12
12. Elytral epipleura pale; United States, Canada, and Europe *decemlineata decemlineata* (Say)
- Elytral epipleura usually dark; Mexico and Big Bend region of Texas (characters separating these two subspecies are variable and inconsistent)
decemlineata multitaeniata (Stal)
13. Elytral suture pale brown or yellow 14
- Suture black; Tex.-Mex. *defecta* (Stal)
14. Space between elytral epipleura and 9th row of punctures black; Pa.-Fla.-La.-Ohio
juncta juncta (Germar)
- Marginal interspace of elytra pale; 8-9.5 mm. long; Texas (? Arizona) *juncta texana* (Schaefer.)

Leptinotarsa collinsi, new species

Figures 81, 87, 100

Oval, strongly convex; entirely dark reddish brown except for portions of elytra. Elytra very pale yellow with the following black or dark brown markings: epipleura: lateral margin between marginal bead and last row of elytral punctures; sutural and subsutural stripes complete and united; second stripe narrow but complete, free from subsutural stripe except at apical fifth, neither of these stripes reaching base of elytra; third stripe broader, starting at base in depression between humerus and disc of elytra, covering only inner portion of humerus, interrupted at basal third, continued at middle as a rather elongate, irregular spot, more or less united with second stripe. There are also six to

eight small dark spots between this third stripe and the lateral and apical margins.

Eyes small, separated by a little more than two thirds the width of the head across the eyes. Vertex alutaceous, moderately, sparsely punctate; clypeal suture evenly arcuate; clypeus a little more closely punctate. Antennae short, reaching humerus. Segments 2 and 4 equal, 3 is one and one half times as long as 2. Terminal segment of maxillary palp distinctly narrower and shorter than penultimate segment, narrower at apex than at base; apex truncate.

Width of prothorax at base almost twice length at middle. Pronotum moderately convex, somewhat flattened at sides. Base strongly curved; sides nearly straight though convergent in basal third then strongly rounded to apex; apical angles produced forward, acute at apex. Surface of pronotum alutaceous; moderately, sparsely punctate at middle; coarsely, closely punctate at sides.

Elytra strongly, evenly convex; surface finely alutaceous, shining. Punctures moderate in size, regularly arranged around first two elytral stripes, irregular beyond second stripe.

Metasternum finely punctate, metasternal episternum coarsely and closely punctate. Tarsal claws moderately divaricate.

Aedeagus produced at apex into a rather long lobe with sides parallel and apex slightly wider but evenly rounded. Stylet irregularly spatulate at apex with very broad membranous margins.

Length 6.2 mm.

Holotype: ♂, Sabino Can., Arizona, VIII-5-55, D. J. and J. N. Knull (Ohio). Paratype: ♂ same date (W577).

This species is similar to *Zygospila tortuosa* (Rogers) and *Z. opifera* (Stal) in size, color, and form and was at first confused with them. However, the divergent tarsal claws and complete, wide marginal dark stripe will serve to identify it. *Calligrapha subdenticulata* Bechné, from Costa Rica is similarly marked, but in that species the dark areas have a more distinct metallic luster and the discal dark patches are more completely joined to the subsutural stripe. Of the United States species, *L. peninsularis* Horn seems to be most closely related to this species, especially so in the form of the aedeagus. In *peninsularis* the elytral stripes are very regular and complete.

Leptinotarsa collinsi is named in honor of Dr. Donald L. Collins, New York State Entomologist.

Genus *Labidomera* Chevrolat 1837:421

Paropsimena Motschulsky 1860:186

<i>clivicollis</i> (Kirby) 1837:213	Me.-Fla.-Iowa
? <i>trimaculata</i> (Fabricius) 1775:95	
s. <i>rogersi</i> Leconte 1858:26	Manit.-Tex.
<i>mimica</i> Brown 1961:973	Tex.

Key to the species of *Labidomera* Chev.

1. Elytra orange or orange-brown except the suture, which is very narrowly dark on the apical third or two-thirds; this narrow stripe not widened at the apex; 10.4–10.8 mm. long; each anterior femur of the male with two subapical teeth; Texas.....
..... *mimica* Brown
- Elytra yellow or orange with dark blue, purple or black spots; the rest of the body entirely dark... 2
2. Each elytron with two to four large dark spots; 9–11 mm. long; eastern U.S.A.; on swamp milkweed (*Asclepias incarnata* L.), hedge bindweed (*Convolvulus sepium* var. *fraterniflorus* M. & B.)
..... *clivicollis clivicollis* (Kirby)
- Dark spots reduced and fragmented so there are more than four on each elytron (figure 11).... 3
3. Large, 10.4–10.8 mm. long; elytral punctures fine, Texas *mimica* Brown
- Smaller, 8.0–9.3 mm. long; elytral punctures moderate; Manitoba to Texas; on *Asclepias* sp.....
..... *clivicollis rogersi* Lec.

Genus *Chrysolina* Motschulsky 1860:210

Chrysomela auct.

<i>subsulcata</i> (Mannerheim)	1853:254	Alaska
<i>cavigera</i> (J. Sahlberg) 1885:35		Alaska
<i>tolli</i> (Jacobson) 1910:54		
<i>magniceps</i> (J. Sahlberg) 1885:38		Alaska
<i>caurina</i> Brown 1962:64		Alaska
<i>flavomarginata</i> (Say) 1824:452		(Ohio-Alta.-Ariz.
s. <i>vidua</i> (Rogers) 1856:36		Idaho-Alta.-B.C.-
<i>subseriata</i> (Leconte) 1860:321		Oreg.
<i>extorris</i> Brown 1962:65		Calif.
<i>hudsonica</i> Brown 1938:35		Nfld.-Que.-Manit.-
		N.W.T.

<i>finitima</i> Brown 1962:67	Alaska
<i>basilaris</i> (Say) 1824:451	Colo.-Yukon
<i>montivagans</i> (Leconte)	
1878:463	
<i>auripennis</i> (Say) 1824:452	Ind.-Ala.-N.Mex.-
<i>inornata</i> (Rogers) 1856:36	Colo.-Iowa
<i>schaefferi</i> Brown 1962:70	Utah-Ariz.-N.Mex.
<i>cyanea</i> (Schaeffer) 1933:479	
<i>subopaca</i> (Rogers) 1856:36	N.Y.-Fla.-Tex.-
<i>cribraria</i> (Rogers) 1856:36	Ill.
<i>staphylea</i> (Linnaeus) 1758:370	Nfld.-N.S. (Eur.)
<i>hyperici</i> (Forster) 1771:20	B.C.-Colo.-Calif.
	(Eur.)
<i>quadrigemina</i> (Suffrian) 1851:125	B.C.-Colo.-Calif.
	(Eur., Australia)
<i>geminata</i> auct.	
<i>gemellata</i> auct.	
<i>varians</i> (Schaller) 1783:271	B.C. (Eur.)

Key to the American species of *Chrysolina* Motsch.
(Modified from Brown 1962:59-61)

1. Elytra punctate-striate; the intervals lacking coarse punctures, usually more or less convex or variably elevated into ridges; the strial punctures occasionally obsolete in specimens with elevated intervals; the elytral epipleura not paler than the disc; flightless species restricted to treeless areas of Alaska. 2
 - Elytra usually with the punctures confused or seriate in part and then lacking impressed striae and convex or ridged intervals; the elytra tending to be punctate-striate only when the epipleura, and often the lateral margins, are reddish and paler than the disc 5
2. Apical abdominal segment transversely impressed and declivous before the apex, very strongly so in males, not strongly but distinctly so in females; legs and apical half of the apical ventral segment usually reddish-yellow or reddish-brown, sometimes blackish (figure 102) . . . *ravigera* (J. Sahlb.)
 - Apical abdominal segment flattened or feebly depressed at middle (♂) or unmodified (♀), with a strongly impressed marginal line but not declivous before the apex; legs and abdomen entirely blackish 3
3. Elytral intervals feebly convex and the length 5 to 5.8 mm. in the four specimens known; apex of the male genital organ very broadly rounded (figure 104) *caurina* Brown
 - Elytra extremely variable, with some of the intervals at least moderately convex except rarely; apex of the male genital organ attenuated into a blunt point 4
 - 4. Length 5.5 to 6.8 mm., usually about 6.2 mm.; elytral intervals 3, 5, 7, and 9 usually strongly elevated into ridges, sometimes not or only moderately elevated above the others; male genital organ feebly recurved before the apex (figure 103) *magniceps* (J. Sahlb.)
 - Length 5.0 to 8.1 mm., usually about 7.0 mm.; elytra with the intervals similar to one another or with the alternate intervals only moderately elevated above the others; male genital organ evenly curved (figure 101) *subsulcata* (Mann.)
 - 5. Pronotum not sulcate although usually with a feeble impression on each side at base; strongly metallic; elytra never with the epipleura or lateral margins pale; the elytral punctures not at all seriate; body broadly oval, the width 7/10 as great as the length; length 4.6-5.5 mm.; B.C.; on *Hypericum* (figure 114) *varians* (Schall.)
 - Pronotum with a distinct sulcus on each side, at least basally, except in some specimens with blackish or bicolored elytra. Elytral punctures usually subseriate in part; body more elongate; the size usually greater 6
 - 6. The coarse punctures of each elytron arranged in a subsutural row and in four pairs of irregular rows; pronotal sulci strongly impressed basally, not or scarcely impressed at middle and apically; metallic above, the elytra not paler at the margins or black; B.C.-Colo.-Calif.; on *Hypericum* 7
 - Elytral punctures rarely arranged in paired rows; pronotal sulci usually moderately or strongly impressed at middle and apically 8
 - 7. Length 5.3 to 6.1 mm., apical ventral segment of male not distinctly impressed (figure 112) *hyperici* (Forst.)
 - Length 6.0 to 7.1 mm.; apical ventral segment of male not deeply but broadly and very distinctly impressed (figures 15, 113) . . . *quadrigemina* (Suff.)
 - 8. Pronotum with the sulci at least moderately impressed from base to apex; lateral margins of elytra not paler than the disc 9
 - Pronotum with the sulci feebly to moderately impressed basally, feebly impressed or obsolete at middle and apically 13
 - 9. Entirely reddish-brown; restricted to Newfoundland and Nova Scotia (figure 111) . . . *staphylea* (L.)

- Not reddish-brown10
10. Pronotum slightly wider at middle than at base; Northern Yukon Territory to the high altitudes of southeastern British Columbia and Colorado (figure 108).....*basilaris* (Say)
- Pronotum widest at base.....11
11. Entirely dark blue, sometimes faintly violaceous; southwestern Utah, Ariz., and N. Mex.....*schaefferi* Brown
- Blackish or bicolored species.....12
12. Elytra green, brassy green, or coppery red, or black-brown and feebly bronzed but not concolorous with the darker pronotum; underside and legs usually very dark blue; pronotal sulci not deeper basally; Ind.-Iowa.-Ala.-N.Mex.; the blackish form restricted to south-central Texas (figure 109)*auripennis* (Say)
- The entire insect black or black-brown; elytra and pronotum very feebly bronzed, concolorous; pronotal sulci at least slightly deeper near the base; Pa.-Fla.-Ill.-Tex. (?N.Y.) (figure 110).....*subopaca* (Rogers)
13. Length 4.2-6.2 mm.; bronze-green or bronze above; elytra with the epipleura and usually, the lateral margins dull red or reddish-yellow; arctic and subarctic species.....14
- Length 5.8 to 7.4 mm.; black or blue-black, very rarely feebly bronzed above; elytra sometimes with pale margins; occurring from central Alberta southward15
14. Elytra with the coarse punctures confused in part; first segment of each anterior tarsus longer than wide; elytra lacking convex intervals; transcontinental at and near the northern limit of trees; on *Achillea* and *Tanacetum* (and ? willow).....*hudsonica* Brown
- Elytra with the coarse punctures arranged in well-defined, regular series; first segment of each anterior tarsus not longer than wide (♂) or with the elytral intervals feebly to moderately convex (♀); arctic Alaska (figure 107).....*finitima* Brown
15. Elytra lacking conspicuous pale margins; entirely blackish, or with the epipleura more or less obscurely rufescent and then sometimes with each lateral interval pale or rufescent in part; Alberta, B.C.-Idaho-Oregon; on *Artemisia* and *Aster*....*flavomarginata vidua* (Rogers)
- Elytra with the epipleura and lateral margins pale reddish-yellow; this pale band covering at least each lateral interval, often extended onto or beyond the next interval.....16
16. Male genital organ abruptly narrowed before the apex (figure 106); San Bernardino Co., California*extorris* Brown
- Male genital organ less abruptly narrowed apically (figure 105); southern Alberta to Iowa, N. Mexico, and Arizona; on *Artemisia*.....*flavomarginata flavomarginata* (Say)

Tribe Chrysomelini

Genus *Chrysomela* Linnaeus 1758:368

Gymnota Gistel 1837:403

Strickerus Lucas 1920:413

Subgenus *Chrysomela* s. str.

Lina Dejean 1837:402

Melasoma Stephens 1831:349

crotchii group: Brown 1956:21

crotchii Brown 1956:24 N.S.-Va.-Alaska-

tremulae: auct. Amer. N.Mex.

saliceti: auct. Amer.

invicta Brown 1956:25 Alta.-Mont.

Subgenus *Microdera* Stephens 1834:351

Macrolina Motschulsky 1860:198

interrupta group: Brown 1956:22

interrupta Fabricius 1801:438 Pa.-Fla.

mainensis Bechyné 1954:670 Nfld.-N.J.-Alta.

alnicola Brown 1956:27

s. interna Brown 1956:29 Alaska-Oreg.

s. littorea Brown 1956:31 Alaska-B.C.

walshi Brown 1956:32 Que.-Ont.

knabi Brown 1956:34 N.H.-N.C.-Alta.-
N.Mex.

s. hesperia Brown 1961:974 Alta.

falsa Brown 1956:36 Nfld.-Lab.-B.C.-Alaska

quadriguttata (Schaeffer) 1928:43

acneicollis (Schaeffer) Alta.-Colo.-B.C.-Calif.
1928:43

quadriguttoides Beller & Hatch 1932:98

scripta group: Brown 1956:22

scripta Fabricius 1801:438 Mass.-Fla.-B.C.-Mex.

laurentia Brown 1956:42 Me.-N.W.T.-Mich.

confluens Rogers 1856:37 Utah-Wash.-Calif.

maculicollis (Schaeffer) 1928:44

semota Brown 1956:45 Mont.-N.W.T.

lineatopunctata (Forster) Que.-N.J.-N.W.T.-
1771:22 Idaho

novaboracensis (Gmelin) 1790:1689

obsoleta (Say) 1824:453

scriptoides (Schaeffer) 1928:44

texana (Schaeffer) 1919:331 Tex.

schaefferi group, new group

schaefferi Brown 1956:50 Manit.-Alaska-Calif.

immaculata (Schaeffer) 1919:330

blaisdelli group, new group

braisdelli (VanDyke) 1938:48 Alaska-N.W.T.

engelhardti (Hatch) 1939:49 Alaska-N.W.T.

Key to the North American species of *Chrysomela* L.
(Modified from Brown 1956:21-23.)

1. Elytra immaculate, pale brown or brownish yellow; pronotum with the sides not or scarcely paler than the disc; tibiae unicolorous; usually larger, the males 7.0-8.0 mm. long, females 7.2-9.7 mm.; apex of aedeagus neither attenuate nor evenly rounded, angulate on each side (*Chrysomela* s. str., = *crotchii* group)2
- Elytra maculate or entirely dark; or with the pronotal sides broadly pale and the disc dark; or with the tibiae distinctly bicolored; or with the body smaller; apex of aedeagus somewhat attenuate or broadly rounded, lacking lateral angles (subgenus *Microdera*)3
2. Except for the elytra, darker; usually blackish with strong green reflections and rufescent areas; the pronotum often rufescent laterally or throughout but rarely strongly so; body beneath usually reddish or rufescent in part; abdomen and legs nearly always largely or entirely dark; elytral

- apices of the female distinctly produced, more strongly acute than in the male; apex of aedeagus produced on each side into a blunt tooth (figure 152); northern Virginia and Nova Scotia to Idaho and Alaska: New Mexico.....*crotchi* Brown
- Except for the elytra, paler; brownish-red, often with greenish reflections in certain lights, the metasternum and legs sometimes slightly darker in part; elytral apices of the female not or scarcely produced, usually more strongly acute than in the male; apex of aedeagus not produced on the sides (figure 151); southwestern Alberta and northwestern Montana*invicta* Brown
3. Elytra without traces of striae except for the stria that limits the external ridge of each; the punctures not arranged in series except near the suture.... 4
- Elytra distinctly substriate; occasionally with the punctures confused as in the other species and with the intervals subequal; usually with the discal punctures subseriate in part and with the third, fifth, and seventh intervals largely impunctate and more convex; elytra entirely black or dark brown; Alaska and North West Territories (*blaisdelli* group)18
4. Elytra entirely pale, or entirely blackish and somewhat bronzed; never with bluish reflections; less than 6.5 mm. long; lateral ridge of each elytron feebly delimited; western (*schaefferi* group).....*schaefferi* Brown
- Elytra with the standard pattern of dark spots, or entirely dark blue or blue-green or dark and with the lateral margin or some discal spots pale (rarely obscurely pale in *lineatopunctata*); lateral ridge of each elytron strongly delimited.....5
5. Each elytron, when pale and maculate, with a basic pattern of seven dark spots of which two are median (figures 115-137); these spots never elongate, often joined together and to the suture to produce an irregular transverse band; the elytra sometimes largely dark due to fusion of the spots, the pale areas then reduced to small spots and, nearly always, very irregular transverse lines; the elytra very rarely entirely pale, sometimes with only the two median spots on each, usually with the spots more or less fused, never entirely dark; the pale ground of the elytra sometimes yellowish but always red in breeding individuals; apex of aedeagus somewhat attenuate and rather narrowly rounded (figure 150) (*interrupta* group). This group consists of eight sibling species and subspecies, which cannot be keyed. The following couplets give their food plants and distributions. When two or more species occur in one locality, they breed on different hosts and are sometimes separable by color....6
- Each elytron, when pale and maculate, with a basic pattern of seven dark spots of which three are median (figures 138-148); these median spots always elongate, never joined to produce a transverse band; the elytra, when largely dark, with pale areas reduced to longitudinal streaks; the elytra sometimes entirely pale (*schaefferi*), rarely with the median and posterior spots lacking in part, sometimes with the spots more or less fused, sometimes entirely blackish or bluish; the pale ground of the elytra is pale yellow in pinned specimens, often silvery in breeding individuals; apex of aedeagus broadly and evenly rounded (figure 149) (*scripta* group)13
6. Breeding on *Alnus*; the adults of *mainensis* very rarely on *Salix* in early spring.....7
- Breeding on *Salix* or *Populus*.....10
7. Occurring east of the Rocky Mountains.....8
- Occurring in the Rocky Mountains and westward9
8. Occurring from southeastern Pennsylvania to Florida; larger; each elytron with the basal spots usually joined, the median spots often joined and nearly always attaining the suture (figures 115-117), the posterior markings nearly always fused into a blotch which always attains the suture; underside and legs largely dark; on alder (*Alnus serrulata*) *interrupta* Fab.
- Occurring from northern New Jersey, Newfoundland, and the interior of Labrador to Alberta and Great Slave Lake; smaller; each elytron usually with seven discrete spots and with the suture entirely pale (figures 118-119); underside and legs largely or entirely pale except in some specimens from Labrador.....*mainensis mainensis* Bech.
9. Occurring on the coasts of British Columbia and southernmost Alaska; darker (figures 122-123); frequently with the pronotal sides largely or entirely dark and with the elytra entirely dark; the underside and legs largely dark.....*mainensis littorea* Brown
- Occurring in inland regions; Oregon to south-central Alaska; paler above (figures 120-121) and sometimes beneath*mainensis interna* Brown
10. Restricted to *Populus balsamifera*; occurring in eastern and southernmost Ontario and in south-

- western Quebec; very variable but intermediate in color and size between *m. mainensis* and *knabi* (figures 124-127)..... *walshi* Brown
- Sometimes occurring on, but not restricted to, *Populus* 11
11. Breeding on both *Populus* and *Salix*; northern, occurring from Newfoundland and Labrador to British Columbia and Alaska; extremely variable in color (figures 132-134)..... *falsa* Brown
- Breeding only on *Salix*; adults of *knabi* frequently on *Populus* in the spring..... 12
12. Occurring in the mountains of southern Alberta and southern British Columbia to southwestern Colorado and Tulare Co., California; smaller; pronotum entirely dark or virtually so; the dark areas of the elytra usually covering more than half of the disc (figures 135-137)..... *aeneicollis* (Schaeff.)
- Occurring from southernmost Ontario, southernmost New Hampshire, and western North Carolina to southern Alberta and New Mexico; larger; the pronotal sides broadly pale, the dark areas of the elytra less extensive (figures 128-131)..... *knabi* Brown
13. Body elongate, the width from 50 to 55 percent as great as the length; the standard elytral pattern of dark spots well defined except rarely in *laurentia*; the three median spots of each elytron very elongate, the intermediate of these usually from six to seven times as long as wide (figures 138-142)..... 14
- Body usually less elongate, the width at least 53 percent as great as the length; elytra largely or entirely dark, or with the median spots shorter and with the intermediate of these very rarely more than five times as long as wide (figures 145-147)..... 15
14. Usually larger; the elytral spots usually relatively smaller, discrete or virtually so (figures 138-139); on *Salix* and *Populus*; southern New England, southernmost Ontario, and the southern parts of the Prairie Provinces and British Columbia to southernmost United States and Mexico..... *scripta* Fab.
- Usually smaller and with the dark areas of the elytra more extensive; the elytral spots sometimes more or less confluent (figures 140-142); more northern; south-central Quebec and central New England to eastern Ontario, Lake Superior and Great Slave Lake..... *laurentia* Brown
15. Head, pronotum, underside. and legs entirely reddish-yellow or virtually so; central and southern Texas (figure 147)..... *texana* (Schaeff.)
- Head, pronotum, underside, and legs dark or bicolored except in some specimens of the more northern *lineatopunctata* 16
16. Body more convex and less elongate, the width from 57 to 59 percent as great as the length; extremely variable in color (figures 145-146)..... *lineatopunctata* Forst.
- Body slightly less convex and slightly more elongate; the width 54 to 58 percent as great as the length; western species 17
17. Elytra virtually dichromatic; either entirely deep blue or blue-green, or pale and maculate with the standard pattern (figure 143), the intermediate condition very rare; the spots usually bluish, sometimes black, rarely confluent; more southern, western Washington to central Utah and central California *confluens* Rogers
- Elytra always maculate with the standard pattern (figure 144); the markings always blackish, virtually always discrete; more northern, northwestern Montana, southeastern British Columbia, and northward *semota* Brown
18. Pronotum bicolored, the sides broadly red..... *blaisdelli* (Van Dyke)
- Pronotum entirely black..... *engelhardti* (Hatch)

Genus *Phaedon* Latreille 1829:151

Emmetrus Motschulsky 1860:221

Orthosticha Motschulsky 1860:196

- prasinella* (Leconte) 1861:358 Wash.-Calif.
- punctatus* Hatch 1928:46
- vandykei* Hatch 1928:61
- purpurca* (Linell) 1898:482 Utah-Ariz.
- purpurescens* Hatch 1928:61
- oviformis* (Leconte) 1861:357 N.Eng.-Alaska
- vancouverensis* Hatch
1928:62
- viridis* (Melsheimer) 1847:175 Que.-Fla.-N.Mex.
- aeruginosus* Suffrian
1858:395
- microreticulatus* Hatch
1928:46

- dictrichi* Hatch 1928:46
- ?oklahomensis* Hatch 1931:103
- americanus* Schaeffer 1929:287 Eastern U.S.A.
- armoraciae* auct. Amer.
- niger* Hatch 1928:47 Wash.
- planus* Hatch 1931:104
- carri* Hatch 1928:46 Que.-Alta.
- cochleariae* auct. Amer.
- uniformis* Fall 1929:150 Mass.-Ga.-Miss.-Ohio
- ryanosceus* Stal 1860:470 Colo.-Ariz.-Mex.
- huachucae* Hatch 1928:62

Key to the North American species of *Phaedon* Latr.
(Fall 1929:148-149)

1. Second elytral interval without a subbasal series of widely spaced larger punctures.....2
- Second elytral interval with a widely spaced subbasal series of larger punctures.....6
2. Head and pronotum finely alutaceous or microreticulate; tarsal claws smaller than elsewhere in the genus3
- Head and pronotum not perceptibly alutaceous, usually visibly but very finely punctulate between the larger punctures4
3. Head coarsely punctate, punctures distinctly larger than those of the median parts of the pronotum; ventral segments coarsely punctate; size larger, about 3.5 mm. long; Que.-Fla.-N.Mex.....
..... *viridis* (Melsh.)
- Head more finely and sparsely punctate, punctures not or but very slightly coarser than those of the pronotum, which are nearly uniform in size from side to side; ventral segments more sparsely and very finely punctate; size usually less than 3 mm. long; Mass.-Ga. *uniformis* Fall
4. Form oblong oval5
- Form distinctly rounded, deep purple or violaceous varying to greenish; ventral surface very finely punctate; Ariz..... *ryanosceus* Stal
5. Interstitial punctures of elytra sparse and very minute; color purpureo-violaceous, the pronotum usually green; ventral surface coarsely punctured; size large, over 4 mm. long; Utah-Ariz.....
..... *purpurea* (Linell)
- Interstitial punctures of elytra always strong and distinct, may be nearly as large as those of the striae; smaller, usually less than 3.5 mm. long; Wash.-Calif. (figure 20)..... *prasinella* (Lec.)

6. Elytra not perceptibly transversely subrugulose..7
- Elytral intervals transversely subrugulose in varying degree, as a rule more distinctly so toward the sides; New England-Alaska.... *oviformis* (Lec.)
7. Clypeal suture nearly equally impressed throughout; antennae entirely black; humeral callus stronger, ventral surface distinctly microreticulate, the last segment commonly entirely pale; eastern U.S. *americanus* Schaefer.
- Clypeal suture feeble at middle, more strongly impressed at sides; basal two segments of antennae more or less pale beneath; humeral callus less strong; ventral surface not or scarcely visibly microreticulate; the last ventral segment black usually with a narrow pale apical border; Que.-Alta.-N.Y. *carri* Hatch

Genus *Gastrophysa* Chevrolat 1837:405

***Gastroidea* Hope 1840:164**

***Gastroidea* Gemminger & Harold 1874:3403**

- cyanea* Melsheimer 1847:175 Conn.-N.Dak.-Calif.-Tex.
- s. caesia* (Rogers) 1856:38 Calif.
- dissimilis* (Say) 1824:450 Mo.-Kans.-Utah
- formosa* (Say) 1824:451 Kans.-Mont.-Ariz.
- polygoni* (Linnaeus) 1758:370 Eur.-Sib., N.S.-N.Y.-Sask.-Mo.
- caerulipennis* (Say) 1826:297

Key to the species of *Gastrophysa* Chev.

1. Entirely metallic, prothorax not testaceous or orange 2
- Legs and prothorax reddish orange; elytra metallic blue; 4-4.5 mm. long; eastern U.S.A. and Canada; on *Polygonum aviculare*..... *polygoni* (L.)
2. Suture purple, rest of elytra green with golden or roppery luster; 4-4.5 mm. long; Kansas-Montana-Arizona; on *Rumex venosus* (figure 19).....
..... *formosa* (Say)
- Elytra uniformly green, blue or purple.....3
3. Elytra with a submarginal carina; head sulcate; body larger, 5.5-6.2 mm. long; Kansas-Missouri-Utah; on *Polygonum* sp. (? *spontaneum*).....
..... *dissimilis* (Say)
- Elytra not distinctly carinate; head flat; size smaller, 4-5.3 mm. long; on *Rumex* spp.....4

4. Moderately convex, sides not usually parallel; eastern U.S.A. *cyanea cyanea* Melsh.
 — Strongly convex, sides parallel; California.....
 *cyanea caesia* (Rogers)

Genus *Plagiodera* Chevrolat 1837:404

Linamorpha Motschulsky 1860:197

Plagiosterna Motschulsky 1860:190

Plagiomorpha Motschulsky 1860:197

Melasomida Schaeffer 1920:117

Pseudolina Schaeffer 1919:331

<i>arizonae</i> (Crotch) 1874:53	Tex.-Ariz.-Colo.-Utah
<i>californica</i> (Rogers) 1856:37	Calif.
<i>thymaloides</i> Stal 1860:468	Tex.-Mex.
<i>versicolora</i> (Laicharting) 1781:148	Eur., Me.-N.J.-Ohio
<i>armoraciae</i> (Fabricius) 1787:103	

Key to the species of *Plagiodera* Chev.

1. Elytra uniformly dark metallic blue, green or purple 2
- Elytra brown without metallic luster, lateral and apical margins paler, testaceous; 4.25 mm. long; Texas-Mexico *thymaloides* Stal
2. Prothorax and legs black with metallic blue, green or purple luster 3
- Prothorax and legs pale, orange or testaceous; 4.7 mm. long; southwestern U.S.A. (figure 21) ..
..... *arizonae* (Crotch)
3. Punctures of pronotum coarse, about as large as those on elytra; color of elytra dark green with very faint bronze luster; 4.2–5.2 mm. long; California; on willow (*Salix* sp.)
..... *californica* (Rogers)
- Pronotal punctures fine, distinctly smaller than those on the elytra; color of elytra dark blue or purple; 3.3–4.5 mm. long; eastern U.S.A.; on willow (*Salix* sp.) *versicolora* (Laich.)

Tribe Phratorini

Genus *Phratora* Chevrolat 1837:429

Phyllodecta Kirby 1837:216

<p><i>interstitialis</i> Mannerheim 1853:259</p> <p><i>aklaviki</i> (Carr) 1932:192</p> <p><i>purpurea</i> Brown 1951:124</p> <p><i>americana</i>: (Schaeffer) in part</p> <p><i>vitellinae</i>: Blatch. 1910:1161</p> <p><i>s. novae-terrae</i> Brown 1951:125</p> <p><i>kenaiensis</i> Brown 1952:339</p> <p><i>californica</i> Brown 1961:976</p> <p><i>americana</i> (Schaeffer) 1928:46</p> <p><i>pallipes</i> (Schaeffer) 1928:47</p> <p><i>vitellinae</i>: auct. Amer.</p> <p><i>vulgatissima</i>: auct. Amer.</p> <p><i>s. canadensis</i> Brown 1951:126</p> <p><i>hudsonia</i> Brown 1951:128</p> <p><i>frosti</i> Brown 1951:129</p> <p><i>americana</i>: (Schaeffer) in part</p> <p><i>s. remissa</i> Brown 1951:129</p>	<p>B.C.-Alaska</p> <p>N.S.-Mass.-B.C.- Yukon</p> <p>Nfld.</p> <p>Alaska</p> <p>Calif.</p> <p>Me.-Ga.-Ohio</p> <p>N.B.-N.H.</p> <p>Que.-Manit.-Alaska</p> <p>N.S.</p> <p>Labr.-Alaska-Colo.</p>	<p>third segment; female with a fringe of long hairs on the anterior margins of antennal segments four to six; B.C. and northward (figure 162).....</p> <p>..... <i>interstitialis</i> (Mann.)</p> <p>— Lateral declivities of the elytra less irregularly punctate, the striae usually defined; males with first segment of each tarsus about three-fourths as wide as the third segment; females lacking, or virtually lacking, long hairs except apically on antennal segments four to six..... 3</p> <p>3. Purple or coppery above, internal sac of male copulatory organ lacking large teeth; on <i>Populus</i> and <i>Salix</i>..... 4</p> <p>— Color above variable; internal sac with two large, spiniform, heavily sclerotized teeth; on <i>Salix</i>; eastern..... 5</p> <p>4. Usually deep purple above, sometimes bright purple, rarely coppery and then usually with purple reflections; Mass.-B.C.-Yukon (figure 161).....</p> <p>..... <i>purpurea purpurea</i> Brown</p> <p>— Coppery above, the reddish reflections always evident, sometimes with purple reflections that rarely are strong; Newfoundland.....</p> <p>..... <i>purpurea novae-terrae</i> Brown</p> <p>5. Deep purple above or dark blue or blue-green and then usually with purple reflections; tibiae normally dark, their extreme apices usually obscurely pale; New England-Ohio-Georgia (figure 160).....</p> <p>..... <i>americana americana</i> (Schaeff.)</p> <p>— Dark blue, blue-green, green, bronze or coppery above; sometimes reddish above but then lacking the deep purple color or reflections usual in <i>americana americana</i>; tibiae sometimes dark, sometimes partly or entirely reddish-yellow; color of both dorsum and tibiae varying individually and geographically; northern New England-Nova Scotia-Ontario.....</p> <p>..... <i>americana canadensis</i> Brown</p> <p>6. Black or greenish above, lacking coppery or bluish reflections; on <i>Betula papyrifera</i>; Hudson Bay-Manitoba-Alaska.....</p> <p>..... <i>hudsonia</i> Brown</p>
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Key to the North American species of *Phratora* Chev.
(Modified from Brown 1951:122)

1. Anterior margins of antennal segments four to six with a fringe of long hairs in males and some females; males with first segments of all tarsi equally dilated..... 2
- Antennal segments four to six lacking long hairs, except near their apices in both sexes, males with first segment of each hind tarsus two-thirds as wide as the third segment and first segment of each front and middle tarsus three-fourths as wide as third segment..... 6
2. Lateral declivities of elytra very irregularly punctate, usually with striae not or scarcely traceable; blue-green, blue, or green above; male with first segment of each tarsus nearly equal in width to

- Blue or greenish-blue above; on *Salix*; Nova Scotia (figure 159) *frosti frosti* Brown
- Coppery above, the reddish reflections strong and

sometimes tending to purple; rarely blue above; on *Salix* and perhaps *Populus tremuloides*
..... *frosti remissa* Brown

Tribe Entomoscelini

Genus *Entomoscelis* Chevrolat 1837:426

americana Brown 1942:172 Minn.-Wash.-Alaska
adonidis auct. Amer.

Genus *Microtheca* Stal 1860:464

ochroloma Stal 1860:464 Ala.-La., S. Amer.

Tribe Prasocurini

Genus *Prasocuris* Latreille 1802:224

phellandrii (Linnaeus) 1758:376 Eur.-Sib., Que.-B.C.-
 Colo.-Ohio

Genus *Hydrothassa* Thomson 1866:279

borecla Schaeffer 1928:289 N.Y.-Alta.
ovalis (Blatchley) 1910:1151 Ind.-Mich.
vittata (Olivier) 1808:595 Me.-Pa.-Alta.
trivittata (Say) 1826:289
varipes (Leconte) 1866:9
obliquata (Leconte) 1866:9 N.Y.-Ind.

Key to the North American species of *Hydrothassa*
 Thoms.

(Modified from Schaeffer 1928)

- | | |
|---|---|
| <p>1. Row of punctures on the pale, last elytral interval entire from base to apex; black lateral vitta on each elytron not reaching the base, discal and marginal pale vittae united at base.....2</p> <p>— Row of punctures on last elytral interval obliterated at or slightly behind middle; black lateral stripe on each elytron reaching the base; subsutural and marginal pale stripes not united at base.....3</p> <p>2. All elytral intervals impunctate; form narrower and relatively more elongate; size smaller, 3-4 mm. long; eastern U.S. and Canada; larva on flowers of <i>Ranunculus acris</i> L....<i>vittata</i> (Oliv.)</p> | <p>— Some of the elytral intervals more or less distinctly punctate; form broader, size larger, 4.5-4.75 mm. long; N.Y.-Ind.....<i>obliquata</i> (Crotch)</p> <p>3. Elytral epipleura with a single row of punctures close to the internal margin and occasionally a few scattered punctures near the base; sides of prothorax nearly parallel or slightly convergent from about apical third to base; form more elongate oval; 3.5-4 mm. long; N.Y.-Alta. (figure 28)....
 <i>borecla</i> Schaeff.</p> <p>— Elytral epipleura with confused double rows of punctures; prothorax wider, sides distinctly divergent from about apical third to base; form more regularly oval; 3.5-4 mm. long; Mich.-Ind.....
 <i>ovalis</i> (Blatch.)</p> |
|---|---|

Tribe Gonioctenini

Genus *Gonioctena* Chevrolat 1837:427

Phytodecta Kirby 1837:213

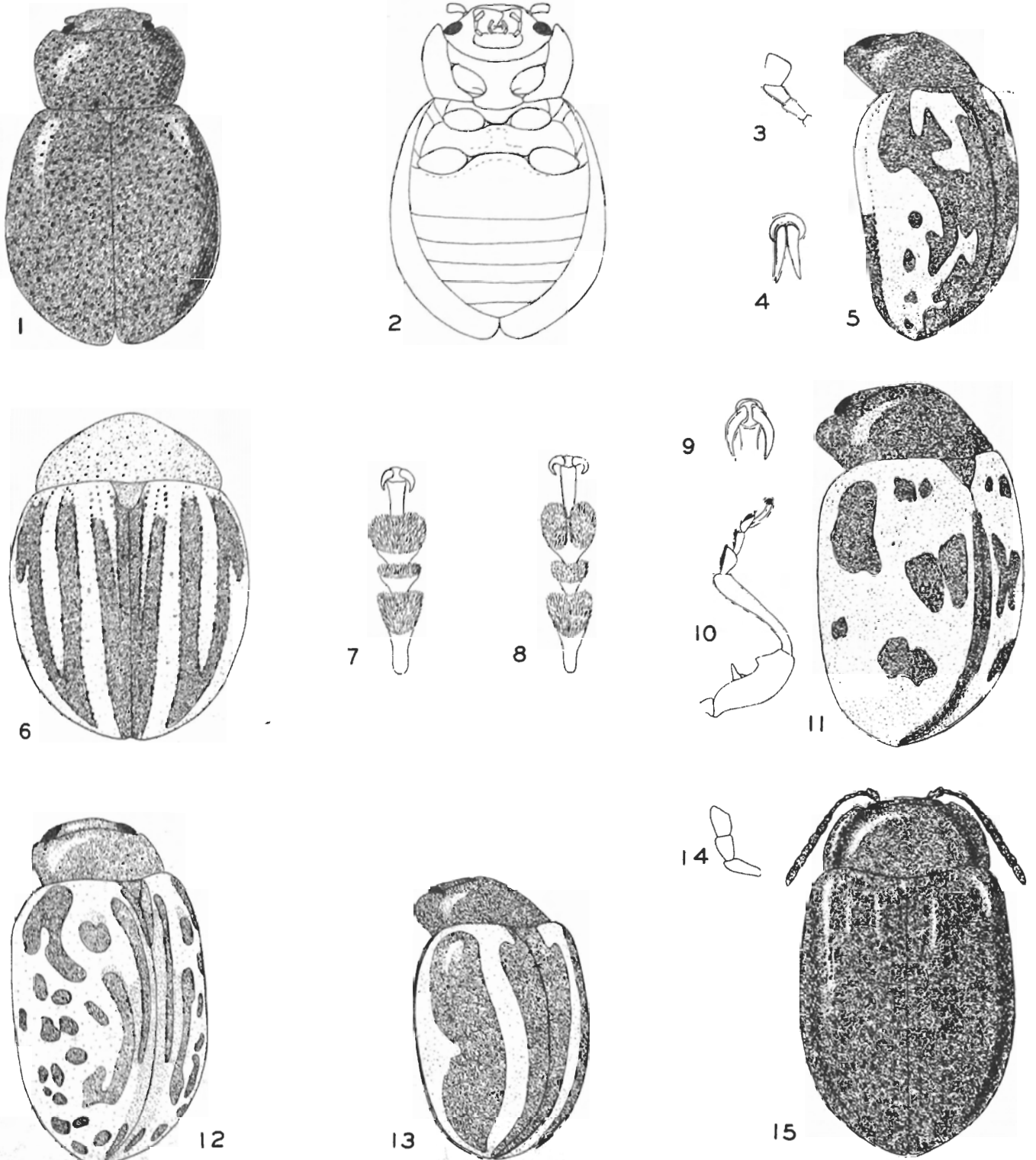
<i>nivosa</i> (Suffrian) 1851:222	Eur.	middle; on willow; arctic and mountainous regions of the west (figure 155)..... <i>nivosa</i> (Suff.)
<i>affinis</i> (Gyllenhal) 1808:257		
<i>s. arctica</i> (Mannerheim) 1852:3	Alaska-Manit.-Siberia	--- Tenth antennal segment not longer than wide; antennae similar in the sexes, not extending beyond middle coxae; tarsi never with the first segments wider than third; elytra polished, never alutaceous; sublateral striae normally regular.....2
<i>s. alberta</i> Brown 1952:340	Alta.-Mont.	
<i>notmani</i> (Schaeffer) 1924:140	N.Y.-N.W.T.	2. Pronotum and elytra immaculate or with small black spots, spots of pronotum not extending onto anterior half of disc (figure 29); individuals with maculate elytra have clypeus black; aedeagus attenuate apically, with a feeble notch at apex (figure 158); N.Y.-Que.-Alta.; on willow.....
<i>americana</i> (Schaeffer) 1924:139	N.Y.-Alta. <i>notmani</i> (Schaef.)
<i>arctica</i> : Bechyné 1948:118		— Pronotum and elytra rarely immaculate (<i>americana</i>), pronotal spots usually extending onto the anterior half of disc; clypeus always pale.....3
<i>guttifer</i> Bechyné 1948:128		3. Aedeagus short, apex truncate and bilobed (figure 156); from Atlantic to Pacific; on the aspen poplar..... <i>americana</i> (Schaef.)
<i>occidentalis</i> (Brown) 1942:104	B.C.-Alta.-Yukon	— Aedeagus attenuate apically, apex deeply cleft (figure 157); on willow; Alta.-B.C. <i>occidentalis</i> Brown

Key to the North American species of *Gonioctena* Chev.
(Modified from Brown 1942:100)

1. Tenth antennal segment distinctly longer than wide; antennae attaining posterior coxae in male and middle of metasternum in female; males with first segment of each front and middle tarsus a little wider than the third segment; elytra often distinctly alutaceous and rather dull; the striae terminating on the humeral umbone more or less irregular at

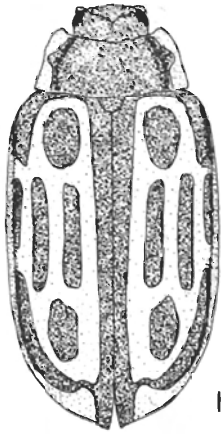
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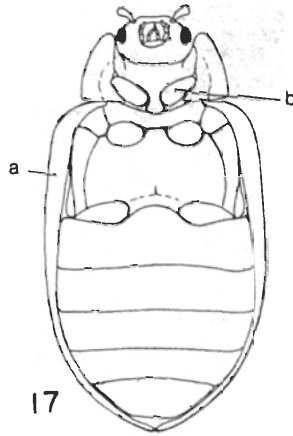


Legend for plate 1

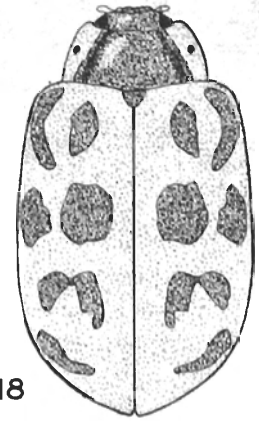
1. *Timarcha vandykei* (?), dorsal view.
2. *Timarcha vandykei* (?), ventral view.
3. *Zygogramma opifera*, palp.
4. *Zygogramma opifera*, claws.
5. *Zygogramma opifera*, dorso-lateral view.
6. *Leptinotarsa peninsularis*, dorsal view.
7. *Leptinotarsa peninsularis*, ventral view of posterior tarsus.
8. *Chrysomela crotchii*, ventral view of posterior tarsus.
9. *Labidomera clivicollis*, claws.
10. *Labidomera clivicollis*, front leg of male.
11. *Labidomera clivicollis rogersi*, dorso-lateral view.
12. *Calligrapha alnicola*, dorso-lateral view.
13. *Calligrapha (Bidensomela) bidenticola*, dorso-lateral view.
14. *Chrysolina quadrigemina*, palp.
15. *Chrysolina quadrigemina*, dorsal view.



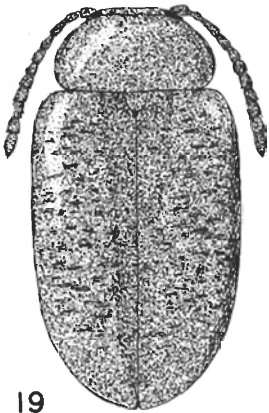
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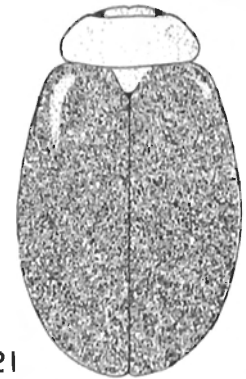
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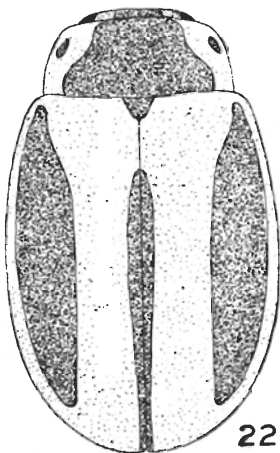
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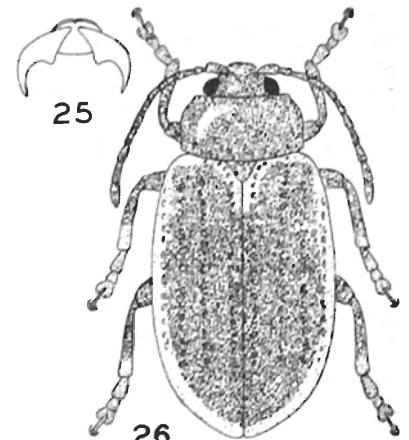
22



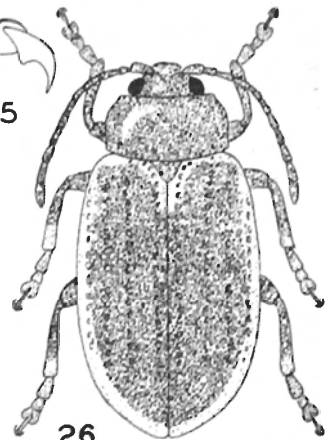
23



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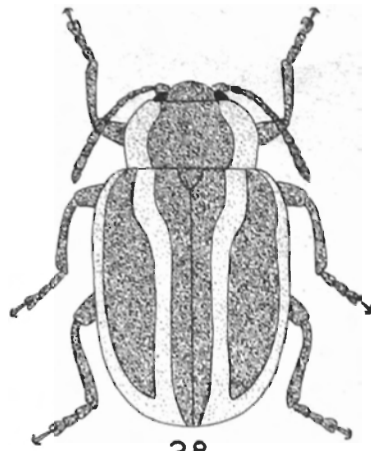
Legend for plate 2

16. *Chrysomela laurentia*.
 17. *Chrysomela mainensis*, ventral view ;
 a. epipleuron ; b. front coxal cavity.
 18. *Chrysomela mainensis*.
 19. *Gastrophysa formosa*.

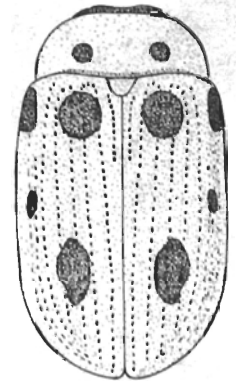
20. *Phaedon prasinella*.
 21. *Plagiomorpha arizonae*.
 22. *Entomoscelis americana*.
 23. *Phratora purpurea*, claws.
 24. *Phratora purpurea*.
 25. *Microtheca ochroloma*, claws.
 26. *Microtheca ochroloma*.



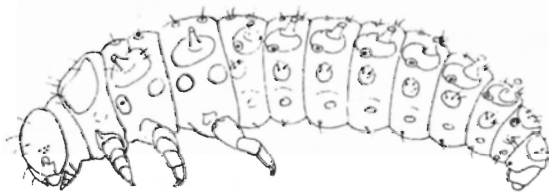
27



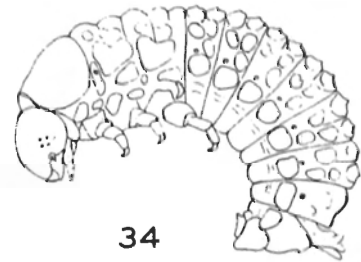
28



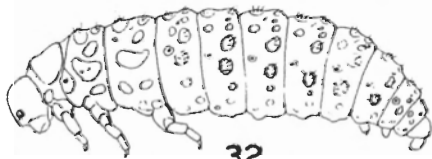
29



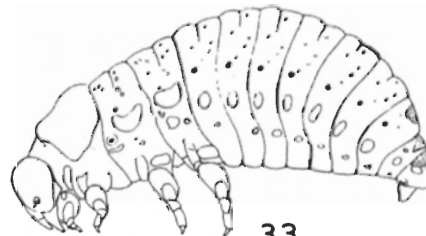
31



34



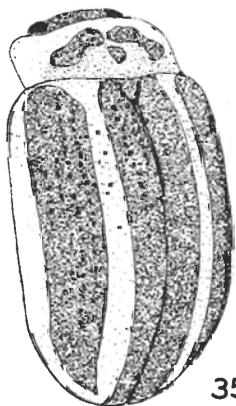
32



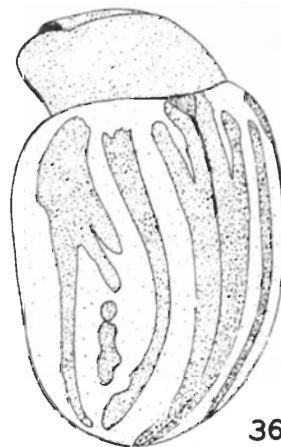
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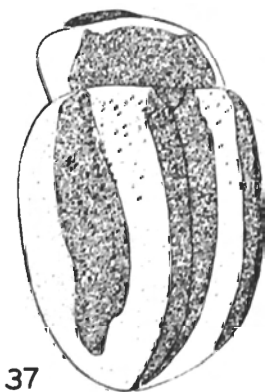
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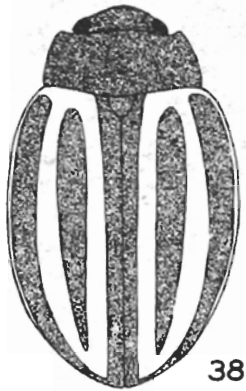
36



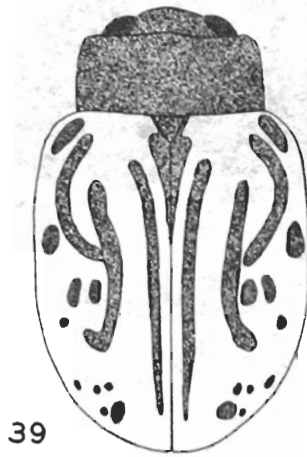
37

Legend for plate 3

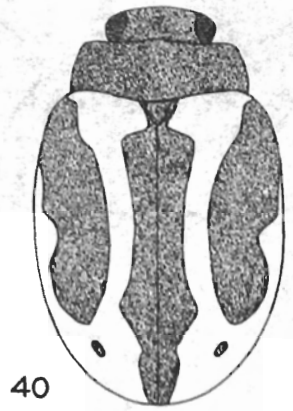
27. *Prasocuris phellandrii*.28. *Hydrothassa boreala*.29. *Goniocтена notmani*.30. *Goniocтена notmani*, middle leg.31. *Phratora americana*, larva.32. *Microtheca ochroloma*, larva.33. *Calligrapha (Coreopsimela) californica coreopsivora*, larva.34. *Goniocтена americana*, larva.35. *Calligrapha (Coreopsimela) californica coreopsivora*.36. *Calligrapha (Graphicalis) lunata hybrida*.37. *Calligrapha (Acalligrapha) praecelsis*.



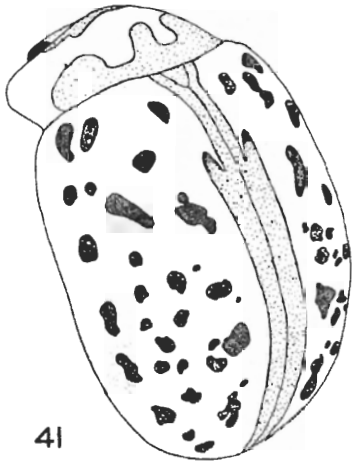
38



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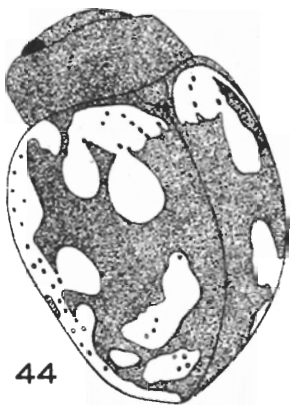
41



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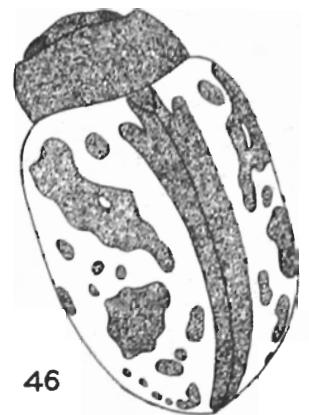
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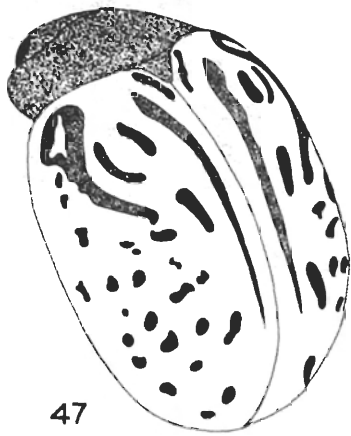


46

Legend for plate 4

38. *Calligrapha cephalanthi* Schwarz, redrawn from Monros 1955.
 39. *Calligrapha dislocata* (Rogers), redrawn from Rogers 1856.
 40. *Calligrapha incisa* (Rogers), redrawn from Rogers 1856.

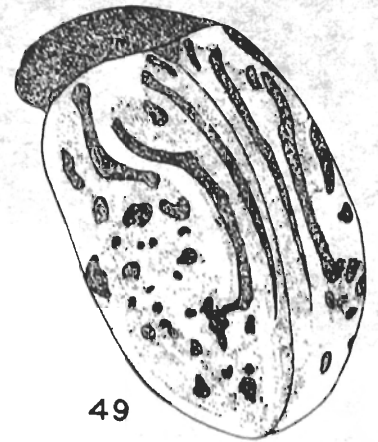
41. *Calligrapha verrucosa* (Suff.)
 42. *Calligrapha multipunctata* (Say)
 43. *Calligrapha wickhami* Bowd.
 44. *Calligrapha multiguttata* (Stal)
 45. *Calligrapha apicalis* Notm.
 46. *Calligrapha fulvipes*



47



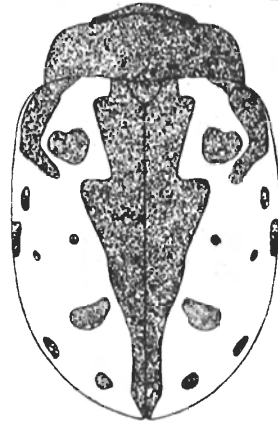
48



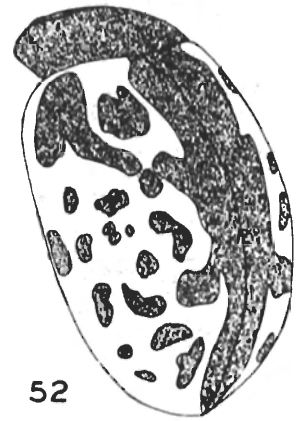
49



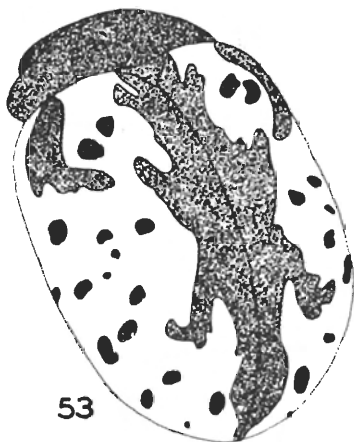
50



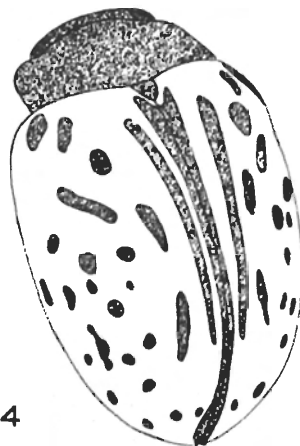
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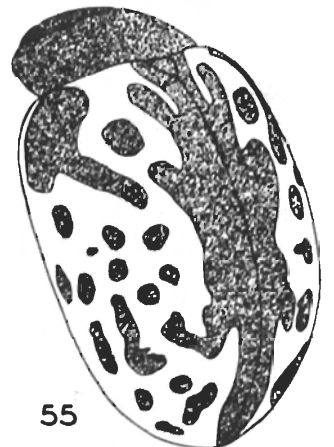
52



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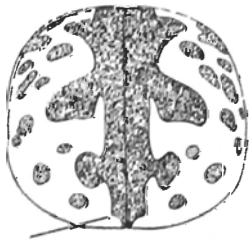


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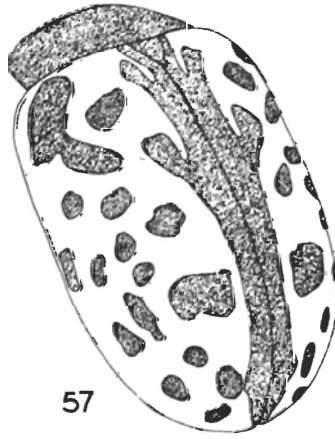
Legend for plate 5

47. *Calligrapha philadelphica* (L.)
 48. *Calligrapha vicina* Schaefer.
 49. *Calligrapha alni* Schaefer.
 50. *Calligrapha spiracae* (Say)

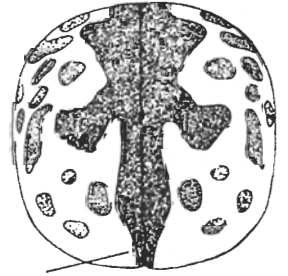
51. *Calligrapha rowena* Knab
 52. *Calligrapha knabi* Brown
 53. *Calligrapha rhoda* Knab
 54. *Calligrapha amelia* Knab
 55. *Calligrapha confuens* Schaefer.



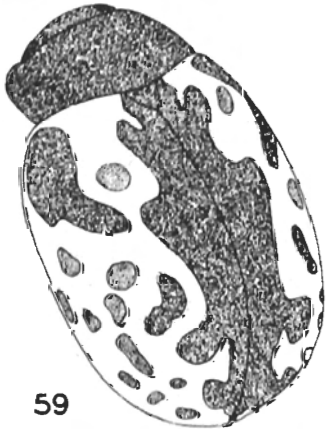
56



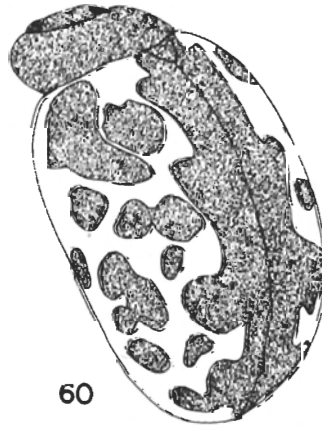
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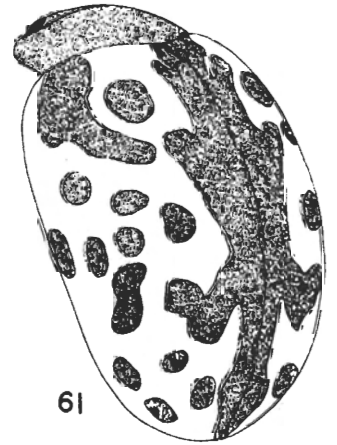
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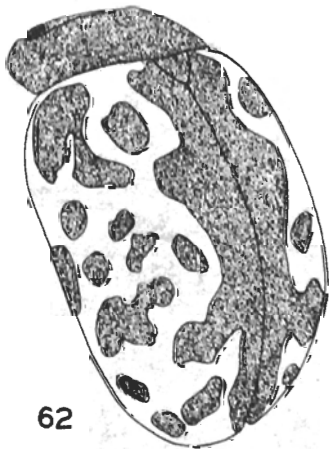
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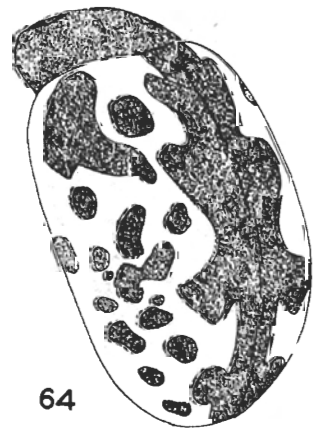
61



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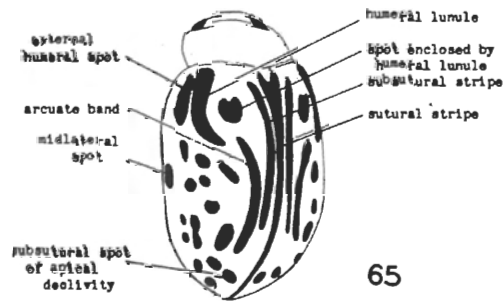


64

Legend for plate 6

56. *Calligrapha scalaris* (Lec.), caudal view.
 57. *Calligrapha dolosa* Brown
 58. *Calligrapha virginica* Brown, caudal view.
 59. *Calligrapha scalaris* (Lec.)

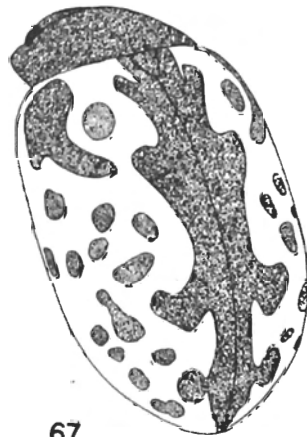
60. *Calligrapha ostryae* Brown
 61. *Calligrapha virginica* Brown
 62. *Calligrapha ignota* Brown
 63. *Calligrapha pruni* Brown
 64. *Calligrapha amator* Brown



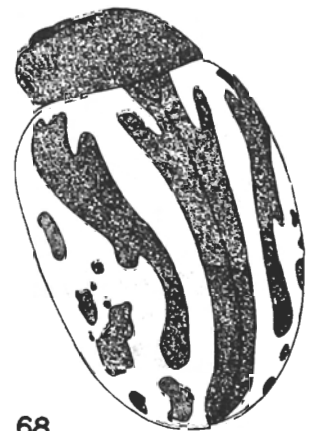
65



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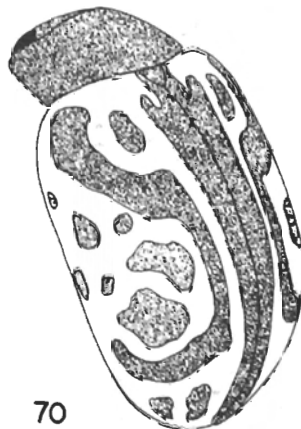
67



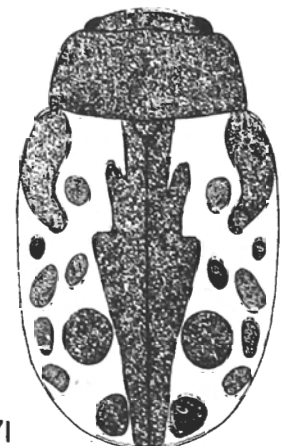
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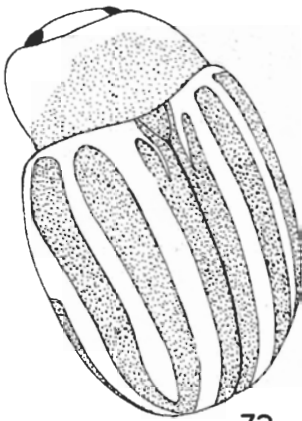


71

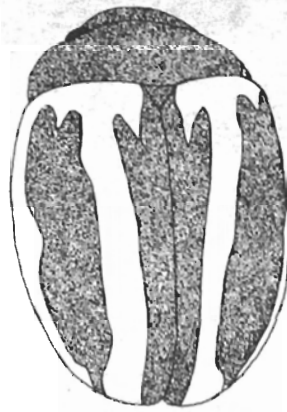
Legend for plate 7

- 65. *Calligrapha*, identification of elytral markings
- 66. *Calligrapha floridana* Schaefer.
- 67. *Calligrapha viliae* Brown

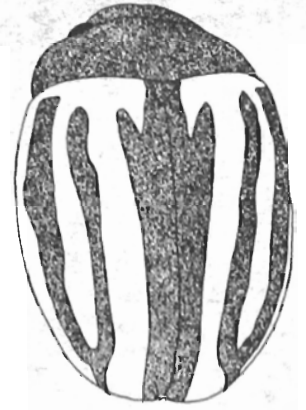
- 68. *Calligrapha sigmoidea* (Lec.)
- 69. *Calligrapha pnirsa* (Stal)
- 70. *Calligrapha serpentina* (Rogers)
- 71. *Calligrapha sylvia* (Stal)



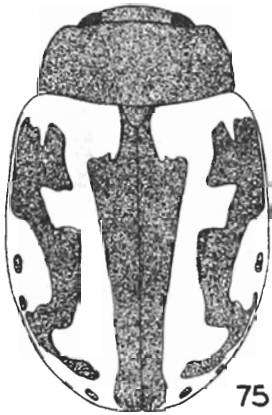
72



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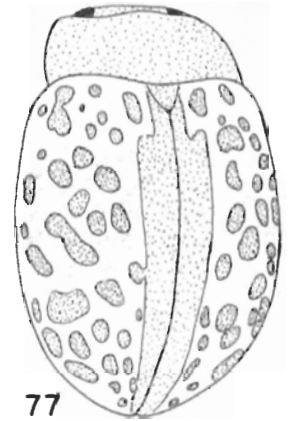
74



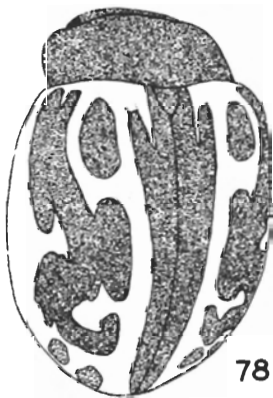
75



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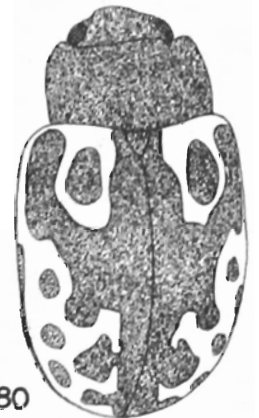
77



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80

Legend for plate 8

72. *Zygogramma continua* (Lec.)
 73. *Zygogramma suturalis* (Fab.)
 74. *Zygogramma suturalis casta* (Rogers)
 75. *Zygogramma opifera* (Stal)

76. *Zygogramma arizonica* Schaefer.
 77. *Zygogramma estriata* Schaefer.
 78. *Zygogramma tortuosa* (Rogers)
 79. *Zygogramma piceicollis* (Stal)
 80. *Zygogramma signatipennis* (Stal)



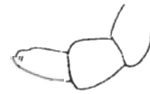
81



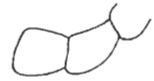
82



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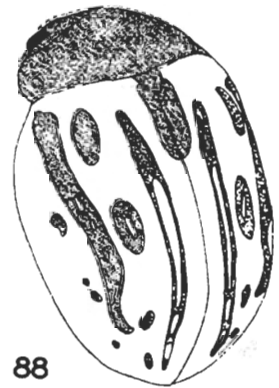
85



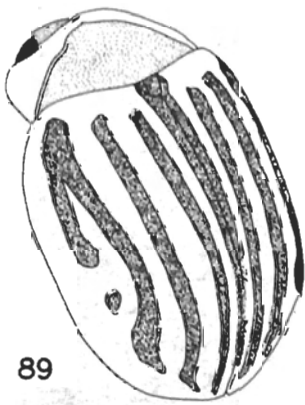
86



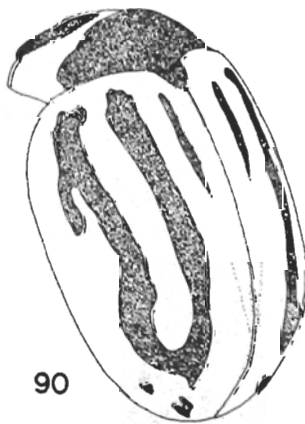
87



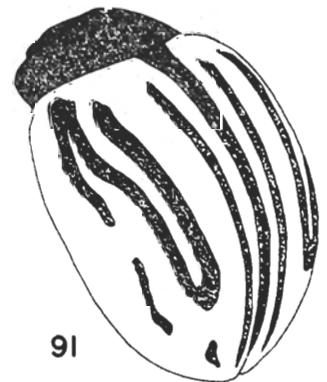
88



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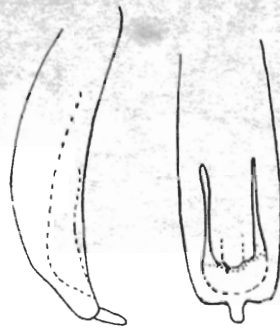
Legend for plate 9

81. *Leptinotarsa collinsi*, new species, maxillary palp.
 82. *Leptinotarsa decemlineata* (Say), maxillary palp.
 83. *Chrysomela mainensis* Bechyné, maxillary palp.
 84. *Gastrophysa dissimilis* (Say), maxillary palp.
 85. *Calligrapha rowena* Knab, maxillary palp.

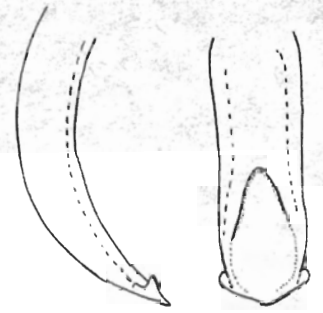
86. *Zygogramma conjuncta pallida* (Bland).
 87. *Leptinotarsa collinsi*, new species.
 88. *Zygogramma heterothecae* (Rogers).
 89. *Zygogramma exclamations* (Fab.).
 90. *Zygogramma conjuncta* (Rogers).
 91. *Zygogramma disrupta* (Rogers).



92



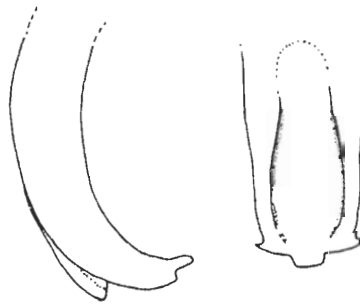
93



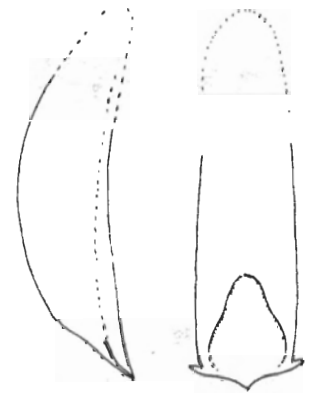
94



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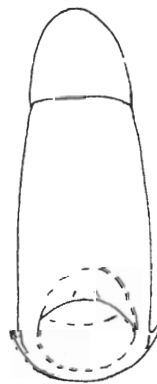
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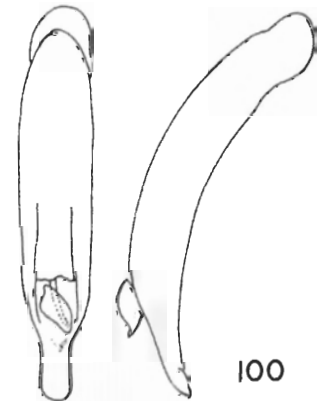
97



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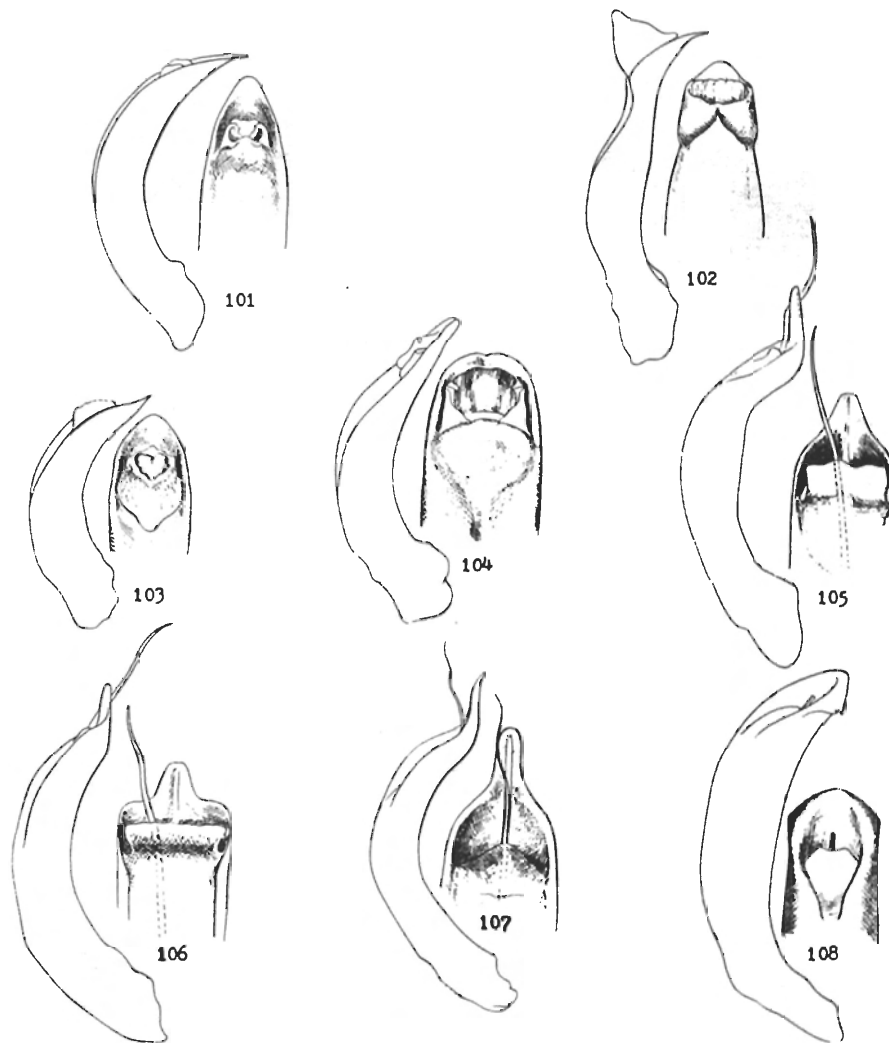
100

Legend for plate 10

92. *Calligrapha (Acalligrapha) praecelsis* (Rogers), aedeagus.*
 93. *Calligrapha (Coreopsomela) californica* Linell, aedeagus.*
 94. *Calligrapha (Calligramma) cephalanthi* Schwarz, aedeagus.*

95. *Calligrapha (Graphicallo) lunata* (Fab.), aedeagus.*
 96. *Calligrapha (Bidensomela) bidenticola* Brown, aedeagus.*
 97. *Calligrapha (Calligrapha) polyspila* (Germar), aedeagus.* This South American species is the type species of *Calligrapha*.
 98. *Zygogramma opifera* (Stal).
 99. *Calligrapha incisa* (Rogers), aedeagus.
 100. *Leptinotarsa collinsi*, new species, aedeagus.

* Redrawn from Monros 1955.

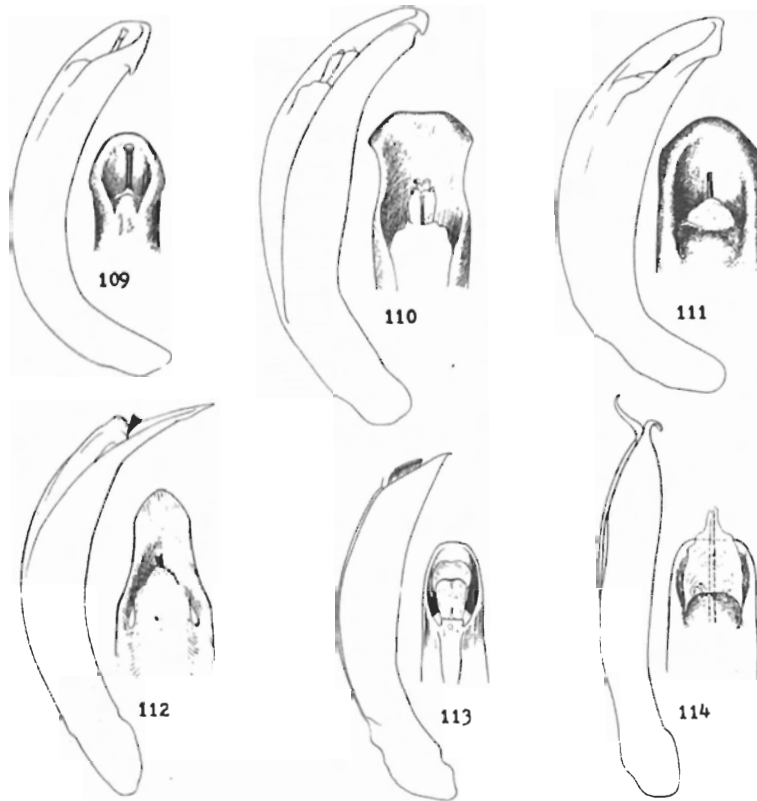


Legend for plate 11

Illustrations of aedeagi after Brown, 1962,
Canadian Ent. 94:63

101. *Chrysolina subsulcata* (Mann.)
102. *Chrysolina cavigera* (Sahl.)

103. *Chrysolina magniceps* (Sahl.)
104. *Chrysolina caurina* Brown
105. *Chrysolina flavomarginata flavomarginata* (Say)
106. *Chrysolina extorris* Brown
107. *Chrysolina finitima* Brown
108. *Chrysolina basilaris* (Say)



Legend for plate 12

Illustrations of aedeagi, after Brown, 1962
Canadian Ent. 94:69

109. *Chrysolina auripennis* (Say)

110. *Chrysolina subopaca* (Rogers)

111. *Chrysolina staphylea* (L.)

112. *Chrysolina hyperici* (Forst.)

113. *Chrysolina quadrigemina* (Suff.)

114. *Chrysolina varians* (Schaller)



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Legend for plate 13

Chrysomela, color pattern of left elytron, after Brown,
1956, Canadian. Ent. 88 (suppl.):19

115-117. *Chrysomela interrupta* Fab.

118-119. *Chrysomela mainensis mainensis* Bechyne

120-121. *Chrysomela mainensis interna* Brown

122-123. *Chrysomela mainensis littorea* Brown

124-127. *Chrysomela walshi* Brown

128-131. *Chrysomela knabi* Brown

132-134. *Chrysomela falsa* Brown

135-137. *Chrysomela aeneicollis* (Schaefer)

138-139. *Chrysomela scripta* Fab.

140-142. *Chrysomela laurentia* Brown

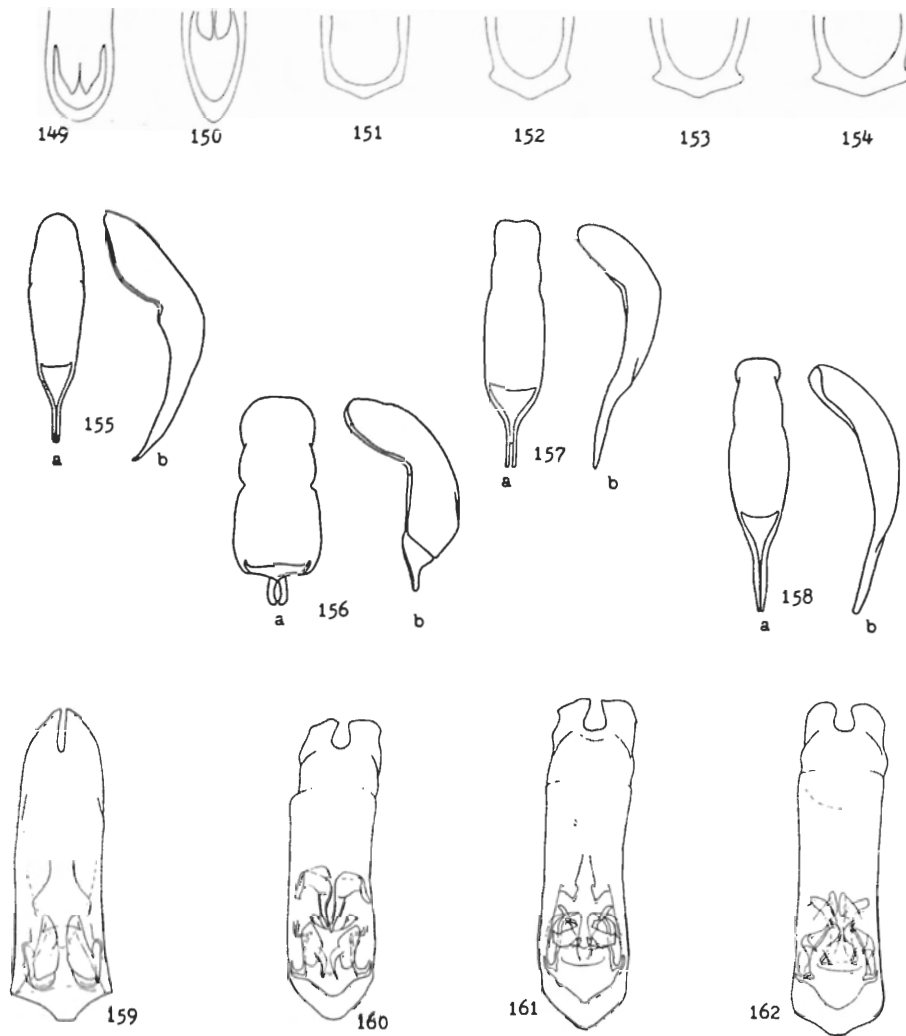
143. *Chrysomela confluens* Rogers

144. *Chrysomela semota* Brown

145-146. *Chrysomela lineatopunctata* Forst.

147. *Chrysomela texana* (Schaefer)

148. *Chrysomela cruentipennis* (Duv.), from
Cuba



Legend for plate 14

Chrysomela, apex of aedeagi, after Brown, 1956,
Canadian Ent. 88(suppl.):17

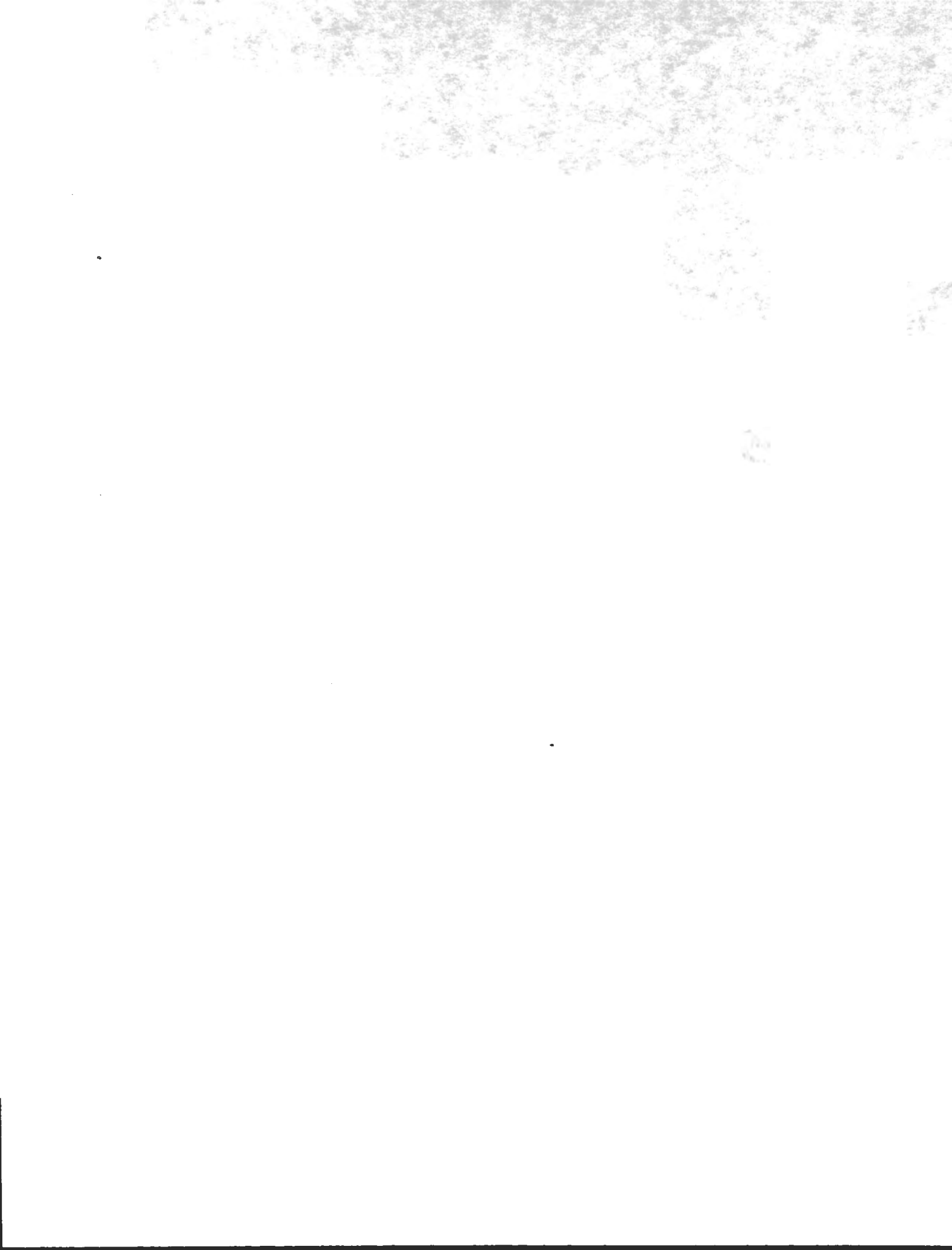
149. *Chrysomela scripta* Fab.
 150. *Chrysomela knabi* Brown
 151. *Chrysomela invicta* Brown
 152. *Chrysomela crotchii* Brown
 153. *Chrysomela tremula* Fab., from Europe
 154. *Chrysomela saliceti* (Weise), from Europe

Gonioctena, aedeagi, after Brown, 1942
Canadian Ent. 74:101.

155. *Gonioctena nivosa* (Suff.)
 156. *Gonioctena americana* (Schaeff.)
 157. *Gonioctena occidentalis* (Brown)
 158. *Gonioctena notmani* (Schaeff.)

Phratora, aedeagi, after Brown, 1951,
Canadian Ent. 83:125

159. *Phratora frosti frosti* Brown
 160. *Phratora americana* (Schaeff.)
 161. *Phratora purpurea* Brown
 162. *Phratora interstitialis* Mann.







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