



#### Contributions and Acknowledgements

Daniel Clark, ODA (Oregon Department of Agriculture): Design and compilation of key and screening aids.

James LaBonte, ODA: Design and compilation of the screening aids.

Steve Valley, Chris Hedstrom and Thomas Shahan, ODA: Acquisition of the images.

Joshua Vlach, ODA. Specimen preparation, review of key and screening aid.

Christine Niwa, USDA FS: Alpha testing of the screening aids.

Richard Westcott, ODA (retired): Specimens, taxonomic advice, review of screening aids.

ODA: Use of the imaging system, the entomology museum, and general support.

USDA Forest Service for funding of this project and USDA APHIS for the acquisition of the imaging system.



#### Introduction

This an image based to key to 41 genera of Buprestidae (flat-headed or metallic woodborers) found in the western United States. The key is designed to be used by individuals with a wide range of taxonomic expertise. Images of all character states are provided. Hotlinks to portions of ODA's buprestid screening aid have been included for some genera. These sections are designed to enable additional sorting and identification of the most abundant species found in wood boring insect trap samples from surveys conducted by the ODA and the USDA FS in the Pacific Northwest and the West over the past ten+ years. Several exotic pest species not known from the West are also included.

\*The screening aids will be most reliable for the conifer forest regions west of the Rocky Mountains. It may not function well with species found in the desert West and east of the Rockies.

The screening aid is designed to be used by individuals with a wide range of taxonomic expertise. Images of all character states are provided. \*\*It is not intended to operate completely independently of support by a taxonomist but instead in the context of a presented workshop.



#### Using this Key and Screening Aid: I

The key and screening aid function much like traditional dichotomous keys with couplets. However, extensive use of PowerPoint navigational features, such as buttons linking non-sequential couplets and enabling return to the originating couplet, have been utilized.

If there are more images than can fit on a single slide, the multiple slides for the couplet are indicated by "Part I", "Part II", etc., following the couplet number at the top of the slide.

Taxonomic jargon has been kept to a minimum. Most terms and character states are explained via the images and associated labels. The first several slides following the introduction illustrate the basic body parts of buprestids and the terms applied



#### Using this Key and Screening Aid: I

to them. A single slide explaining a few technical terms follows those. Couplets dealing with exotic species have text in white.

#### THIS IS VERY IMPORTANT!

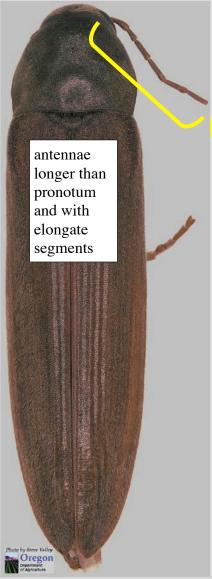
The screening aids are designed so that specimens not keying to Screening targets will end at a couplet half with "FTT", which stands for "Forward To Taxonomist". These specimens are NOT unimportant nor should they be discarded - quite the opposite! Any specimen that does not appear to be a screening target should be forwarded to a cooperating taxonomist for further identification.



#### Features of Non-Buprestids









Elateridae

Eucnemidae

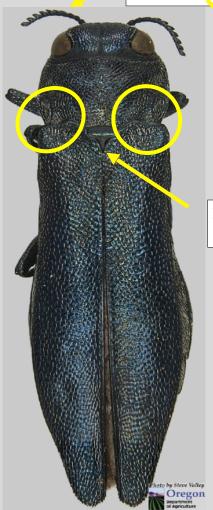
Melandryidae

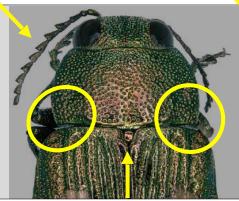
Throscidae



### Features of Typical Buprestids

Antennae do not extend beyond posterior margin of the pronotum. Antennae composed of short segments.

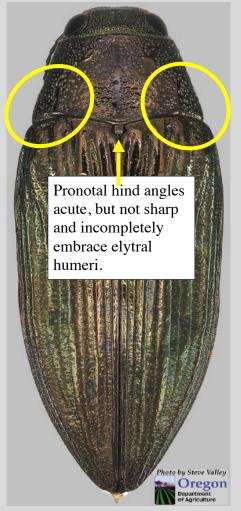




Pronotal hind angles not acute, not sharp.

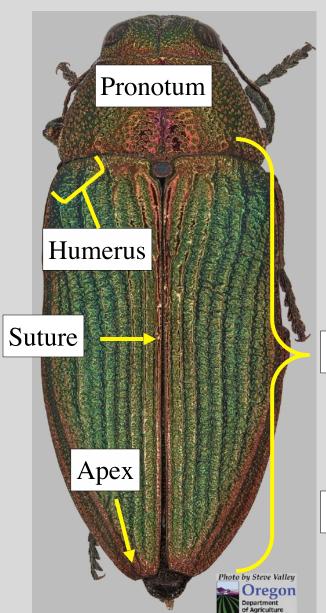








#### BASIC BODY PARTS OF BUPRESTIDS: I

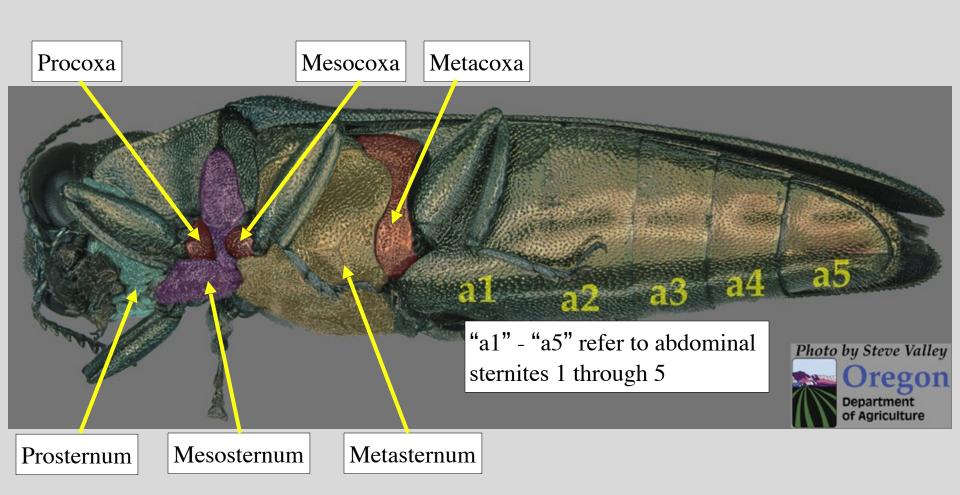


Elytron\*

\*Elytra is the plural of elytron

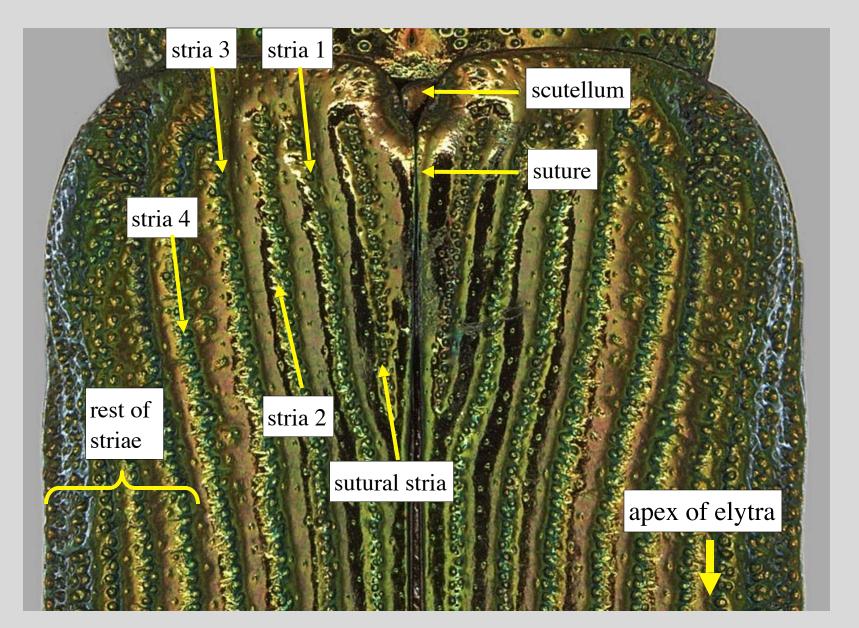


#### BASIC BODY PARTS OF BUPRESTIDS: II



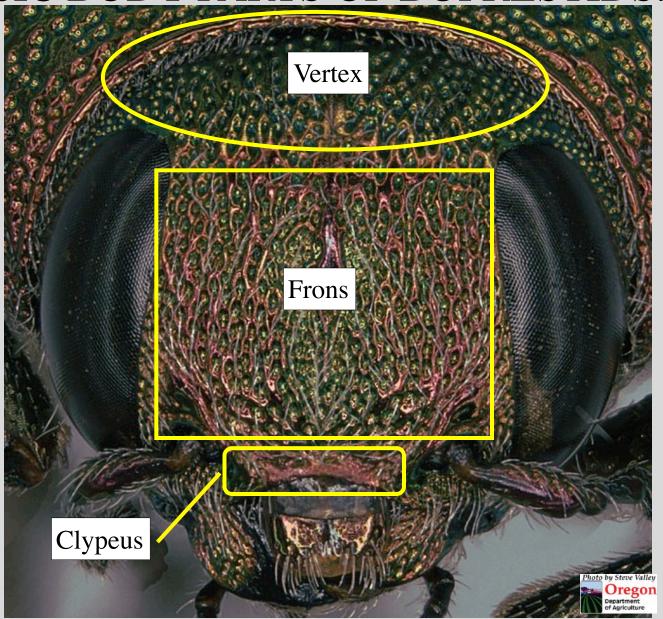


#### BASIC BODY PARTS OF BUPRESTIDS: III



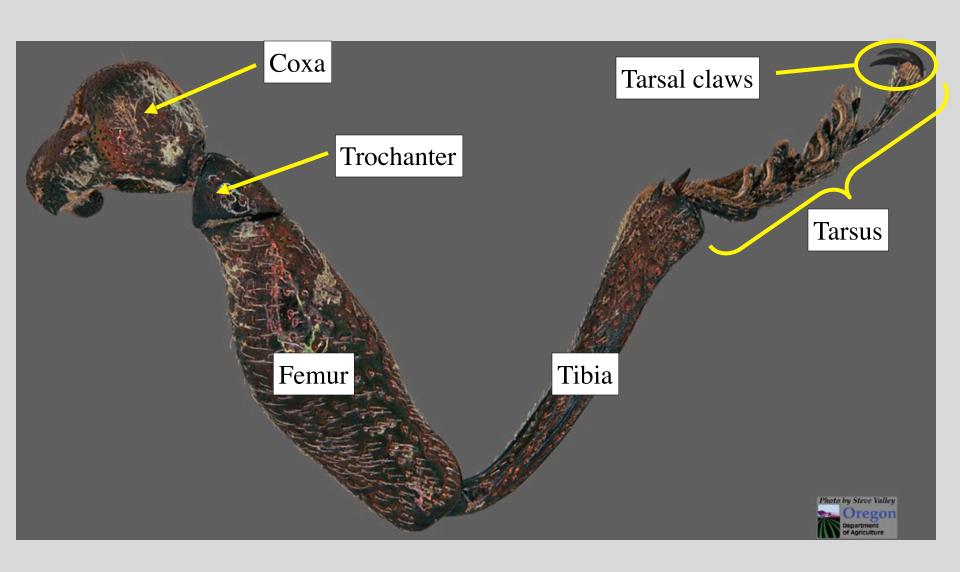


#### BASIC BODY PARTS OF BUPRESTIDS: IV





#### BASIC BODY PARTS OF BUPRESTIDS: V





#### A Few Technical Terms

Acuminate: strongly and abruptly tapered to a narrow apex

Arcuate: arched

Carina: an elevated ridge (plural is "Carinae")

Elytral: of or on an elytron or the elytra

Pubescence: short, fine, closely set hair-like structures

Pubescent: covered with pubescence

Punctate: with punctures

Rugae: ridges or wrinkles

Rugose-punctate: with ridges and punctures

Serrate: with notched edges like the teeth of a saw

Seta: relatively long, stiff hair-like structures (plural is "Setae")

Setose: covered with setae

Sinuate: referring to a structure or the margin of a structure

is winding or wavy

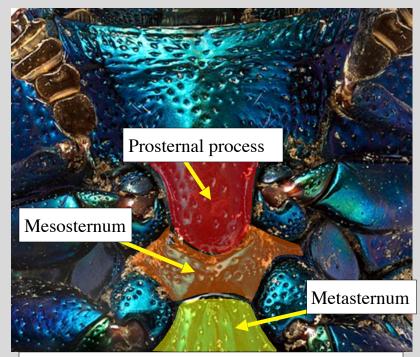
Strigae: fine, impressed lines or streaks. "Strigate" = with strigae.

Transverse: running across the longitudinal axis at right angles

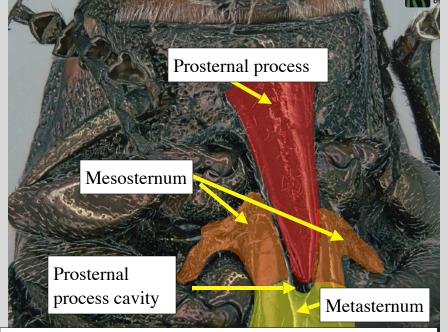
Truncate: squared off

Venter: underside. "Ventral" = on venter.





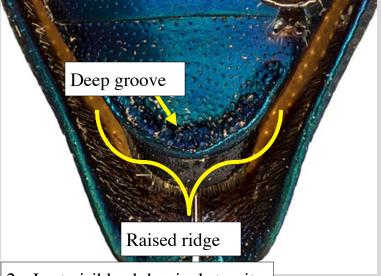
1a. Prosternal process not dividing mesosternum





1b. Metasternm forming part of prosternal process cavity





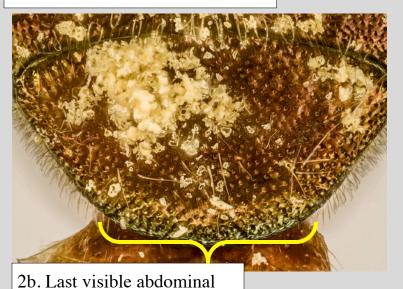
7	(1)
	(1)

Last visible abdominal sternite with
deep groove forming a raised ridge
around apical half (a)

2a. Last visible abdominal sternite.

sternite without raised ridge

or deep groove.





# Thrincopyge (2)

# Thrincopyge LeConte 1858

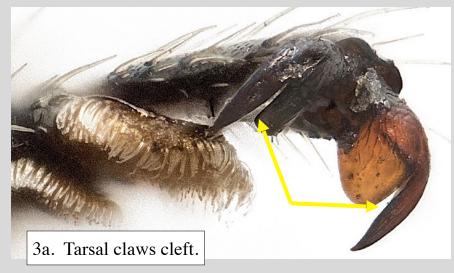
2 species in North America

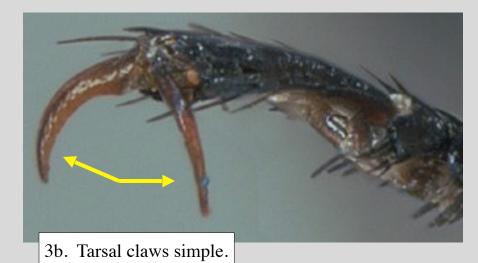
AZ, NM, TX





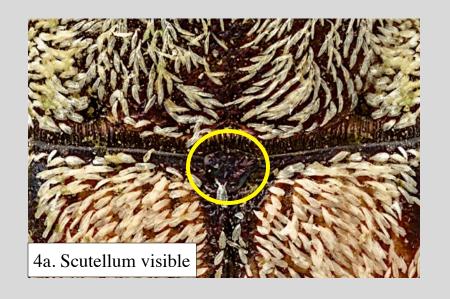
# 3 (2)







#### 4 (3)





Scutellum <u>not</u> visible (b) ...... 5



#### Acmaeoderoides (4)



# Acmaeoderoides Van Dyke 1942

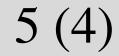
12 species in North America

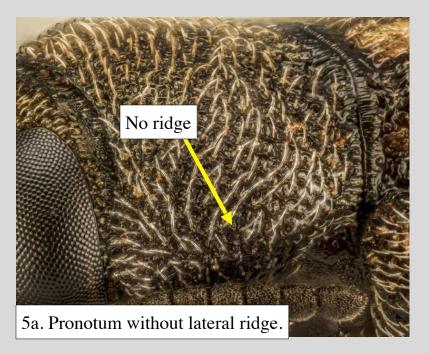
AZ, sCA, NV, TX



A. rufescens Nelson

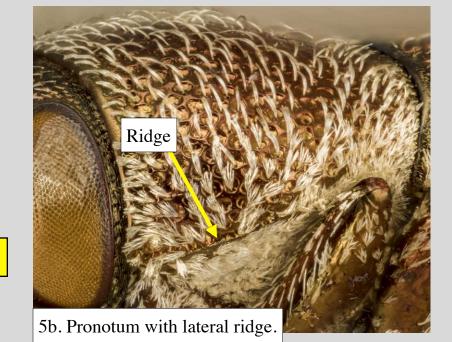






Lateral margin of pronotum without or with only a faint ridge (a) ... *Anambodera* Barr

At least a part of lateral margin of pronotum with <u>distinct</u> ridge (b) ... 6





#### Anambodera (5)

#### Anambodera Barr 1974

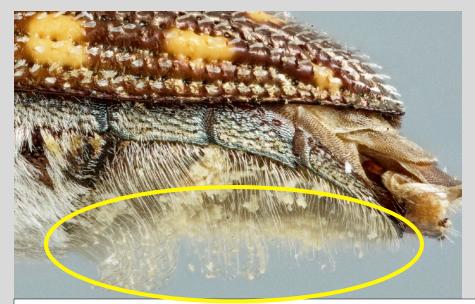
6 species in North America

BC-CA to ID-AZ





#### 6(5)



Female abdominal sterna three to five clothed differently than rest of body consisting of dense long recurved hairlike setae (a) .......

..... Acmaeoderopsis Barr

6a. Female abdominal segments 3-5 with long, recurved setae.



6b. Female abdominal segments 3-5 setae not distinctive.

Female abdominal sterna three to five not distinctively clothed with long recurved setae (b) ...

..... Acmaeodera Eschscholtz

Note: Keys typically only distinguish females. See the notes section on this slide for other distinguishing characters from the original description. However, we only had a single female specimen on hand so were unable to assess these characters for males.



#### Acmaeoderopsis (6)



#### Acmaeoderopsis Barr 1974

12 species in North America

AZ, sCA, NM, NV, TX





#### Acmaeodera (6)

### Acmaeodera Eschscholtz 1829

144 species in North America

Widespread



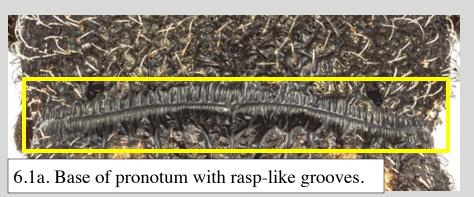


A. idahoensis

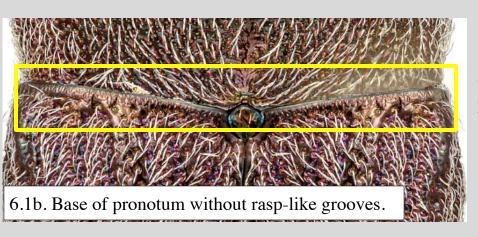
A. audreyae



6.1(3)



Articulating base of pronotum with row of rasp-like grooves ... *Ptosima* **Dejean 1833** 



Articulating base of pronotum without row of rasp-like grooves ... 7



#### *Ptosima* (6.1)



# Ptosima Dejean 1833

4 species in North America

Midwestern US to TX; eastern US

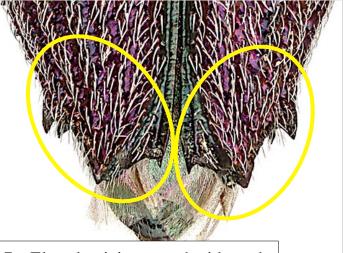


P. gibbicollis (Say)



### 7 (6.1)

Elytral apices conspicuously armed with teeth (a) ...... Paratyndaris Fisher



7a. Elytral apicies armed with teeth.



7b. Elytral apicies rounded.



7c. Elytral apicies serrate.



#### Paratyndaris (7)

#### Paratyndaris Fisher 1919

15 species in North America

AZ, sCA, FL, MS, NM, NV, OK, FL



P. olneyae (Skinner)







Elytra metallic blue/green with a longitudinal red/orange stripe on each elytron (occasionally solid metallic color) (a-b) .... *Chrysophana* LeConte



Elytra dark (c) ...... Polycesta Dejean



# Chrysophana (8)



Chrysophana LeConte 1860

2 species in North America

BC-CA to CO-AZ





#### Polycesta (8)



# Polycesta Dejean 1833

12 species in North America

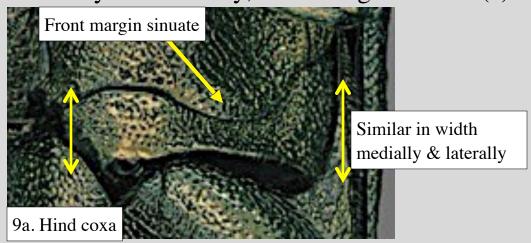
PA, AL, FL, OR, MO-TX-CA



Polycesta californica LeConte



Hind coxa similar is width medially and laterally, front margin sinuate (a) ..... 10



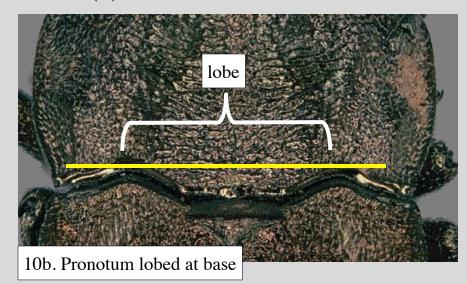




### 10 (9)



10a. Pronotum truncate at base





#### 10.1 (10)

Prosternum with distinctly limited antennal cavities, and carinae on each side of middle ... *Trigonogya* Schaeffer

NOTE: This couplet was derived from American Beetles. No specimen was available for character examination or imaging.

*Trigonogya* has only been collected a handful of time from southermost Texas.

Prosternum without distinctly limited antennal cavities, and without carinae on each side of middle ... *Mastogenius* Solier



# Trigonogya (10.1)

# Trigonogya Schaeffer 1904

Monotypic:

*Trigonogya reticulaticollis* (Schaeffer) 1904

sTX





#### Mastogenius (10)

# *Mastogenius*Solier 1849

7 species in North America

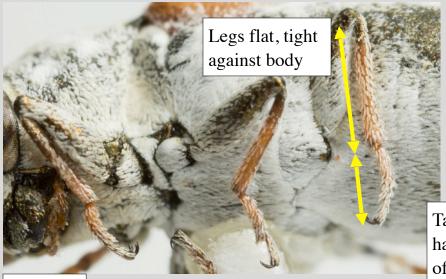
Widespread in East

In West: AZ-TX



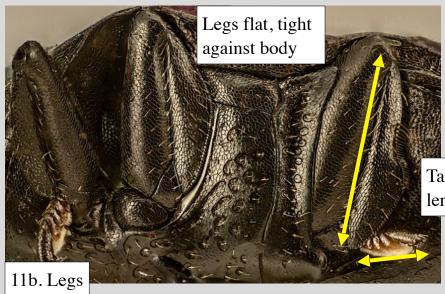


#### 11 (10)



Tarsi at least half as long as of tibiae

11a. Legs

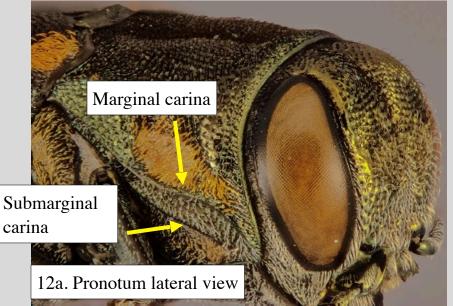


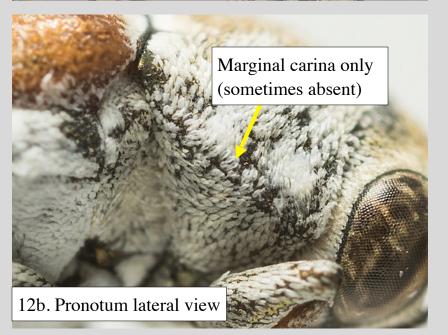
If tarsi longer than 2/5 of tibiae; legs flat, tightly folding against body (b)

Tarsi about 2/5 length of tibiae



#### 12 (11)





Pronotum without submarginal carina, some without any lateral carina (b) ... *Lepismadora* Velten



### Agrilus (12)

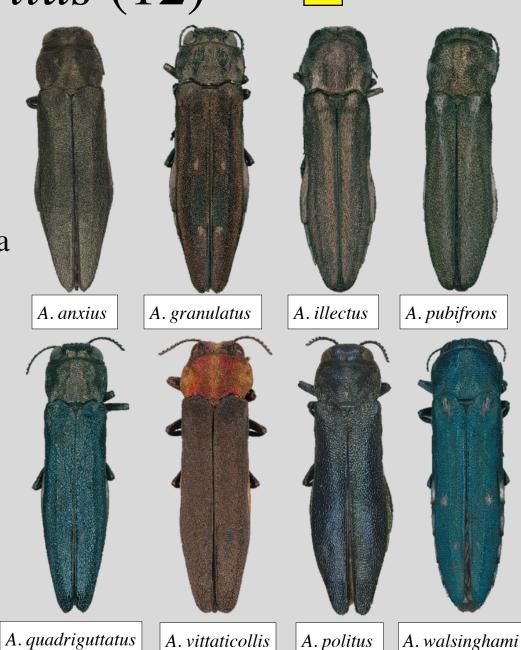
# *Agrilus*Curtis 1825

174 species in North America

Widespread

Screening aid to select

Agrilus species of concern





### 12.1 (12)







### Lepismadora (12)

# *Lepismadora*Velten 1987

Monotypic:

Lepismadora algodones
Velten

Velten & Rellamy 1987

**sCA** 



L. algodones Velten



#### Paragrilus (12.1)

# Paragrilus Saunders 1871

2 species in North America

Eastern US; TX, FL

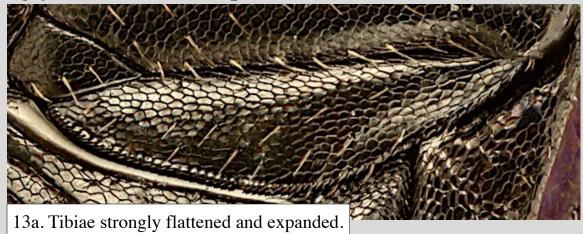


P. rugatulus Thomson



#### 13 (11)

Tibiae strongly flattened and expanded (a) ..... Pachyschelus Solier







### Pachyschelus (13)

#### Pachyschelus Solier 1833

8 species in North America

Widely distributed in East In West: AZ, NM, CO



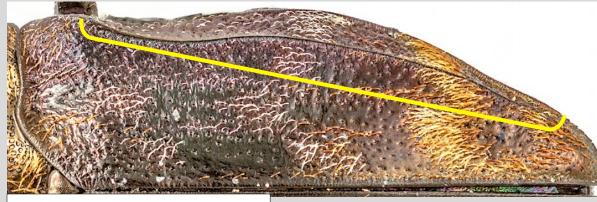


### 14 (13)



14a. Body broad, ovate.

Body shape broad, ovate (a); elytra with sublateral carina extending from humerus to near apex (c) ... *Brachys* **Dejean** 



14c. Elytra with sublateral carina.



14d. Elytra without sublateral carina.

Body narrow, elongate; elytra without sublateral carina ... 14.1



14b. Body narrow, elongate.



### Brachys (14)

# Brachys Dejean 1833

11 species in North America

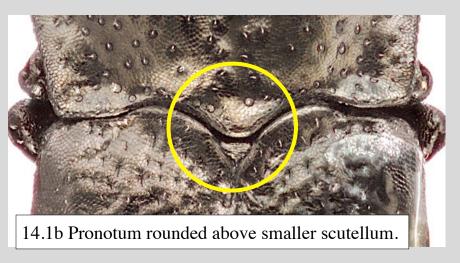
Widely distributed in the East In West: AZ, CO, MT, NM, WA





#### 14.1 (14)





Hind margin of pronotum rounded above scutellum; scutellum smaller (b) ...... *Taphrocerus* Solier



#### Taphrocerus (14.1)

#### Taphrocerus Solier 1833

13 species in North America

Widely distributed in the East In West: AZ, CA, CO, MT, NM, UT, WY



T. mercedensis White



#### Aphanisticus (14.1)



# Aphanisticus Latreille 1829

1 species in US

Aphanisticus cohinchinae

seminulum

Obenberger 1929

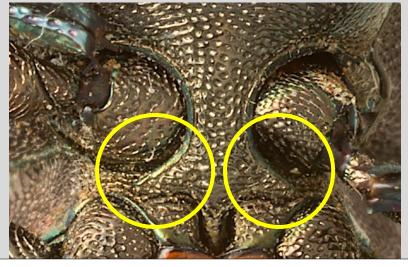
Southern TX, introduced in FL



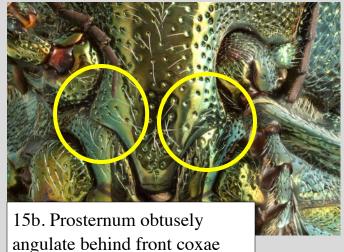
A. cohinchinae seminulum Obenberger



#### 15 (9)



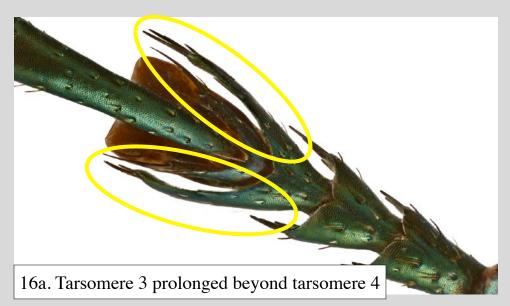
15a. Prosternum acutely angulate behind front coxae



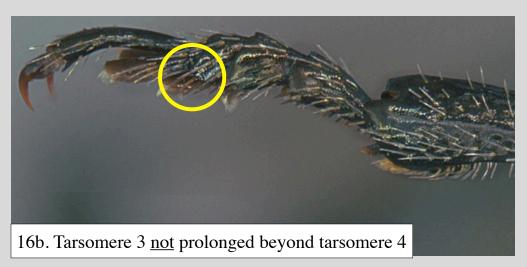




#### 16 (15)



Tarsomere 3 prolonged on each side into a long, divergent spine that extends beyond tarsomere 4 (a) ...... Actenodes Dejean





#### Actenodes (16)

# Actenodes Dejean 1833

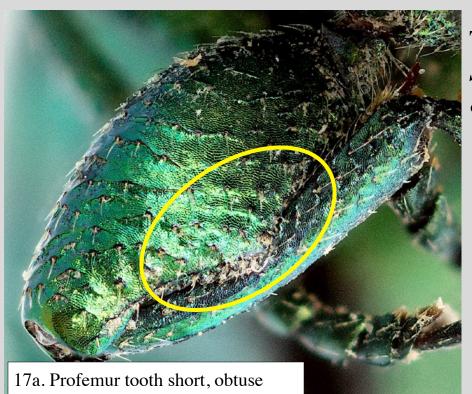
9 species in North America

AZ, sCA, NM





#### 17 (16): Part I



Tooth on front femur short, obtuse (a) ... Sphaerobothris Semenov-Tian-Shanskij & Rikhter







#### Sphaerobothris (17)

Sphaerobothris
Semenov-Tian-Shanskij
& Rikhter 1934

2 species in North America

AZ, sCA, NM, TX



S. platti (Cazier)



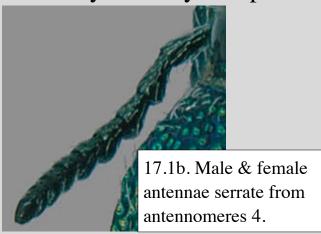
#### 17.1 (17)

Male antennomeres 4-10 densely setose, biramous or slightly to strongly asymmetric (a); female antennae serrate from antennomere 3; antennomere 11 usually distinctly narrower and more elongate than anennomere 10; antennomeres not laterally compressed ... *Knowltonia* Fisher



Note: Unfortunately, only male specimens were available for imaging.

Male antennae similar to female, serrate from antennomere 4 (b); antennomere 11 usually not narrower or more elongate than antennomere 10; outer antennomeres usually laterally compressed ... *Chrysobothris* Eschscholtz





#### Knowltonia (17.1)



#### Knowltonia Fisher 1935

4 species in North America

AZ, CA, CO, ID, NM, OR, UT



K. biramosa Fisher



#### Chrysobothris (17.1)

# Chrysobothris Eschscholtz 1829

134 species in North America

Widespread



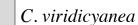
C. femorata



C. lilaceous

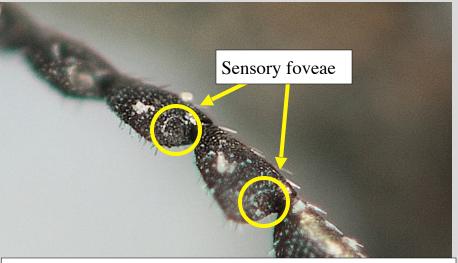


C. subcylindrica



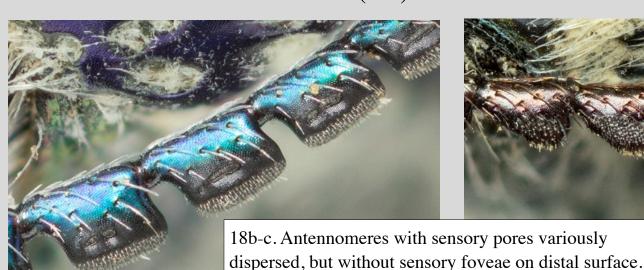


### <u>18</u> (15) $\Box$



Antennae with sensory foveae (or pits) on distal surface of antennomeres (a) ......19

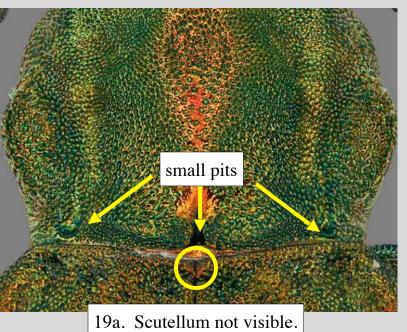
18a. Antennomeres with sensory foveae on distal surface.





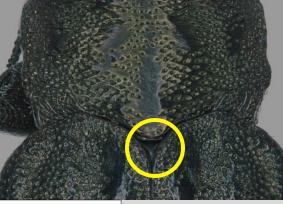


### 19 (18)



Scutellum not visible; pronotum with three small, deep pits along hind margin (a) ..... *Trachykele* Marseul





Scutellum visible; pronotum without deep pits along hind margin (b-c) ...... 20

19b-c. Scutellum visible; no pits



### Trachykele (19)

#### Trachykele Marseul 1865

6 species in North America

T. Lecontei in se U.S. Other 5 BC-CA to ID-CO-NM

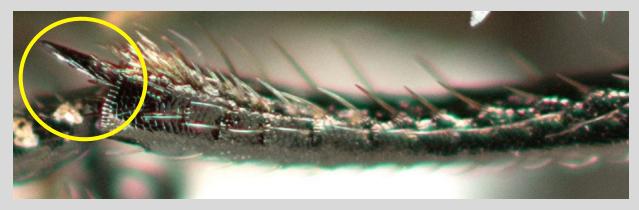


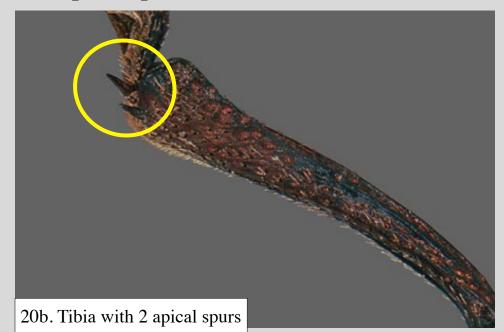
T. blondeli Marseul



### 20 (19)

Protibia with one apical spur (a) ...... Sphenoptera Dejean







### Sphenoptera (20)

# Sphenoptera Dejean 1833

1 introduced species in North America

#### *Sphenoptera jugoslavica* (Obenberger 1926)

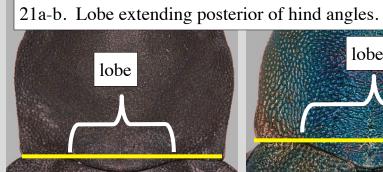
\*This species was intentionally introduced as a biocontrol of knapweed in the nwUS: CA, CO, ID, MT, NV, OR, UT, WA, WY

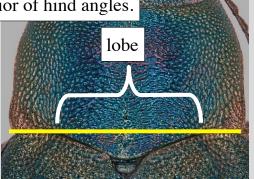


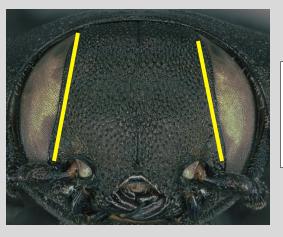
S. jugoslavica (Obenberger)



#### 21 (20)

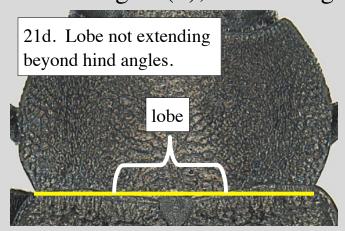


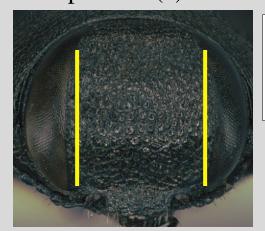




21c. Inner margins of eyes not parallel.

Posterior margin of pronotum feebly lobed, lobe not extending posterior of hind angles (d); inner margins of eyes about parallel (e)......24





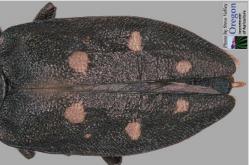
21e. Inner margins of eyes about parallel.



#### 22 (21): Part I





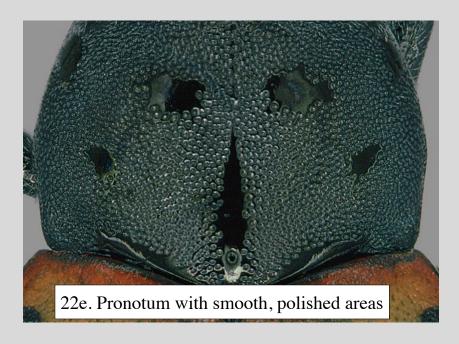




22b-d. Pale areas, if present, not large, sinuate



### 22 (21): Part II





22f-g. Pronotum with smooth, polished areas



#### Xenomelanophila (22)

### Xenomelanophila Sloop 1937

Monotypic:

Xenomelanophila miranda (LeConte) 1854

CO-OR to NM-AZ

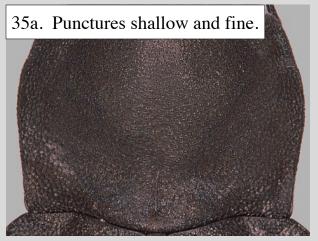




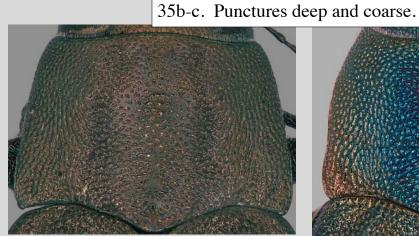
#### 23 (22) Part I



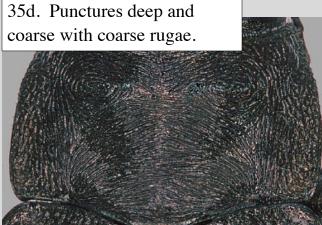
Punctures on pronotum shallow and fine (a), mesothorax with pits near the 



Punctures on pronotum deep and coarse, sometime with coarse transverse rugae (b-d), mesothorax without pits near coxa ............ Phaenops Dejean









#### 23 (22) Part II



#### Melanophila (23)

#### Melanophila Eschscholtz 1829

5 species in North America

Widespread

Screening aid to selected Western species





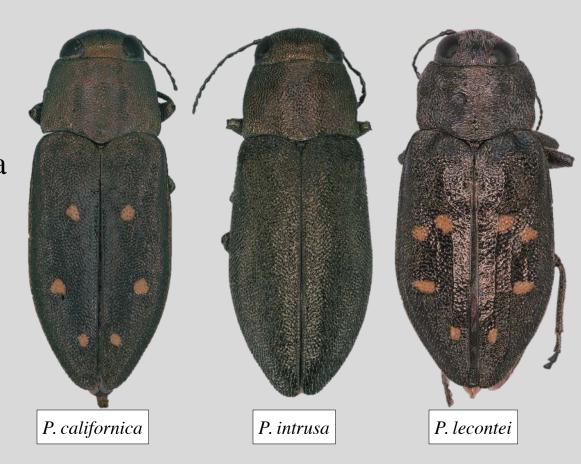
#### Phaenops (23)

# Phaenops Dejean 1833

15 species in North America
\*2 species are only known from the type
specimen

Widespread

Screening aid to selected Western species





#### 24 (21)

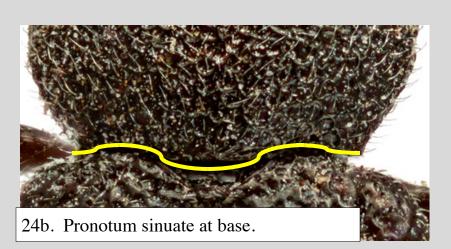


24a. Pronotum truncate at base.



24c. Antennae of both sexes serrate.

Pronotum mostly sinuate at base (b); male antennae pectinate in male (d) ... 26





24d. Male antennae pectinate.

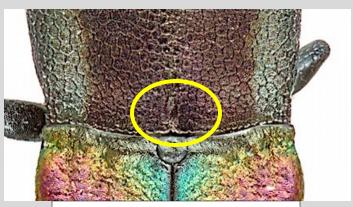


### 25 (24)

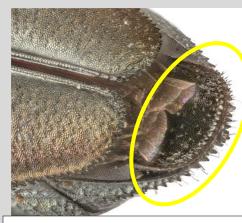
Body elongate, slender, *Agrilus*-like (a); pronotum with posteromedial depression (c); pygidium with margin serrate (e) ......... *Agrilaxia* Kerremans



25a. Agrilus-like body shape.



25c. Posteromedial depression

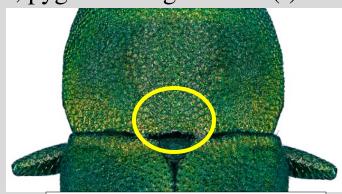


25e. Pygidial margin serrate

Body short, more robust, not *Agrilus*-like (b); pronotum without posteromedial depression (d); elytra; pygidial margin entire (f) ......... *Anthaxia* Eschscholtz



25b. Body shape more robust.



25d. No posteromedial depression



#### Agrilaxia (25)

### Agrilaxia Kerremans 1903

2 species in North America

Widely distributed in East to AZ, CO, NM



A. flavimana (Gory)

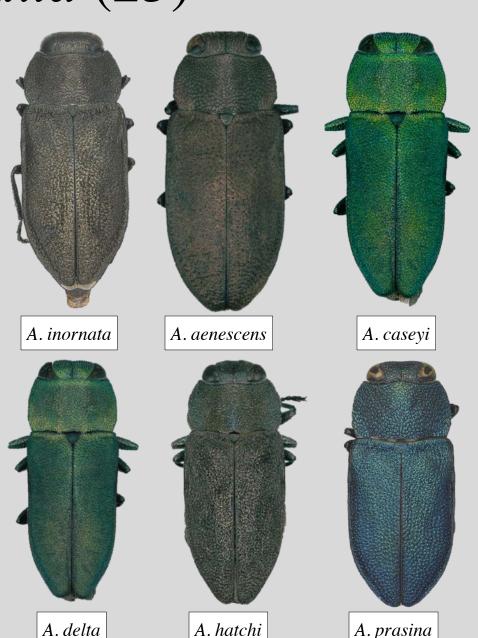


#### Anthaxia (25)

# Anthaxia Eschscholtz 1829

~40 species in North America

Widespread





# 26 (24)

Pronotum without lateral margins (a), broadly evenly rounded at sides (c) .... Trichinorhipis Barr

26b. Pronotum without lateral margin.



26c. Pronotum broadly rounded at sides.

26b. Pronotum with lateral margin.

Pronotum with lateral margins (b); quadrate at sides (d) ...... 27



26d. Pronotum quadrate at sides.



# Trichinorhipis (26)

#### Trichinorhipis Barr 1948

Monotypic:

*Trichinorhipis knulli* Barr 1948

sCA, NV



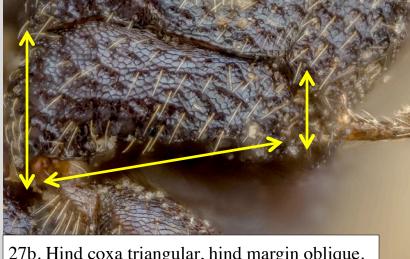


#### 27 (26)

Hind coxae only slightly narrowed laterally (a) ...... Xenorhipis LeConte



Hind coxae triangular, hind margin strongly oblique (b) .... Hesperorhipis Fall



27b. Hind coxa triangular, hind margin oblique.



# Xenorhipis (27)

# Xenorhipis LeConte 1866

3 species in North America

Eastern U.S. to TX



X. brendeli LeConte



# Hesperorhipis (27)

# *Hesperorhipis* Fall 1930

4 species in North America

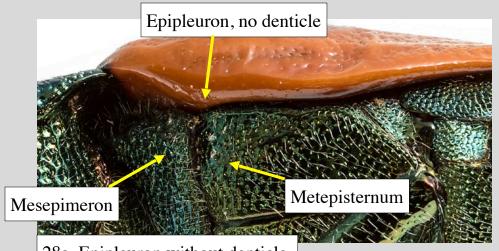
AZ, CA, NV



H. jacumbae Knull

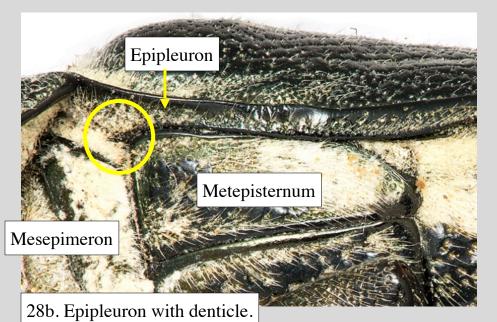


#### 28 (18)



Elytral epipleuron without denticle edging between mesepimeron and posterolateral angle of metepisternum (a) ...

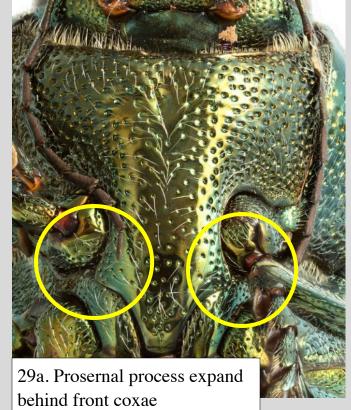
28a. Epipleuron without denticle



Elytral epipleuron with denticle wedging between mesepimeron and posterolateral angle of metepisternum (b) .................. 30

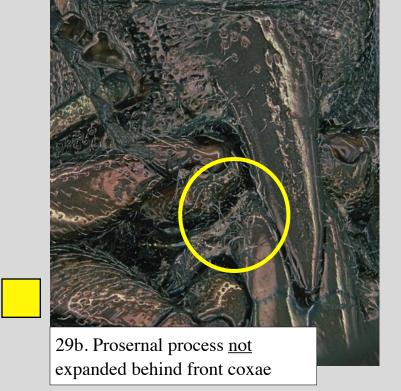






Prosternal process strongly widened behind front coxae (a) ...... Juniperella Knull

Prosternal process not or only slightly widened behind front coxae (b) ... *Buprestis* Linnaeus





### Juniperella (29)

#### *Juniperella* Knull 1947

Monotypic:

*Juniperella mirabilis* Knull 1947

**sCA** 



J. mirabilis Knull

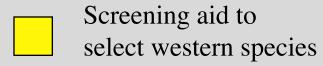


### Buprestis (29)

# Buprestis Linnaeus 1758

26 species in North America

Widespread





B. intrica



B. confluenta



B. gibbsi



B. nuttalli



B. viridisuturalis

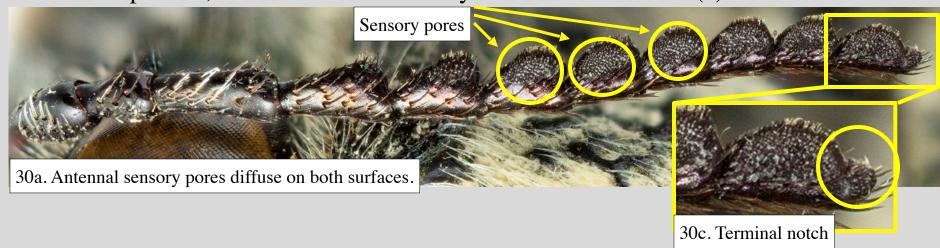


B. connexa



#### 30 (28)

Sensory pores diffuse on both surfaces of antennae (a); protrochanter usually with sharp tooth; antennomere 11 usually with terminal notch (c) .......... 31







30d. No terminal notch

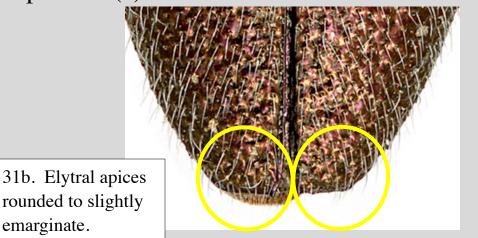


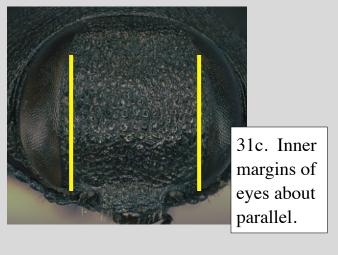
emarginate.

#### 31 (30): Part I



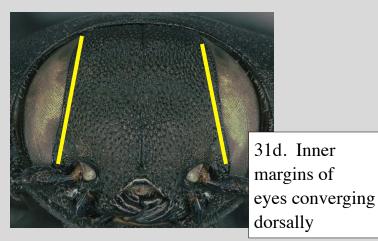
Elytral apices rounded to slightly emarginated (a); inner margin of the eyes parallel (c) .....





Elyral apices moderately to deeply emarginated and bidentate (b); inner 



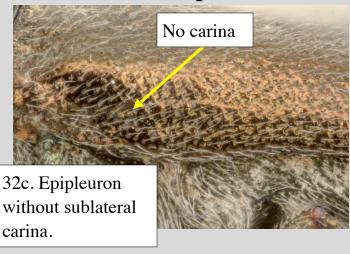


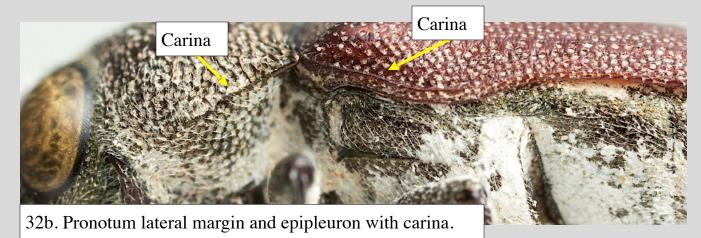


#### 32 (31): Part I











### Ampheremus (32)



Ampheremus Fall 1917

Monotypic:

*Ampheremus cylindricollis* Fall 1917

AZ, sCA, NV, NM, UT



A. cylindricollis Fall



#### Nanularia (32)



# Nanularia Casey 1909

7 species in North America

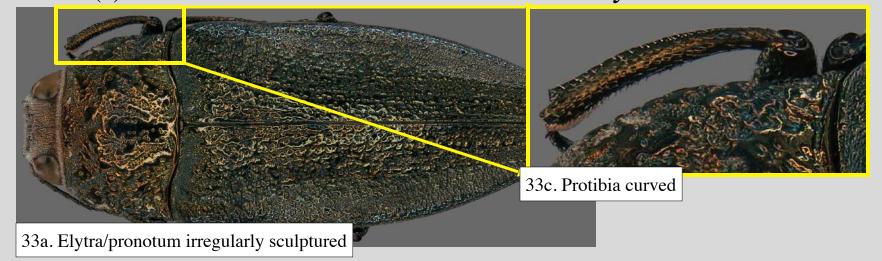
AZ, CA, CO, ID, NV, UT, TX

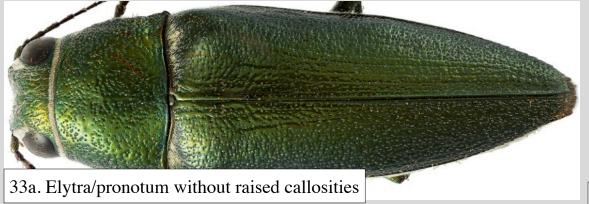


*N. brunneata* (Knull)



# 33 (31)





33d. Protibia straight



#### Gyascutus (33)

# *Gyascutus*LeConte 1858

8 species in North America

AZ, ID, NM, NV, OR, TX, UT



Gyascutus fulgidus Barr



#### 34 (33)

Epipleuron with small marginal tooth near metacoxa (a) .... Prasinalia Casey







### Prasinalia (34)

# Prasinalia Casey 1909

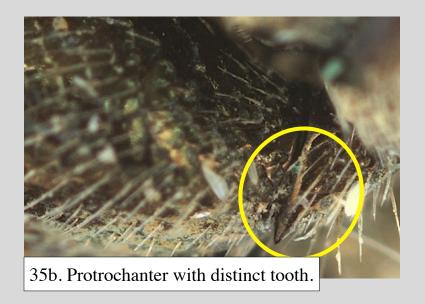
2 species in North America

AZ, sCA

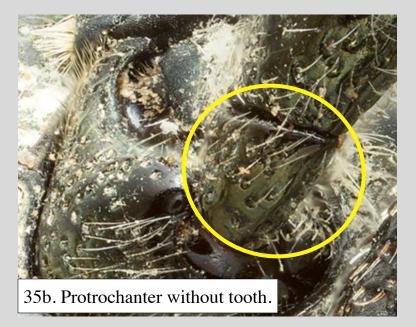




### 35 (34)



Protrochanter with distinct acute tooth ...... Barrellus Nelson & Bellamy





#### Barrellus (35)

Barrellus Nelson & Bellamy 1996

Monotypic:

*Barrellus femoratus* (Knull 1941)

sCA



B. femoratus Nelson & Bellamy



#### Hippomelas (35)

# Hippomelas Laporte & Gory 1837

4 species in North America

AZ, NM, TX



H. planicauda Casey

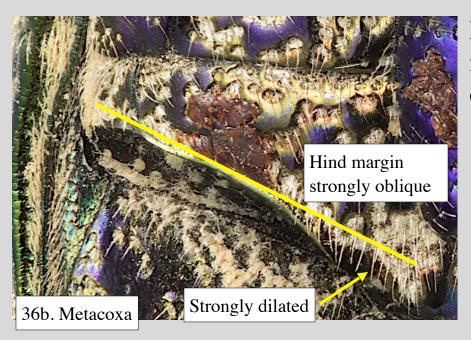


# 36 (30)



Metacoxal plates slightly dilated medially, hind margin weakly oblique (a) ... *Agaeocera* Saunders

Weakly dilated





# Agaeocera (36)

# Agaeocera Saunders 1871

2 species in North America

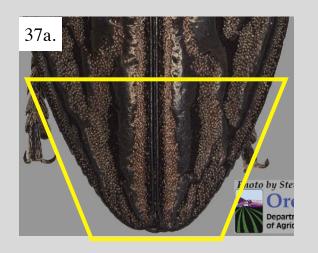
AZ, sCA, NM, TX

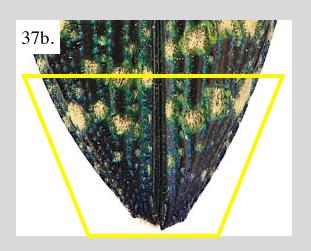




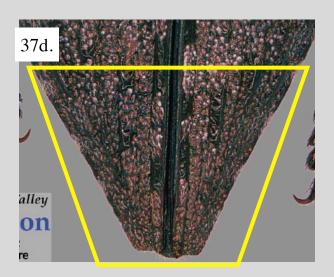
#### 37 (36)

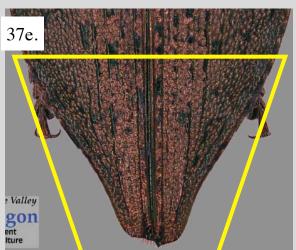
Elytral apices not narrowed and prolonged (a-c) ........... 38

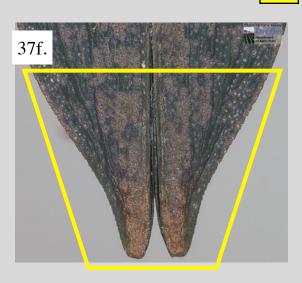














#### 38 (37)







#### Lampetis (39)

# Lampetis Dejean 1833

3 species in North America

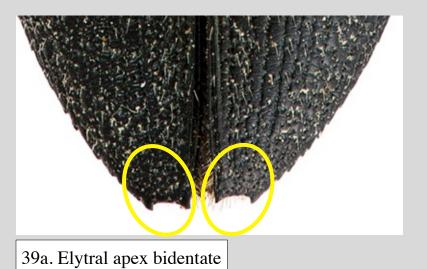
AZ, CO, KS, LA, NM, OK, TX



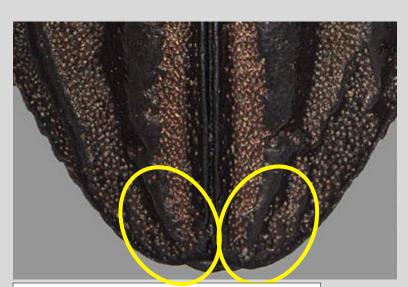
L. webbii (LeConte)



### 39 (38)



Elytral apex sharply bidentate (a) ...... Spectralia Casey



39b. Elytral apex rounded or unidentate

Elytral	apex	rounded	and/or	uniden	tate
(b)			• • • • • • • • • •	∠	10



# Spectralia (39)

# Spectralia Casey 1909

6 species in North America

AZ, sCA, NM, TX
S. gracilipes neUS to TX



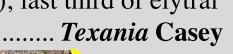
S. purpurascens (Schaeffer)

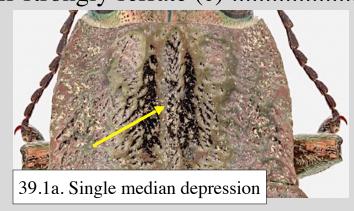


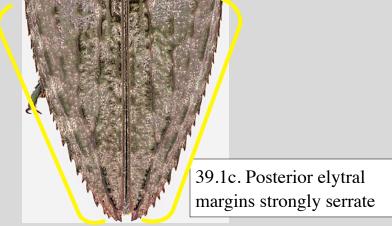
#### 40 (39)



Pronotum with a single median longitudinal depression (a); last third of elytral 

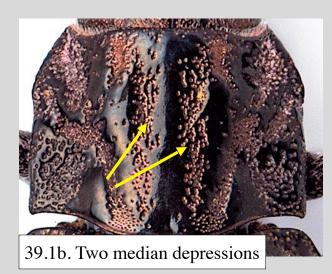


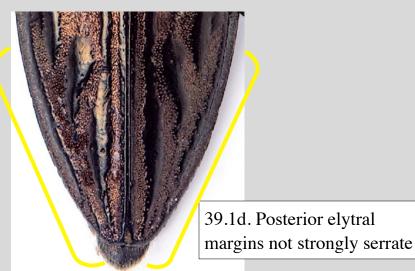




Pronotum with two median longitudinal depressions (a); last third of elytral 









#### Texania (40)



# Texania Casey 1909

3 species in North America

Southeastern US, TX, LA, NY, PA, IN



T. campestris (Say)



# Chalcophora (40)

# Chalcophora Dejean 1833

5 species in North America

Widespread in East

*C. angulicollis* is the only true Western species: AZ, CA, CO, ID, MT, NE, NM, OR, SD, WA, WY

C. fortis reaches into KS, NE

C. liberata reaches into TX

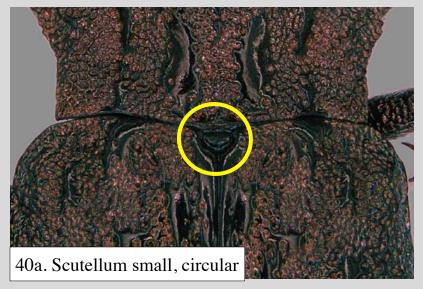
C. virginiensis reaches into KS, NE, OK, TX

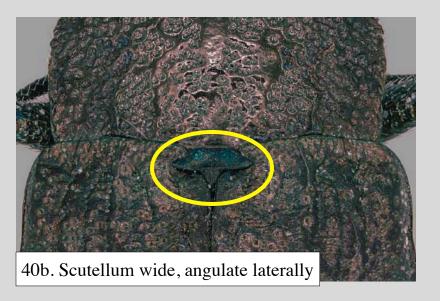


C. angulicollis (LeConte)



#### 41 (37)





Scutellum wider than long, angulate laterally (b) ... *Poecilonota* Eschscholtz



# Dicerca (41)

#### Dicerca Eschscholtz 1829

24 species in North America

Widespread



D. crassicollis LeConte

D. horni Crotch

*D. tenebrica* (Kirby)



# Poecilonota (41)

# Poecilonota Eschscholtz 1829

9 species in North America

Widespread



P. californica LeConte



## Agrilus Screening Aid









Screening aid to select Agrilus species of concern





#### A1: Part I





A1a. Each elytron with 3 orange pubescent patches







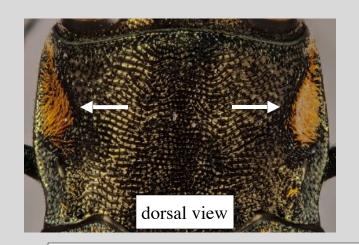


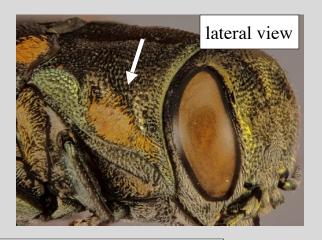


Ab-f. Elytron without 3 orange pubescent patches



#### A1: Part II





Alg-h. Dorsum of pronotum with patches of orange pubescence.







Ali-k. Pronotum without patches of pale pubescence.



#### A1: Part III

Agrilus

auroguttatus

Schaeffer,

the Gold-spotted

Oak Borer\*





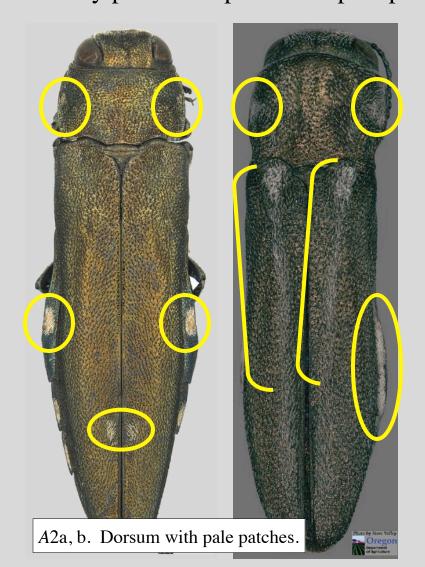


### A2 (A1): Part I\*



\*Second half of this couplet is on next slide.







A2c. Abdominal sternites with pale patches.



### A2 (A1): Part II\*



\*First half of this couplet is on preceding slide.

Neither dorsal or ventral surfaces with distinct pubescent pale patches or 





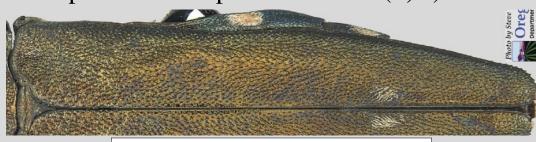


A2f. Abdominal sternites without pale patches.



### A3 (A2I)

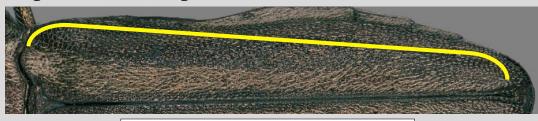




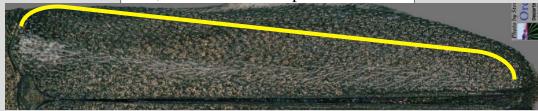
A3a, b. No pubescent stripes near suture.



Elytra with pubescent stripes near suture (c, d) ...... FTT

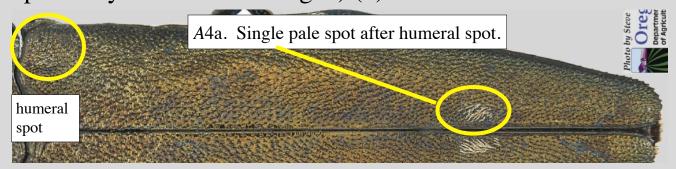


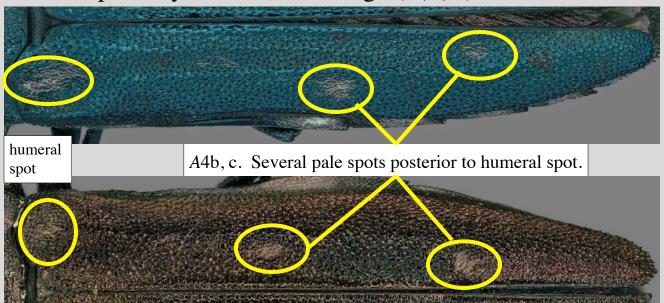
A3c, d. Pubescent stripes near suture.





## A4(A3)



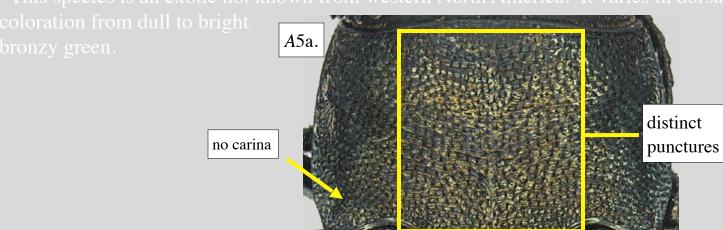


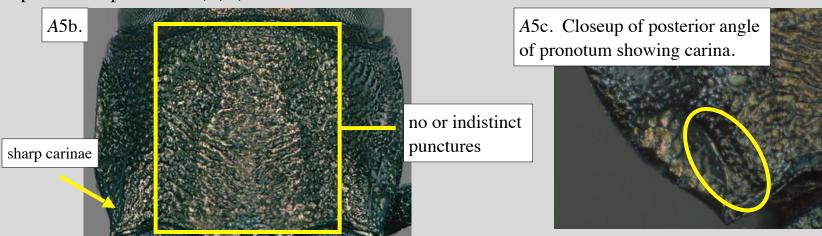


## A5 (A4): Part I



This species is an exotic not known from western North America. It varies in dorsal







### A5 (A4): Part II





Agrilus
biguttatus
Fabricius\*

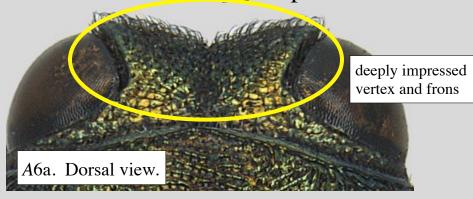
\*This species is an exotic not known from western North America. It varies in dorsal coloration





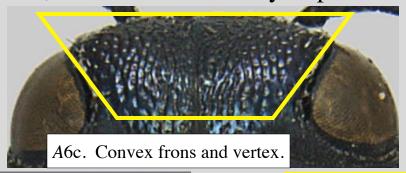
#### A6 (A2-II)







Vertex and frons convex, at most with a finely impressed median line (c-e)



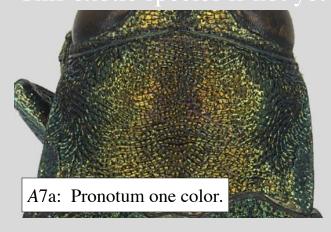


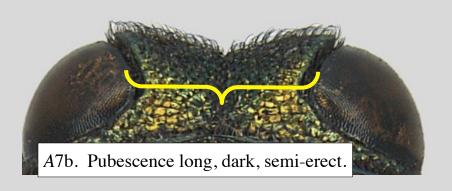


### A7 (A6): Part I



Pronotum all one color, metallic green (sometimes with bluish tints) (**a**); from dorsal view, frons with semi-erect, long, dark pubescence (**b**); portrait (**f**) ......... *Agrilus planipennis* Fairmaire, the Emerald Ash Borer\* This exotic species is not yet known from western North America.

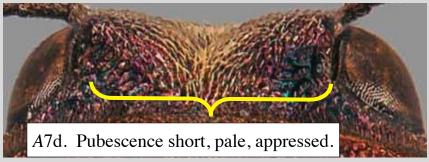




Pronotum multi-colored, with coppery stripes on either side of median line (c); from dorsal view, froms with appressed, short, pale pubescence









# A7 (A6): Part II

Agrilus

planipennis
Fairmaire,
the Emerald
Ash Borer\*



<sup>\*</sup> This exotic species is not yet known from western North America.



## Buprestis Screening Aid









Screening aid to select western species of



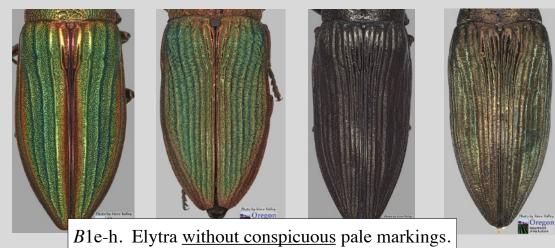
Buprestis





#### B1

*B*1a-f. Elytra with <u>conspicuous</u> pale markings.

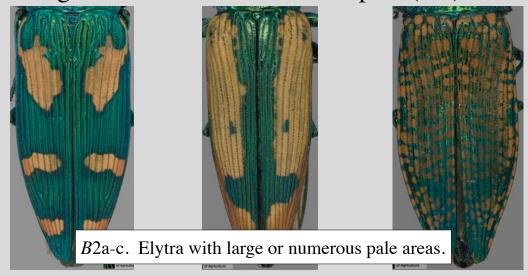




## B2(B1)



Elytra with pale areas large or with numerous small spots (a-c) ...... B3





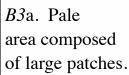
B2d. Elytra mostly dark.



## B3 (B2)



Pale area of elytron composed of large patches (a) ..... B4





*B*5b. Pale area linear.



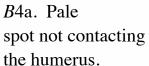
*B*5c. Pale area composed of many small dots.

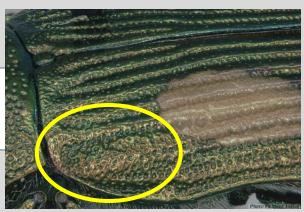




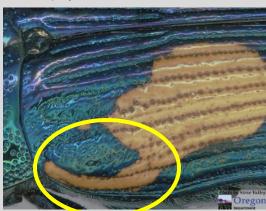
#### *B*4 (*B*3): Part I







*B*4b. Pale spot contacting the humerus.





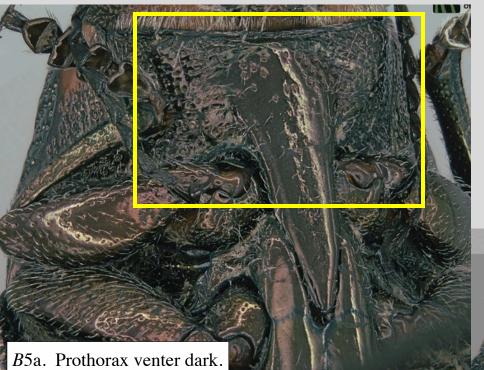
*B*4 (*B*3): Part II

*Buprestis langii* Mannerheim 1843





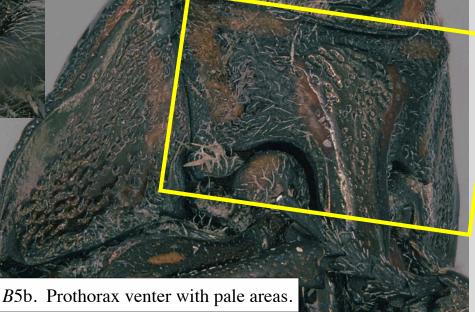
### *B*5 (*B*2): Part I



Venter of prothorax WITHOUT orange markings (a); hind angles of pronotum dark from dorso-lateral perspective (c) portrait

(e) ... Buprestis laeviventris (LeC.)

Venter of prothorax with conspicuous orange markings (**b**); hind angles of pronotum orange from dorsolateral perspective (**d**).....FTT





# B5 (B2): Part II

B5c. Pronotum with dark hind angle.



*B*5d. Pronotum with pale hind angle.





## B5 (B2): Part III

*Buprestis laeviventris* (LeConte 1857)





### B6 (B1)

Dorsal surface not bright metallic green or blue ( $\mathbf{a}$ ); head with orange or yellowish markings on frons ( $\mathbf{b}$ ); venter of abdomen usually with orange spots ( $\mathbf{c}$ ) ... B7



*B*6a. Dorsal surface not bright green or blue.



*B*6b. Frons with pale markings.



*B*6c. Venter of abdomen with spots.



*B*6d. Dorsal surface bright green or blue.



*B*6e. Frons without pale markings.



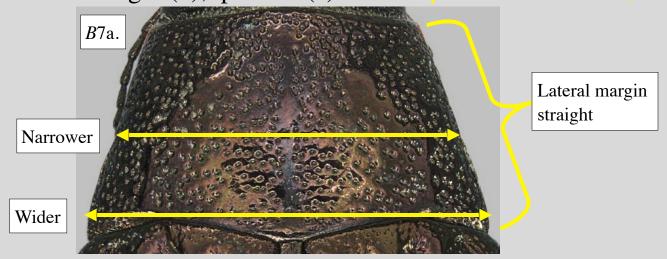
*B*6f. Venter of abdomen without spots.



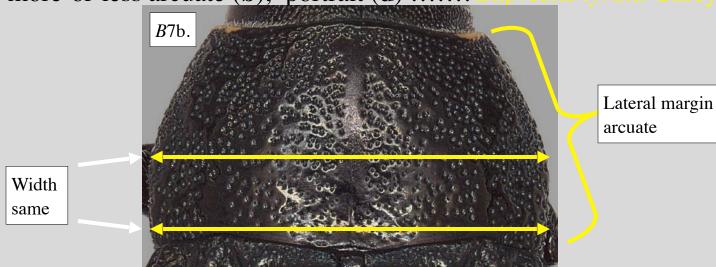
#### *B*7 (*B*6): Part I



Pronotum distinctly wider at posterior margin than near middle, lateral margins more-or-less straight (a); portrait (c) ..... Buprestis subornata (LeC.)



Pronotum about as wide near middle as at posterior margin, lateral margins more-or-less arcuate (**b**); portrait (**d**) ...... Buprest is lyrata Casey





B7 (B6): Part II

*Buprestis subornata* (LeConte 1860)





*B*7 (*B*6): Part III

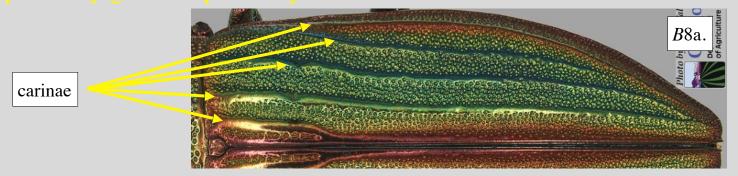
*Buprestis lyrata* Casey 1909





### *B*8 (*B*6): Part I









B8c: Blue form.

B8 (B6): Part II



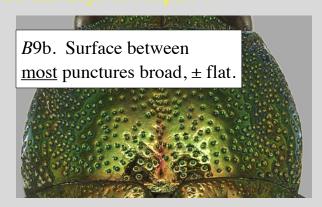


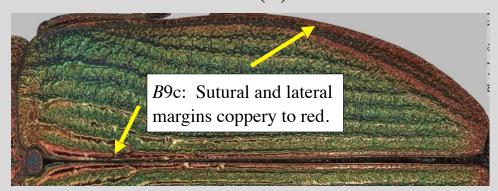
#### *B*9 (*B*8): Part I

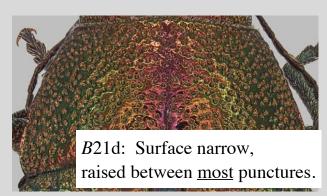


Color of elytra uniform, brassy green to blue or purplish (**a**); pronotum surface between <u>most</u> punctures (including those along the sides of the pronotum) broad, ± flat (**b**); portrait (**e**) ...... Buprestis langii Mannerheim \*This species has a color form with large pale spots on the elytra that keys to couplet 7.











## B9 (B8): Part II

*Buprestis langii* Mannerheim 1843



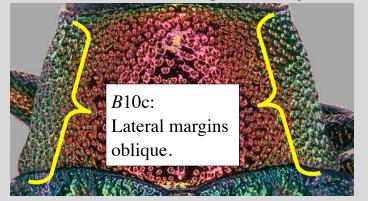


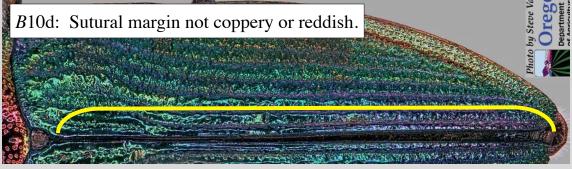
### B10 (B9)

Pronotum with lateral margins arcuate, overall shape not trapezoidal (a); sutural margin of elytron normally coppery or red (b) ..... B11





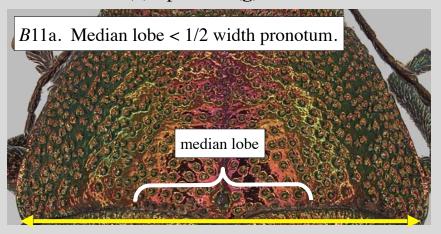






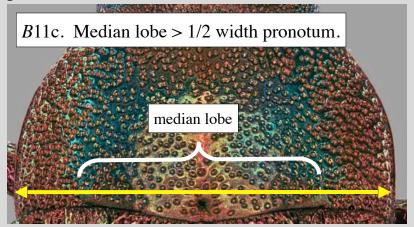
### *B*11 (*B*10): Part I

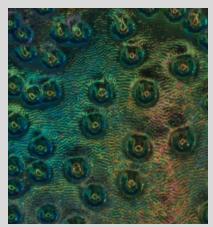






*B*11b. Surface between punctures smooth, glossy.





*B*11d. Surface between punctures finely meshed, dull.



# B11 (B10): Part II



*B*11e. Punctures indistinct, coalescent.





B11 (B10): Part III

*Buprestis adjecta* (LeConte 1854)





### Melanophila Screening Aid





Screening aid to select western species of *Melanophila* 



#### *M*1: Part I

Elytra with pale areas (a); portrait (c) .......... Melanophila consputata







#### M1: Part II

*Melanophila consputa* **LeConte** 

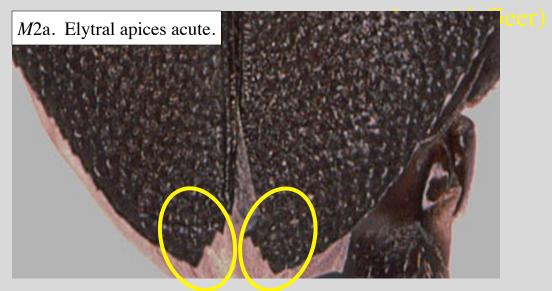




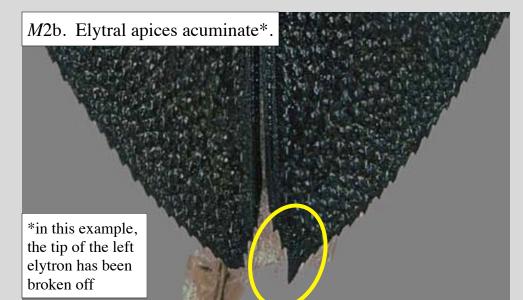
## M2 (M1): Part I



Tips of elytral apices acute (a); portrait (c)............... Melanophila



Tips of elytral apices acuminate (b)......FTT





*M2* (*M*1): Part II

Melanophila acuminata (de Geer)





## Phaenops Screening Aid









Screening aid to select western species of Phaenops



#### *P*1: Part I



Elytra green to blue to purplish (a); portrait (d) ......... Phaenops gentilis



Elytra black to bronze with or without pale spots  $(\mathbf{b}, \mathbf{c})$ ...... P2





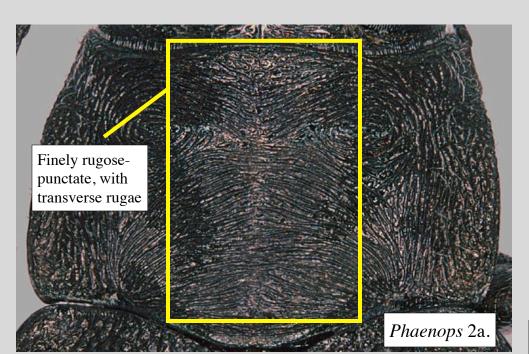
P1: Part II

Phaenops gentilis (LeConte)



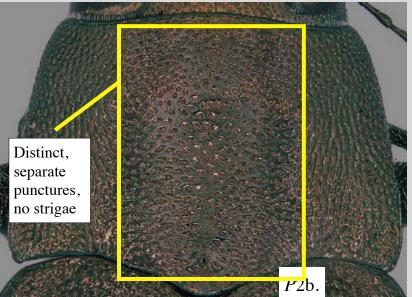


#### P2(P1)



Pronotum with surface finely rugose-punctate, center of pronotum with transverse rugae (a) ...... P3

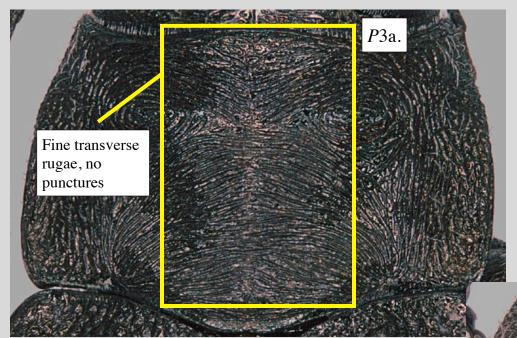
Pronotum with most punctures separate from one another, center of pronotum without transverse rugae (b)......FTT





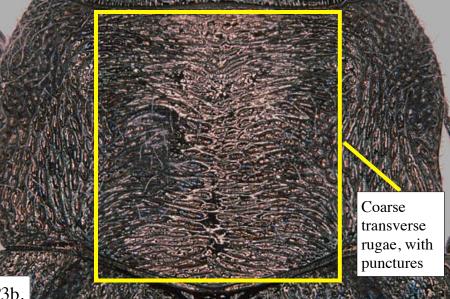
### *P*3 (*P*2): Part I





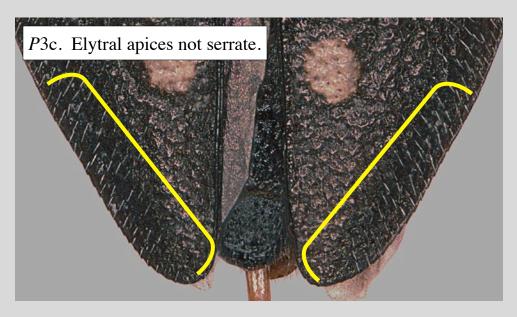
Center of pronotum with fine transverse rugae, usually with no distinct punctures (a); apices of elytra at most indistinctly serrate (c); portraits (e-f) ..... Phaenops drummondi

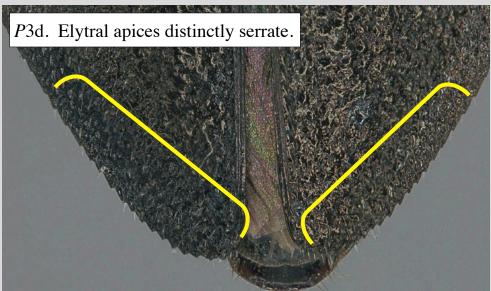
Center of pronotum with transverse rugae coarse and strong, usually with at least some punctures distinct (**b**); apices of elytra distinctly serrate (**d**).





# P3 (P2): Part II







# *P*3 (*P*2): Part III





Phaenops drummondi (Kirby)



*P*3e. Immaculate elytra