




SCREENING AID FOR THE CERAMBYCIDAE OF THE WESTERN U.S.A.

Version 061313

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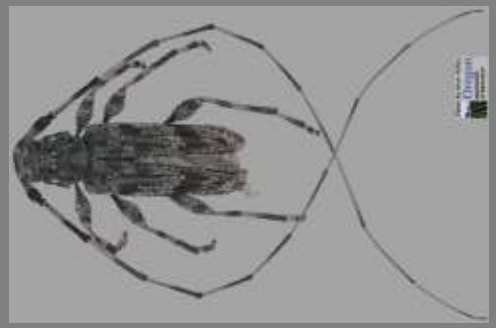


Contributions and Acknowledgements

James R. LaBonte, ODA (Oregon Department of Agriculture: Design and compilation of the screening aid.

Steven A. Valley, ODA: Acquisition of most of the images.

Thomas E. Valente, ODA: Acquisition of some of the images.

Joshua J. Vlach, ODA. Design of screening aid, specimen preparation.

Christine Niwa, USDA FS: Alpha testing of the screening aid and administration of the grant.

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 screening aid is not a comprehensive treatment of western North American Cerambycidae (roundheaded or longhorned wood borers). It is designed to enable efficient 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 are also included. *This aid will be most reliable in 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.

This 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 with training, such as at a workshop.

Use of This Screening Aid: I

The screening aid functions much like the traditional dichotomous key, with couplets. However, PowerPoint navigational features have been used for efficiency. Buttons linking non-sequential couplets and enabling return to an originating couplet are indicated by . All slides have this button, , to move immediately to the beginning of the key. This button, , returns to the appropriate Index page from a portrait slide.

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 cerambycids and the terms applied

Use of This Screening Aid: II

to them. Several slides illustrating families that are frequently confused with cerambycids and some key differentiating features are included thereafter. A single slide explaining a few technical terms follows those. Index slides with images of all the target exotic species and screening aid target species are after these introductory slides. The screening aid key follows. Couplets dealing with exotic species have text in white and an asterisk following the species name.

THIS IS VERY IMPORTANT!

This aid is 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.

Use of This Screening Aid: III

Realistic limitations and expectations:

It is likely that native species not treated in this screening aid, particularly in the southern border states, will be encountered, given the great diversity of Cermabycidae. Furthermore, the influx of exotic cerambycids continues and exotics new to the U.S. and North America are being found with dismaying frequency. Specimens from either set of species may not key readily and may not even end up at "FTT".

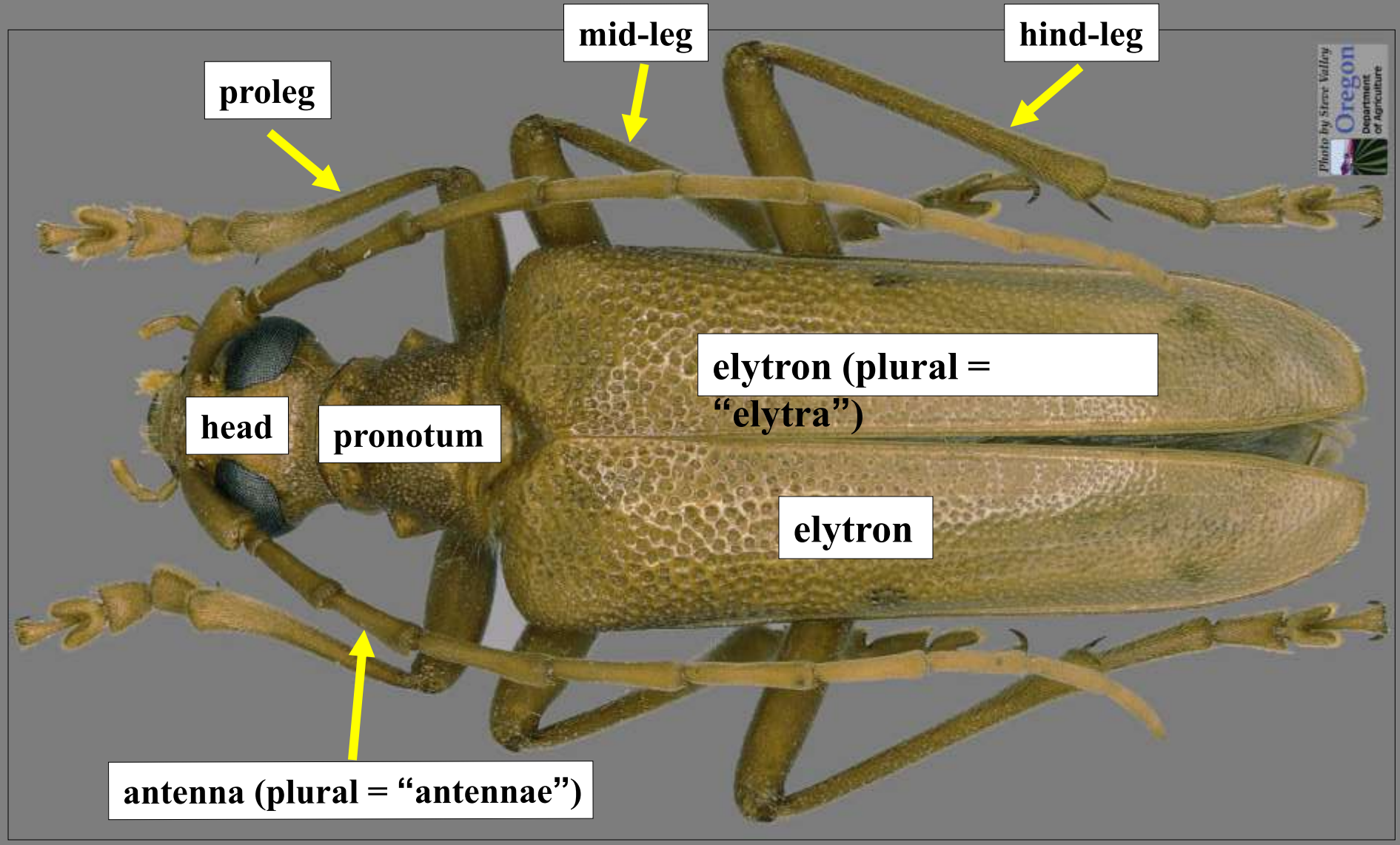
Monochamus and *Tetropium* are two genera which include exotic species that are known to be or could be destructive. Unfortunately, the characters distinguishing species are often subtle and variable. Any specimen that doesn't readily key out to a native species or that looks unusual should be treated as an "FTT".

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
Emarginate: broadly notched
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
Scape: the first antennal segment
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: 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.

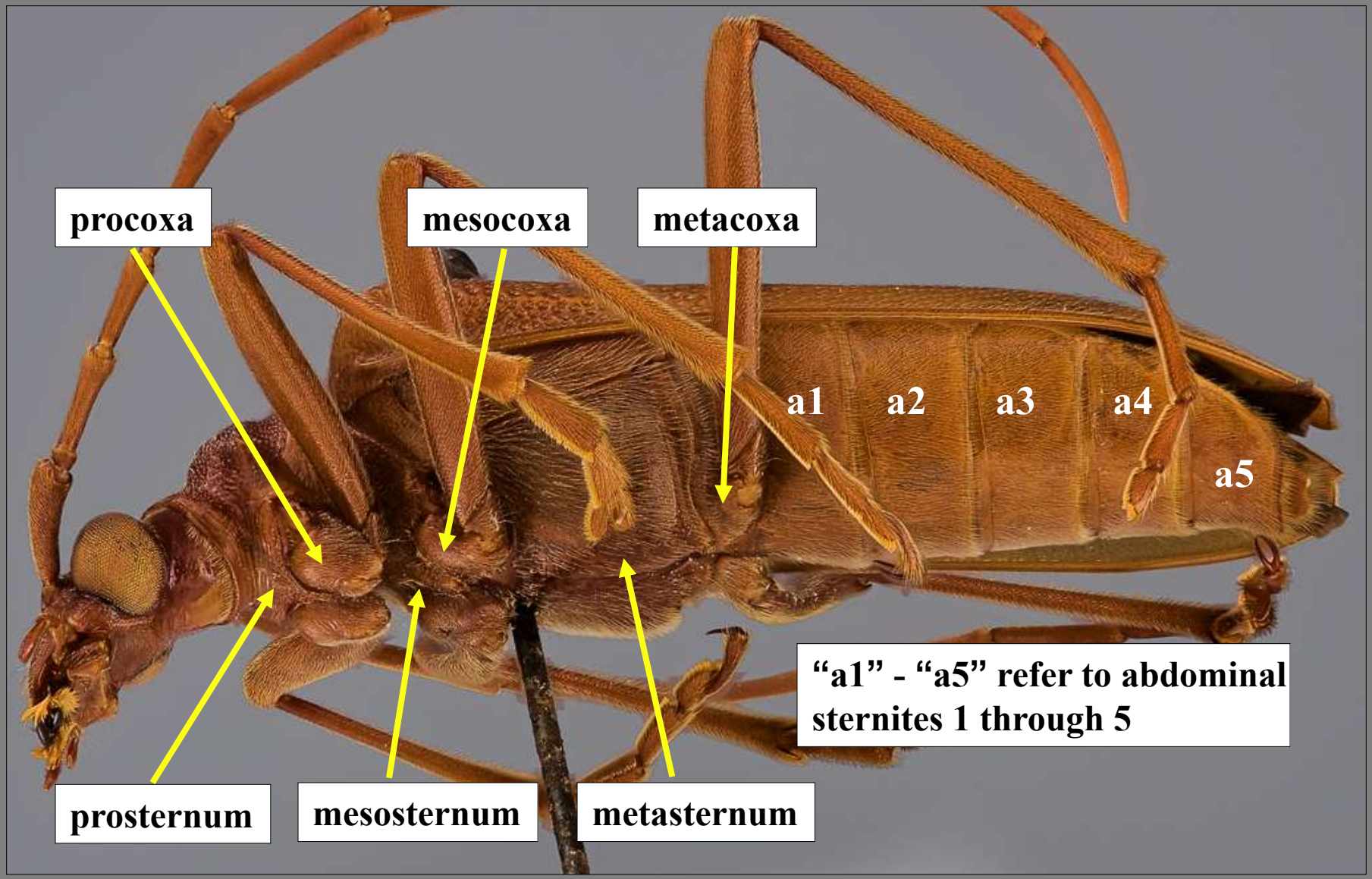
Begin key

Basic Body Parts of Cerambycidae: Dorsum



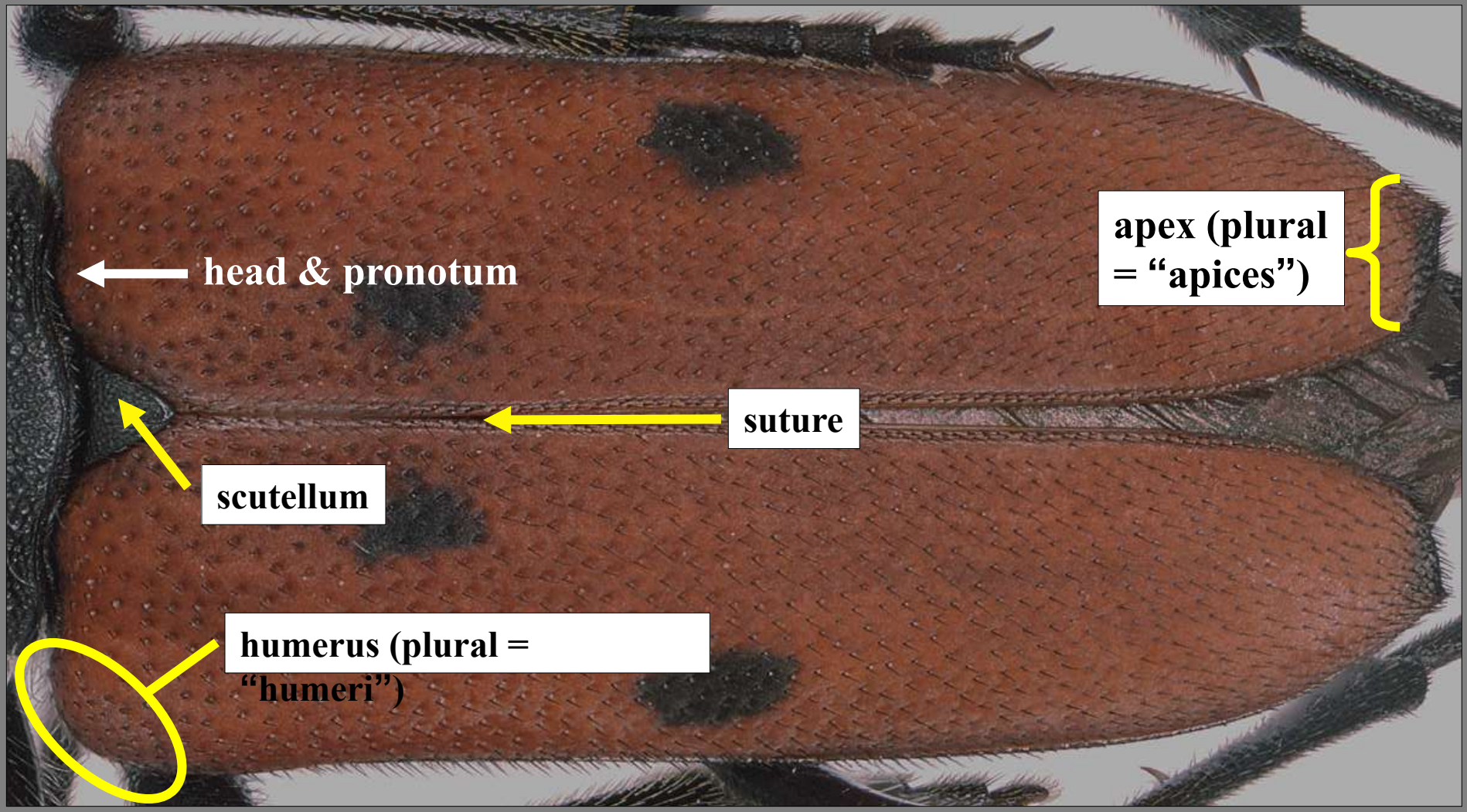
Begin key

Basic Body Parts of Cerambycidae: Venter



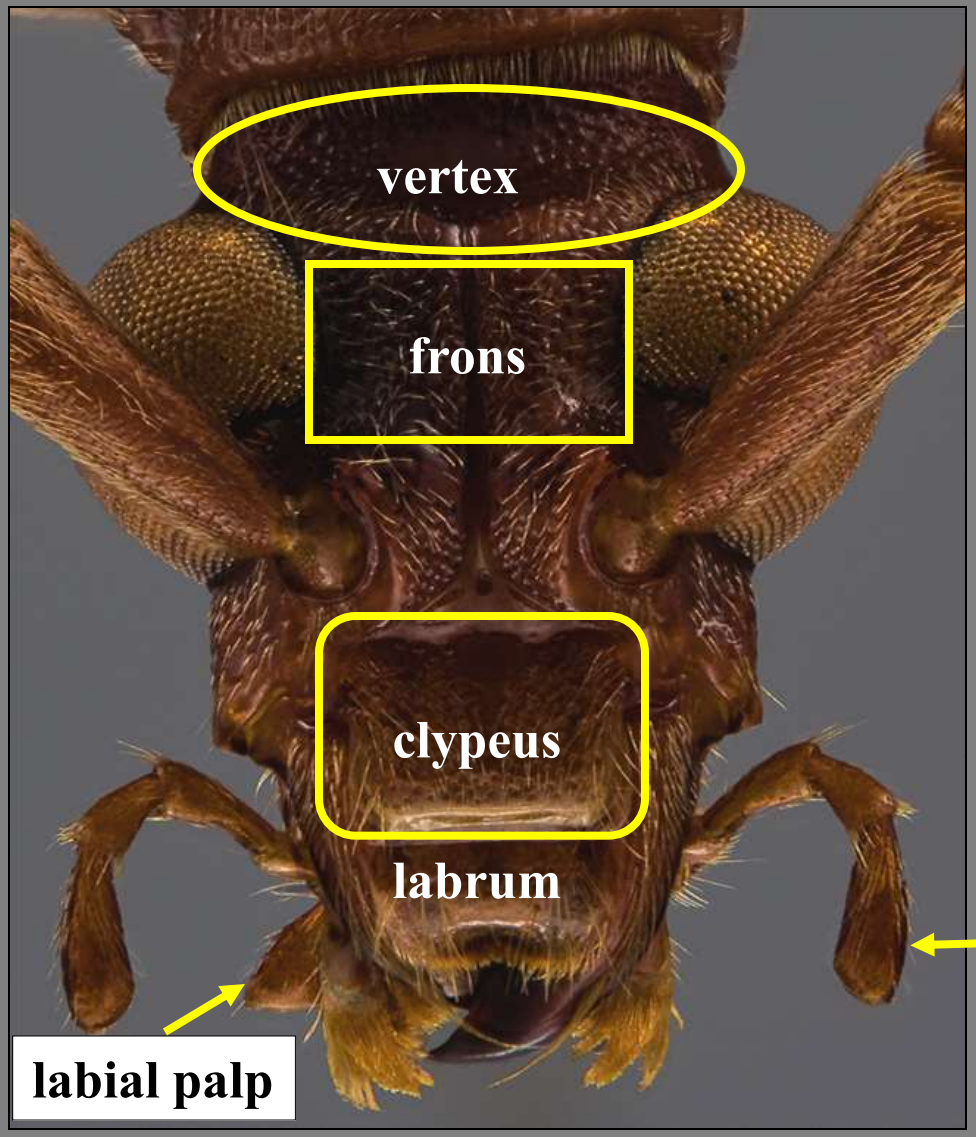
Begin key

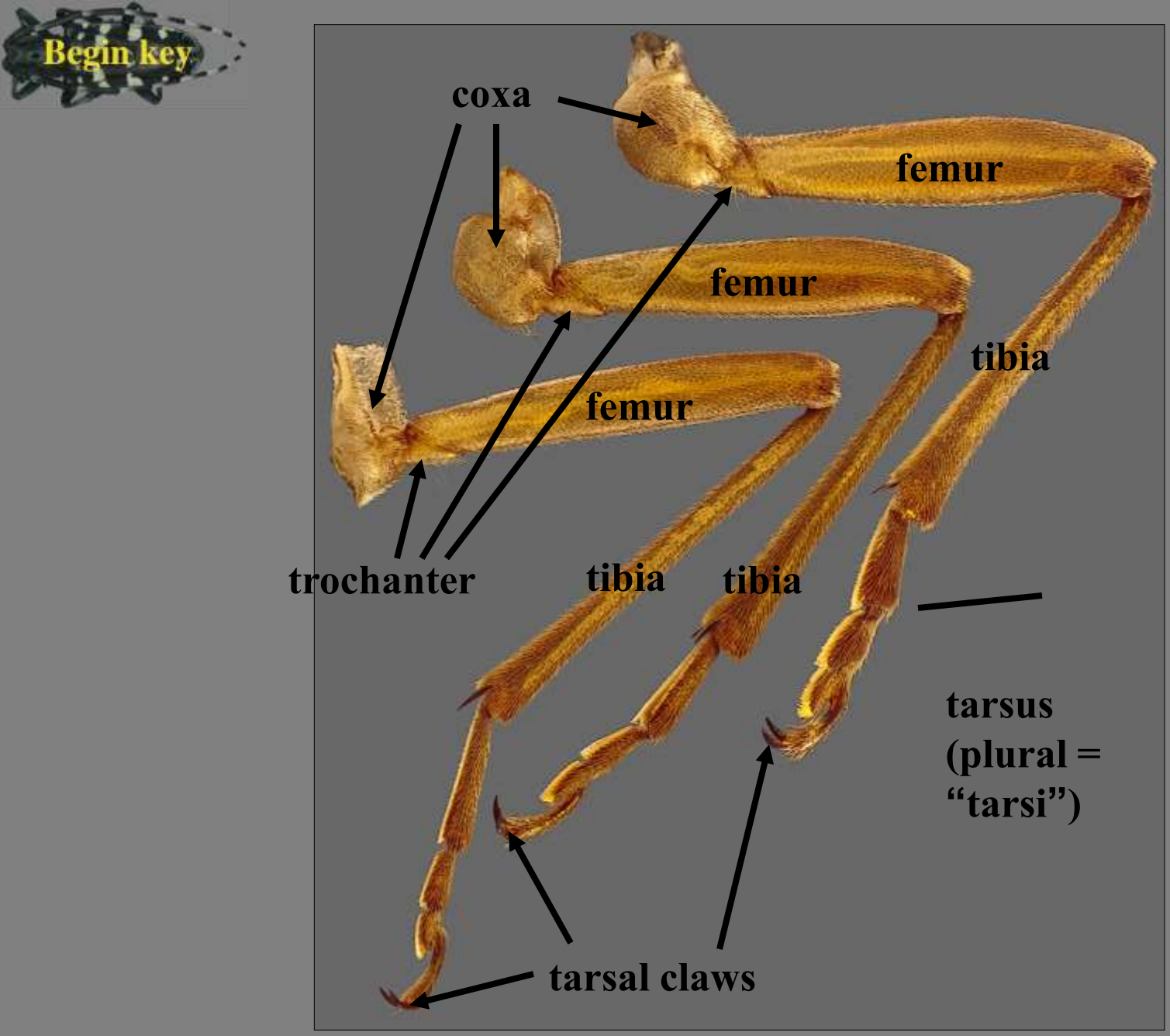
Basic Body Parts of Cerambycidae: Elytra



Begin key

Basic Body Parts of Cerambycidae: Head



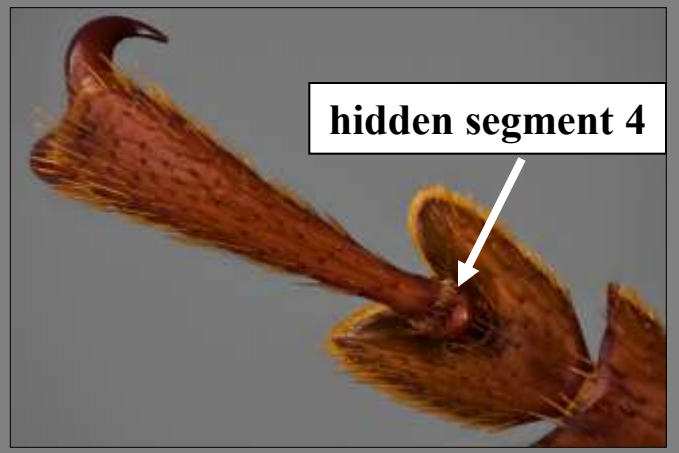


Basic Body Parts of Cerambycidae: Legs

Begin key

Features Typical of Cerambycids: I

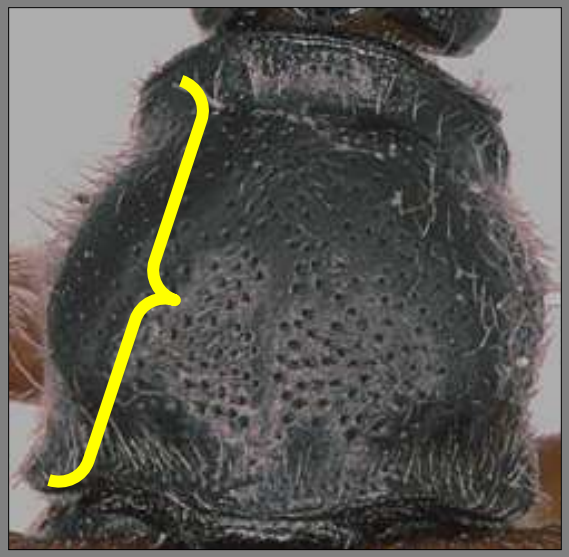
All 3 sets of tarsi appear to be comprised of 4 segments each (except for a few very primitive cerambycids which have all tarsi clearly composed of 5 segments). In cerambycids, each tarsus really has 5 segments, but the 4th is very small and hidden between the lobes of the 3rd segment.

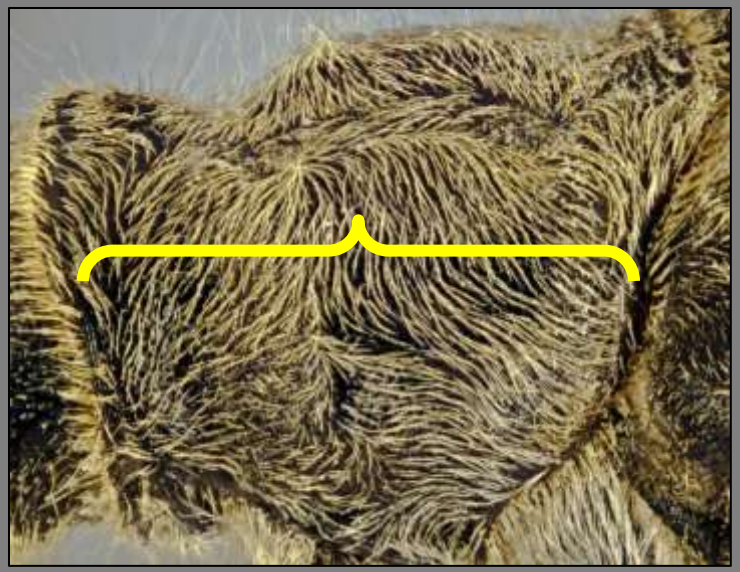


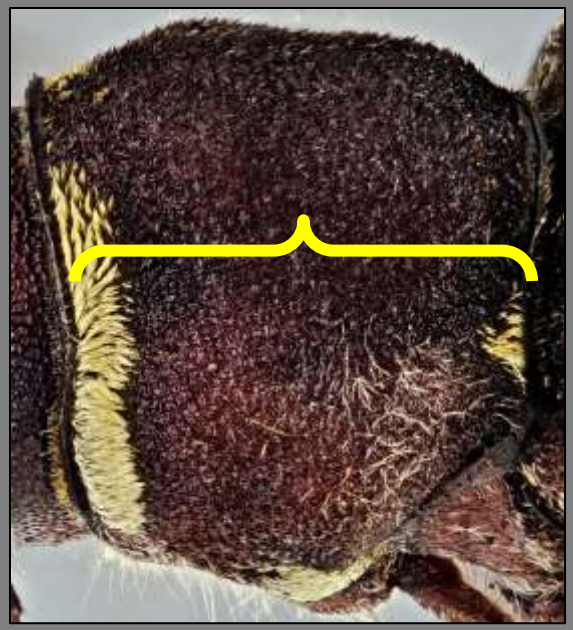
Begin key

Features Typical of Cerambycids: II

Pronotum without sharp lateral margins

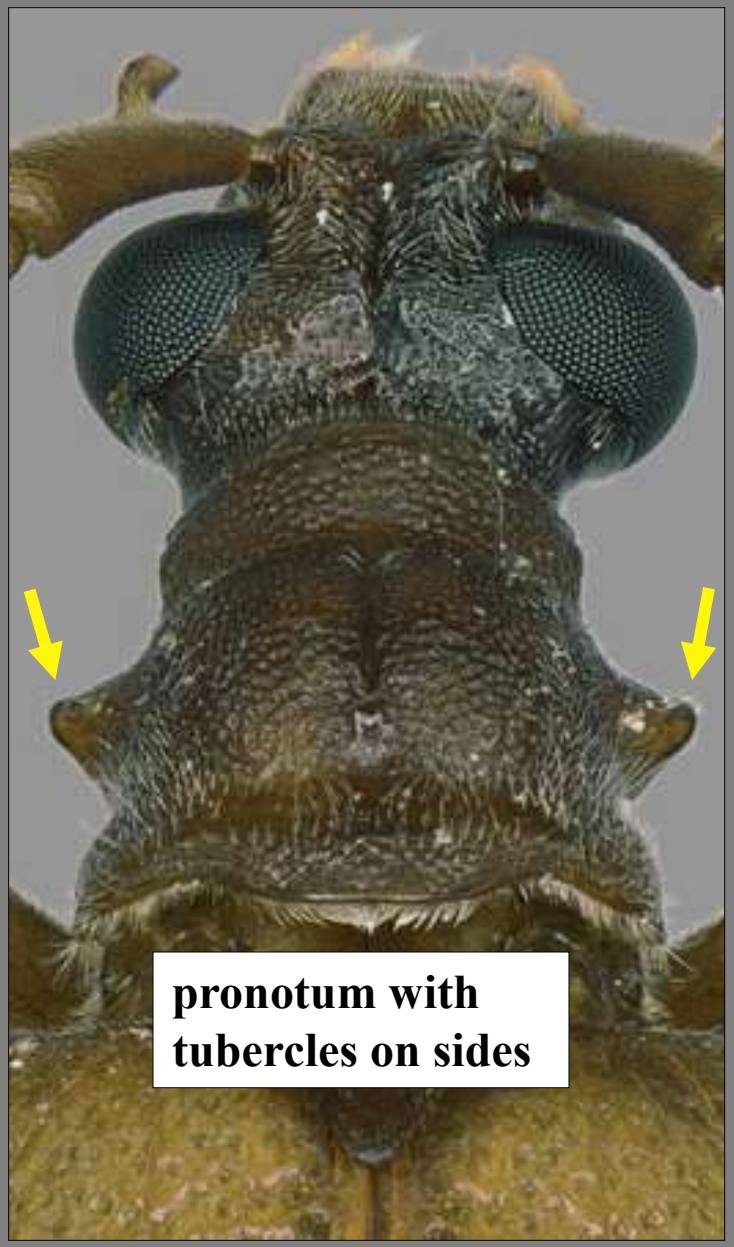






Begin key

Features Typical of Cerambycids: III



pronotum with tubercles on sides

pronotum with spines on sides

Begin key

Features Typical of Cerambycids: IV

Antennae long and slender, extending beyond the hind margin of the pronotum

Cerambycid with atypically short antennae

Begin key

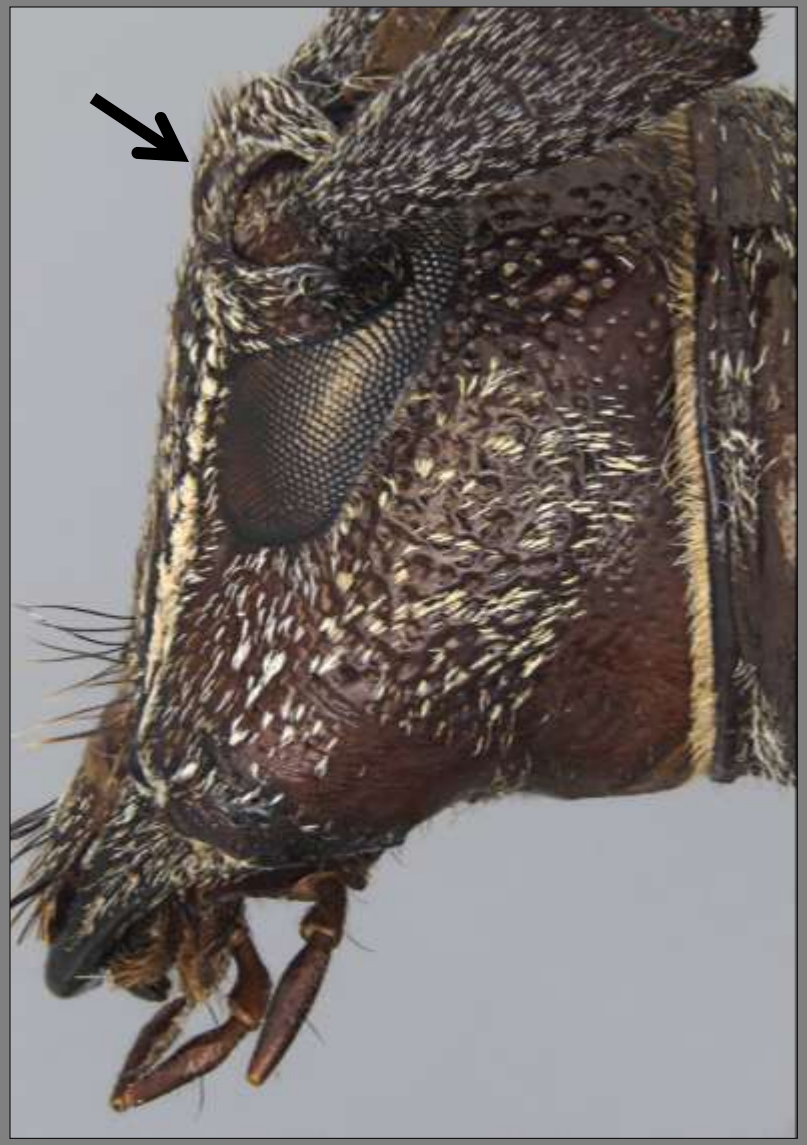
Features Typical of Cerambycids: V

Elytra generally lack distinct striae (thin carinae may be present)

Begin key

Features Typical of Cerambycids: VI

Antennae are inserted on prominences



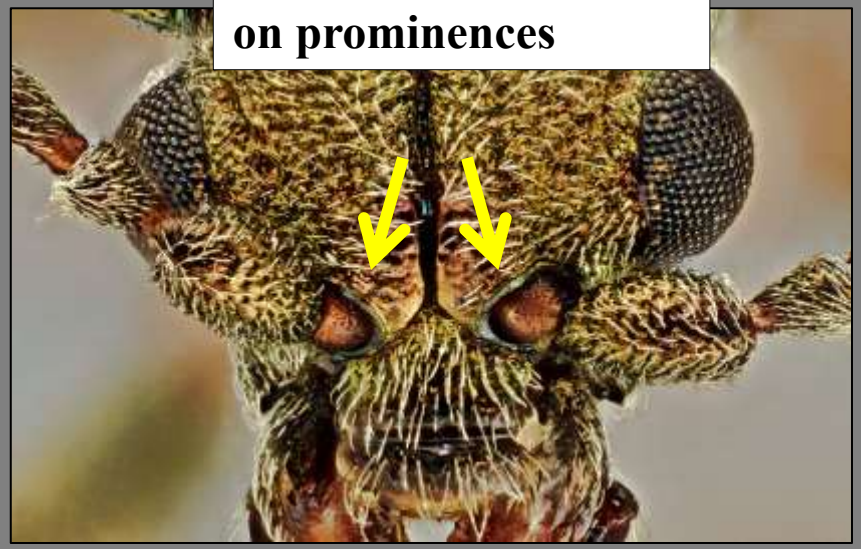
Begin key

Non-Cerambycids: Chrysomelidae

All tarsi 5-segmented with a hidden 4th segment (like Cerambycidae)

Antennae shorter than half length of body

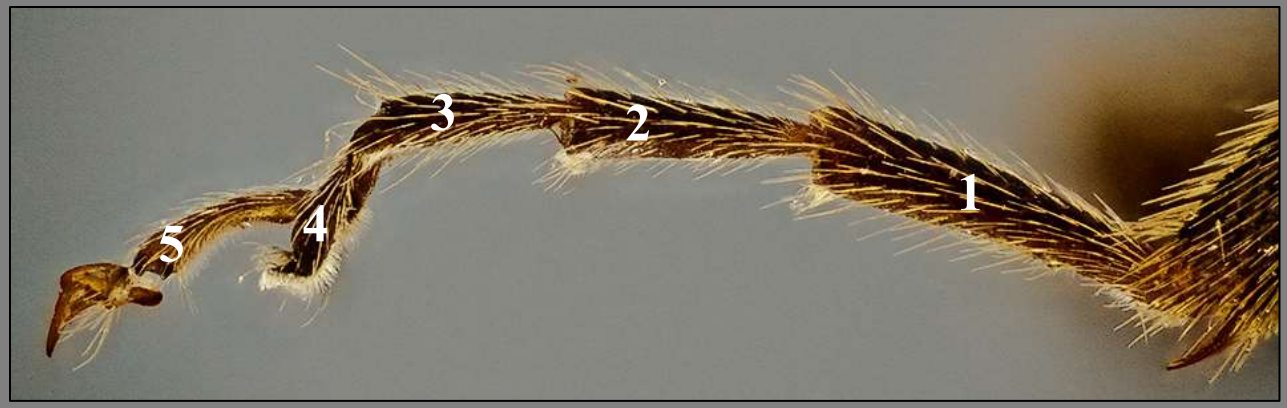
Antennae not inserted on prominences



Begin key

Non-Cerambycids: Cantharidae

All tarsi clearly 5-segmented



Lateral margins of pronotum sharp, carinate

Begin key

Non-Cerambycids: Cleridae

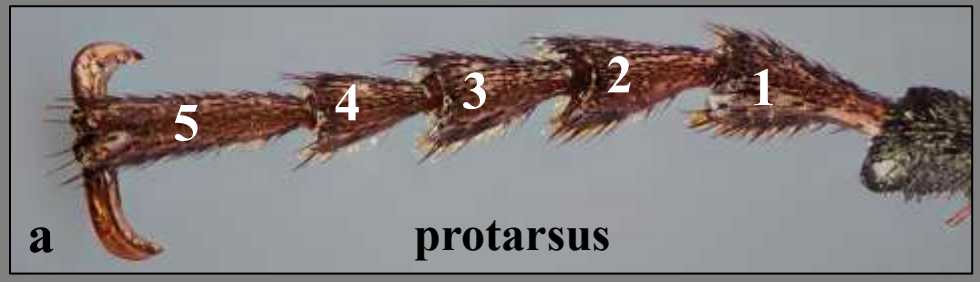
All tarsi are clearly 5-segmented

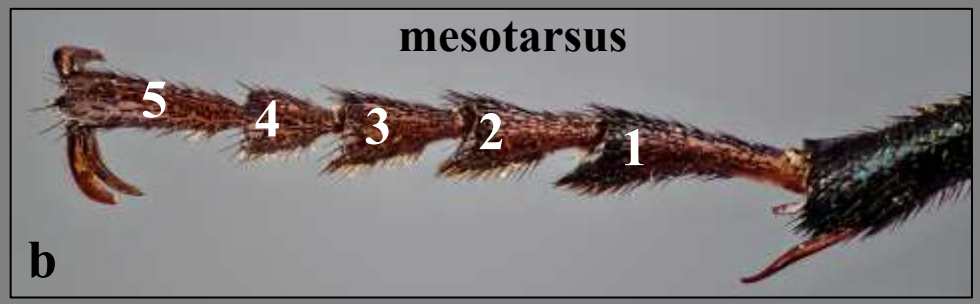
<u>Most</u> Cleridae antennae are short & clubbed

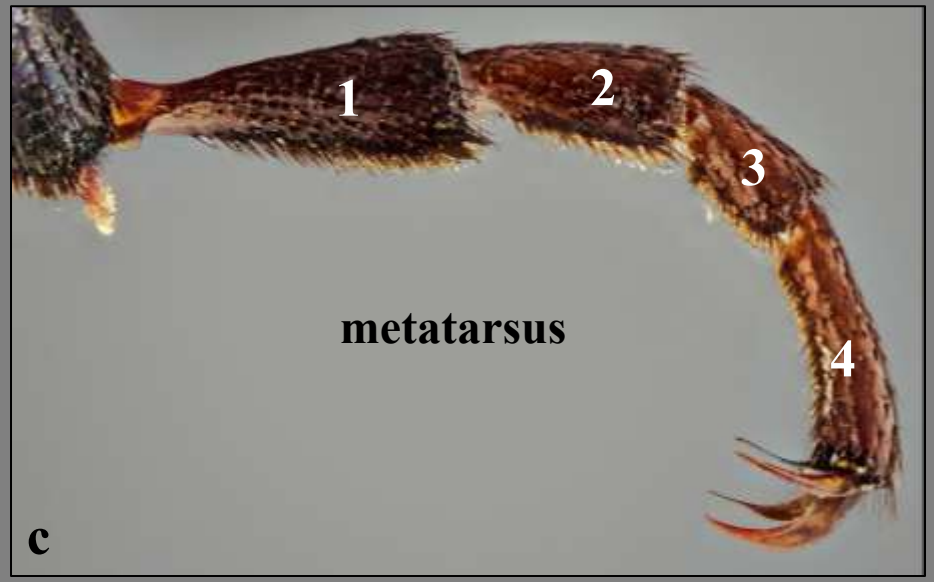
Begin key

Non-Cerambycids with 5-segmented pro- and mesotarsi and 4-segmented metatarsi (5-5-4)

There are several common beetle families that can be confused with Cerambycidae that all have 5-segmented pro- and meso-tarsi (a-b) and 4-segmented metatarsi (c). These include Meloidae, Oedemeridae, Pyrochroidae, and Stenotrachelidae.

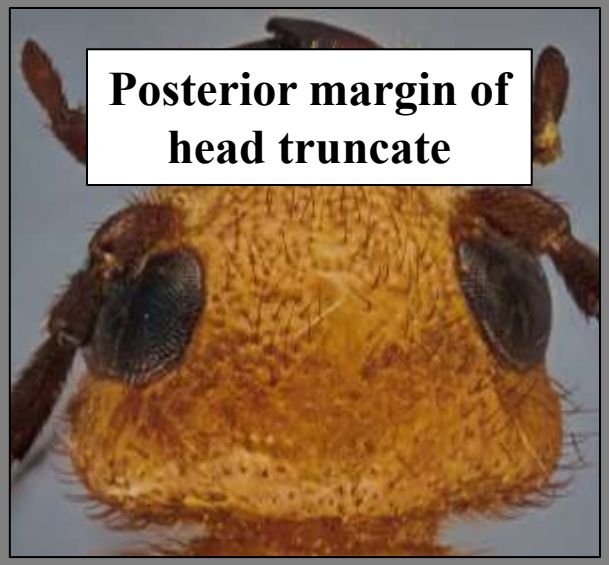






Begin key

Non-Cerambycids with 5-5-4 tarsi: Meloidae



Begin key

Non-Cerambycids with 5-5-4 tarsi: Oedemeridae

Begin key

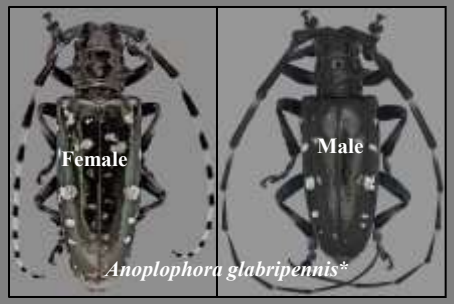
Non-Cerambycids with 5-5-4 tarsi: Pyrochroidae

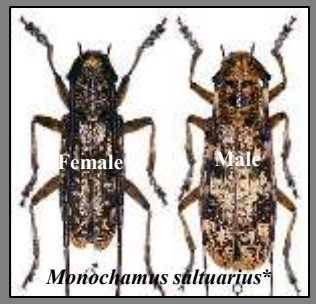
Begin key

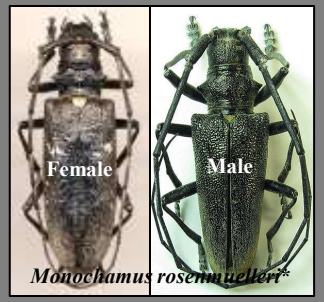
Non-Cerambycids with 5-5-4 tarsi: Stenotrachelidae

Exotic Cerambycid Species Target Index

Click picture for direct link to species page







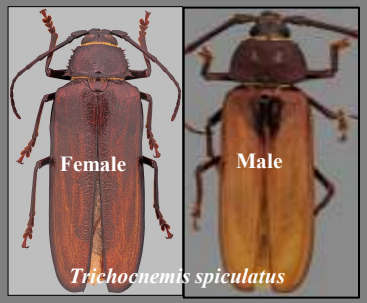
Begin key

Cerambycid Screening Species Target Index: I

Click picture for direct link to species page


Acmaeops proteus


Asemum nitidum

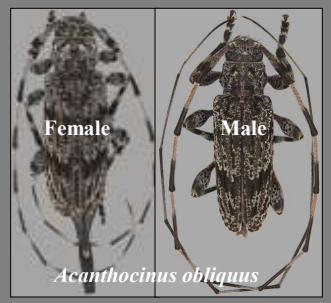


Trichocnemis spiculatus


Leptura obliterata


Monochamus obtusus


Neoclytus leucozonus

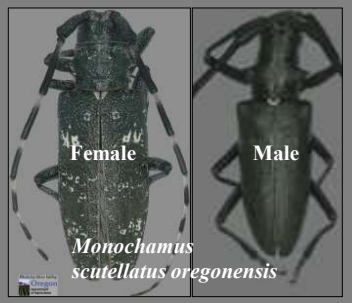


Acanthocinus obliquus

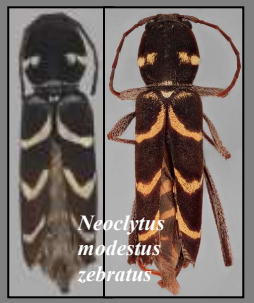

Brothylus gemmulatus


Grammoptera subargentata


Megacyllene robiniae



Monochamus scutellatus oregonensis


Neoclytus modestus zebratus


Arhopalus asperatus


Centrodera dayi


Holopleura marginata


Megasemum asperum


Neoclytus acuminatus

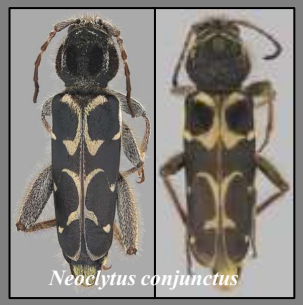

Phymatodes aeneus


Arhopalus productus


Centrodera spurca


Judolia instabilis


Monochamus clamator


Neoclytus conjunctus

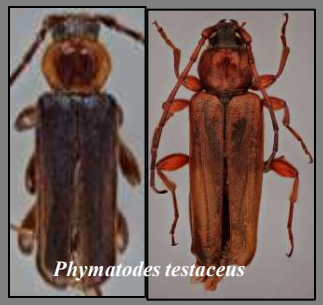

Phymatodes decussatus

Begin key

Cerambycid Screening Species Target Index: II

Click picture for direct link to species page


Phymatodes dimidiatus


Phymatodes testaceus


Spondylis upiformis


Strophiona laeta

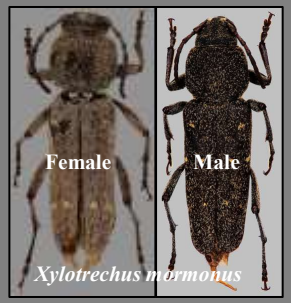

Xylotrechus longitarsis


Phymatodes lecontei


Prionus californicus


Stenocorus nubifer


Tetropium cinnamopterum


Female

Male

Xylotrechus mormonus


Phymatodes nitidus


Rhagium inquisitor


Stenocorus vestitus

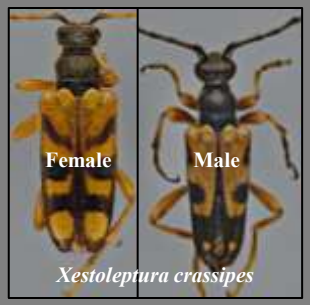

Xestoleptura crassicornis


Xylotrechus nauticus


Phymatodes oregonensis


Rosalia funebris


Stictoleptura canadensis


Female

Male

Xestoleptura crassipes

1: Part I

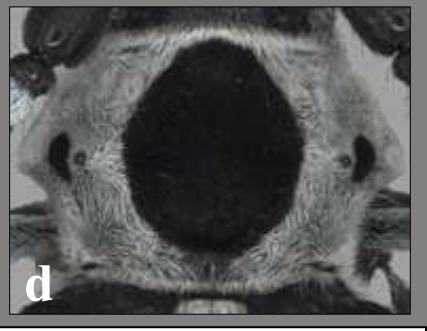
Elytra with broad bands of black and white (a); pronotum white with a large central black dot (c); portrait (d)……..…….....*Rosalia funebris* Motschulsky*

***This species is not common in traps but is often submitted for identification, particularly as a possible Asian longhorned beetle.**

Elytra without broad bands of black and white - may have white spots or patches on a black background; pronotum never white with a large central central black dot……2

Elytra broadly banded black and white.

Elytra at most with white patches or speckles.



Pronotum white with a central black dot.

Pronotum never white with a central black dot.

Begin key

1: Part II

Index

Rosalia funebris
Motschulsky

Begin key

2 (1)

Pronotum with complete antemedian and median bands of yellow pubescence (a-c)…….....3

Pronotum lacking bands of pale pubescence (d); with bands of pale pubescence along anterior and/or posterior margins (e); with additional incomplete median band of pale pubescence (f); or with longitudinal or oblique markings (g)……..6

Begin key

3 (2)

Pronotum with bands of pale pubescence narrow (a-b)……..……4

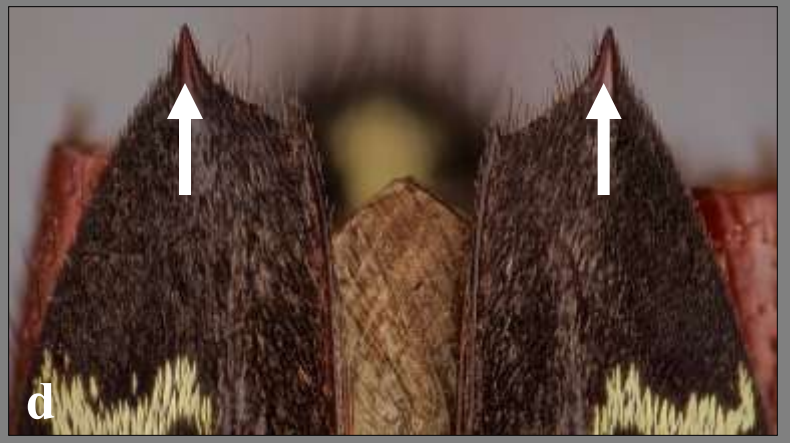
Pronotum with bands of pale pubescence broad (c)……....FTT

Begin key

4 (3)

Pronotum with posterior margin truncate (a); if elytral apices are pointed, the points are short (c)……..……5

Pronotum with posterior margin lobed at middle (b); elytral apices with long points (d)……..FTT

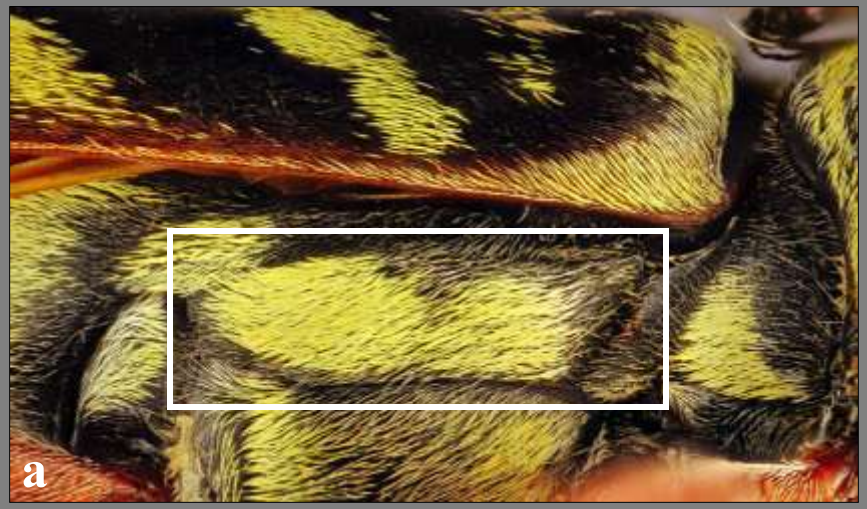


Begin key

5 (4): Part I

Pale pubescence on metaepisternum continuous or at most separated by a narrow bare spot at middle (a); portrait (c)….*Megacyllene robiniae* (Forster)

Pale pubescence on metaepisternum widely split into anterior and posterior spots by a broad bare area at middle (b)……..FTT



Begin key

5 (4): Part II

Index

***Megacyllene robiniae* (Forster)**

Begin key

6 (2)

Elytra covering more than half of abdomen (a-e)……..……....7

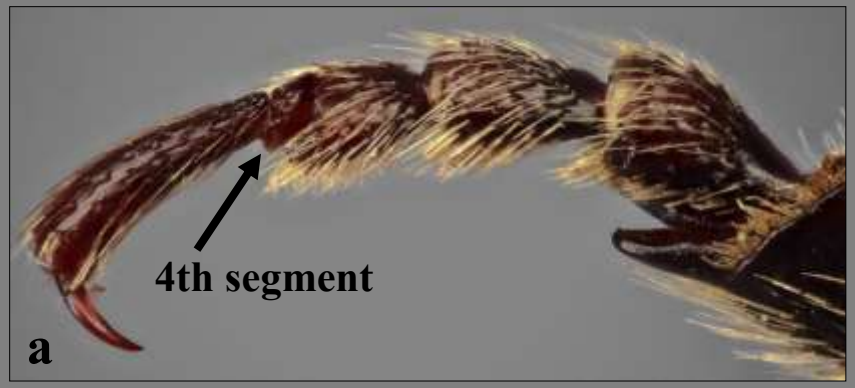
Elytra covering half or less of abdomen (f-g) or very slender in posterior half, exposing much of the abdomen (h)…….……....FTT

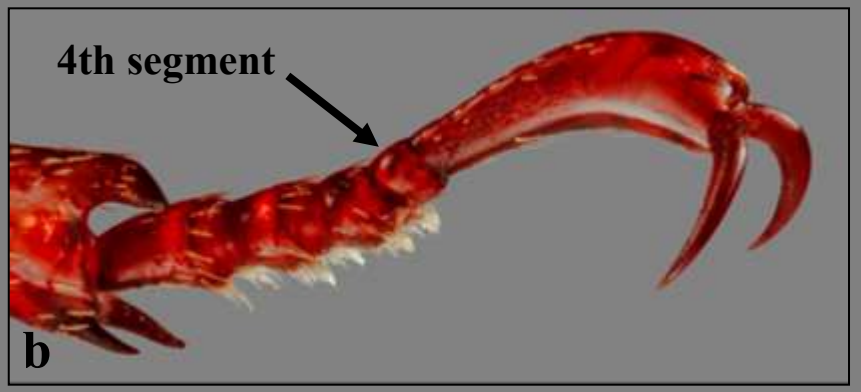
Begin key

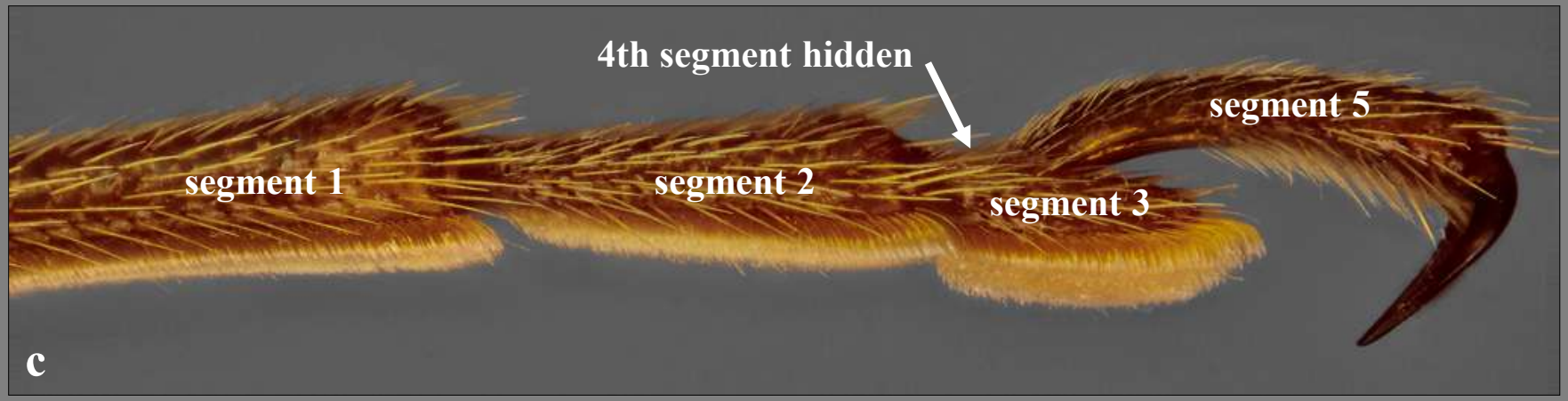
7 (6)

Tarsi with five easily seen segments – the 4th segment is smaller but <u>not</u> hidden within the lobes of the 3rd segment (a-b)……..……..8

Tarsi with only four easily seen segments – the 4th segment is very small and <u>hidden</u> within the lobes of 3rd (c)……..…9





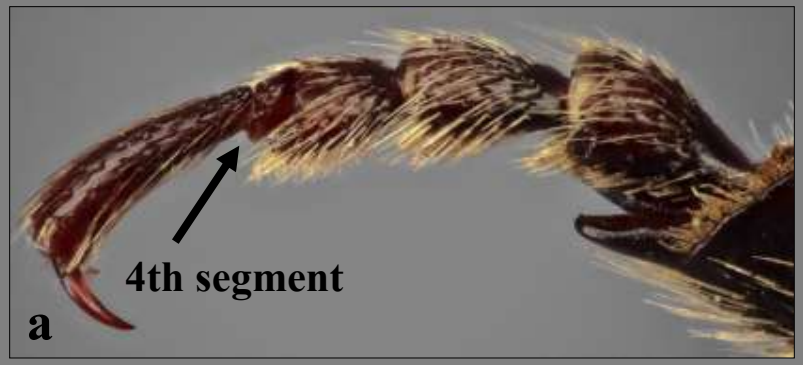


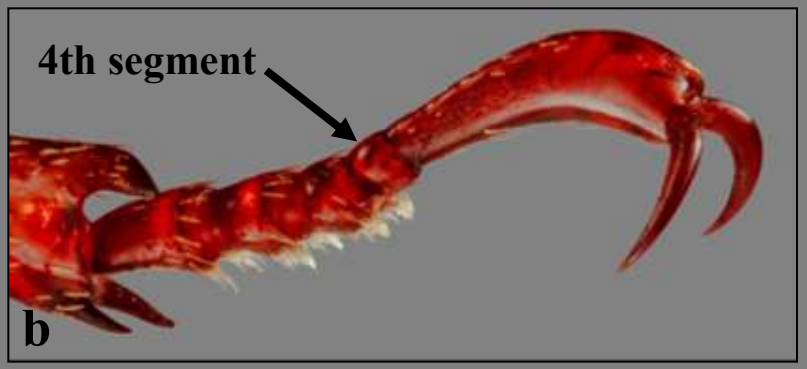
Begin key

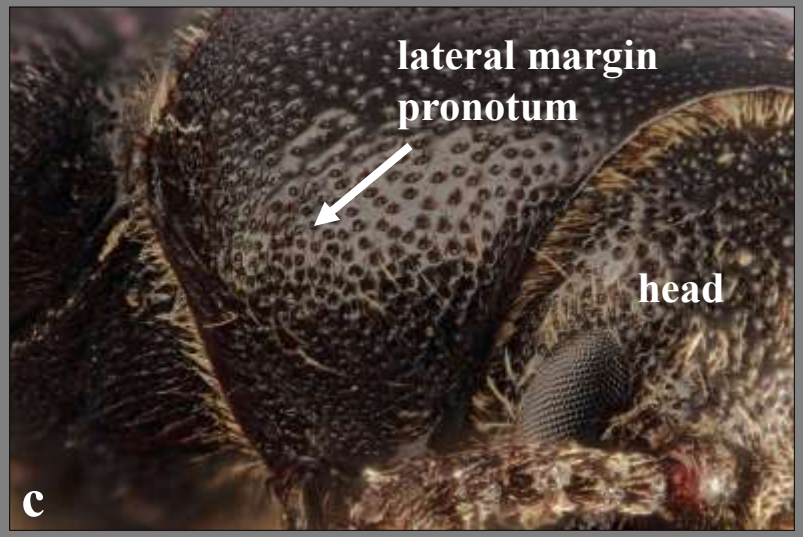
8 (7): Part I

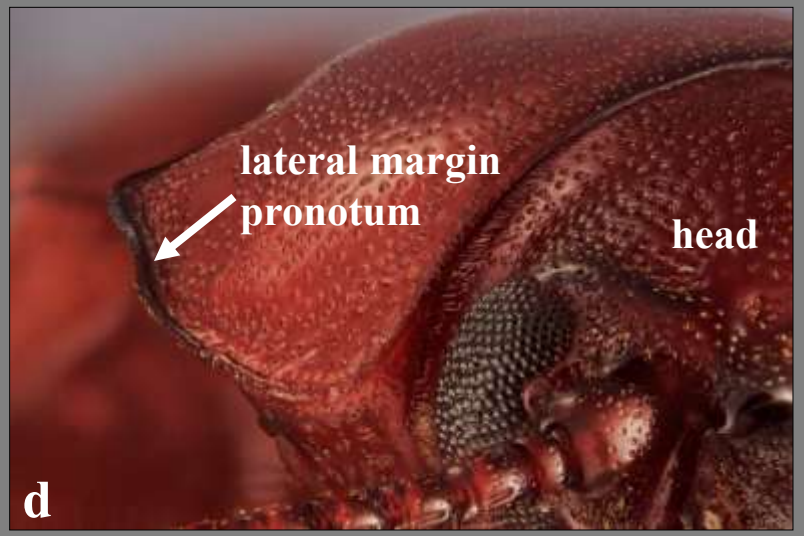
Tarsi with 4th segment small, between lobes of 3rd (a); lateral margins of pronotum without raised ridge (c); portrait (e)……..
…….*Spondylis upiformis* Mannerheim

Tarsi with 4th segment larger, not between lobes of 3rd (b); lateral margins of pronotum with raised ridge (d)…..……..……...FTT









Begin key

Index

8(7): Part II

Spondylis upiformis Mannerheim

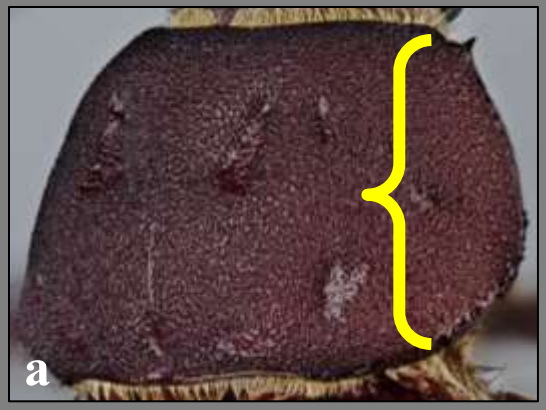
e

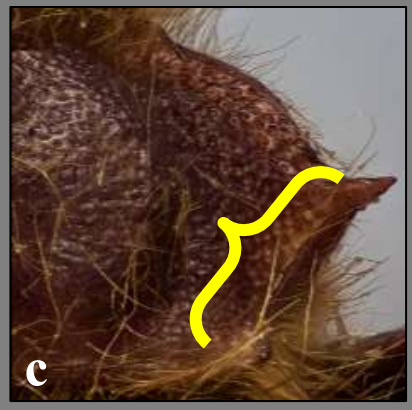
Begin key

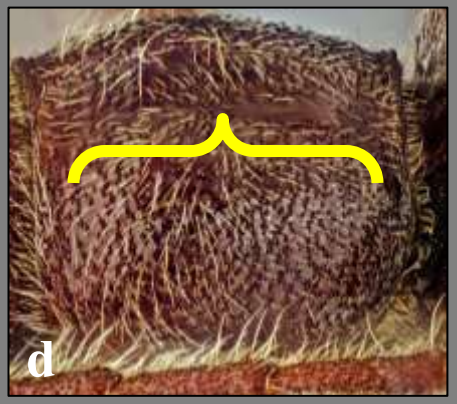
9 (7)

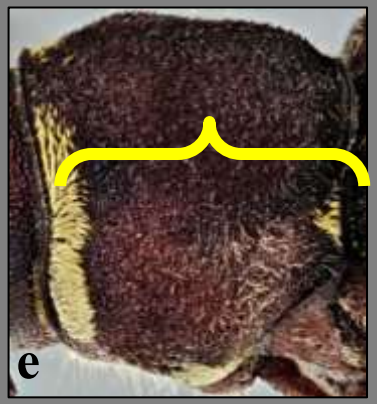
Each lateral margin of pronotum <u>with</u> either a raised ridge over the entire length (a-b) or at least in the posterior half (c)……..…….....10

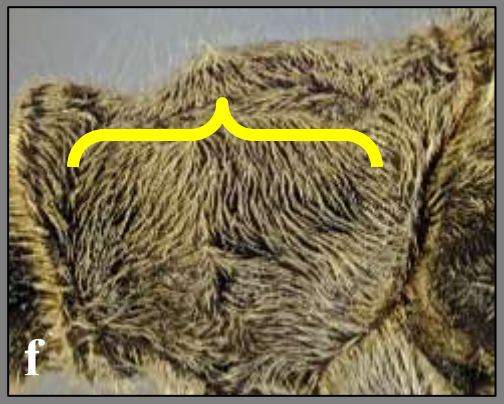
Lateral margins of pronotum <u>without</u> raised ridges (d-g)……..……16

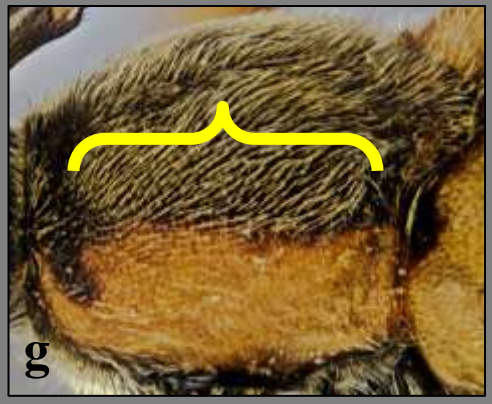










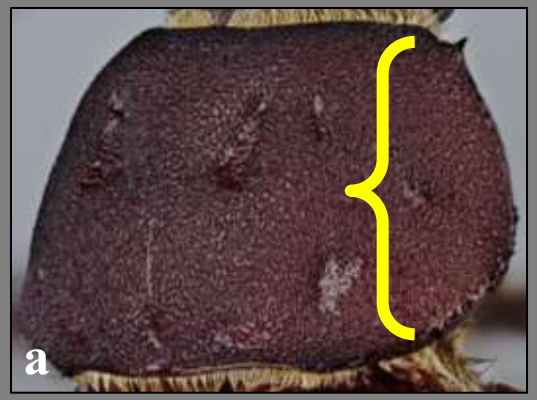


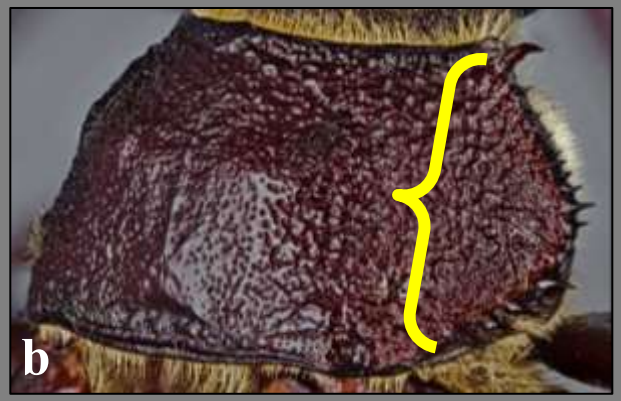
Begin key

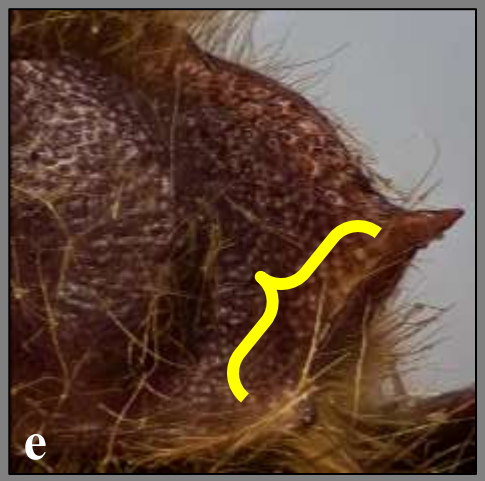
10 (9): Part I

Pronotum with <u>complete</u> lateral margins (a-c) and <u>usually</u> <u>without</u> long dorsal pubescence and <u>usually</u> with <u>at least</u> two spines on each lateral margin (g-j) (some male *Prionus* spp. have long pronotal pubescence and no more than two spines per side)**.....……....11**

Pronotum with strong lateral margins only in posterior half, margins in anterior half weak at most (d-e), <u>with</u> long dorsal pubescence (f) and with <u>no more</u> than two spines (sometimes none) on each lateral margin (k-m)…….……..…FTT





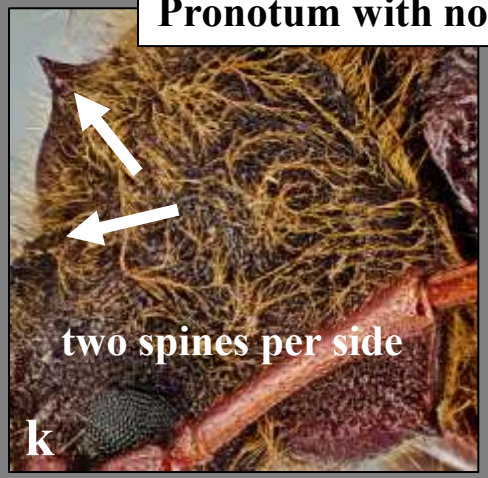


Begin key

10 (9): Part II

Pronotum with at least two spines on each lateral margin

Pronotum with no more than two spines on each lateral margin

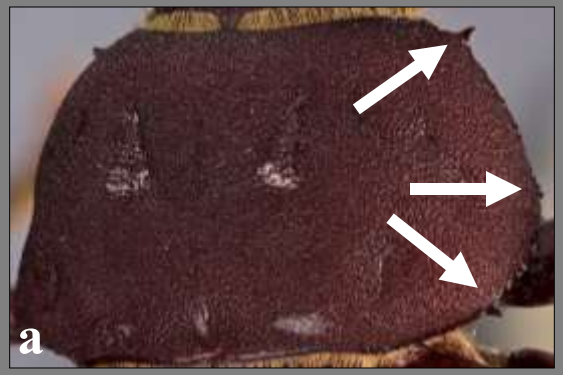


Begin key

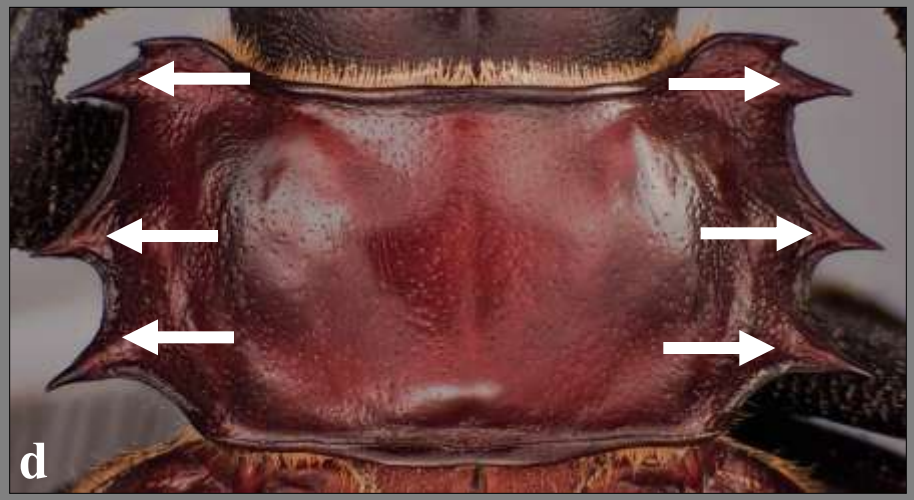
11 (10)

Spines on lateral margins of pronotum small (a-c)……..…12

Spines on lateral margins of pronotum large (d, e)…….13



Pronotum with small spines on lateral margins



Pronotum with large spines on lateral margins

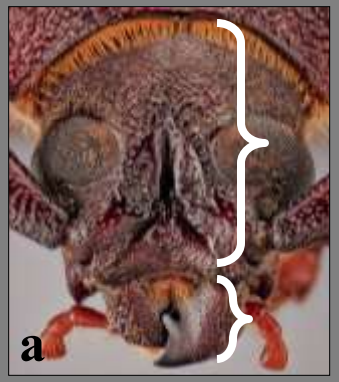
Begin key

12 (11): Part I

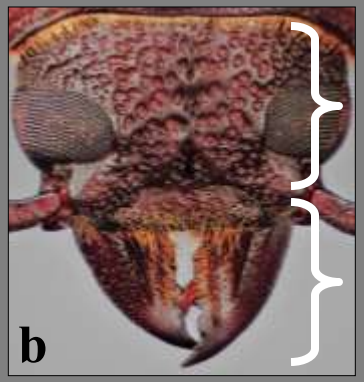
Mandibles much shorter than head (a); spines on lateral margin of pronotum very fine spinules (d, e); portrait (f, g)……*Trichocnemis spiculatus* LeConte

This species is not common in traps but is frequently submitted for identification.

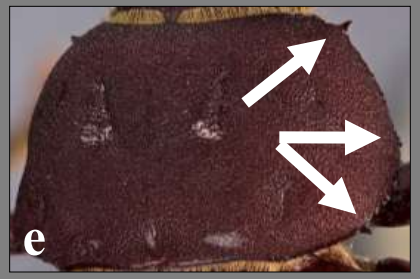
Mandibles as long or longer than head (b, c); spines on lateral margin of pronotum larger (e)……FTT



Mandibles much shorter than head



Mandibles as long or longer than head



Pronotum with very fine spines on lateral margins

Pronotum with larger spines

Begin key

Index

12 (11): Part II

Trichocnemis spiculatus LeConte

f. Female

g. Male

Begin key

13 (11)

Antennal segment surface comprised of very fine, irregular wrinkles (a) OR very small pores (b)……..14

Antennal segment surface with fine longitudinal ridges (c)……FTT

Antennal segments wrinkled or with fine pores

Antennal segments with fine longitudinal ridges

Begin key

14 (13)

Antennal segments shiny, with network of fine wrinkles - most obvious on outer segments and underneath (a)……..……..……..15

Antennal segments dull, with no network of wrinkles - most obvious on outer segments and underneath (b)……FTT

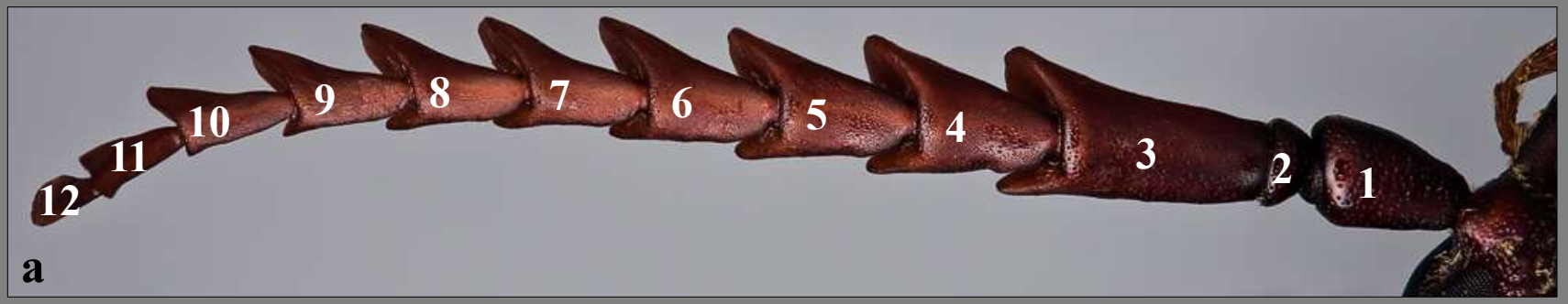
Begin key

15 (14): Part I

Antennae with twelve segments (a)…….. *Prionus californicus* Motschulsky*

***This species is not common in traps but is frequently submitted for identification. Large, broad specimens from Arizona, Colorado, and New Mexico may be *P. heroicus* Semenov.**

Antennae with thirteen segments (b)……..……FTT



Begin key

Index

15 (14): Part II

***Prionus californicus* Motschulsky**

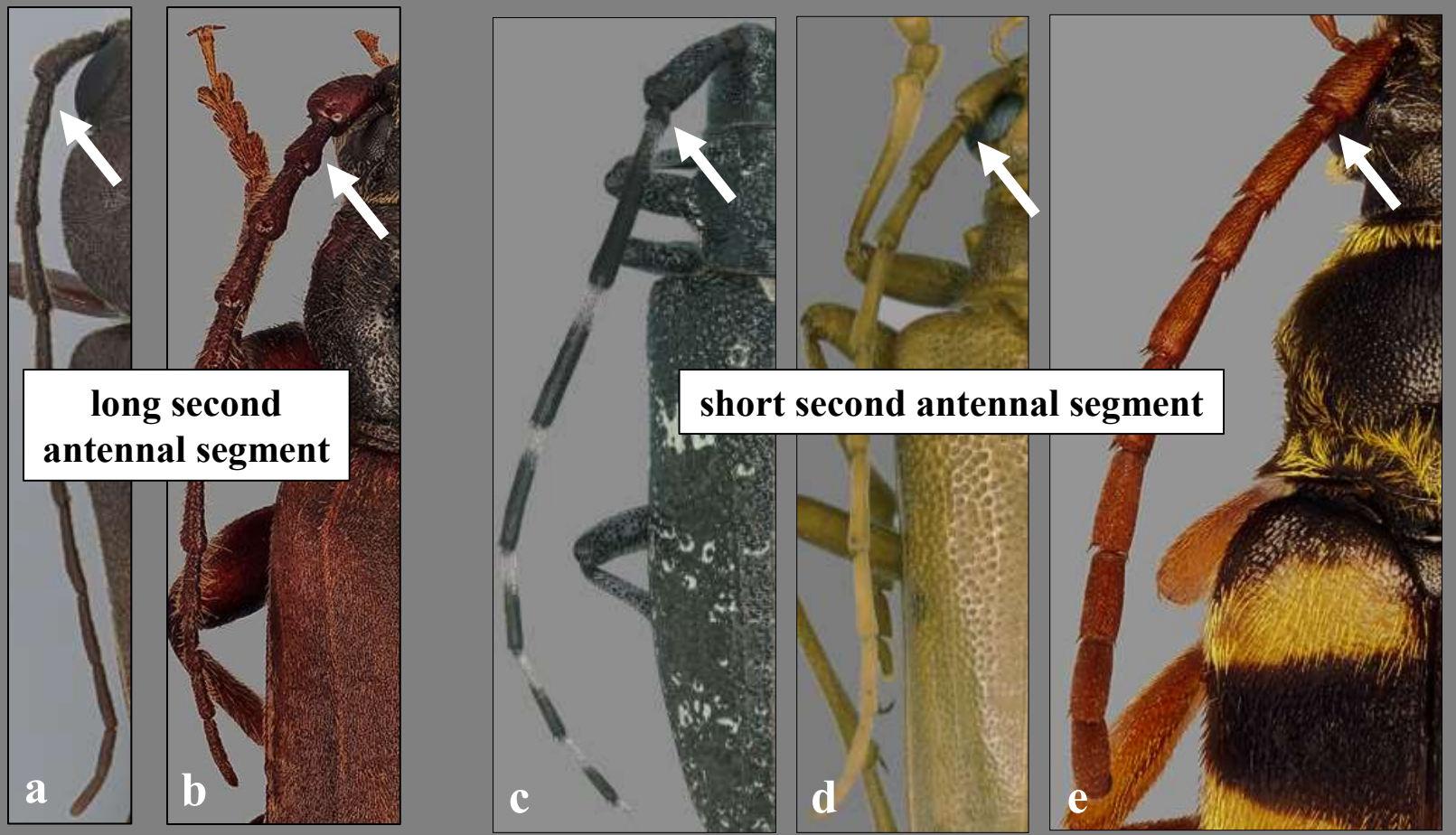
c

Begin key

16 (9): Part I

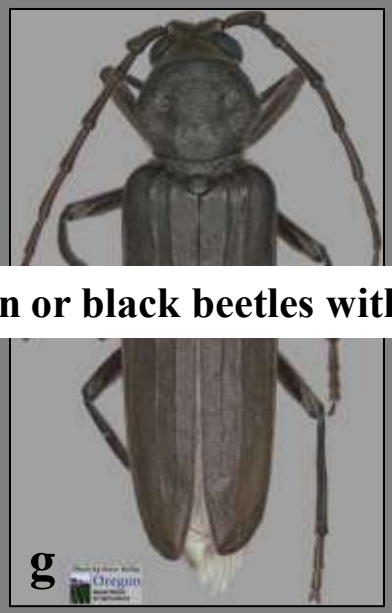
Second antennal segment (indicated by arrow) almost half as long as scape or longer (a-b); brown or black beetles without metallic or brightly contrasting colors (f-j)……..…….....17

Second antennal segment much less than half as long as scape (c-e); body often with metallic or brightly contrasting colors (k-o)…...…27



Begin key

16 (9): Part II



Brown or black beetles without metallic or brightly contrasting coloration

Beetles with metallic or brightly contrasting coloration

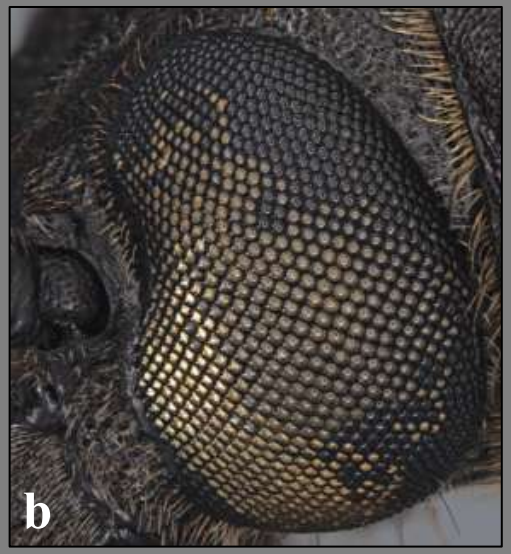
Begin key

17 (16)

Eyes completely divided into separate dorsal and ventral lobes (a)….18

Eyes not divided into separate dorsal and ventral lobes (b-d)……..…22

completely divided eye



emarginate, but not divided eyes

Begin key

18 (17)

Dorsum of pronotum punctate and/or with a few irregular large granules (a-d)……19
Dorsum of pronotum with many small granules (e)…….....…..…..FTT

Begin key

19 (18)

Dorsum of pronotum with irregularly distributed punctures, often with shiny and smooth bare patches (a-c)……..…..20

Dorsum of pronotum finely, densely, more-or-less uniformly punctate (d)……..……....FTT

Begin key

20 (19): Part I

Dorsum of pronotum roughly, rugosely punctate (a); portrait (d)…
……..…*Tetropium fuscum* (Fabricius)*

Dorsum of pronotum <u>not</u> roughly, rugosely punctate (b-c)……21

Begin key

Index

20 (21): Part II

Tetropium fuscum (Fabricius)*

Begin key

21 (20): Part I

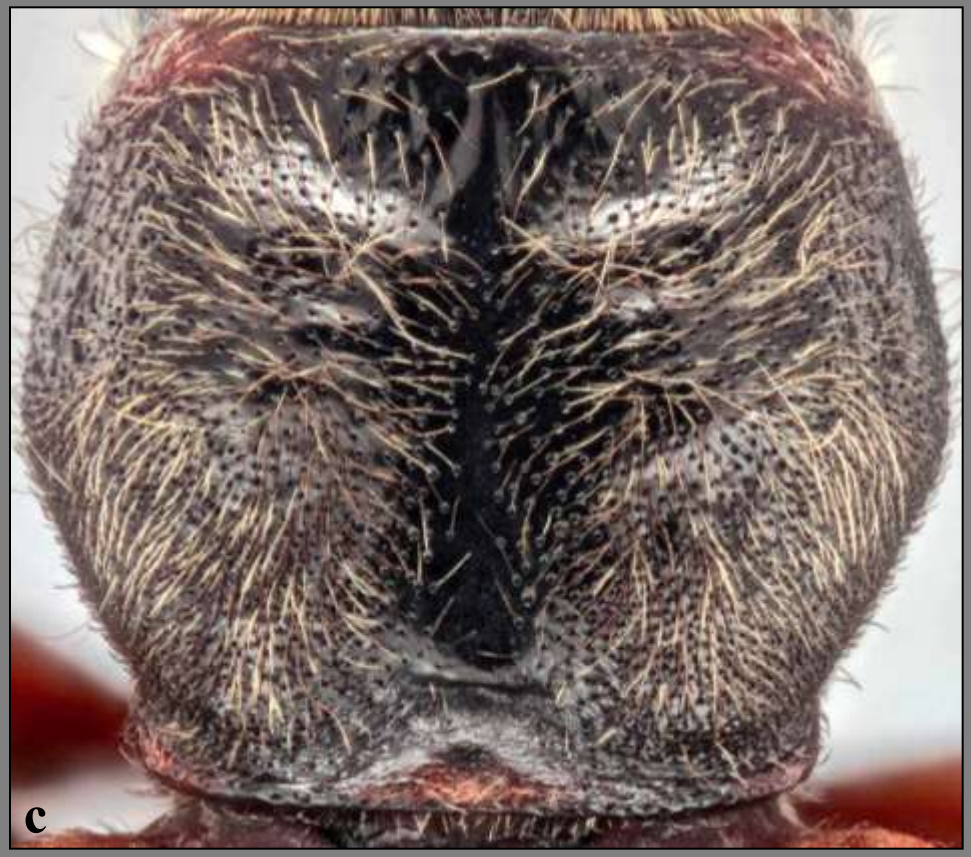
Dorsum of pronotum with punctures in central area larger, more widely spaced, not densely and rugosely punctate in lateral (especially posterolateral) areas, shiny between punctures (a)……..……*Tetropium castaneum* (Linnaeus)*

Begin key

21 (20): Part II

Dorsum of pronotum with smaller and more densely spaced punctures, very dense and more-or-less rugose in lateral (especially posterolateral) areas, dull between punctures in latter regions….*Tetropium cinnamopterum* Kirby

***These pronotal characters can be subtle and variable. Any specimens keying here should be forwarded to a taxonomist as a precaution.**



Begin key

Index

21 (20): Part III

Tetropium castaneum (Linnaeus)*

Begin key

Index

21 (20): Part IV

Tetropium cinnamopterum Kirby

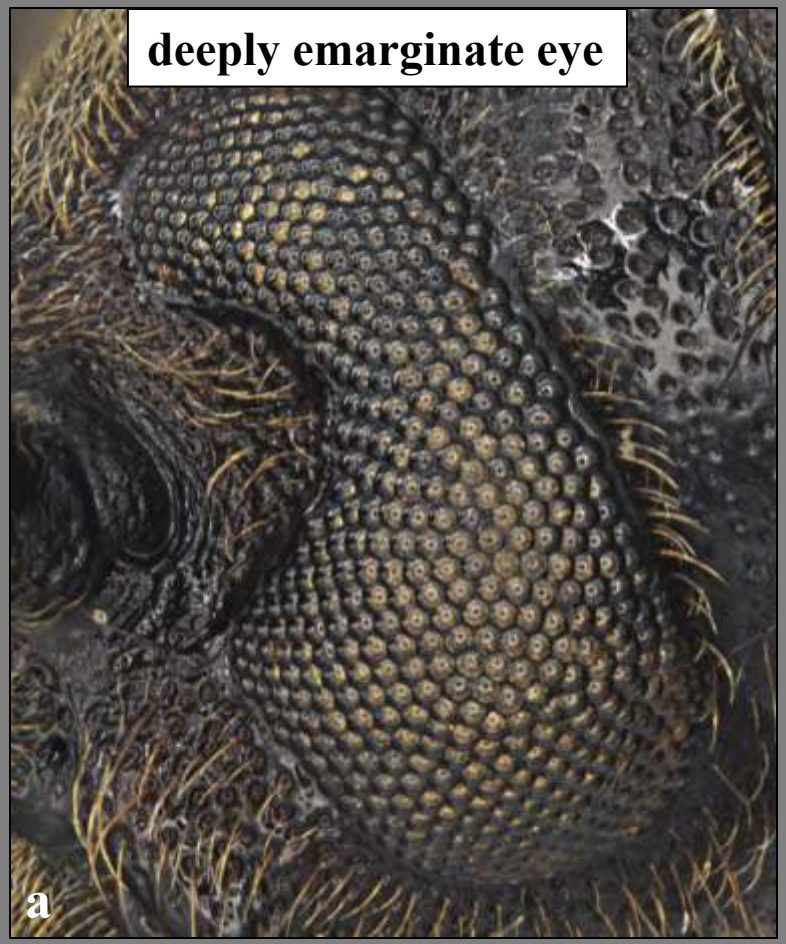
g

Begin key

22 (17): Part I

Eyes deeply emarginate (a); portrait (d)….*Megasemum asperum* (LeConte)

Eyes only shallowly emarginate (b-c)……..…23



Begin key

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22 (17): Part II

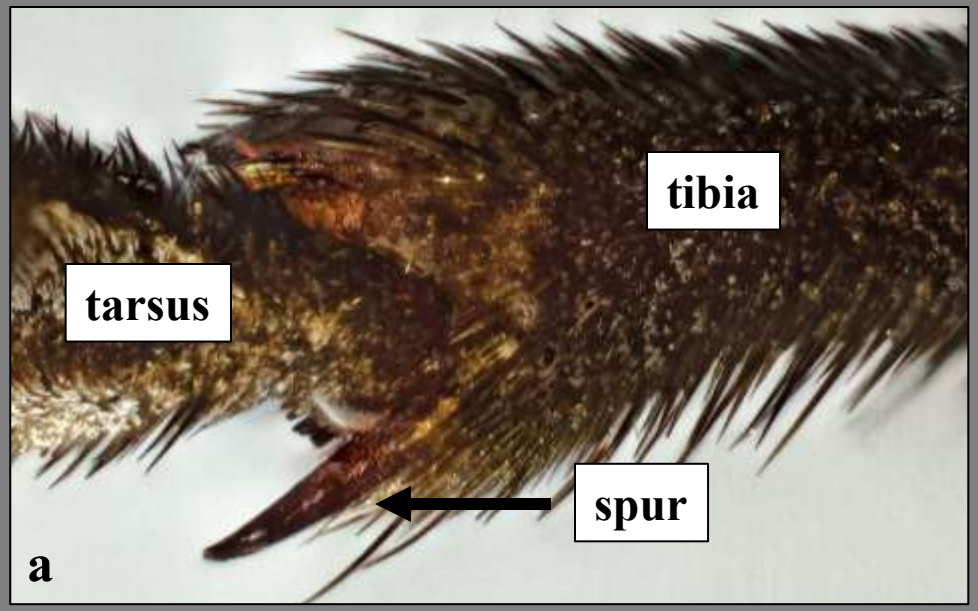
Megasemum asperum (LeConte)

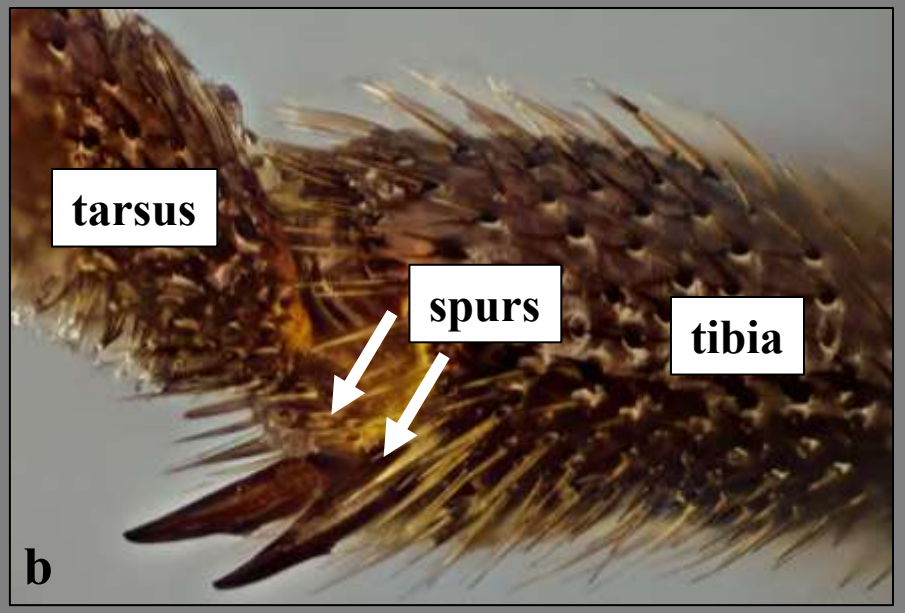
Begin key

23 (22)

Each protibia with one spur at the apex (a)……...24

Each protibia with two spurs at the apex (b)……26





Begin key

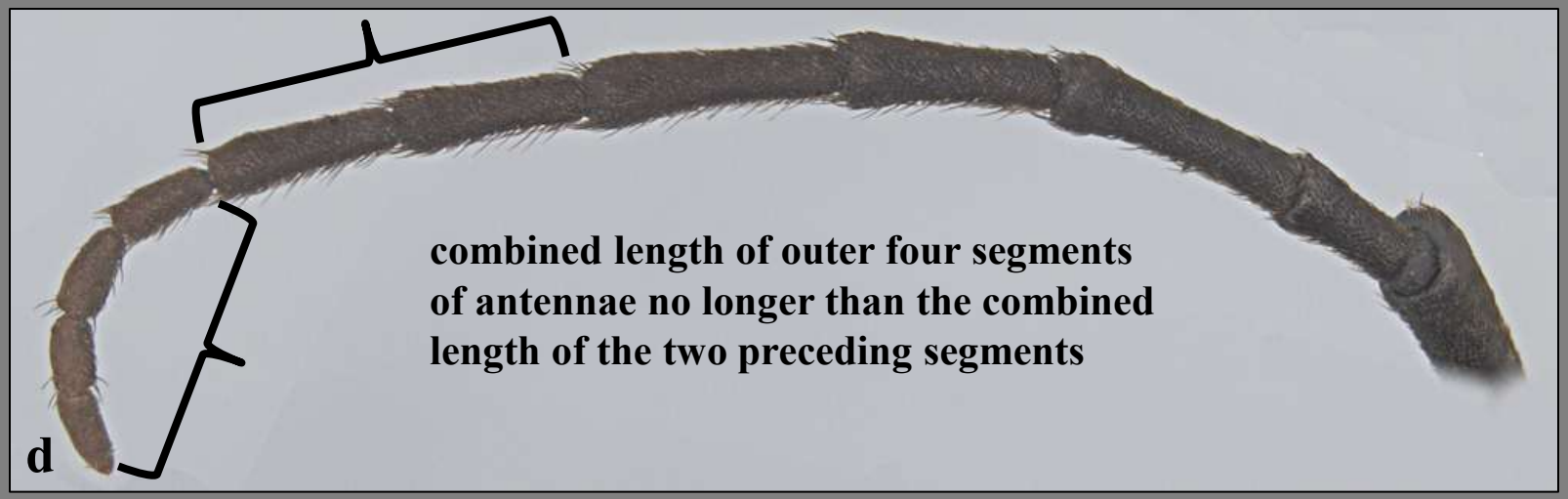
24 (23): Part I

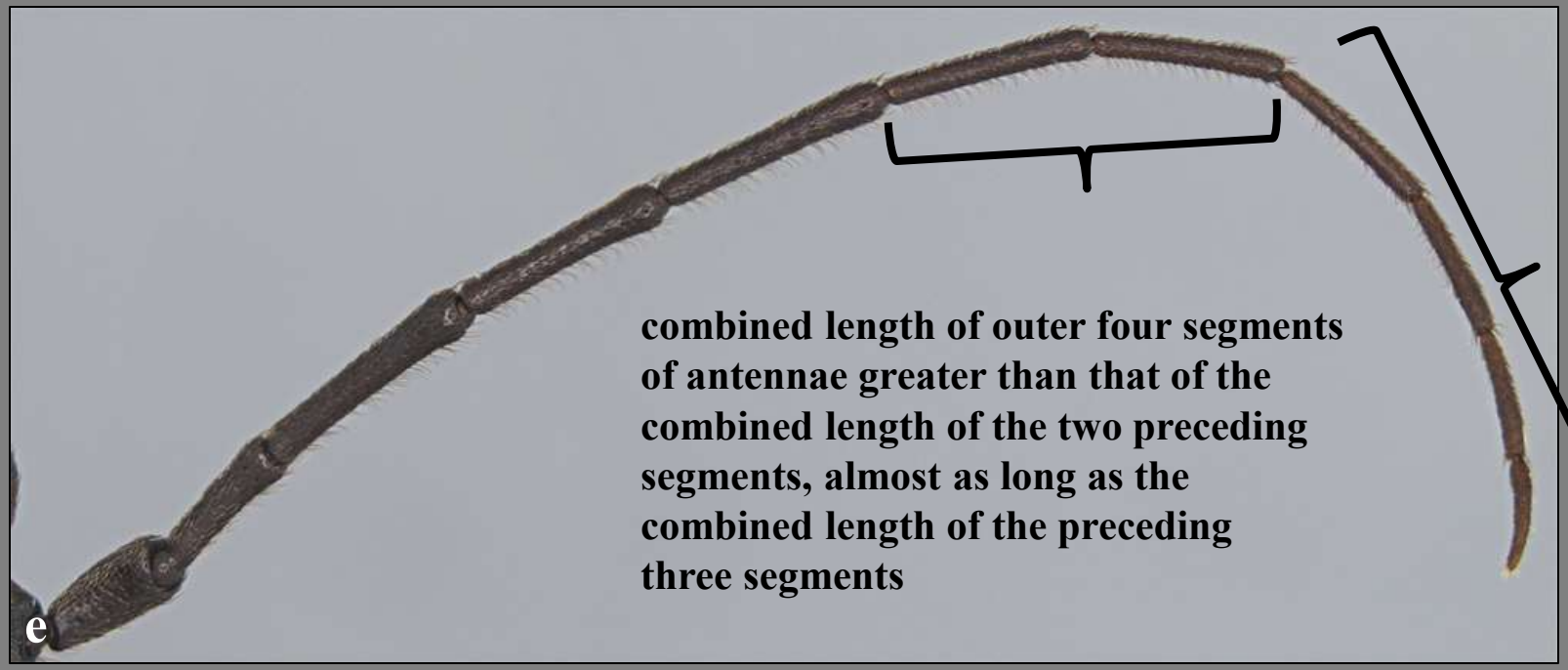
Pronotum distinctly wider than long, with angulate sides (a); combined length of outer four segments of antennae no longer than the combined length of the two preceding segments (d); portrait (f)…….....
……..…….*Arhopalus asperatus* (LeConte)

Pronotum about as wide as long, with rounded sides (b-c); combined length of outer four segments of antennae greater than that of the combined length of the two preceding segments and almost as long as the combined length of the preceding three segments (e)…….25

Begin key

24 (23): Part II





Begin key

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24 (23): Part III

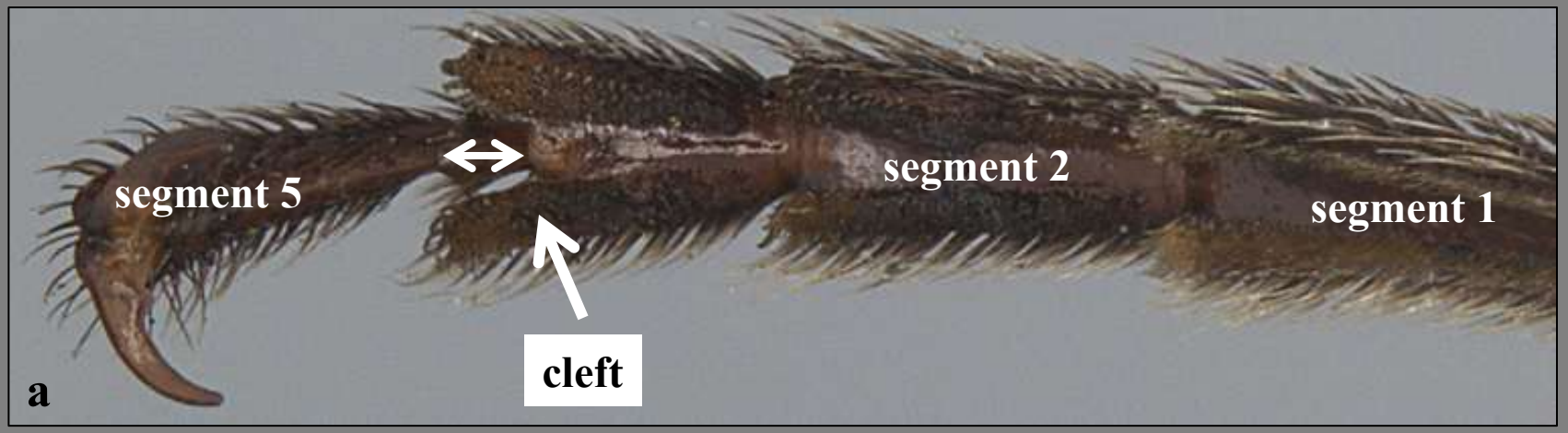
Arhopalus asperatus (LeConte)

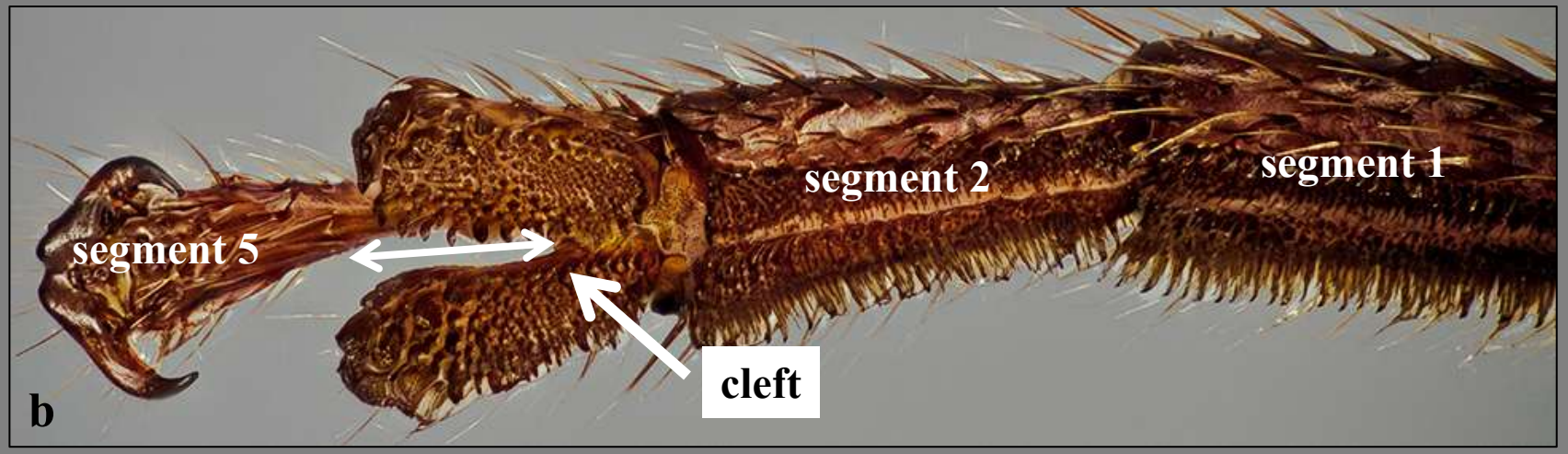
Begin key

25 (24): Part I

Third segment of metatarsus cleft for no more than about half its length (best seen from a ventral position) (a); portrait (c)…*Arhopalus productus* (LeConte)

Third segment of metatarsus cleft almost its entire length (b)……..…FTT





Begin key

Index

25 (24): Part II

Arhopalus productus (LeConte)

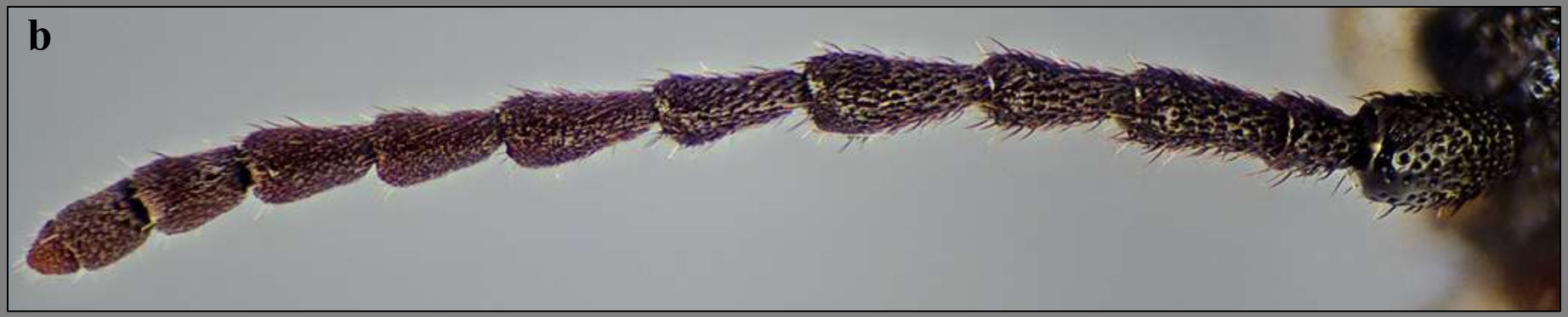
Begin key

26 (23): Part I

Basal antennal segments broad, with antennal segments becoming narrower toward the apex (a); portrait (c)…*Asemum nitidum* LeConte

Basal antennal segments at most slightly broader than the following segments, antennae overall narrow and cylindrical throughout their length (b)……FTT

a



b

Begin key

Index

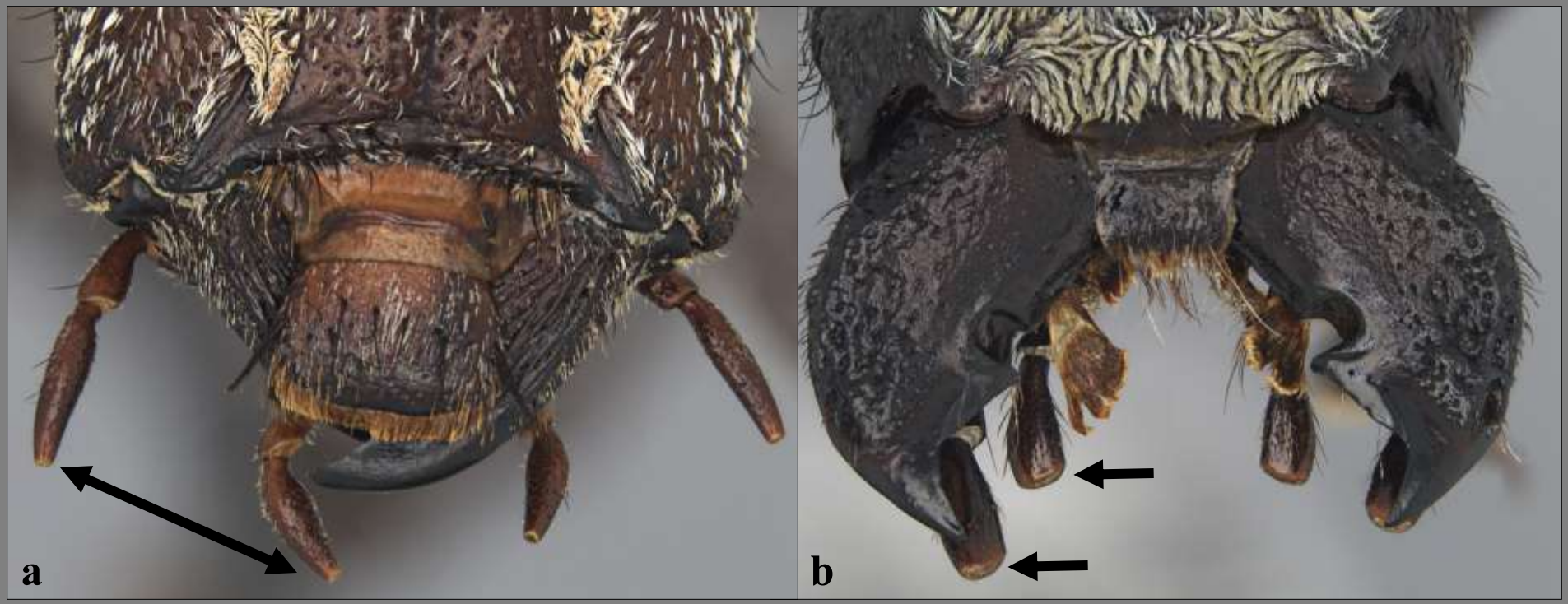
26 (24): Part II
Asemum nitidum LeConte

Begin key

27 (16): Part I

Apex of terminal palpi tapering (a); frons (in profile) ~vertical to posteriorally directed (c)……...……..……28

Apex of terminal palpi exanded and broadly rounded or blunt (b); frons subvertical to anteriorally oblique (d)……..…39



terminal palpi tapering to apex

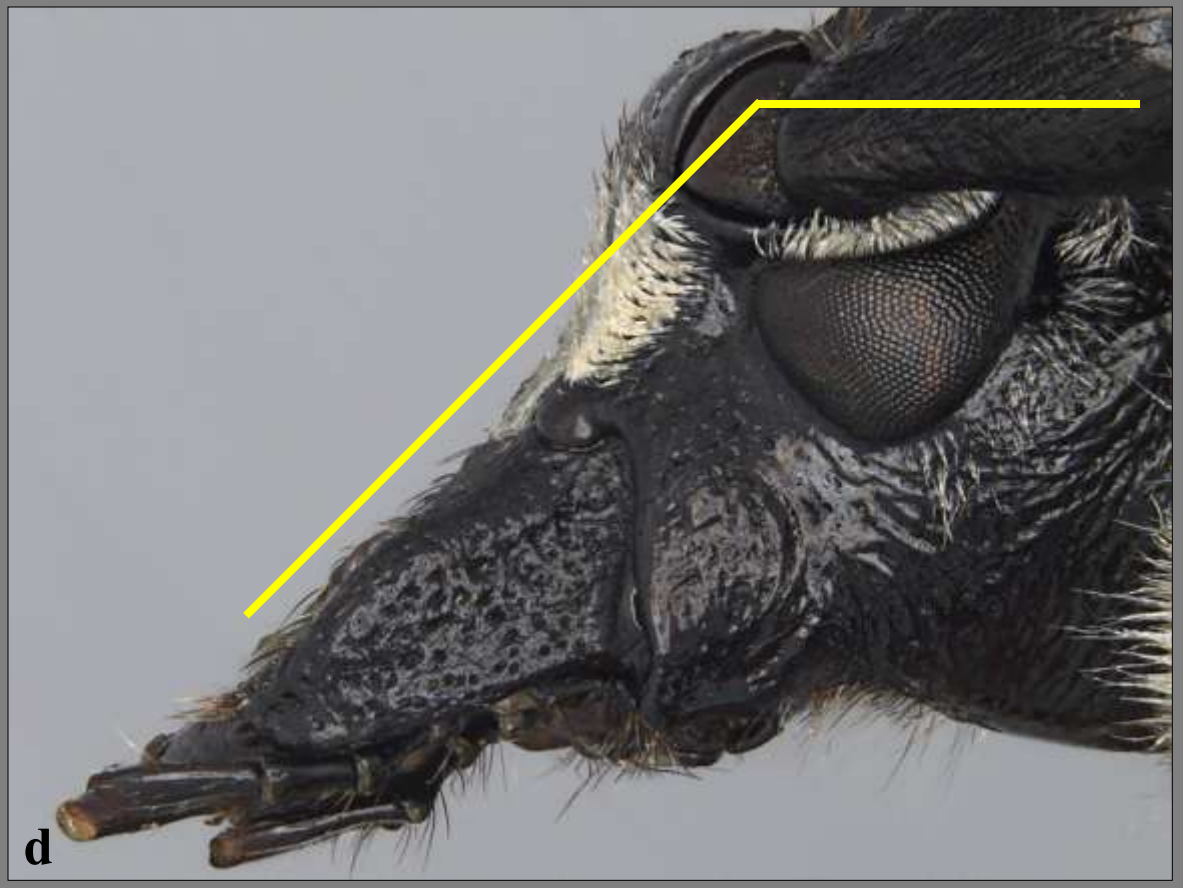
terminal palpi broad at apex

Begin key

27 (16): Part II

frons ~vertical

frons anteriorally oblique



Begin key

28 (27): Part I

Each side of pronotum with tubercles or spines (a-e)……..…28A

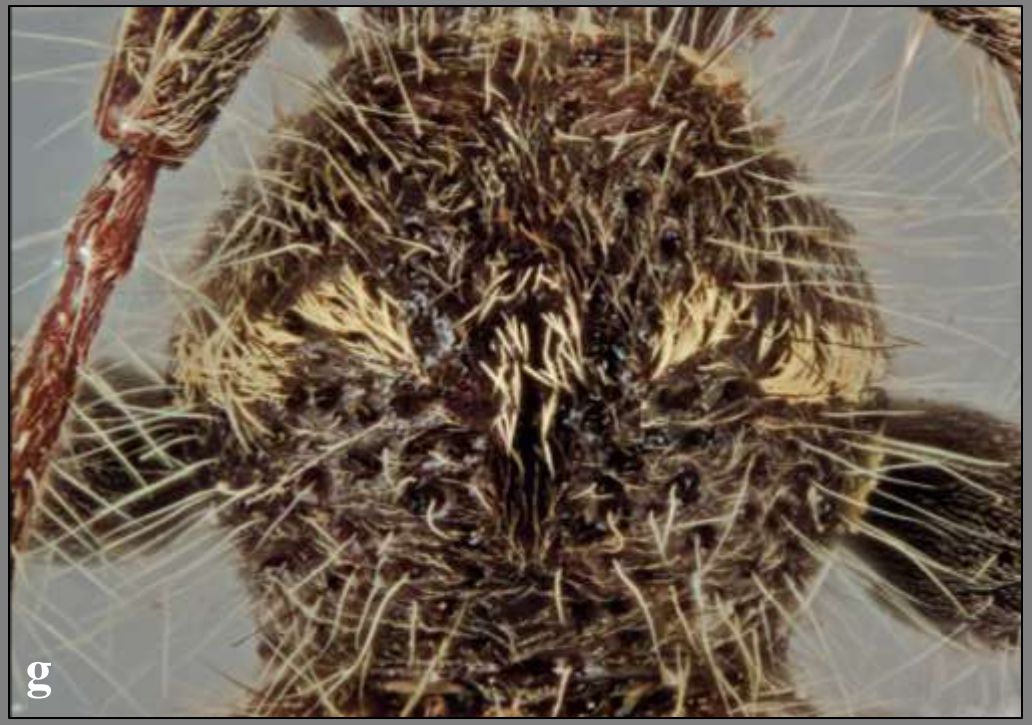
Each side of pronotum convex but without tubercles or spines (f-g)…..FTT

pronota with lateral spines or tubercles

Begin key

28 (27): Part II

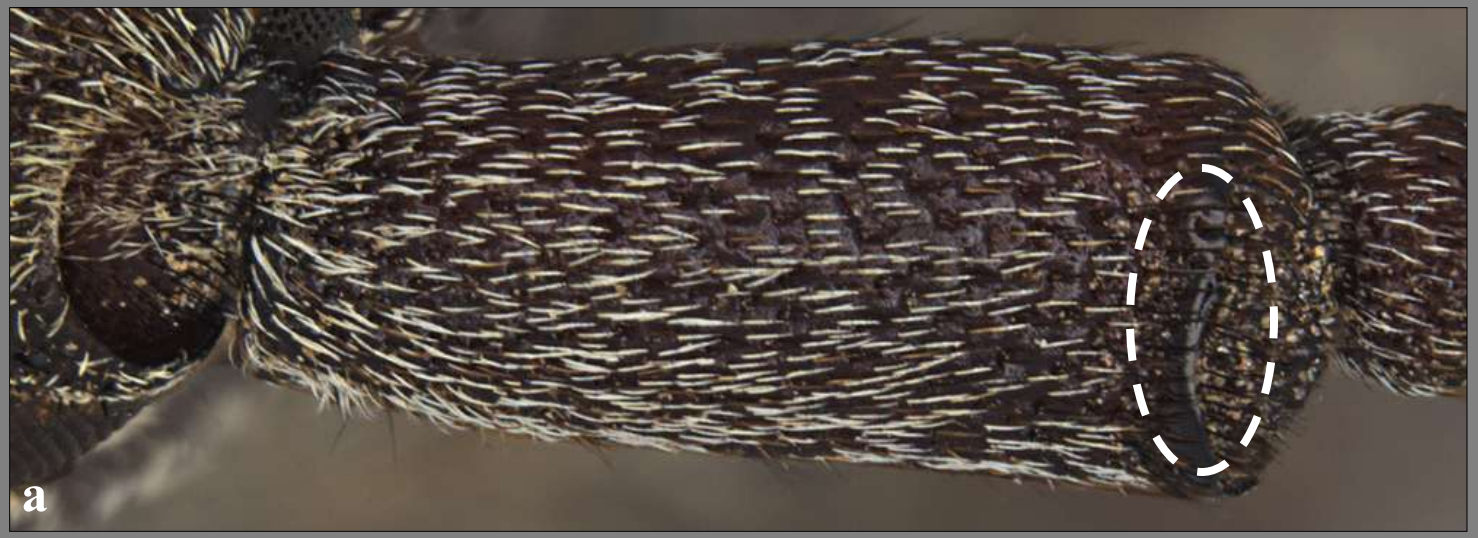
pronota without lateral spines or tubercles



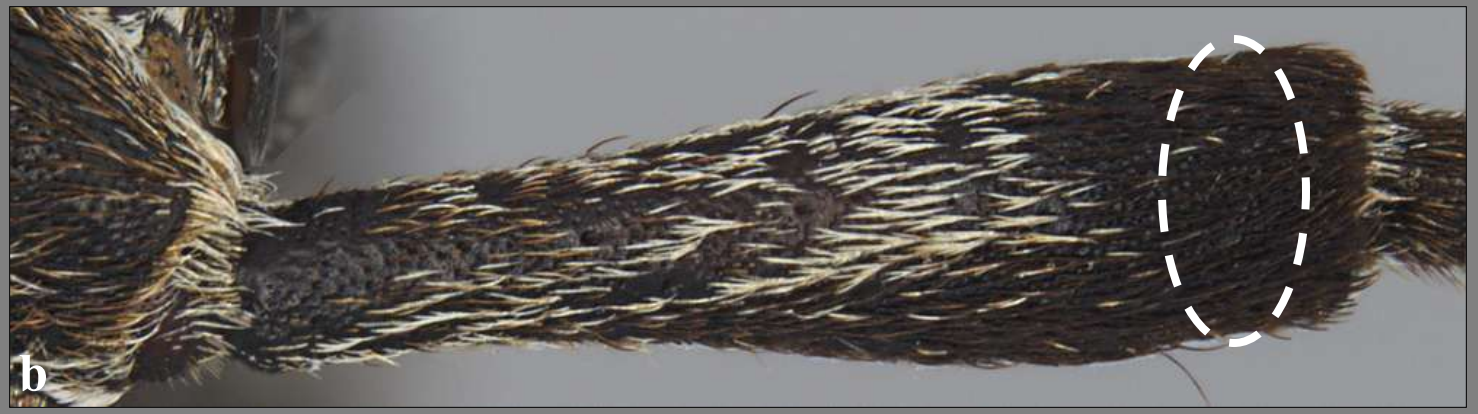
Begin key

28A (28)

Horizontal welt on scape (a)……..……29



No horizontal welt on scape (b)……..…37



Begin key

29 (28)

Elytra <u>either</u> entirely smooth (a) or granulate only in anterior third (b); scutellum <u>may</u> lack pubescence (d);……..…..…29A

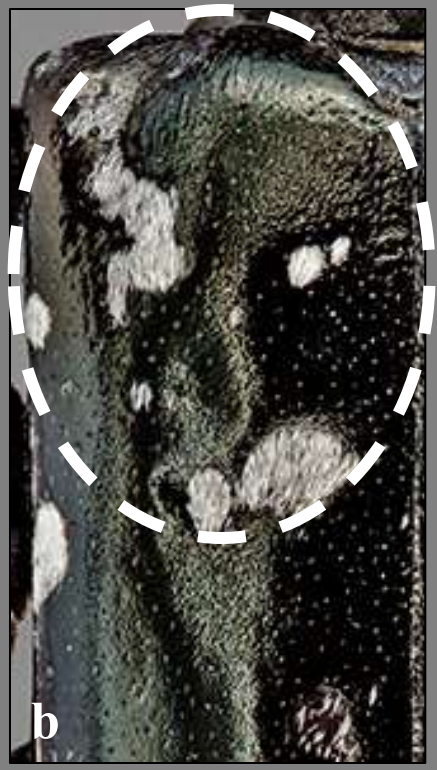
Elytra rugose throughout length (c); scutellum <u>usually</u> with at least some pale pubescence (e-f)…….……..…….30

Begin key

29A (29): Part I

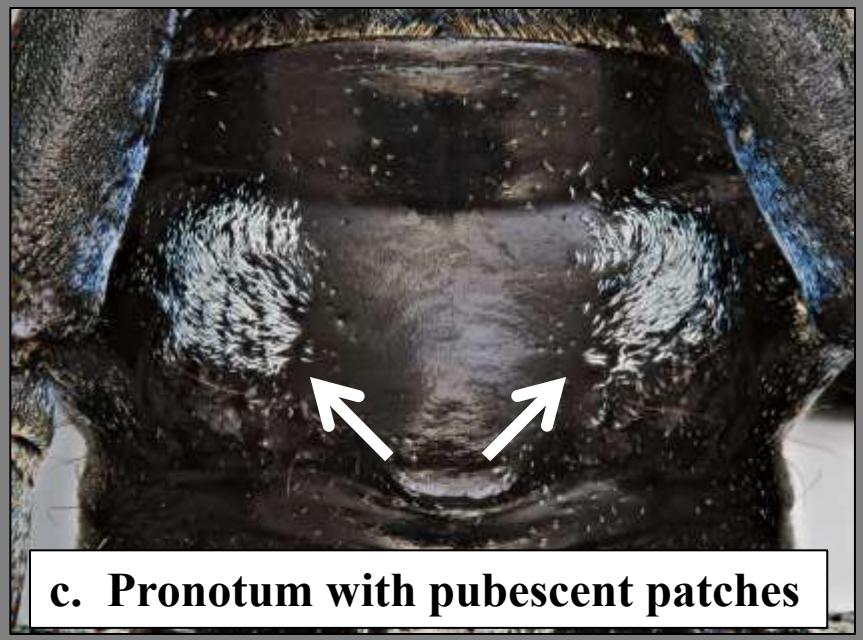
Elytra with granules in anterior third (a); pronotum with a patch of pale pubescence on either side of middle (c); scutellum with dense pubescence (e); portrait (g)……..*Anoplophora chinensis* (Forster)* - Citrus longhorned beetle

Elytra entirely smooth (b); pronotum without patches of pale pubescence (d); scutellum without pubescence (f); portraits (h-i)..……..……..…..*Anoplophora glabripennis* Motschulsky* - Asian longhorned beetle

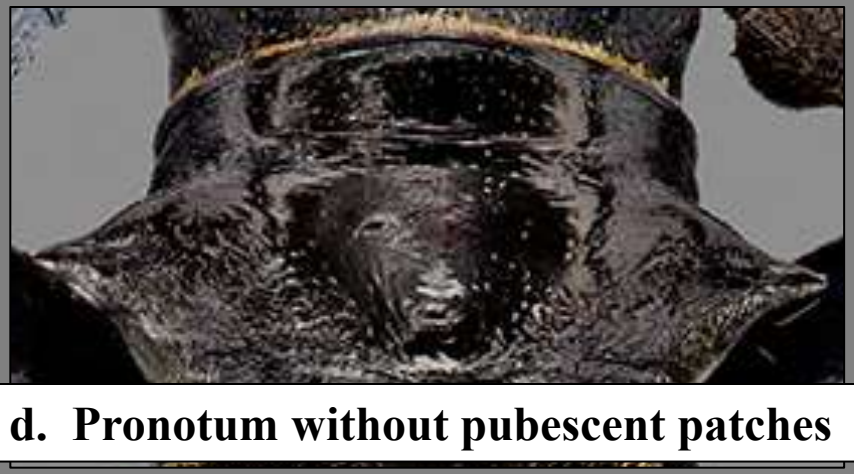


Begin key

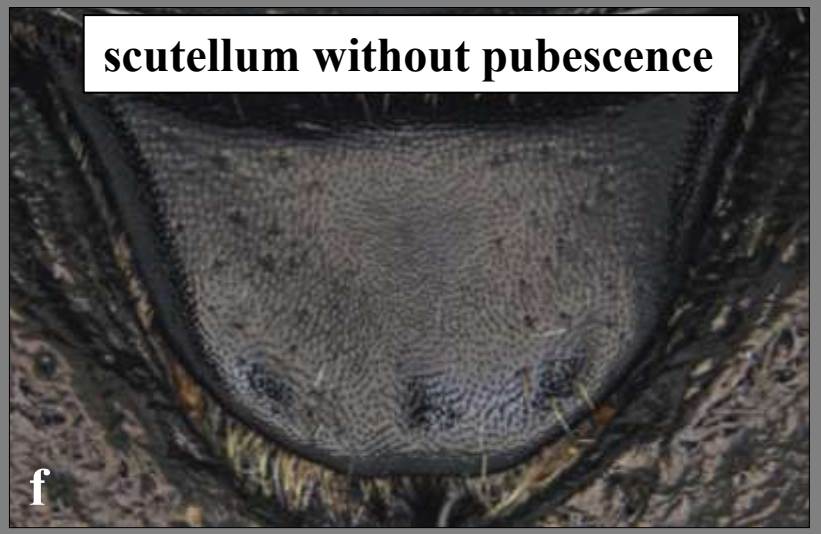
29A (29): Part II



c. Pronotum with pubescent patches



d. Pronotum without pubescent patches



29A (29): Part III

Anoplophora chinensis (Forster)*

g. Male

Begin key

Index

29A (29): Part IV

Anoplophora glabripennis Motschulsky*

***Important note:**
The number and size of spots on the elytra can vary. Also, a yellow-spotted variety exists in Asia, although it is not known from North America.

h. Female

i. Male

Begin key

30 (29): Part I

Elytral apices with small projections at suture (a); portrait (d)……..*Monochamus clamator* LeConte

Elytral apices broadly rounded to suture (b) or slightly truncate (c)……31

Begin key

Index

30 (29): Part II

Monochamus clamator LeConte

Begin key

31 (30)

Base color of elytra reddish brown (a-b)…….32

Base color of elytra black (c-d)…….33

base color of elytra reddish brown

base color of elytra black

Begin key

32 (31): Part I

Elytra with interrupted stripes of black and white pubescence alternating with orange pubescent stripes (a); scutellum densely and completely covered by pubescence (c); pronotum with orange pubescence (e); portrait (g)…….*Monochamus alternatus* Hope*

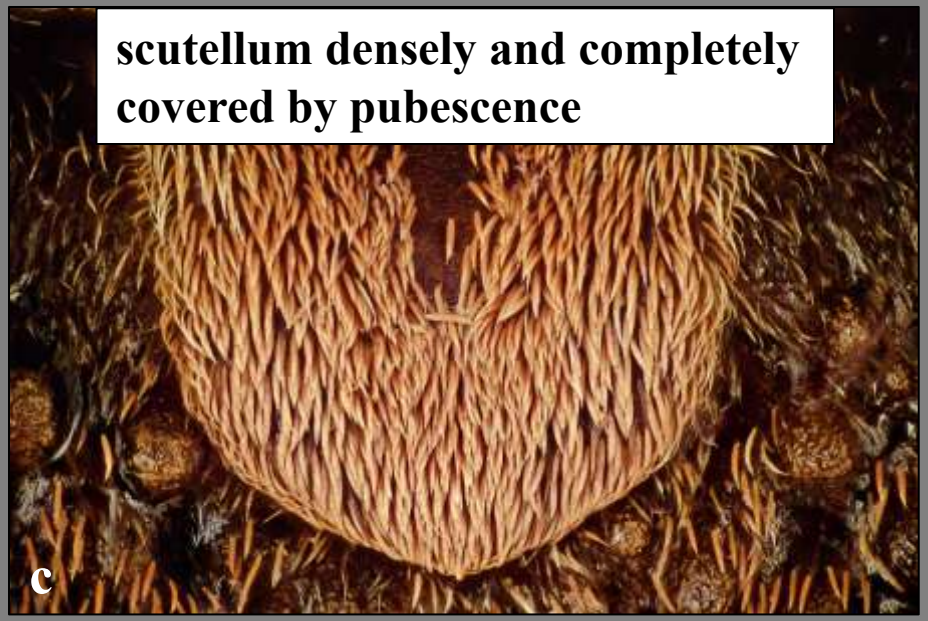
Elytra with interrupted bands of pubescence that is only brown and white (b); scutellum mostly bare of pubescence (d); pronotum with creamy or yellowish pubescence (f); portrait (h)……..*Monochamus obtusus* Casey

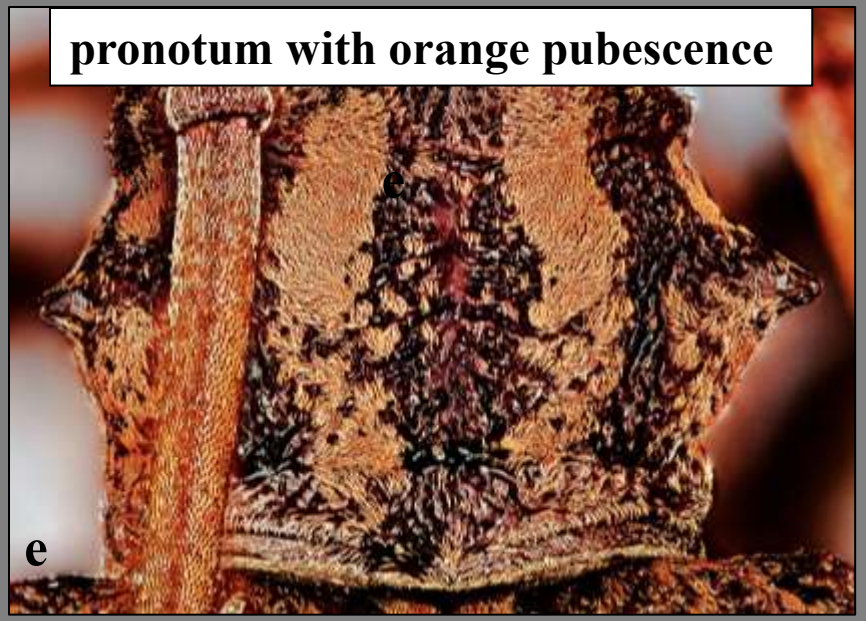
elytra with interrupted stripes of black and white pubescence alternating with orange pubescent stripes

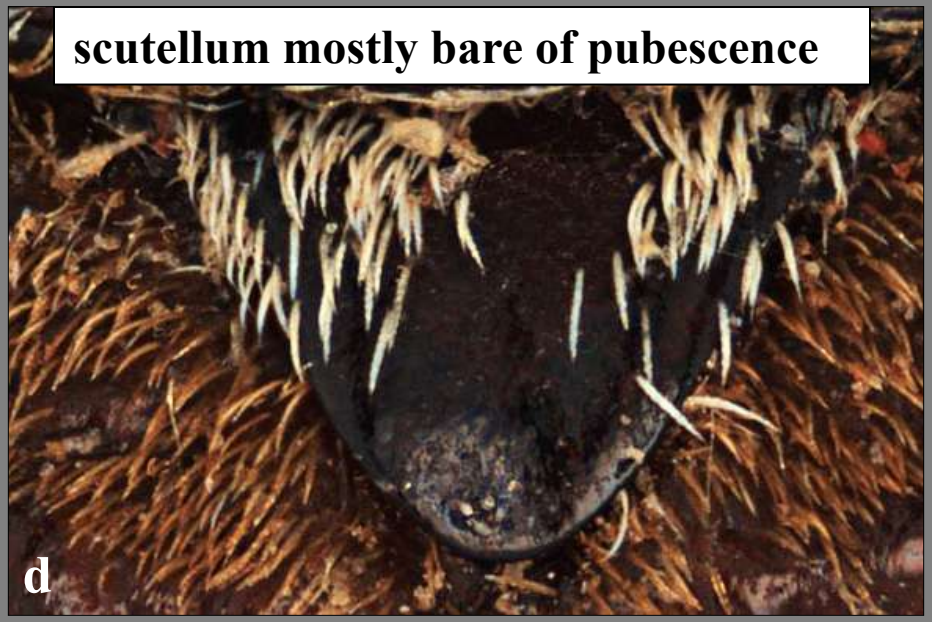
elytra with interrupted bands of pubescence that is only brown and white

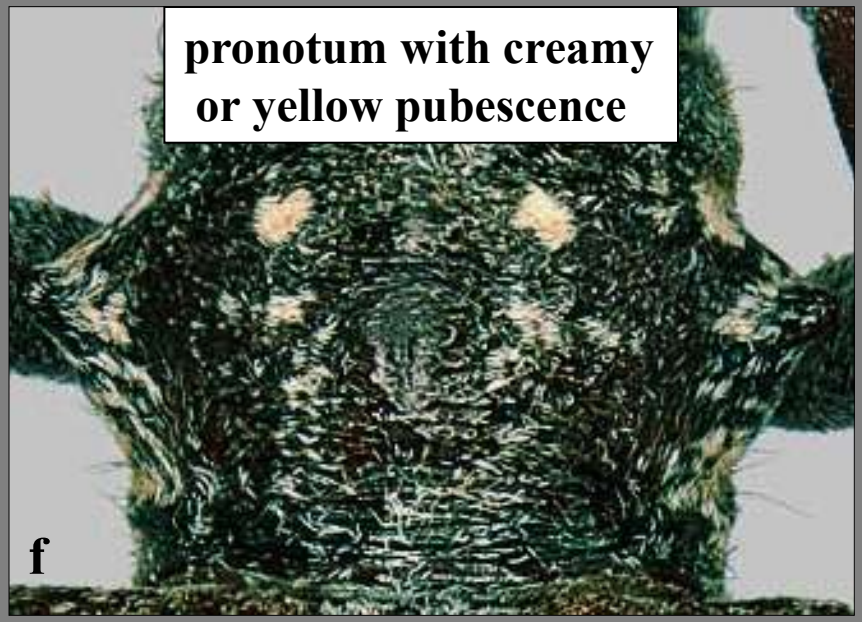
Begin key

32 (31): Part II









Begin key

Index

32 (31): Part III

Monochamus alternatus Hope*

Begin key

Index

32 (31): Part IV

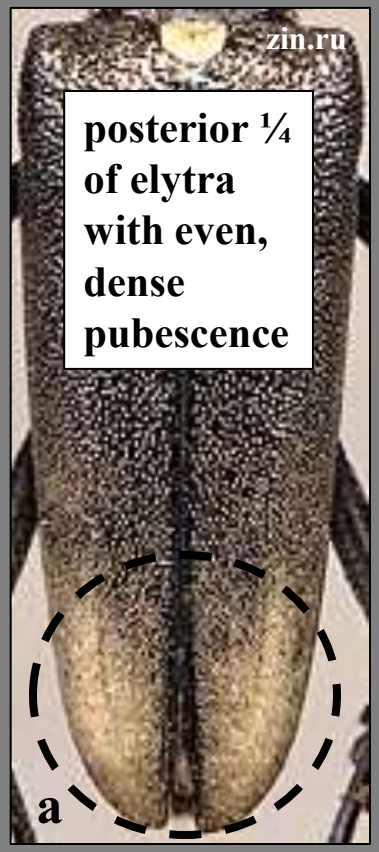
Monochamus obtusus Casey

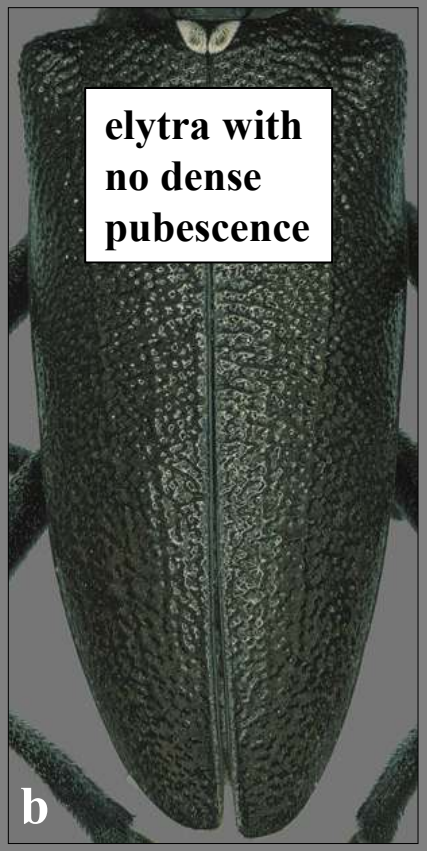
Begin key

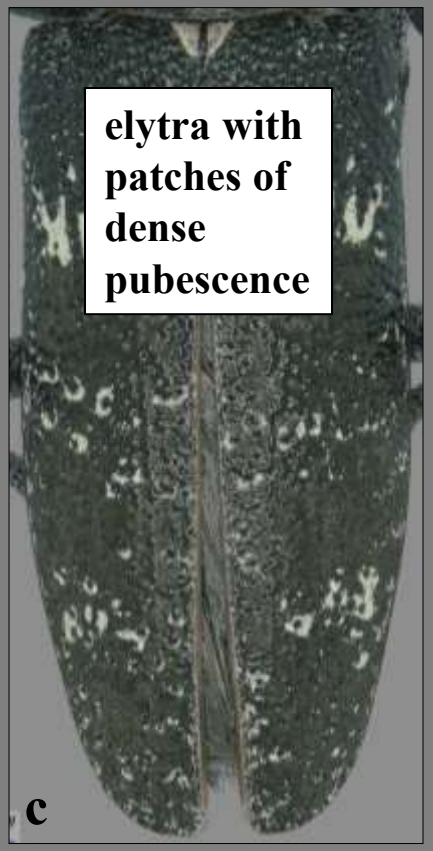
33 (31): Part I

Posterior quarter of each elytron with even coat of dense, fine pubescence (a); scutellum densely and completely covered by pubescence (d); portraits (f-g).....
.....*Monochamus rosenmuelleri* (Cederhjelm) (*M. urussovii* is a synonym)

Elytra without evenly dense, fine pubescence (b-c), although there may be patches of dense pubescence (c); scutellum may be densely and completely covered by pubescence or with a bare anterior spot or narrow bare median line (e)……..34







33 (31): Part II

Monochamus rosenmuelleri (Cedeerhjelm)

f. Female

zin.ru

g. Male

moibiol.ru

Begin key

34 (33): Part I

Scutellum completely covered by dense pubescence (a); elytra with more evenly distributed, sparse, semi-erect, relatively long, curved pubescence (easily seen along lateral margins) (c); portrait (e).....*Monochamus sartor* (Fabricius)*

Scutellum with a bare anterior spot and/or a narrow bare median line (b); elytra with unevenly distributed, prostrate, short pubescence (d).....35

Begin key

34 (33): Part II

Begin key

Index

34 (33): Part II

Monochamus sartor (Fabricius)*

Begin key

35 (34): Part I

Elytra with distinct, deeply impressed, and large punctures only in anterior quarter, punctures in posterior quarter small, shallow, and sparse (a); portrait (c).....*Monochamus saltuarius* (Gebler)*

Elytra with distinct, deeply impressed, and large punctures throughout length (b).....36

Begin key

Index

35 (34): Part II

Monochamus saltuarius (Gebler)*

Begin key

36 (35): Part I

Elytra with large punctures separated by shiny ridges throughout elytral length (a); portraits (c-d).....*Monochamus scutellatus oregonensis* LeConte

Elytra with large punctures separated by shiny ridges almost completely confined to anterior half, punctures in posterior half smaller and not separated by shiny ridges (this characteristic is most easily assessed on either side of the suture) (b); portraits (e-f)..... *Monochamus sutor* (Linnaeus)*

Begin key

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36 (35): Part II

Monochamus scutellatus oregonensis LeConte

c. Female

d. Male

Begin key

Index

36 (35): Part III

Monochamus sutor (Linnaeus)*

Begin key

Index

36 (35): Part III

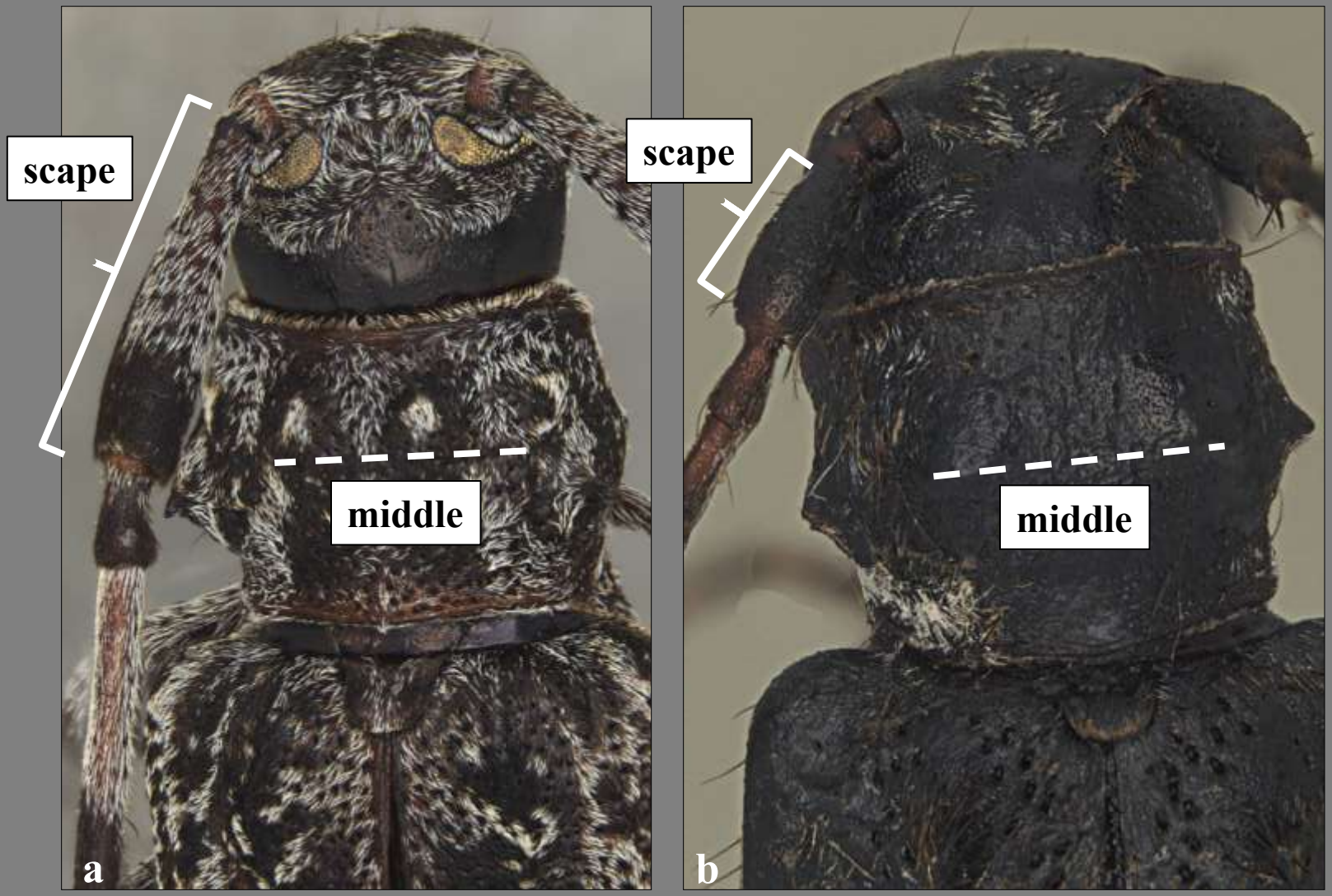
Monochamus sutor (Linnaeus)*

Begin key

37 (28)

When retracted, scape reaches the middle of the pronotum (a)……..…38

When retracted, scape <u>doesn't</u> reach the middle of the pronotum (b)…FTT



Begin key

38 (37): Part I

Anterior region of elytra simply punctured (a); portraits (c, d)
…….*Acanthocinus obliquus* (LeConte)

Anterior region of elytra punctured <u>and</u> granulate (b)…….FTT

Begin key

Index

38 (37): Part II

Acanthocinus obliquus (LeConte)

Begin key

39 (27): Part I

Each side of pronotum with distinct tubercles or spines (a-e)……..…40

Each side of pronotum convex but without distinct tubercles or spines (sides may be angulate, as in figures f-h (f-s)……47

Begin key

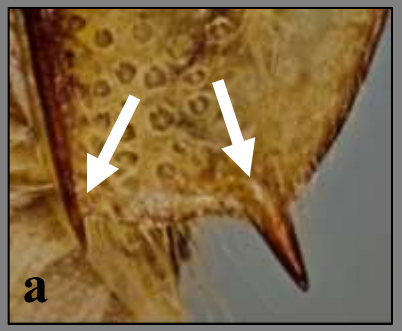
39 (27): Part II

Each side of pronotum convex but without distinct tubercles or spines (sides may be angulate, as in figures f-h).

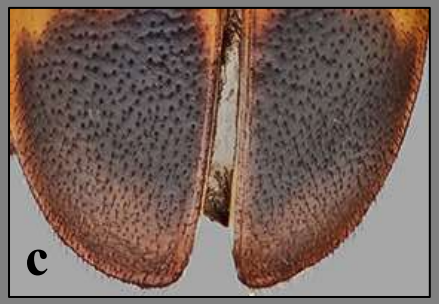
Begin key

40 (39): Part I

Elytral apices each with a pair of spines (a); each antennal segment with a spine and distinctive body colors (see 41d and 41e).....41



Elytral apices each without spines (b-f), although some apices may be concave and pointed at the angles (e-f); antennal segments without spines and color not as in 41c and 41d (g-m).....42



Begin key

40 (39): Part II

Antennal segments without spines and color unlike 41c and 41d.

Begin key

41 (40): Part I

Each elytron with a single small median dot anterior to the post-median dark band (a); portrait (d).....*Phoracantha recurva* Newman*

Each elytron with a band anterior to the post-median dark band, which may be an oblique bar (b) or a sinuate band reaching the suture (c); portrait (e).....*Phoracantha semipunctata* (Fabricius)*

Note: there are many species of cerambycids that have spines on the antennae and with a pair of spines on the apex of the elytra. However, most of these are in the eastern and southwestern United States and none closely resemble these two species of *Phoracantha*.

Begin key

Index

41 (40): Part II

Phoracantha recurva Newman*

Begin key

Index

41 (40): Part III

Phoracantha semipunctata (Fabricius)*

Begin key

42 (40): Part I

Thick longitudinal ridges running length of elytra, elytral color mottled black and yellowish orange-red (a); portrait (e)……*Rhagium inquisitor* (Linnaeus)

Elytra without thick longitudinal ridges running length of elytra, elytral color not mottled (b-d)……..….43

Begin key

Index

42 (40): Part II

Rhagium inquisitor (Linnaeus)

e

Begin key

43 (42)

Body color nearly uniform tan or light brown, usually with a single, small, dark, spot at the midpoint of each elytral margin (a)…….44

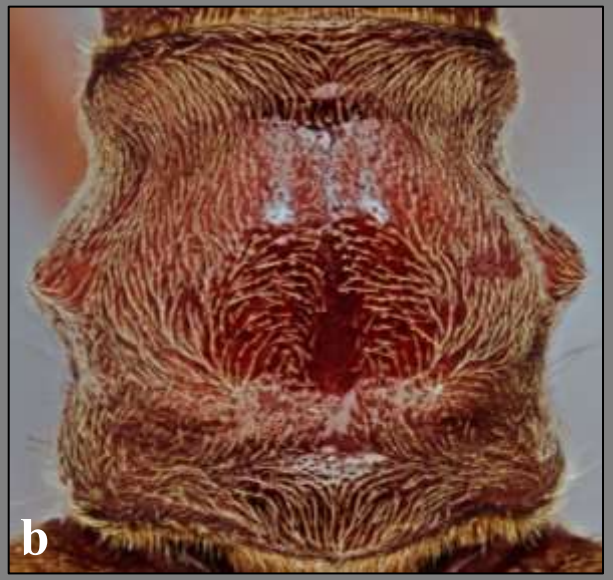
Body color otherwise (b-g)……..FTT

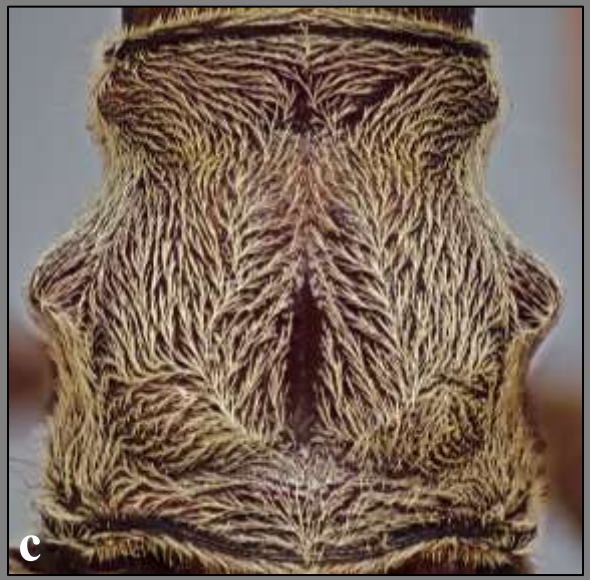
Begin key

44 (43): Part I

Pronotum dorsally coarsely punctate (a) and elytra coarsely, densely punctate in anterior half (d); dorsal surface sparsely pubescent on pronotum (a) and elytra (d) ……..….45

Pronotum dorsally finely punctate (b-c) and elytra finely, more sparsely punctate in anterior half (e-f); dorsal surface densely pubescent on pronotum (b-c) and elytra (e-f)……..……..….FTT





Begin key

44 (43): Part II

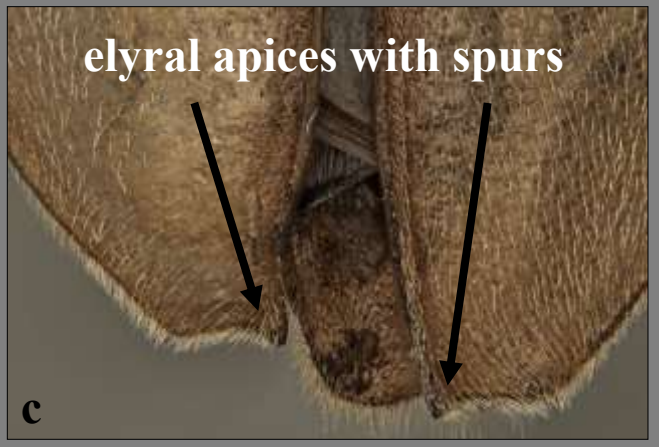
Begin key

45 (44): Part I

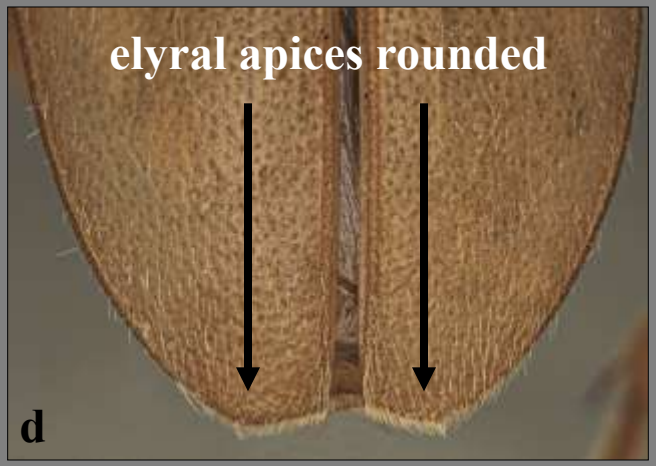
Elytra with reclining pubescence (a), elytral apices often with sutural spurs (c); portrait (e)…*Centrodera spurca* (LeConte)

Elytra with suberect pubescence (b), elytral apices narrowly rounded, without sutural spurs (d)……..…..46

a. Elyra with reclining pubescence.



b. Elyra with suberect pubescence



Begin key

Index

45 (44): Part II

Centrodera spurca (LeConte)

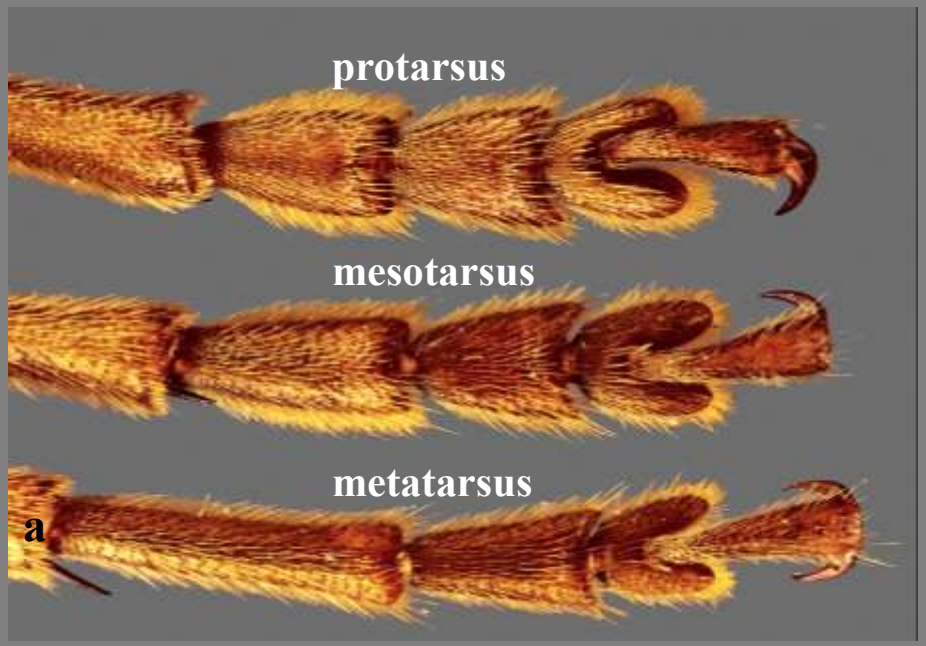
e

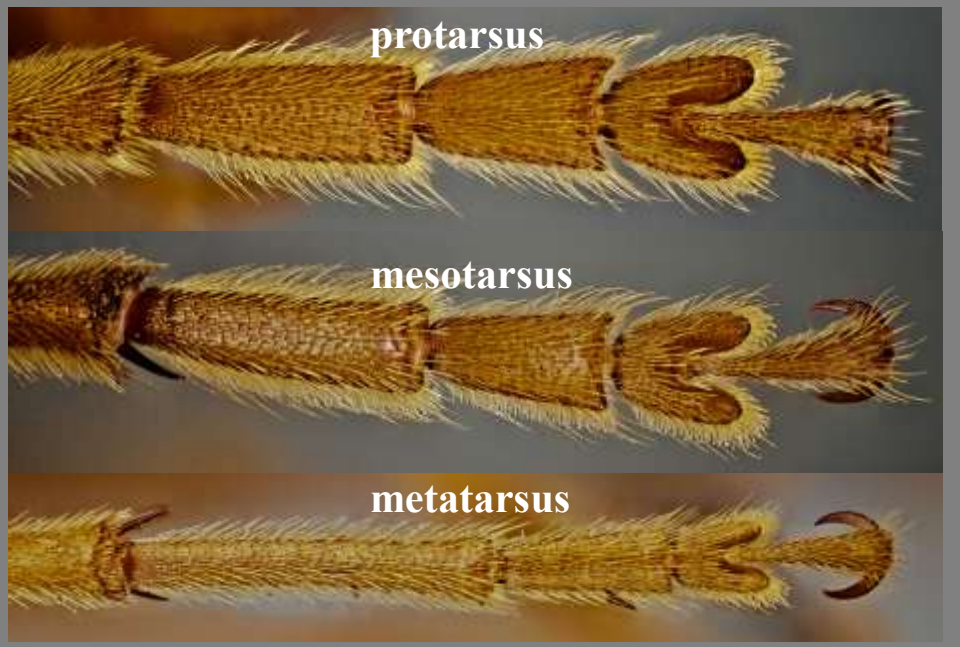
Begin key

46 (45): Part I

Pro- and metatarsi short and broad (a); portrait (c)……..…*Centrodera dayi* Leech

Pro- and metatarsi elongate (b)……..FTT





Begin key

Index

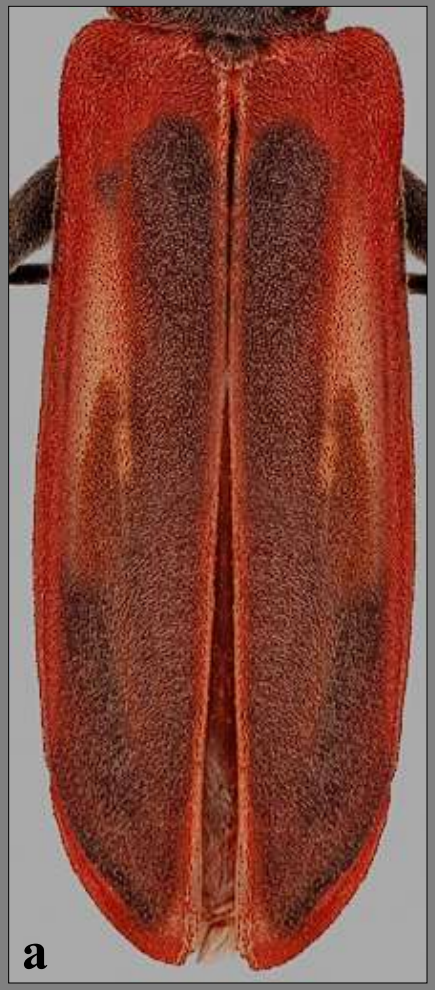
46 (45): Part II
Centrodera dayi Leech

Begin key

47 (39): Part I

Elytra black with reddish-orange margins (a); portrait (l)……
…… *Holopleura marginata* LeConte

Elytral color otherwise (b-k)……..…48



Begin key

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47 (39): Part II
Holopleura marginata LeConte

Begin key

48 (47): Part I

Antennae distinctly banded and with segments 4-8 triangular (a); portraits (e-f)…….*Stictoleptura canadensis* (Olivier)

If antennae distinctly banded, no segments are triangular (b), otherwise unbanded (c-d)……..……49

Begin key

Index

48 (47): Part II

Stictoleptura canadensis (Olivier)

Begin key

49 (48)

Elytra not strongly constricted behind middle (a-c)……..50

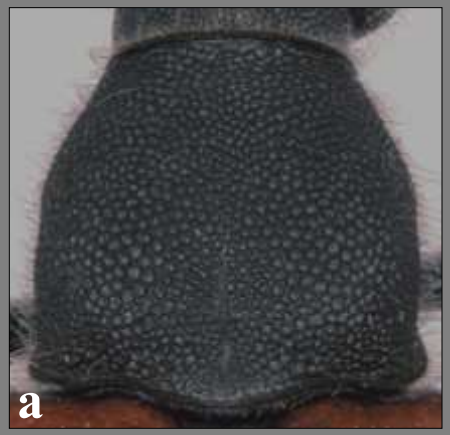
Elytra strongly constricted behind middle (d)..……..FTT

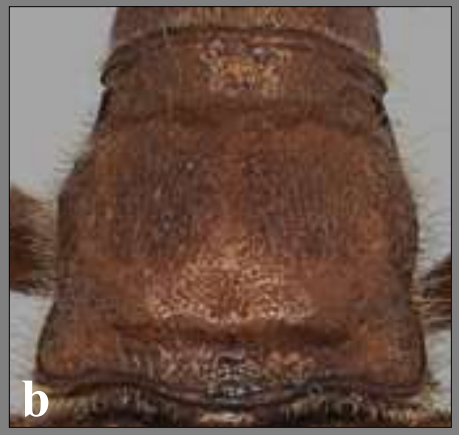
Begin key

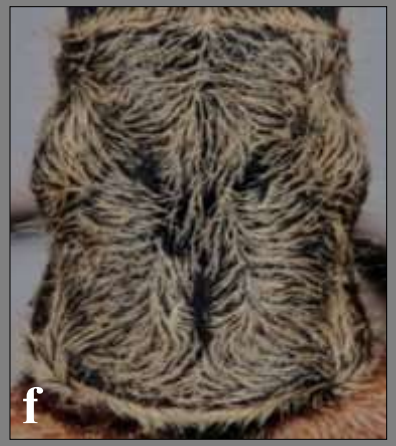
50 (49)

Pronotum bell-shaped, with posterior margin broader than anterior margin (a-c)……..51

Pronotum widest at middle, with anterior and posterior margins about the same width (d-f)……69







Begin key

51 (50)

Posterior angles of pronotum sharp, at least partially covering anterior margins of humeri (a-c)……..……..52

Posterior angles of pronotum not sharp, covering none of anterior anterior margins of humeri (d-f)…….61

Begin key

52 (51)

Elytra pale with dark bands or blotches (a-d)…….....53

Elytra more or less one color (e-i) or with color on margins contrasting with color on central area (j-k)……..…57

Begin key

53 (52)

Elytral apex emarginate, with outer angle pointed (a)……..54

Elytral apex rounded (b) or truncate (c), outer angle not pointed…..55

Begin key

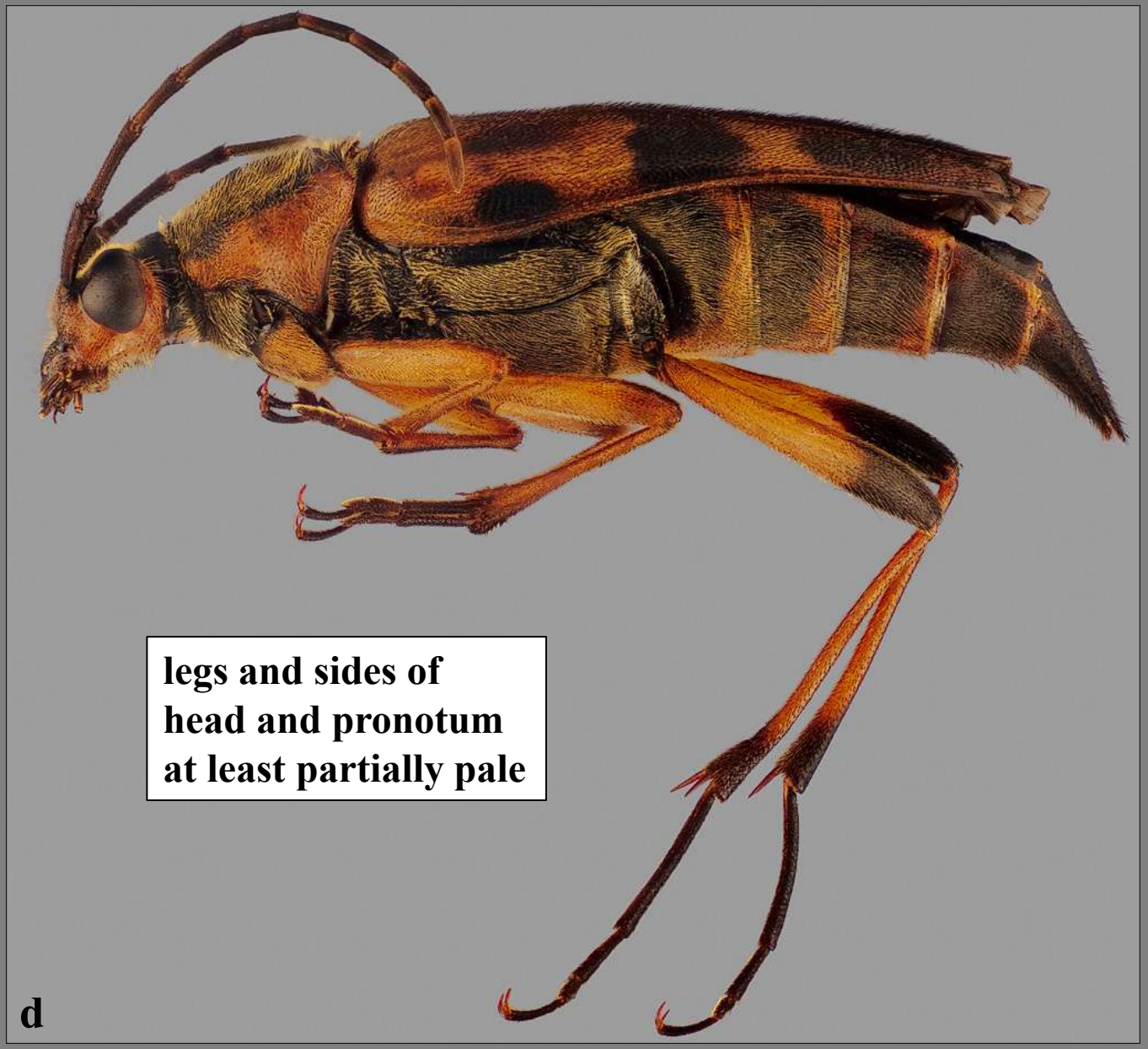
54 (53): Part I

Elytron normally with a large, dark oblique spot in anterior half and with a large, dark postmedian band (a); legs and sides of head and pronotum at least partially pale (d); portrait (f)……..*Leptura obliterata* (Haldeman)

Elytron without an oblique spot in anterior half and without a post-median band; legs, head, and pronotum all dark (b-c, e)…….FTT

Begin key

54 (53): Part II



legs and sides of
head and pronotum
at least partially pale

d

Begin key

54 (53): Part III

legs and sides of head and pronotum all dark

e

Begin key

Index

54 (53): Part IV

Leptura obliterata (Haldeman)

Begin key

55 (53)

Elytral apex narrowly rounded (a); body stout (d-e)……..……56

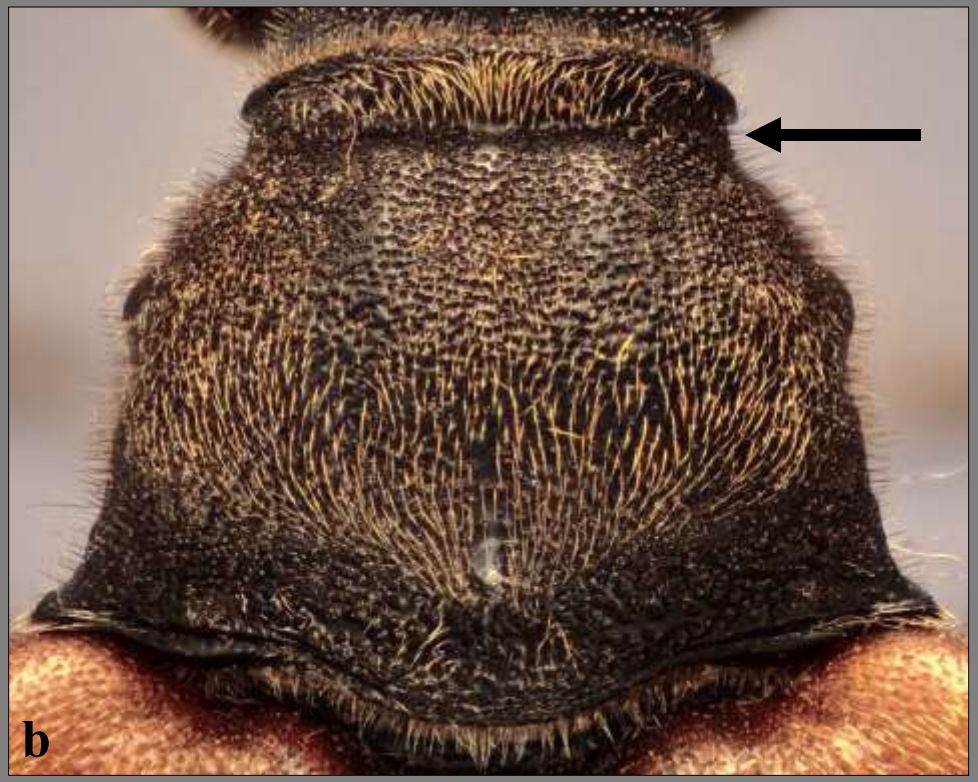
Elytral apex broadly rounded or truncate (b-c); body narrow (f-g)…..FTT

Begin key

56 (55): Part I

Pronotum with long pubescence; deep , horizontal groove just behind anterior margin (a); portrait (c)…….*Judolia instabilis* (Haldeman)

Pronotum with short pubescence; deep , horizontal groove well behind anterior margin (b)……..…….FTT



Begin key

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56 (55): Part II

Judolia instabilis (Haldeman)

Note: In this species, the dark spots on the elytra vary greatly in their size and shape.

Begin key

57 (52)

Elytral apex rounded (a) or slightly truncate (b)……....58

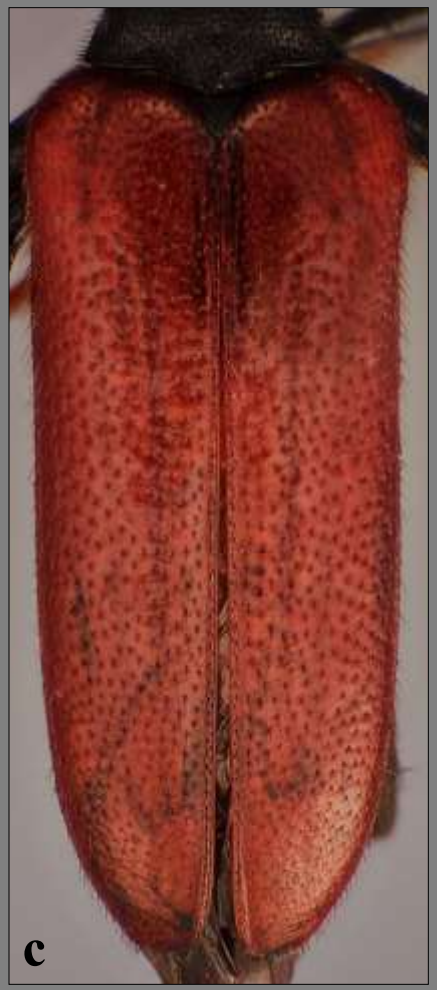
Elytral apex strongly squarely (c) or obliquely truncate (d)……..FTT

Begin key

58 (57)

Elytra dark (a-b)……..59

Elytra reddish-brown (c) or dark with pale margins (d)……..FTT



Begin key

59 (58)

Body color not metallic (a)……..…..……..60

Body color metallic bluish or greenish (b)……..FTT

a

b

Begin key

60 (59): Part I

Tempora strongly rounded (a); portrait (c)…*Grammoptera subargentata* (Kirby)

Tempora oblique or more-or-less parallel (b)……..……FTT

Begin key

60 (59): Part II

Index

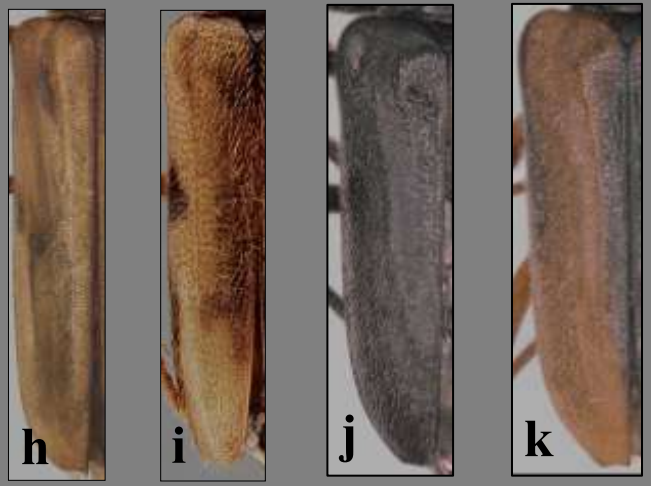
Grammoptera subargentata (Kirby)

Begin key

61 (51)

Elytra banded or with large spots (a-g)……62

Elytra without bands or large spots (h-k)……68

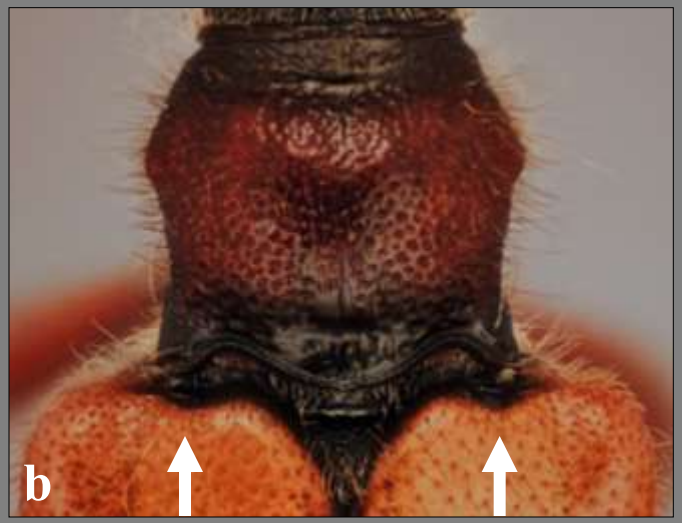


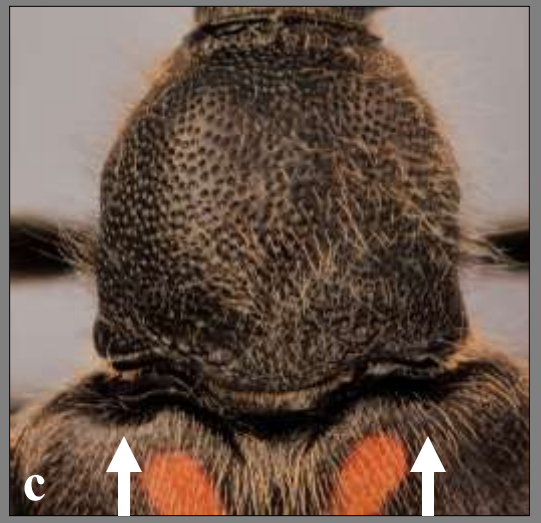
Begin key

62 (61)

Pronotum with posterior margin weakly sinuate; anterior margin of elytron not sinuate (a)……..…….……..…63

Posterior margin of pronotum strongly sinuate; anterior margin of elytron sinuate (b-c)……..……..……64



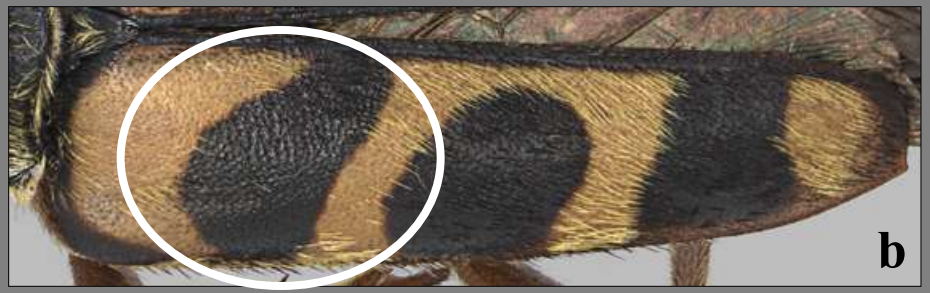


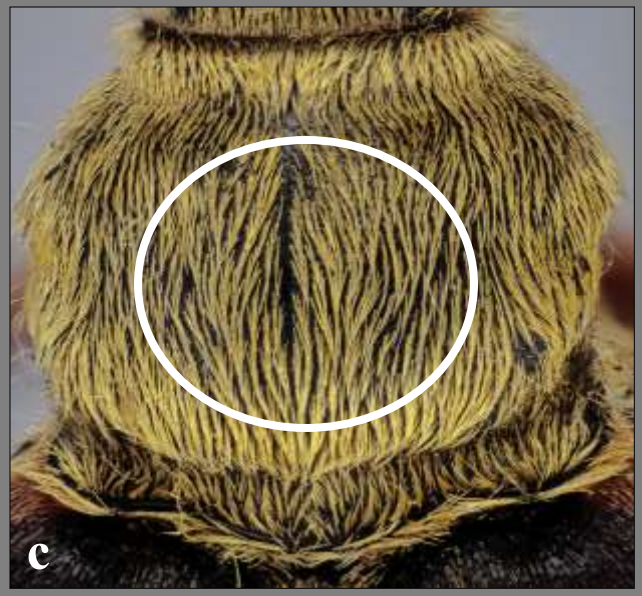
Begin key

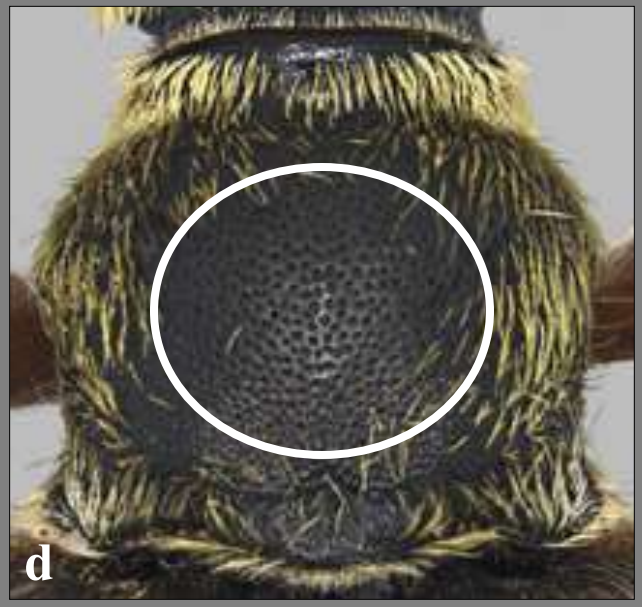
63 (62): Part I

Anterior dark elytral band transverse (a); pronotum with center obscured by dense pubescence (c); portrait (e)…….*Strophiona laeta* (LeConte)

Anterior dark elytral band oblique (b); center of pronotum with at most sparse pubescence (d)……..……..FTT







Begin key

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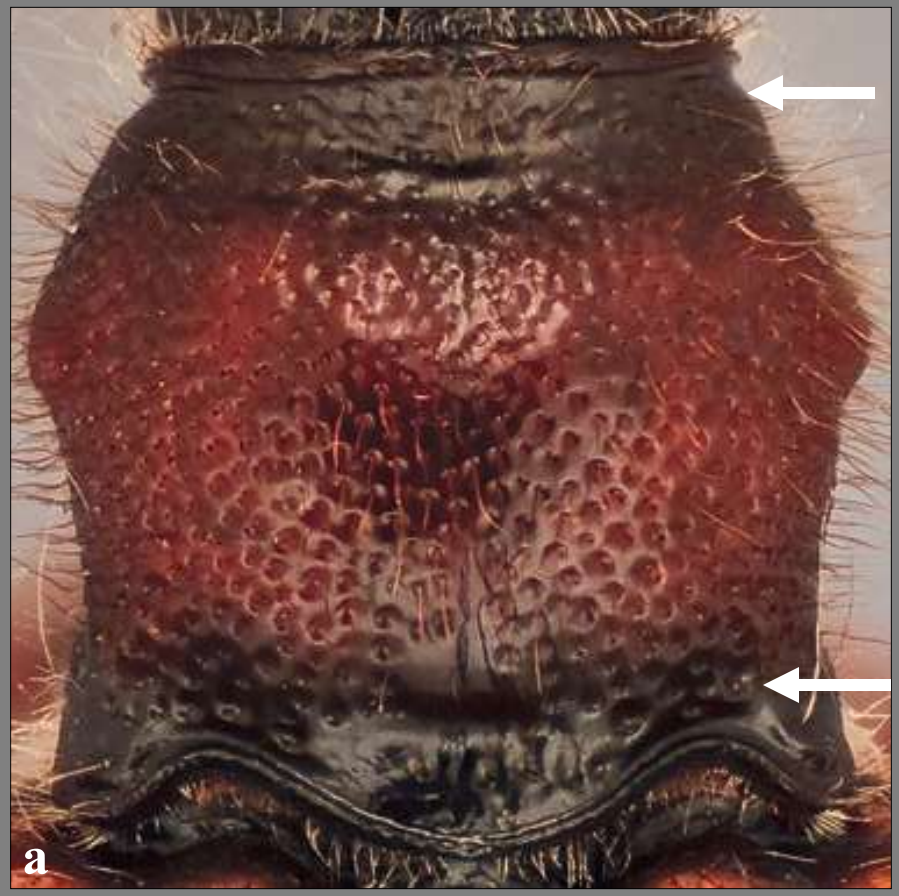
63 (62): Part II
Strophiona laeta (LeConte)

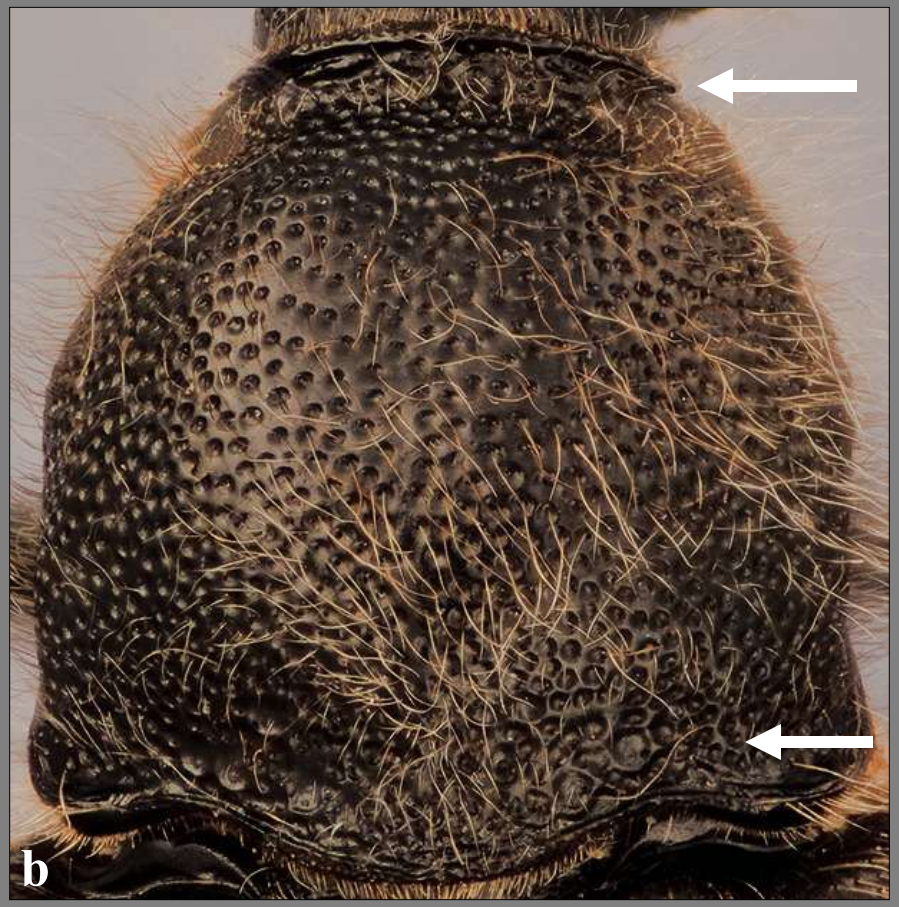
Begin key

64 (63)

Pronotum deeply and broadly impressed at both anterior and posterior margins (a)……..……...…65

Pronotum at most shallowly impressed at both anterior and posterior margins (b)……...FTT



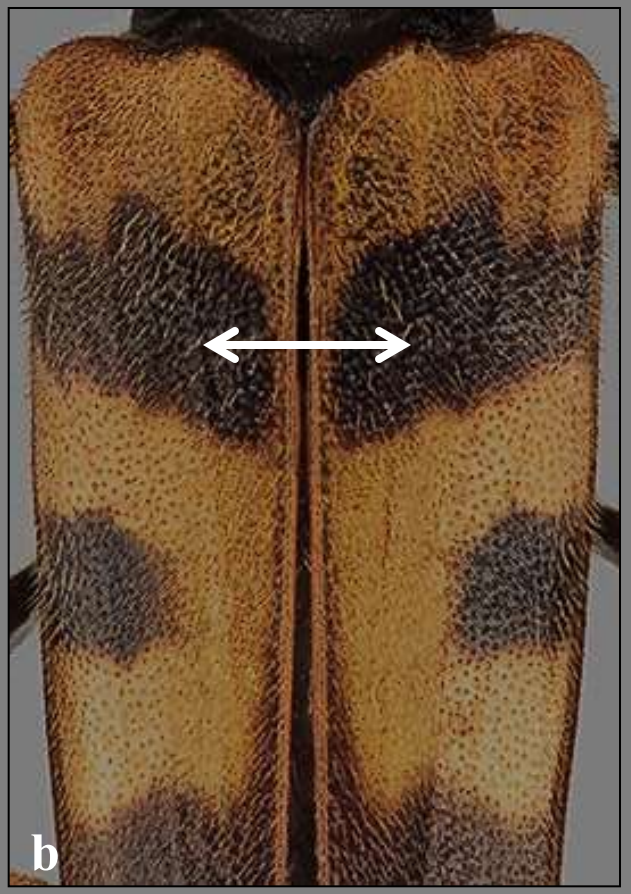


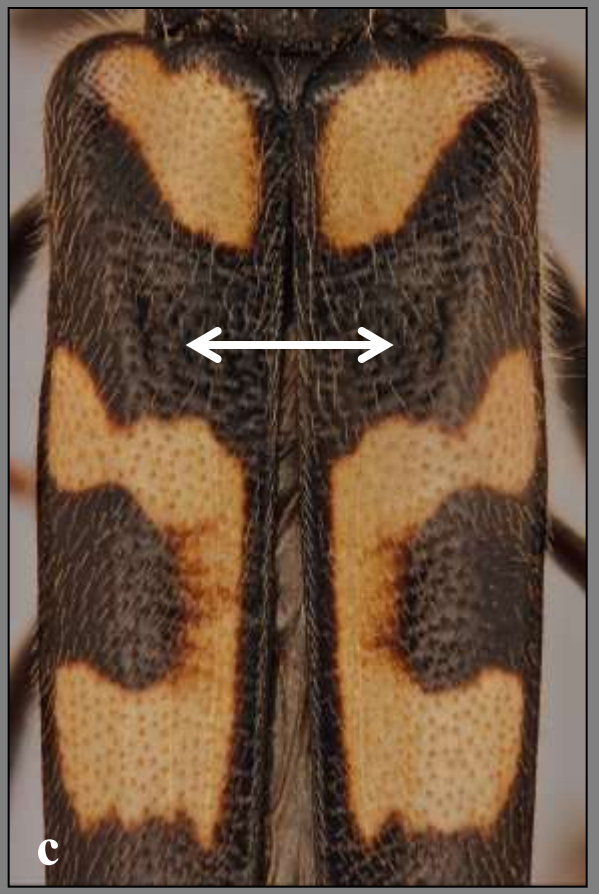
Begin key

65 (64): Part I

Elytron with anterior dark band always present and transverse (a); portrait (d)……*Xestoleptura crassicornis* (LeConte)

If elytron has an anterior dark band, it is oblique (b-c)……..…66





Begin key

Index

65 (64): Part II

Xestoleptura crassicornis (LeConte)

Begin key

66 (65)

Elytral suture is pale anterior of anterior dark band (a-c).....67

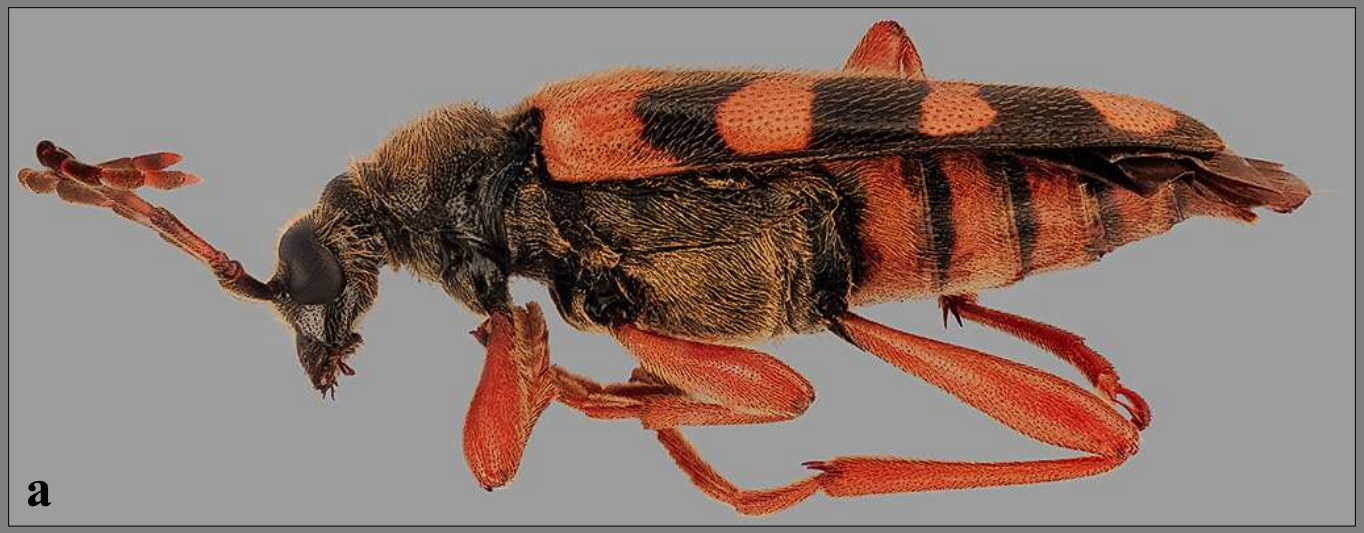
Elytral suture is dark anterior of anterior dark band (d).....FTT

Begin key

67 (66): Part I

Legs pale (a); portraits (c-d)……*Xestoleptura crassipes* (LeConte)

Legs with at least femora dark (b)……FTT



a

b

Begin key

Index

67 (66): Part II

Xestoleptura crassipes (LeConte)

c. Female

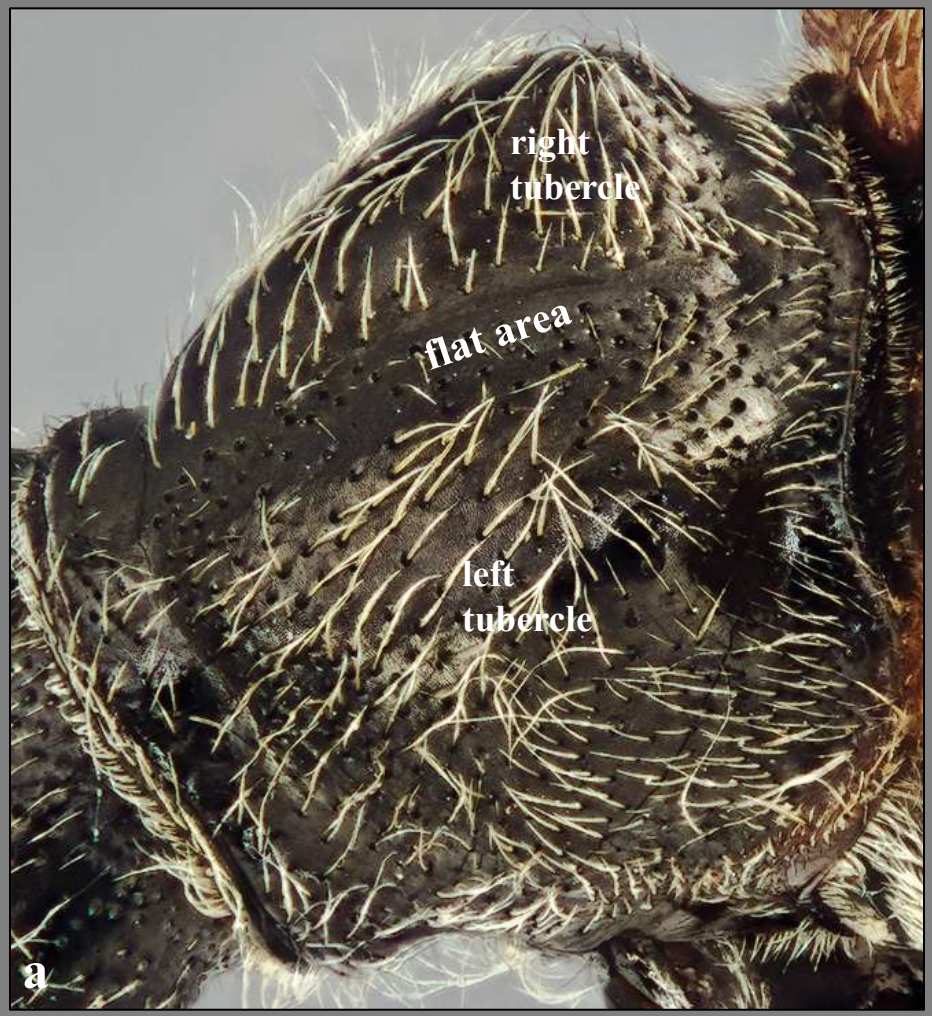
d. Male

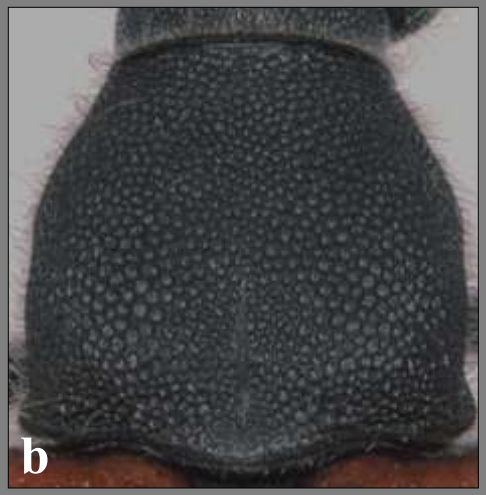
Begin key

68 (61): Part I

Pronotum with median area strongly flattened and with a broad elevated tubercle on either side (a).....*Acmaeops proteus* (Kirby)

Dorsum of pronotum more evenly convex in median area (b-d).....FTT





Begin key

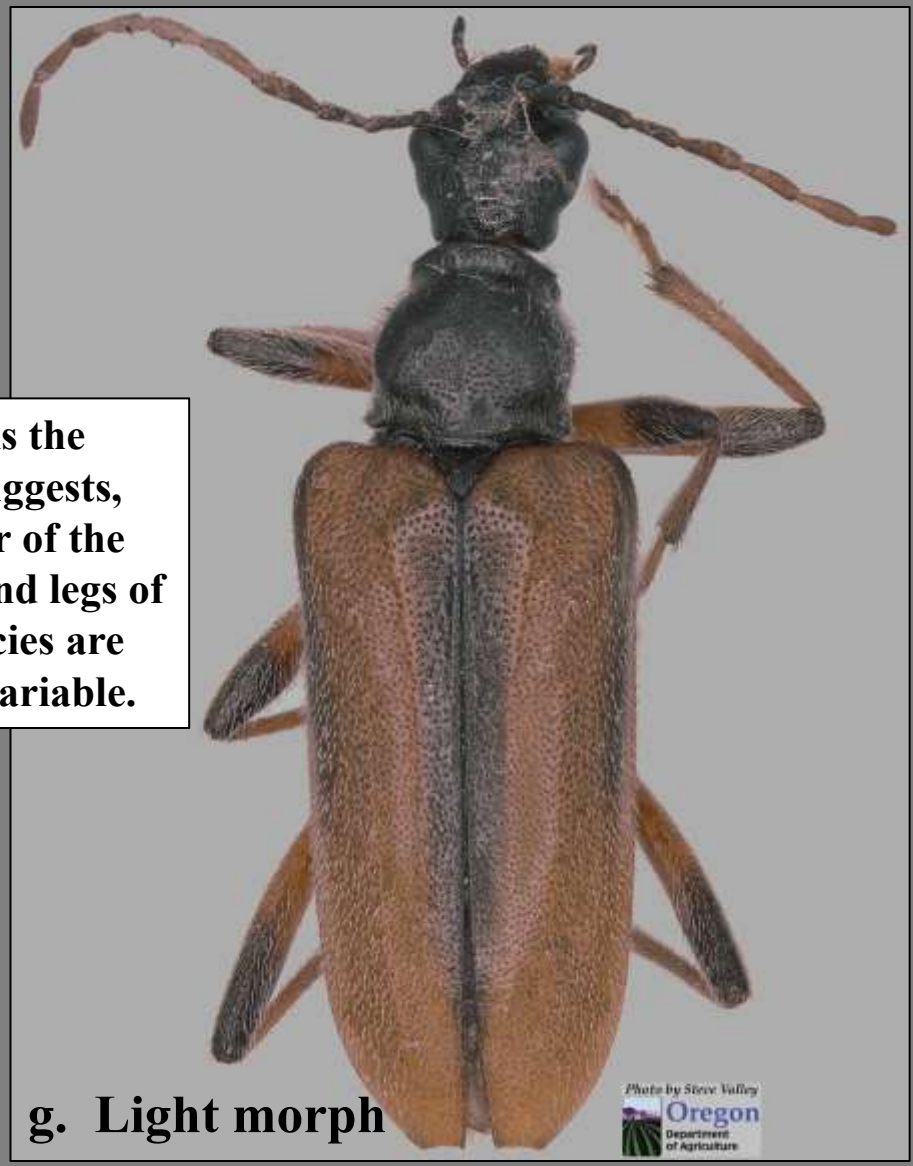
Index

68 (61): Part II

Acmaeops proteus (Kirby)

f. Dark morph

Note: As the name suggests, the color of the elytra and legs of this species are highly variable.



g. Light morph

Begin key

69 (50)

Pronotum elongate, lateral margins more-or-less parallel except for rounded median tubercles (a-b)……70

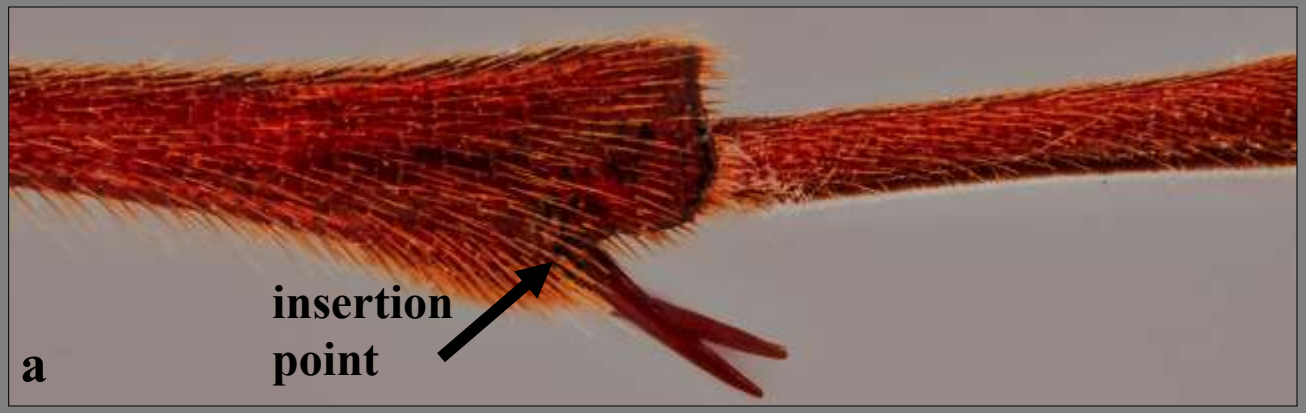
Pronotum rounded, lateral margins arcuate (c-f)…..…74

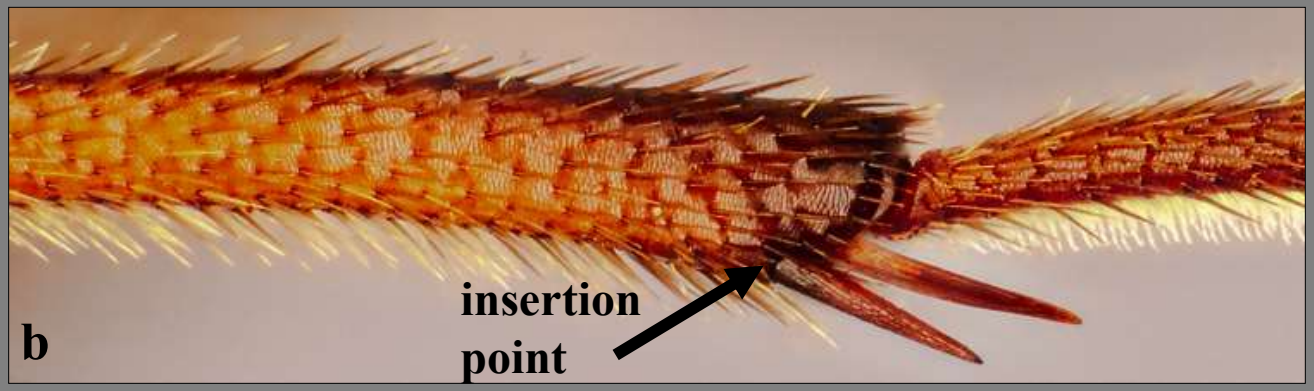
Begin key

70 (69)

Tibial spurs inserted before tibial apex (a)……71

Tibial spurs inserted at tibial apex (b)……FTT





Begin key

71 (70)

Elytra not striped (a-b)……72

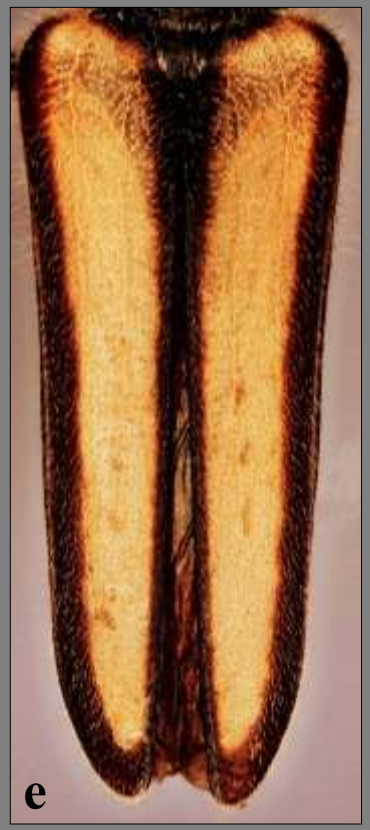
Elytra striped (c-d)…...…FTT

Begin key

72 (71)

Pronotum with dense pubescence obscuring the surface (a); at least the inner half of the length of the elytron with dense, prostrate pubescence obscuring the surface (c-d)……..……..73

Pronotum with sparse pubescence <u>not</u> obscuring the surface (b); surface of elytron visible through uniformly sparse, short pubescence (the example shown is striped – no unstriped example was available) (e)……..…..…..FTT

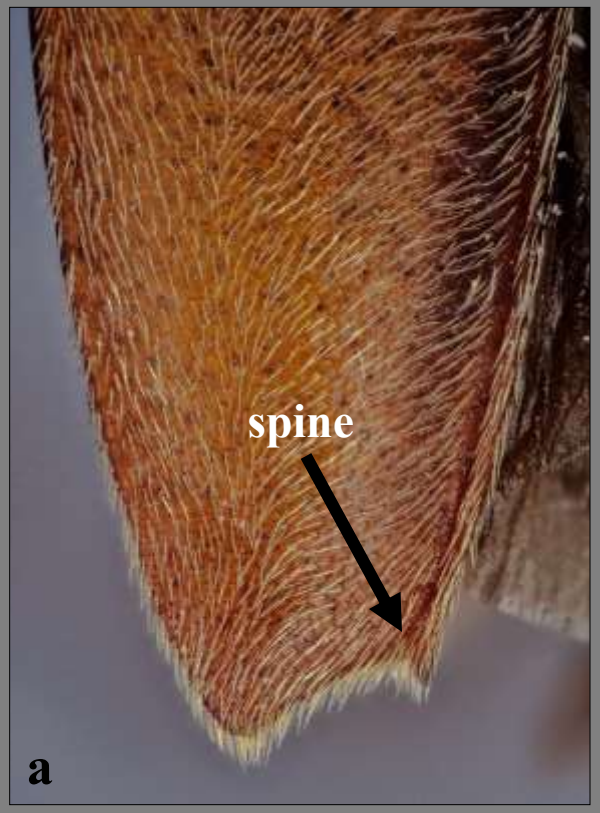


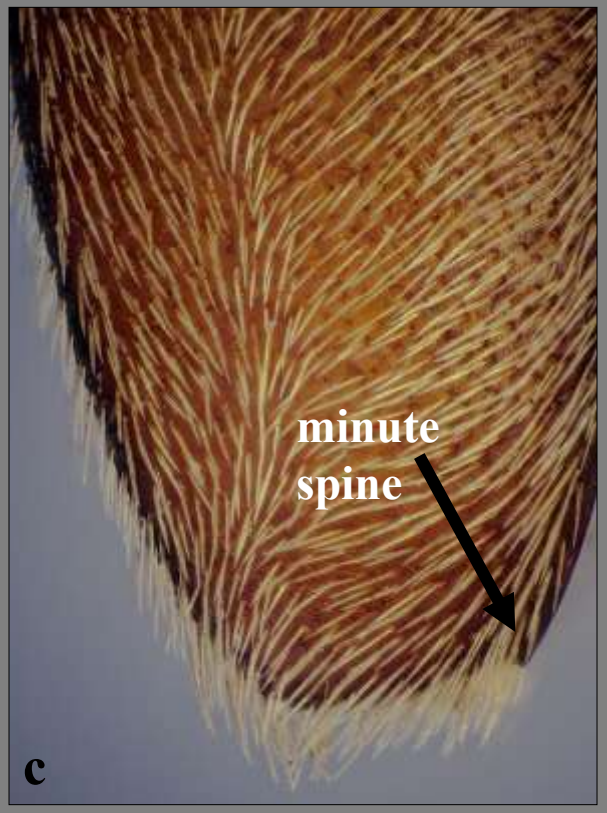
Begin key

73 (72): Part I

Apex of elytron obliquely truncate with a distinct spine at the end of the suture (a); portraits (d-e)……..….*Stenocorus nubifer* (LeConte)

Apex of elytron rounded (b) or very slightly truncate (c), with at most a very small and obscure spine at the end of the suture; portraits (f-g)……*Stenocorus vestitus* Haldeman





Begin key

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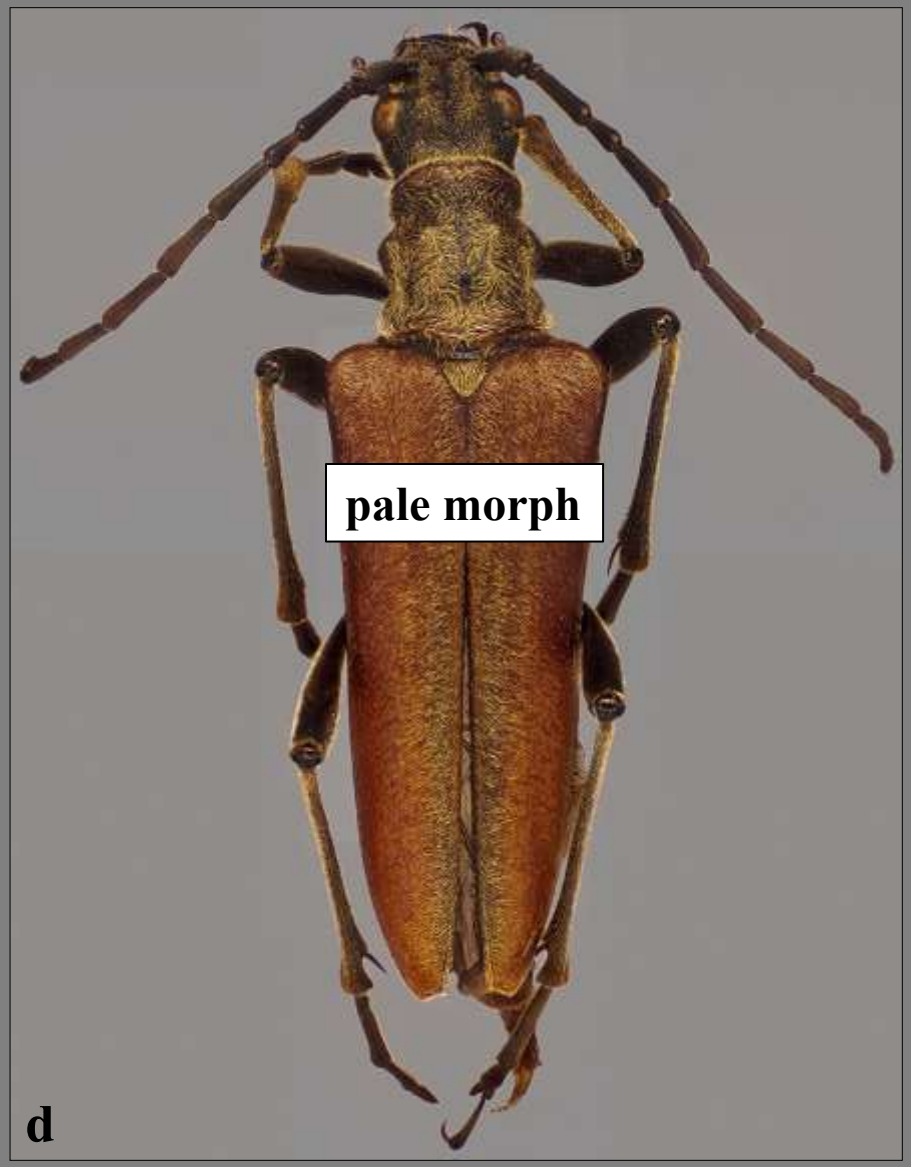
73 (72): Part II
Stenocorus nubifer (LeConte)



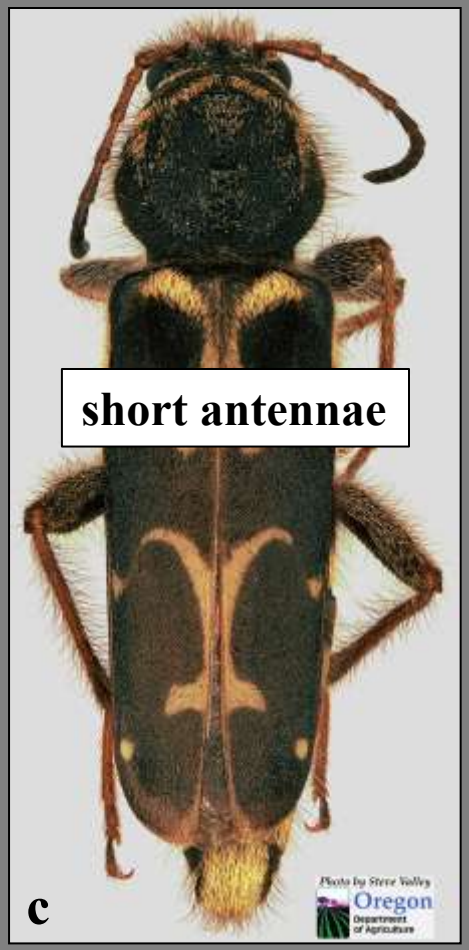
73 (72): Part III
Stenocorus vestitus Haldeman

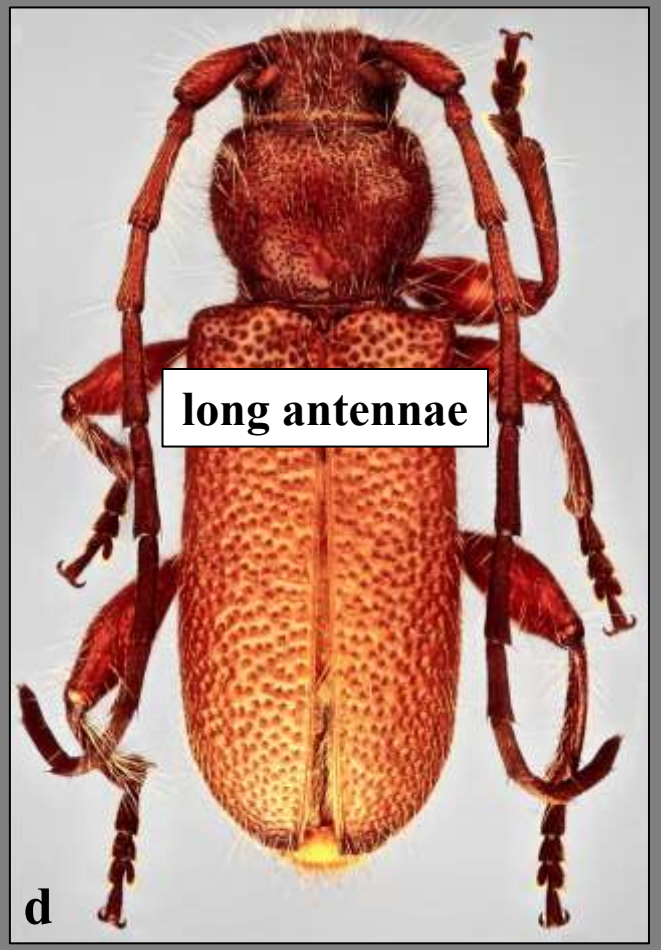
Begin key

74 (69)

Lateral procoxal cavities rounded (a); antennae often, but not always, short, barely reaching elytral humeri (c)……..…….....…..75

Lateral procoxal cavities angulate (b); antennae always long, extending well past elytral humeri (d) ……90



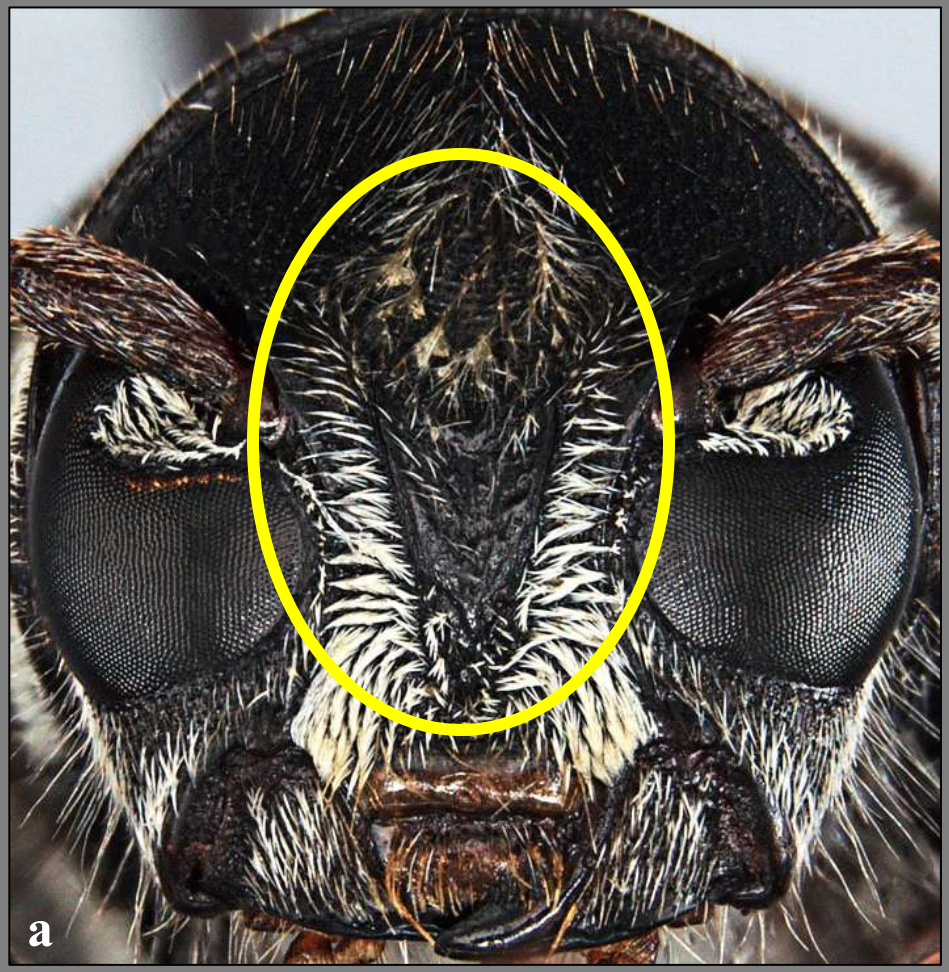


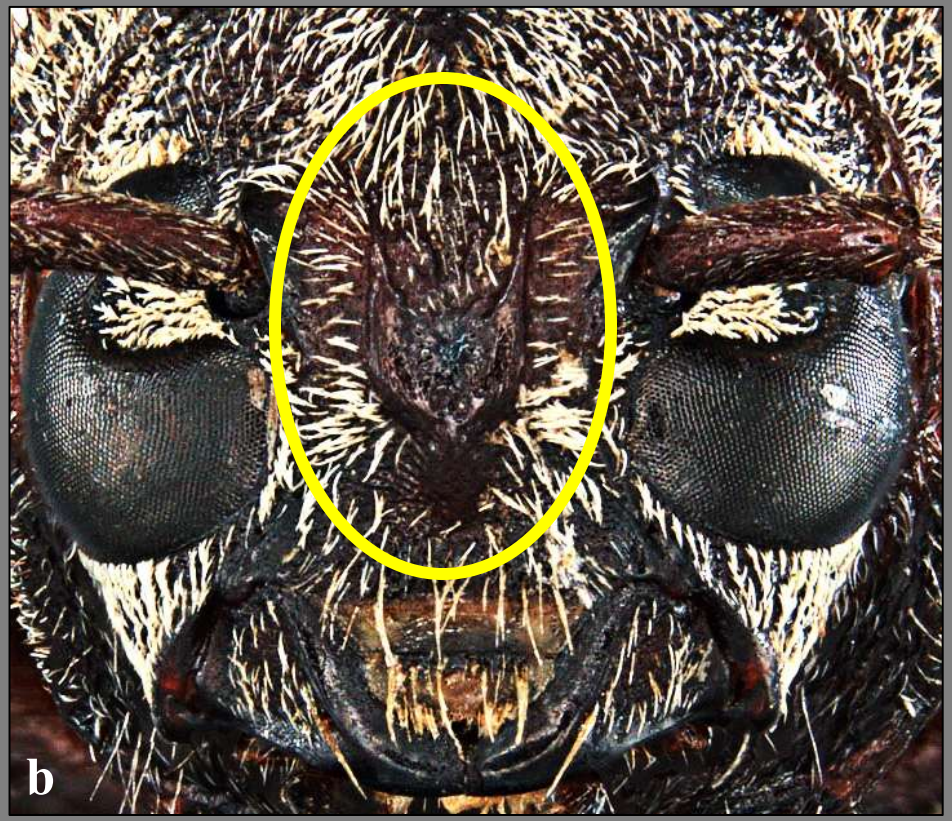
Begin key

75 (74): Part I

Frons with a "V" (a) or "Y" (b) shaped carina……..76

Frons without a "V" or "Y" shaped carina (c-h)…….……81





Begin key

75 (74): Part II

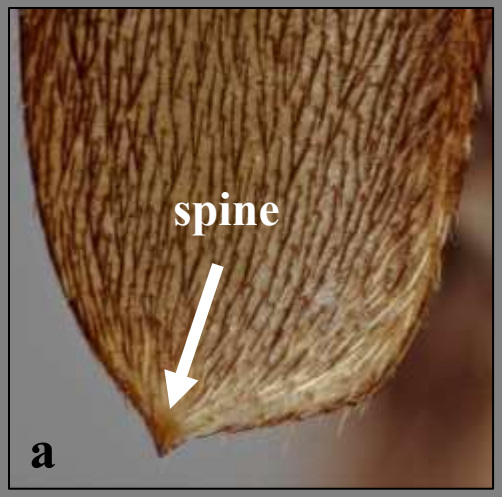
Frons without a “V” or “Y” shaped carina.

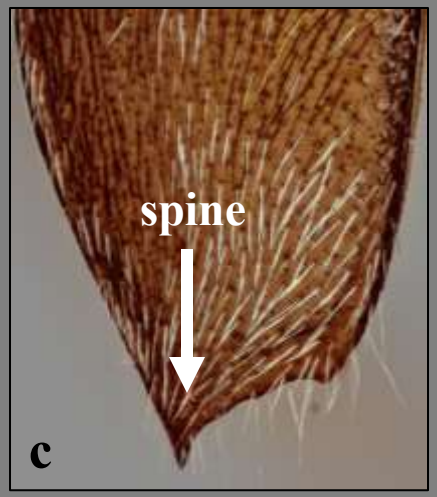
Begin key

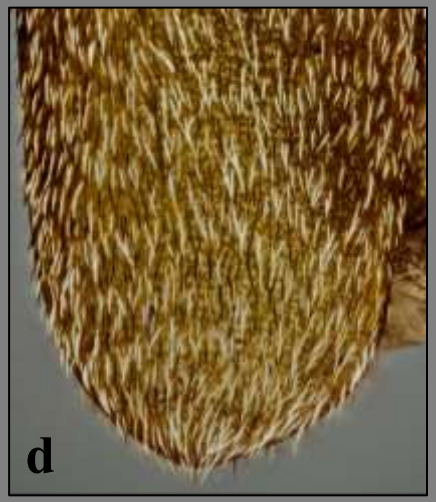
76 (75)

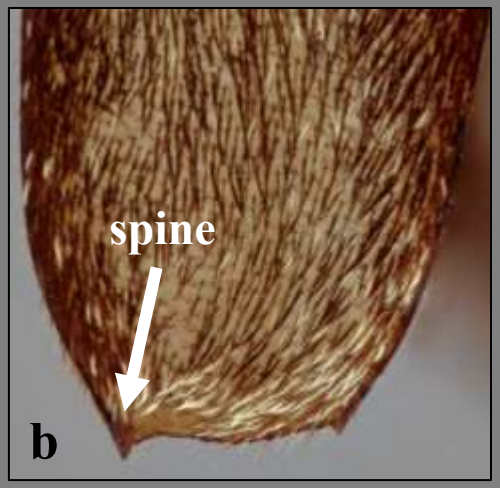
Elytral apex with distinct, sharp, spine at outer angle (a-c)……..77

Elytral apex rounded (d) or obliquely truncate (e), without spine at outer angle……..…..78







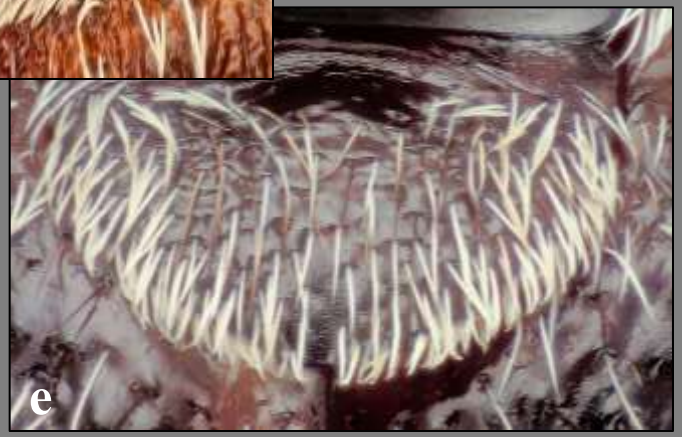


Begin key

77 (76): Part I

Elytra with distinct, undulating pale pubescent bands, without pale pubescence along suture (a); scutellum with a fringe of pale pubescence along posterior margin but otherwise with dark pubescence (d); portrait (e)…….*Xylotrechus nauticus* (Mannerheim)

Elytra with at most broken bands of pale pubescence, with pale pubescence concentrated along suture (b-c); scutellum with predominantly pale pubescence (e)…….....FTT



Begin key

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77 (76): Part II

Xylotrechus nauticus (Mannerheim)

Begin key

78 (76)

Elytral apices rounded (a)……..……79

Elytral apices obliquely truncate (b-c)..……80

Begin key

79 (78): Part I

All the pale markings on elytra are in the form of dots, not bands (a-b); pronotum <u>never</u> with pale anterior and posterior marginal markings; portraits (g-h)…..……
……..….*Xylotrechus mormonus* (LeConte)

At least some of the pale elytral markings are in the form of bands (c-e) – sometimes these are very faint (e); pronotum <u>sometimes</u> with pale markings (f-g)……..…….FTT

Begin key

Index

79 (78): Part II

Xylotrechus mormonus (LeConte)

g. Female

h. Male

Begin key

80 (78): Part I

Pronotum with distinct, sharply defined, pale pubescent markings at both anterior and posterior margins and without abundant pale pubscence scattered through dark medial area (a); dark areas on elytra without abundant scattered pale pubescence (c); portraits (e-f).....…*Xylotrechus longitarsis* (Casey)
Note: It is rarely possible to distinguish specimens of *X. longitarsis* from *X. undulatus* (Say). Specimens from west of the Rocky Mountains are normally assigned to *X. longitarsis* and specimens from Alaska and east of the Rockies are normally assigned to *X. undulatus*.

Pronotum without distinct, sharply defined, pale lateral pubescent markings at both anterior and posterior margins and with abundant pale pubescence scattered throughout the dark medial area (b); dark areas on elytra with abundant scattered pale pubescence (d)…….FTT

Begin key

80 (78): Part II

c

dark areas on elytra without abundant scattered pale pubescence

d

dark areas on elytra with abundant scattered pale pubescence

Begin key

Index

80 (78): Part III
Xylotrechus longitarsis (Casey)

normal elytral markings

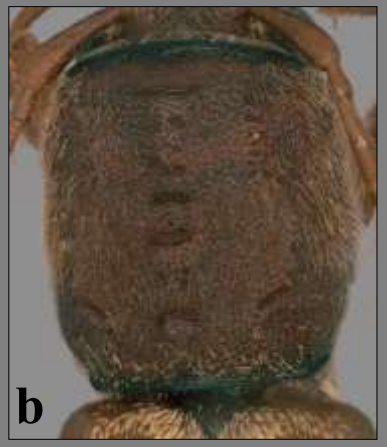
reduced elytral markings

Begin key

81 (75)

Pronotum with median row of transverse carinae (a-d)……82

Pronotum without median row of transverse carinae (e-g)…….…86

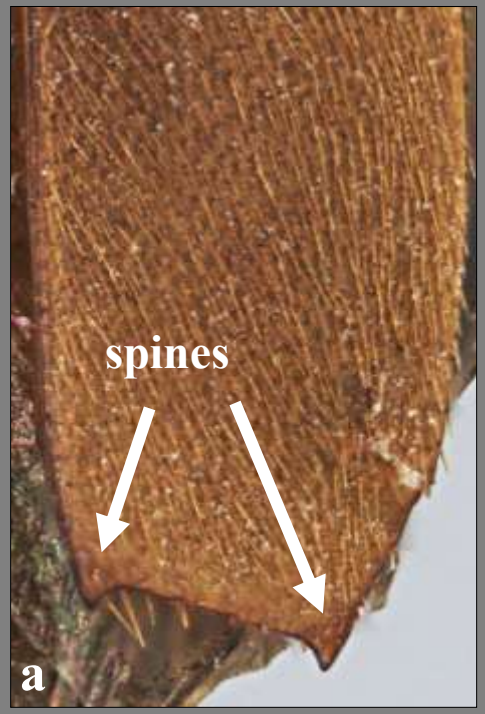


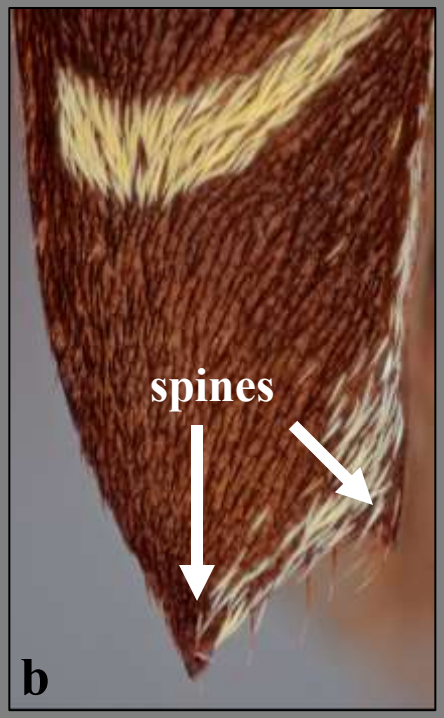
Begin key

82 (81)

Sharp spines on at least outer angle of elytral apices (a-b)……83

Outer angle of elytral apices without sharp spine (s), obliquely truncate (c) or rounded (d)……..…84





Begin key

83 (82): Part I

Pronotum without pale, pubescent patches (a); scutellum at most with thin pubescence (e); overall body color reddish brown, median and posterior elytral bands straight (g); portrait (g)…..……*Neoclytus acuminatus* (Fabricius)

Pronotum with pale, pubescent patches (b-d); scutellum covered with dense, white pubescence (f); overall body color dark brown, all elytral bands arcuate (h-i); portraits (h-i)……..……*Neoclytus modestus zebratus* Van Dyke

Begin key

83 (82): Part II

Index

Neoclytus acuminatus (Fabricius)

Begin key

Index

83 (82): Part III

Neoclytus modestus zebratus Van Dyke

white morph

h

i

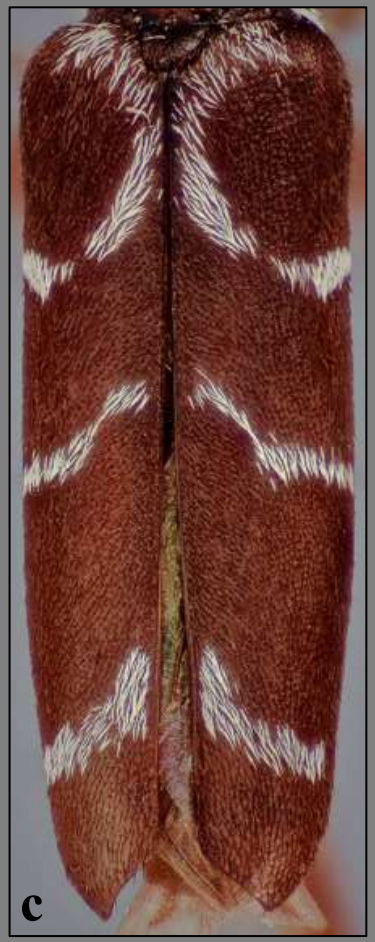
yellow morph

Begin key

84 (82)

Elytra with at least anterior pair of pale bands connected along the suture (a-c)……..85

Elytra with none of the pale bands connected along the suture (d)……..….FTT

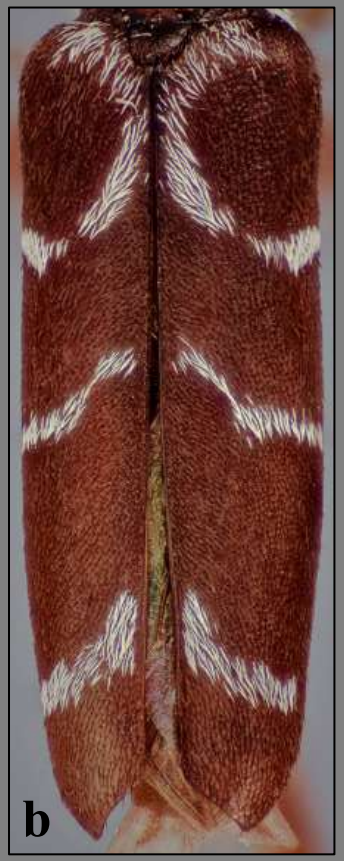


Begin key

85 (84): Part I

Normally <u>both</u> the anterior and posterior pairs of pale elytral bands connected along the suture (a); pronotum with distinct pale markings and abundant long setae (d); elytral apices rounded (f); portraits (f-g)…….....*Neoclytus conjunctus* (LeConte)

Only anterior pair of pale elytral bands connected along the suture (b-c); pronotum without distinct pale markings and without long setae (e) elytral apices obliquely truncate or broadly pointed (e); portraits (h-i)…..*Neoclytus leucozonus* (Laport & Gory)

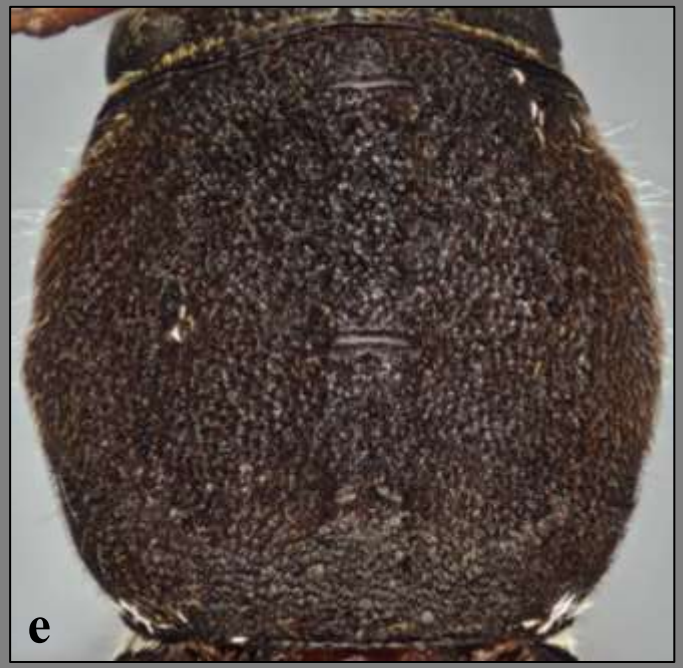


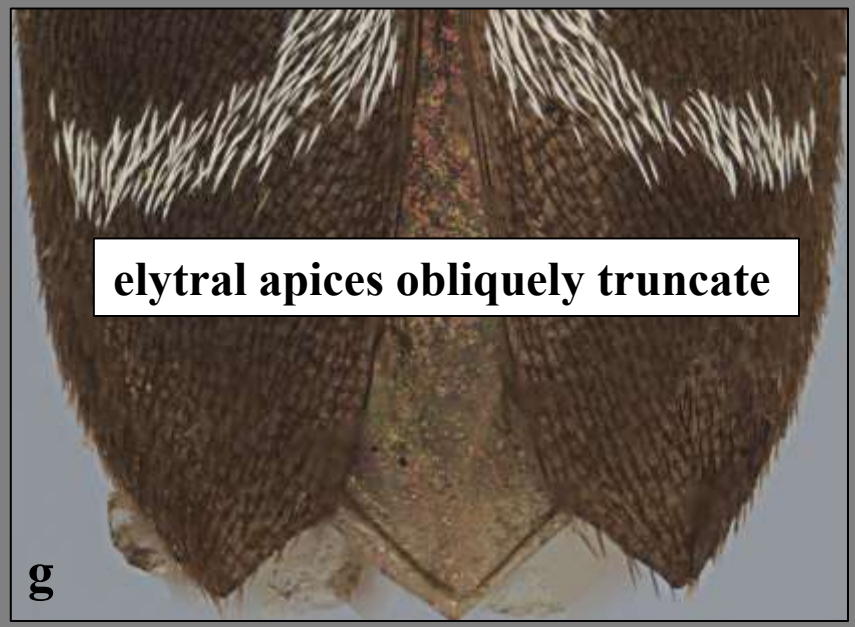
Begin key

85 (84): Part II

pronotum with pale markings & many long setae

pronotum without pale markings & without many long setae





Begin key

Index

85 (84): Part III

*Neoclytus conjunctus (*LeConte)

white morph

f

g

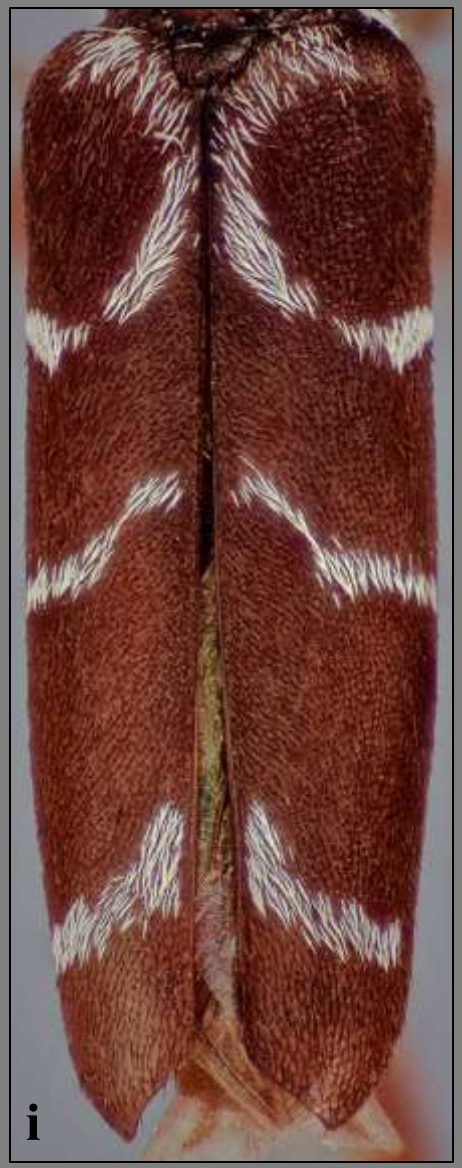
yellow morph

85 (84): Part IV

Neoclytus leucozonus (Laporte & Gory)

reduced pale elytral markings

h



i

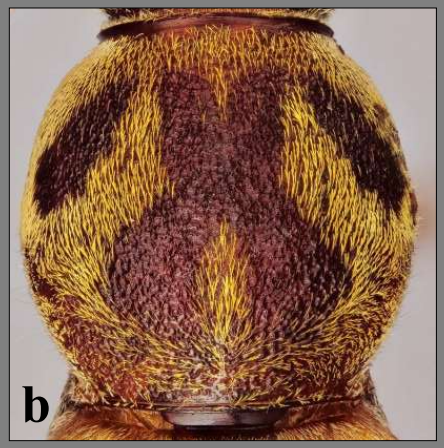
well-developed pale elytral markings

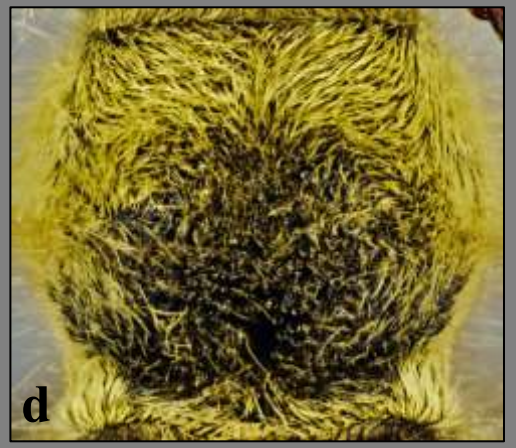
Begin key

86 (81): Part I

Pronotum either with pale bands of pubescence (a-c) or with pale pubescence scattered more widely over the dorsum (d-e); smaller (h-j) (~10 mm long)……87

Pronotum without pale pubescence (f), although sometimes a pale band is along the posterior margin of the head (g); larger (k) (20-25 mm long)……FTT





g. Band at posterior of head

Begin key

86 (81): Part II

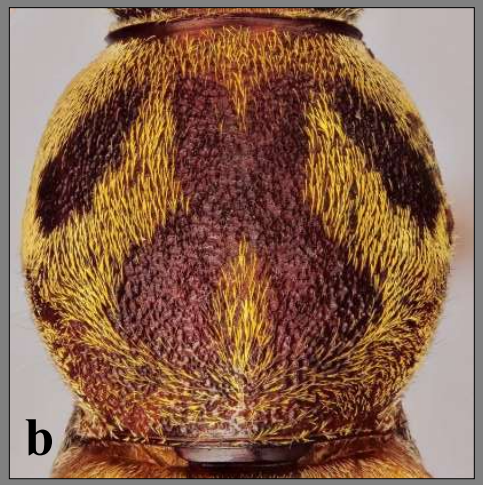
smaller size

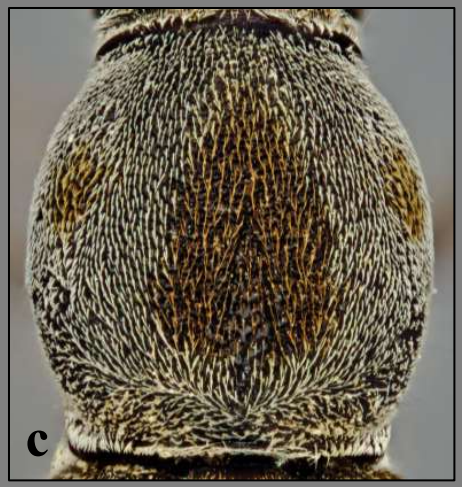
Begin key

87 (86)

Pronotum with sharp, well-defined pale markings (a-c)…….....……..….88

Pale pubescence on pronotum not in the form of sharply defined markings but more generally distributed over the dorsum (d-e)…….....……FTT

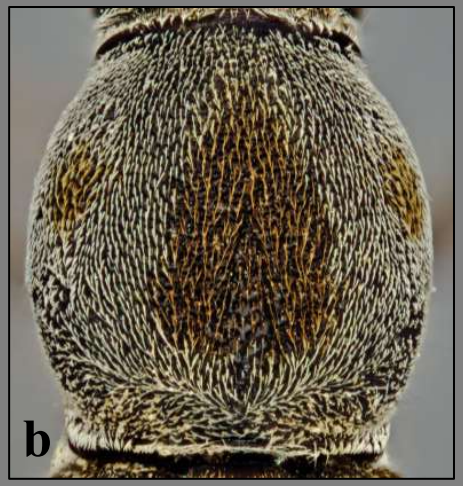




Begin key

88 (87)

Pronotum with dark median area surround by paler, more-or-less arcuate bands (a-b)……...89



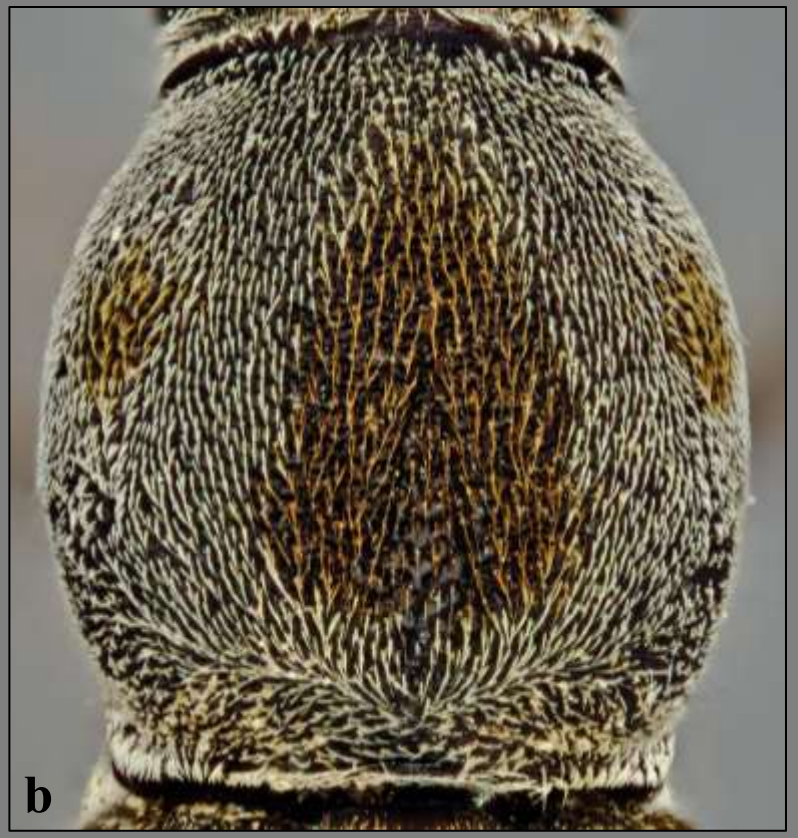
Pale pubescence on pronotum mostly in form of bands at anterior and posterior margins (c)……....FTT

Begin key

89 (88): Part I

Pronotum with an interrupted median pale pubescent stripe and an arcuate lateral pale pubescent stripe on either side(a); pale pubescence golden (c); portrait (c)……..…..*Chlorophorus annularis* Fabricius*

Pronotum with dark central area surrounded by pale pubescence (b); pale pubescence gray (d); portrait (e).....*Chlorophorus strobilicola* Champion*



Begin key

Index

89 (88): Part II

Chlorophorus annularis Fabricius*

Begin key

Index

89 (88): Part III

Chlorophorus strobilicola Champion*

Begin key

90 (74)

At least meso- and meta-femora strongly club-shaped, very narrow and cylindrical in basal third to half and abruptly much broader in the apical half to two-thirds (a-c)……..……91

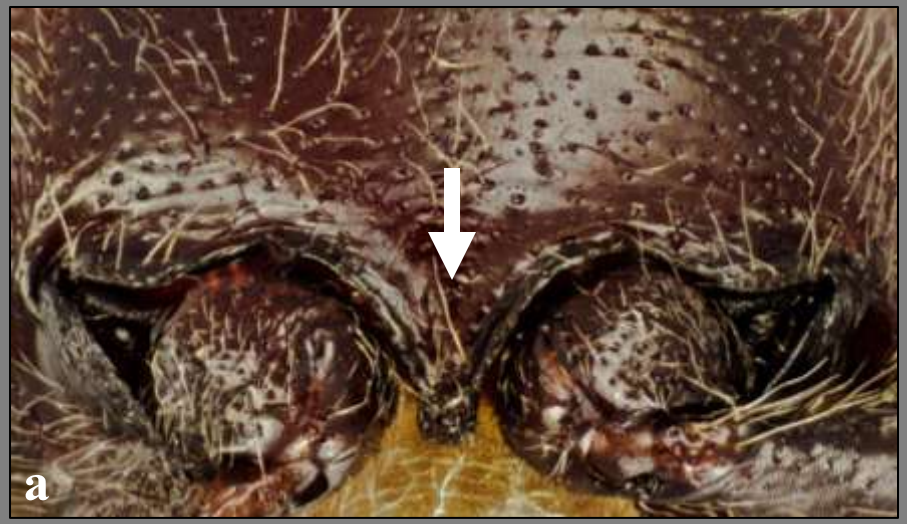
Femora not strongly clubbed, slightly broadened around apical third to half but not narrowly cylindrical at base (d-f)…….……...102

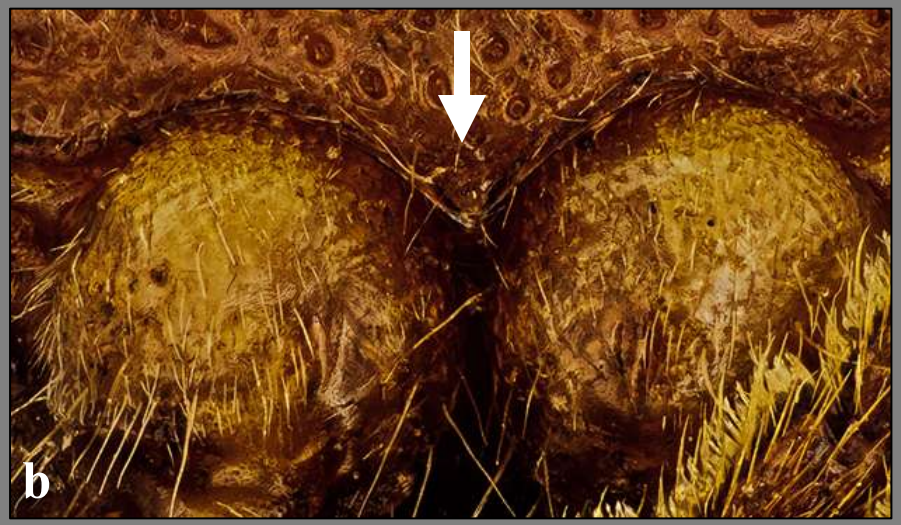
Begin key

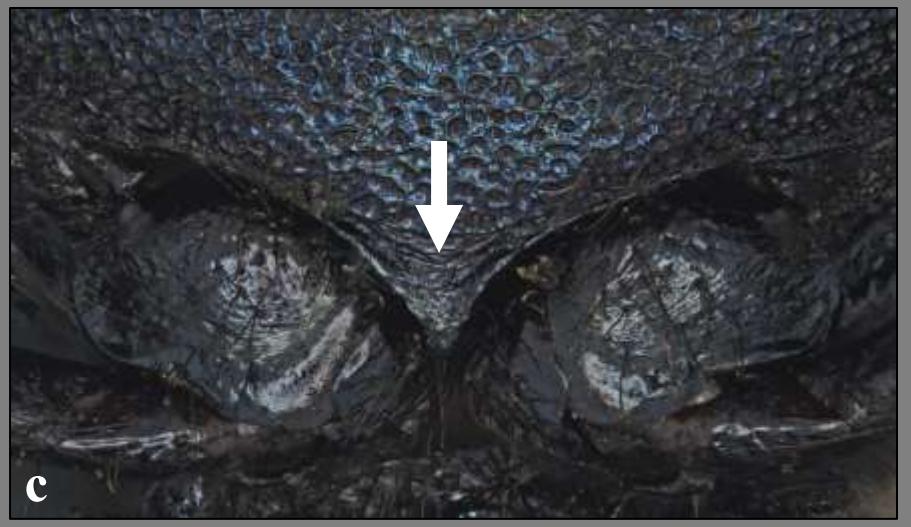
91 (90)

Process separating procoxae extends almost the length of the procoxae (a).....92

Procoxae are in contact or the procoxal process extends no farther than half the length of the procoxae (b-c)…….....….93







Begin key

92 (91): Part I

Elytra dark with pale markings (a); rest of body dark (c) ; portrait (c)……*Callidiellum rufipenne* (Motschulsky)*

Elytra pale with dark markings (b); rest of body pale (d) ; portrait (d)……..……*Callidiellum villosulum* (Fairmaire)*

Begin key

Index

92 (91): Part II

Callidiellum rufipenne (Motschulsky)*

Begin key

Index

92 (91): Part III

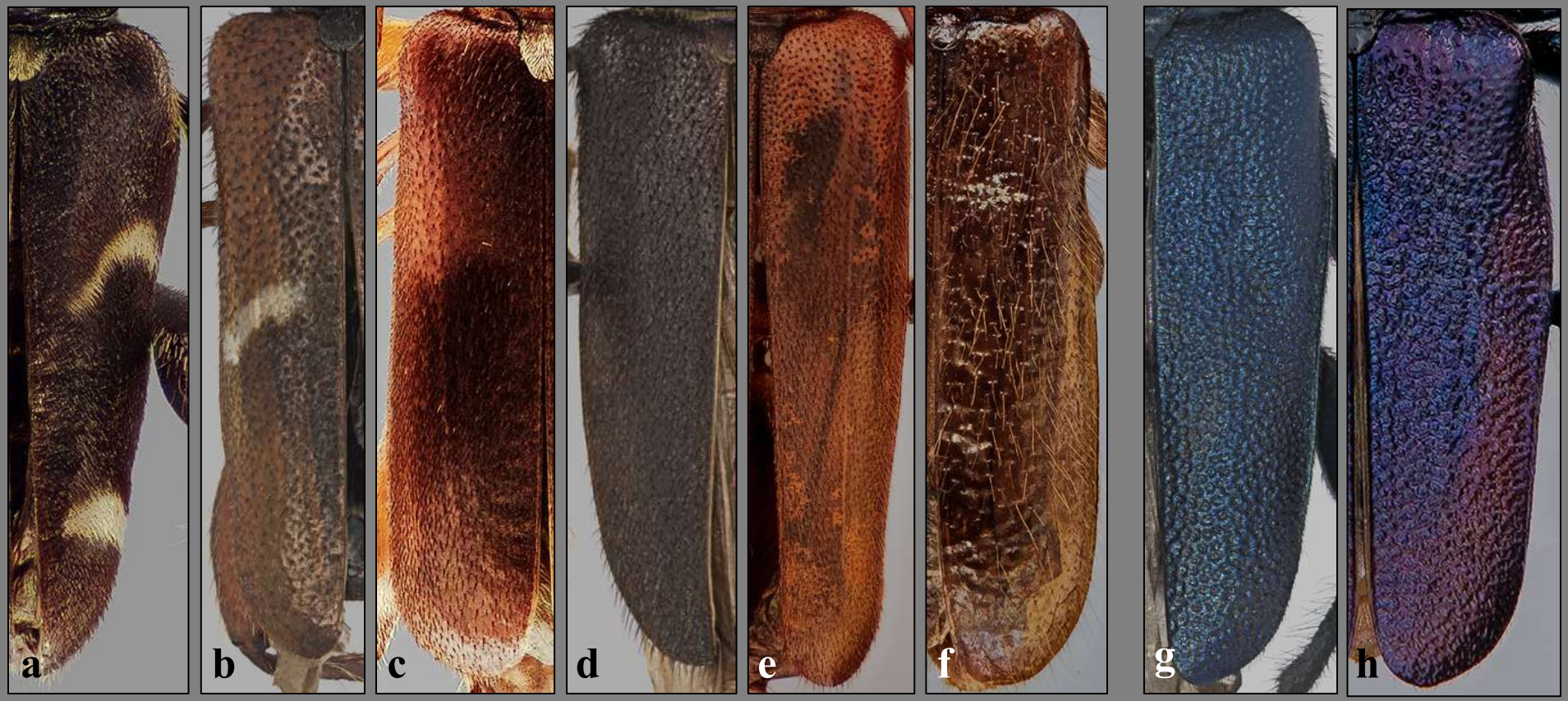
Callidiellum villosulum (Fairmaire)*

Begin key

93 (91): Part I

Elytra often with pale bands (a-b) or extensive pale markings (c), otherwise overall brown or black (d-e) or brassy (f) (rarely dark metallic), with small and fine punctures; antennae and body slender (i-l)…….…94

Elytra never with pale bands (g-h), sometimes with vague pale borders along outer margins (h), with large and coarse punctures; antennae and body stout (m-n); often, not always, dark metallic in color.....…FTT



Begin key

93 (91): Part II


i


j

antennae and bodies slender


m

antennae and bodies stout


k


l


n

Begin key

94 (93)

Elytra with pale bands (a-b) or extensive pale markings (c)……95

Elytra without pale bands or extensive pale markings (d-f)…....…98

Begin key

95 (94): Part I

Elytra with extensive pale markings but without pale bands (a); portrait (e)……*Phymatodes dimidiatus* Kirby

Elytra only with pale bands (b-d)……96

Begin key

Index

95 (94): Part II

Phymatodes dimidiatus Kirby

e

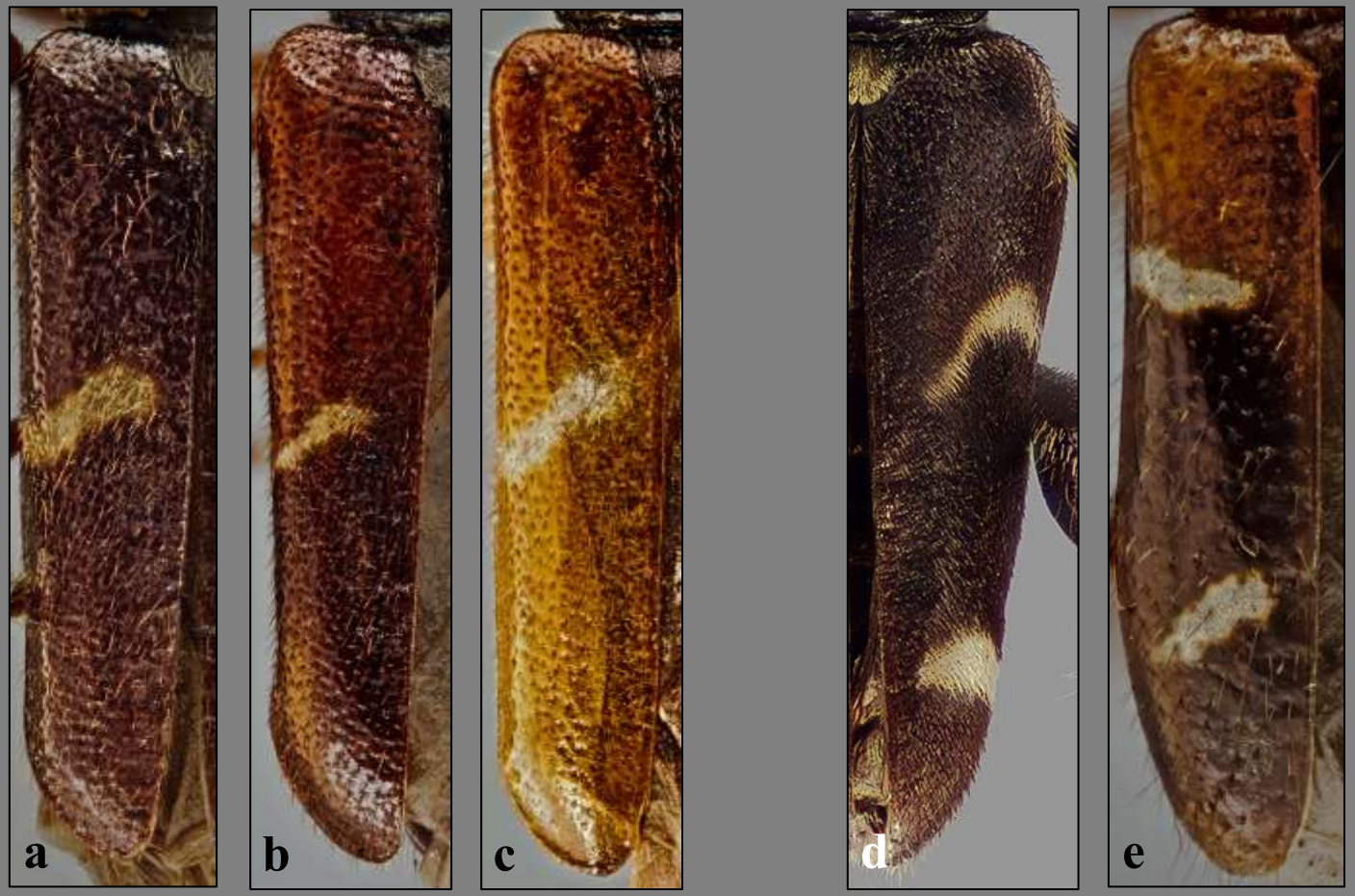
Begin key

96 (95): Part I

Each elytron with one pair of pale bands, elytra varying in color (a-c); portrait (f)……*Phymatodes oregonensis* Linsley

Note: Another western species, *P. vulneratus* LeConte, will key here. The characters Distinguishing these two species are very subtle. Individuals keying to *P. oregonensis* are much more common in the samples we've seen.

Each elytron with two pairs of pale bands (d-e)……97



Begin key

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96 (95): Part II

Phymatodes oregonensis Linsley

Begin key

97 (96): Part I

Elytra dull, with dense pubescence (a); portrait (c .....*Phymatodes decussatus* (LeConte)

Elytra glossy, with sparse pubescence (b); portraits (d-e).....*Phymatodes nitidus* LeConte

Begin key

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97 (96): Part II

Phymatodes decussatus (LeConte)

Begin key

Index

97 (96): Part III

Phymatodes nitidus LeConte

Begin key

98 (94): Part I

Elytra brassy and shiny with long, sparse pubescence (a); portrait (c)…… ……..*Phymatodes aeneus* LeConte

Elytra with dense pubescence and often dull (b-c), if shiny, not brassy (d-e)……..……..99

Begin key

Index

98 (94): Part II
Phymatodes aeneus LeConte

Begin key

99 (98)

Eye incompletely separated into dorsal and ventral lobes, lobes connected by strip 3 or more facets wide (a)…..……...…..100

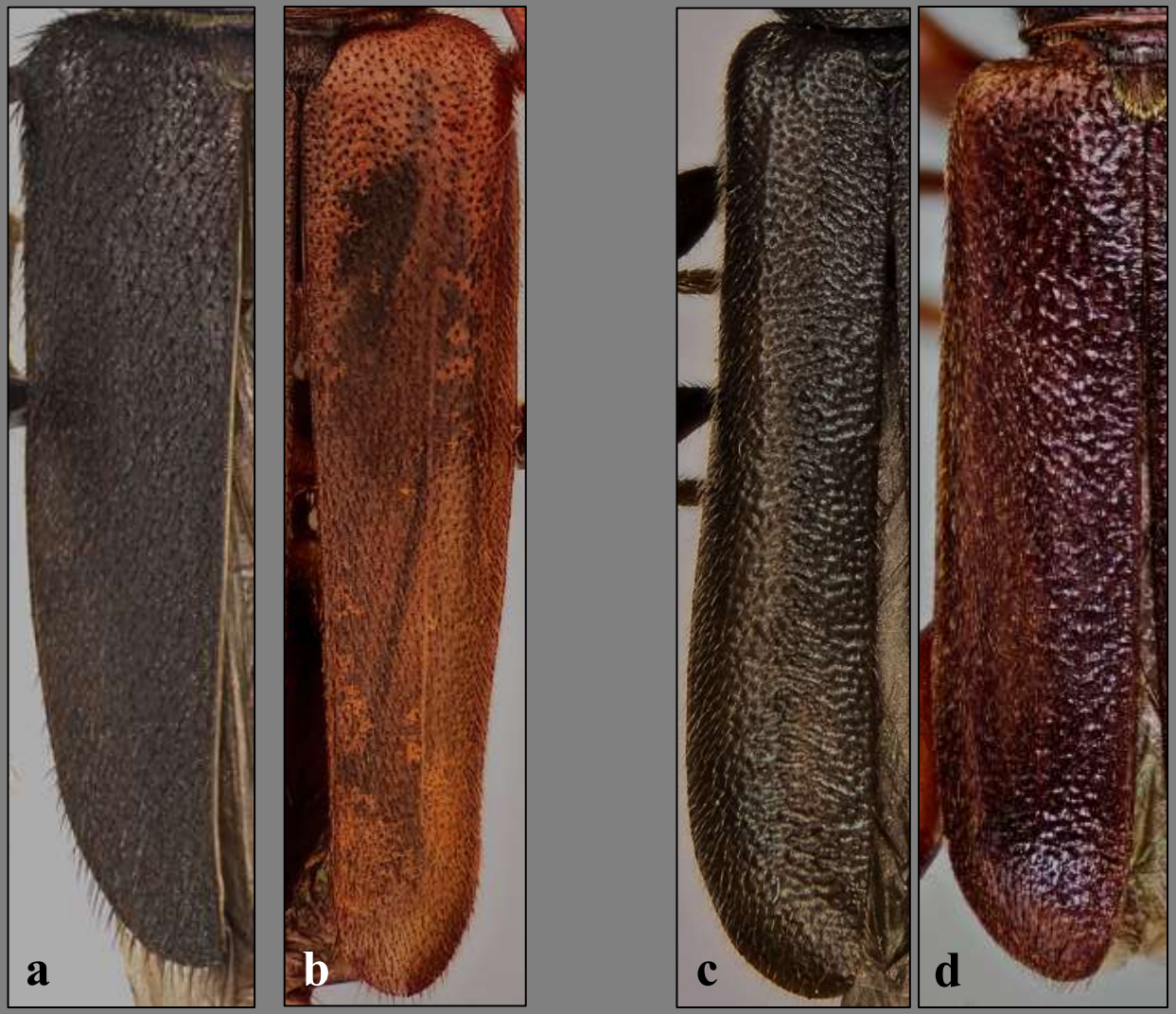
Eye almost completely separated into dorsal and ventral lobes, lobes connected by strip no more than 2 facets wide (b).…FTT

Begin key

100 (99)

Elytra dull (a-b)…..……...….101

Elytra shiny (c-d)…..……...….FTT



Begin key

101 (100): Part I

Dorsum of pronotum granulate-punctate (a); elytra very finely and indistinctly punctate (c); normally unicolorous; portrait (e).....*Phymatodes lecontei* Linsley

Dorsum of pronotum only with punctures, granules absent (b); elytral punctures larger and distinct (d); if elytra dark, then the pronotum is pale; portraits (f-g)……..*Phymatodes testaceus* LeConte

Begin key

101 (100): Part II

elytra very finely and indistinctly punctate

elytral punctures larger and distinct

Begin key

Index

101 (100): Part III

Phymatodes lecontei Linsley

Begin key

Index

101 (100): Part IV
Phymatodes testaceus LeConte

f. Dark morph

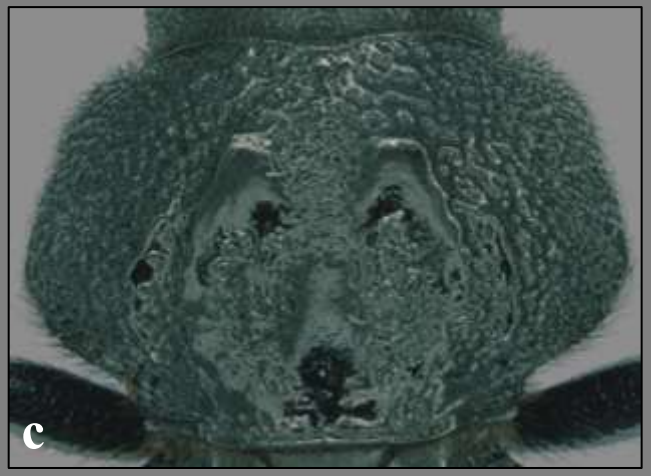
g. Pale morph

Begin key

102: (90) Part I

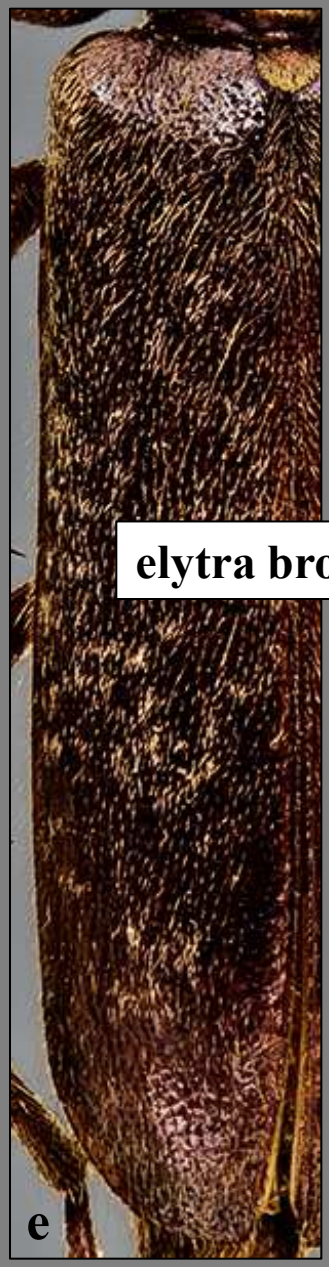
Pronotum heavily pubescent (a-b), if distinct raised shiny areas are present, these are small and inconspicuous (a); elytra are brown and heavily pubescent (e-g)….103

Pronotum thinly pubescent with large, raised shiny areas (c-d); elytra uniformly bright metallic purple (h) or sharply bicolored (i) and thinly pubescent……..…FTT



Begin key

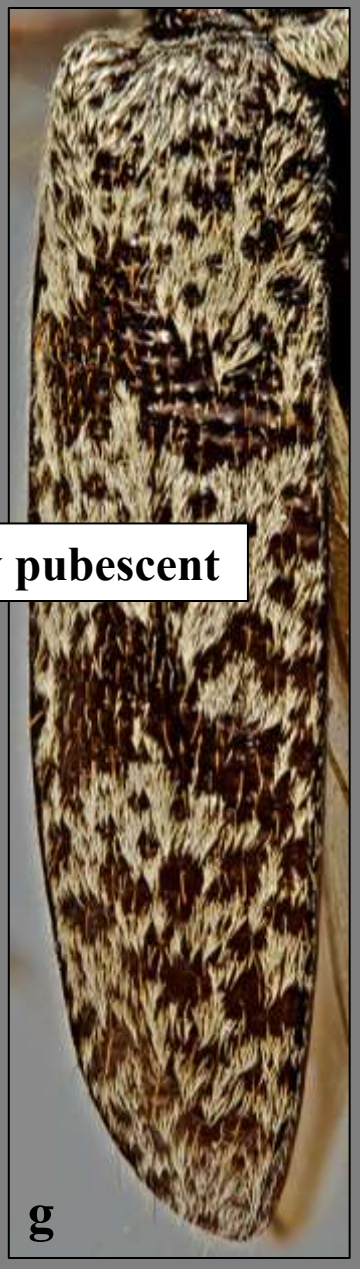
102: (90) Part II



elytra brown and heavily pubescent

e

f

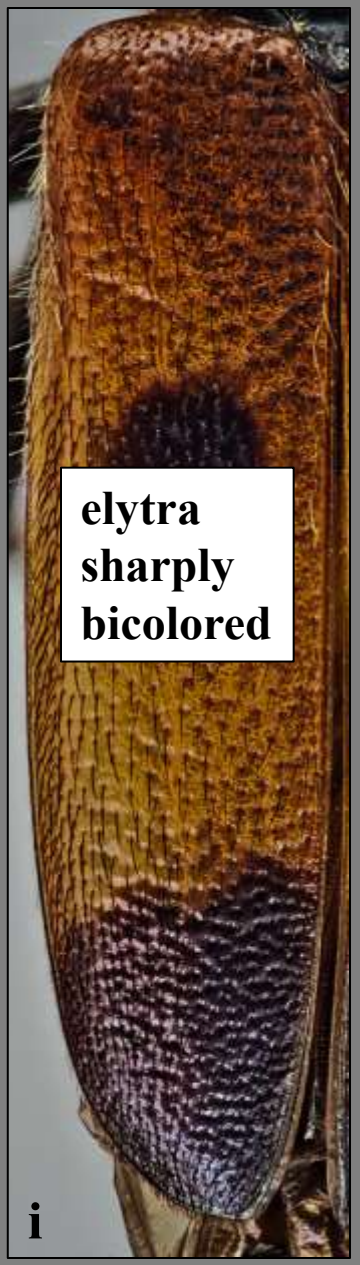


g

elytra uniformly bright metallic

h

elytra sharply bicolored



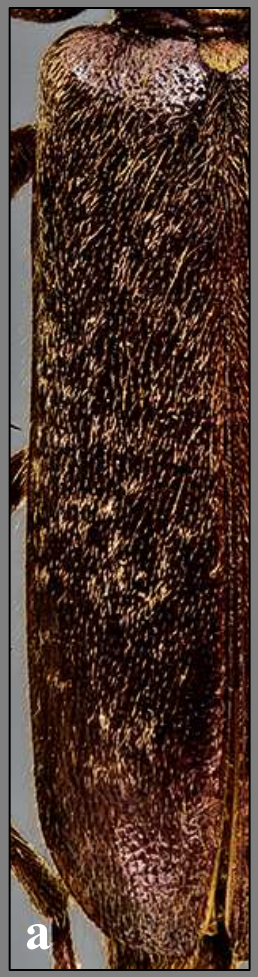
i

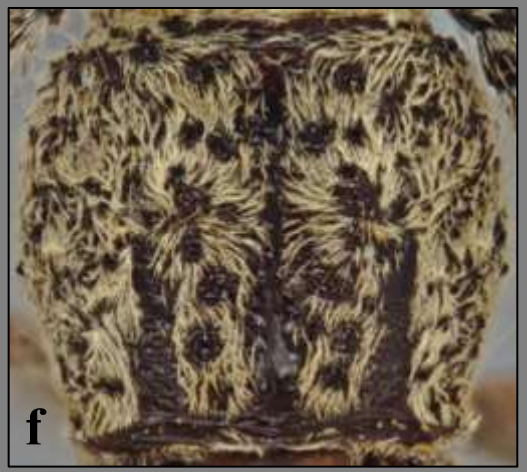
Begin key

103: (102) Part I

Elytra (a) and pronotum (d) with more-or-less even covering of pubescence; portrait (g)……..*Trichoferus campestris* (Falderman)*

Elytra (b-c) and pronota (e-f) with abundant denuded round spots…….....104





Begin key

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103: (102) Part II

Trichoferus campestris (Falderman)*

Begin key

104: (103) Part I

Pronotum (a) and elytra (c) with smaller punctures and smaller denuded round spots and without extensive denuded markings; portrait (e)…….....*Brothylus gemmulatus* LeConte

Pronotum (b) and elytra (d) with larger punctures and larger denuded round spots and with extensive denuded markings.....…FTT

Begin key

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104: (103) Part II

Brothylus gemmulatus LeConte