



SCREENING AID FOR THE
MOST ABUNDANT
SOUTHEASTERN
SCOLYTINAE

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Contributions and Acknowledgements

Jim LaBonte (Oregon Dept. of Agriculture, ODA) designed this Power Point screening aid.

Steve Valley (ODA) acquired the images for this aid.

Bob Rabaglia (USFS) developed the original text version of this screening aid and provided recommendations on improving the Power Point version.

Rick Hoebeke (Cornell University) reviewed the text version of this aid and provided suggestions on how it could be improved.

Don Bright (Canada Dept. of Agriculture, retired) and Steve Wood (Brigham Young University, emeritus) for their tireless efforts in developing the systematics and taxonomy of Scolytinae.

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

Introduction

This screening aid is not intended to replace a full course in the identification of Scolytinae. It is intended to be a means by which individuals responsible for sorting and identifying large volumes of wood boring insect trap samples can quickly and efficiently sort out the most common species encountered in samples from surveys in the southeastern U.S., and, to a lesser degree, the East in general. It is designed to be used by individuals with a wide range of taxonomic expertise. It is image-supported, with images of almost all character states provided. It is not intended to operate completely independently of support by a taxonomist but instead in the context of a presented workshop.

Use of This Screening Aid

The screening aid functions much like the traditional dichotomous key, with couplets. However, buttons linking non-sequential couplets and enabling return to the originating couplet have been utilized. Images associated with the first half of a particular couplet are indicated with the couplet number, followed by “a”, and, if necessary, a number thereafter. Images for the 2nd half of the couplet have “b” rather than “a” appended.

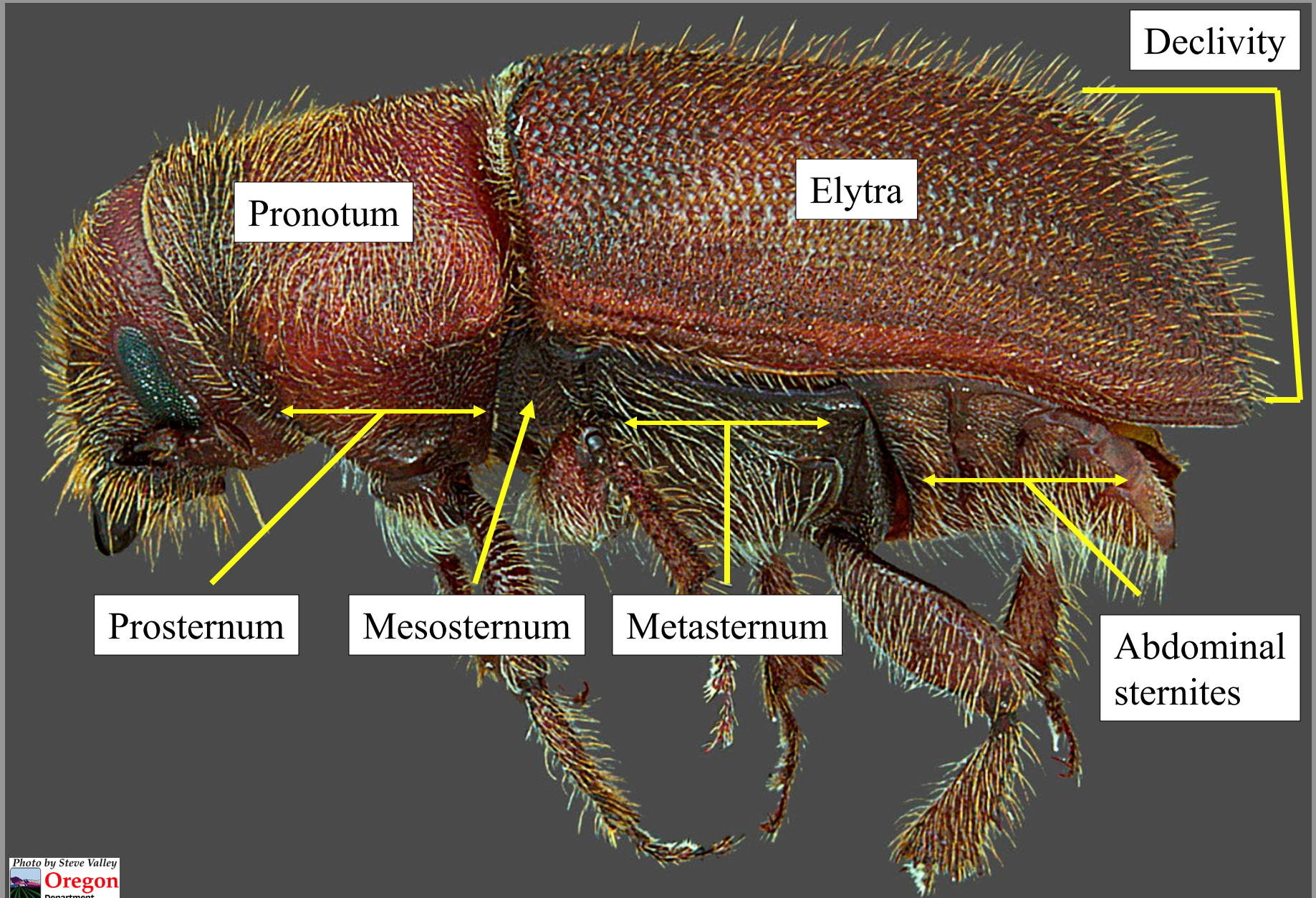
Where possible and efficient, taxonomic jargon has been kept to a minimum. It is intended that unfamiliar terms and character states are explained via the images and associated labels. The first several slides following the introduction illustrate the basic body parts of Scolytinae and the terms applied to them. A single slide explaining a few technical terms follows those.

Use of This Screening Aid: II

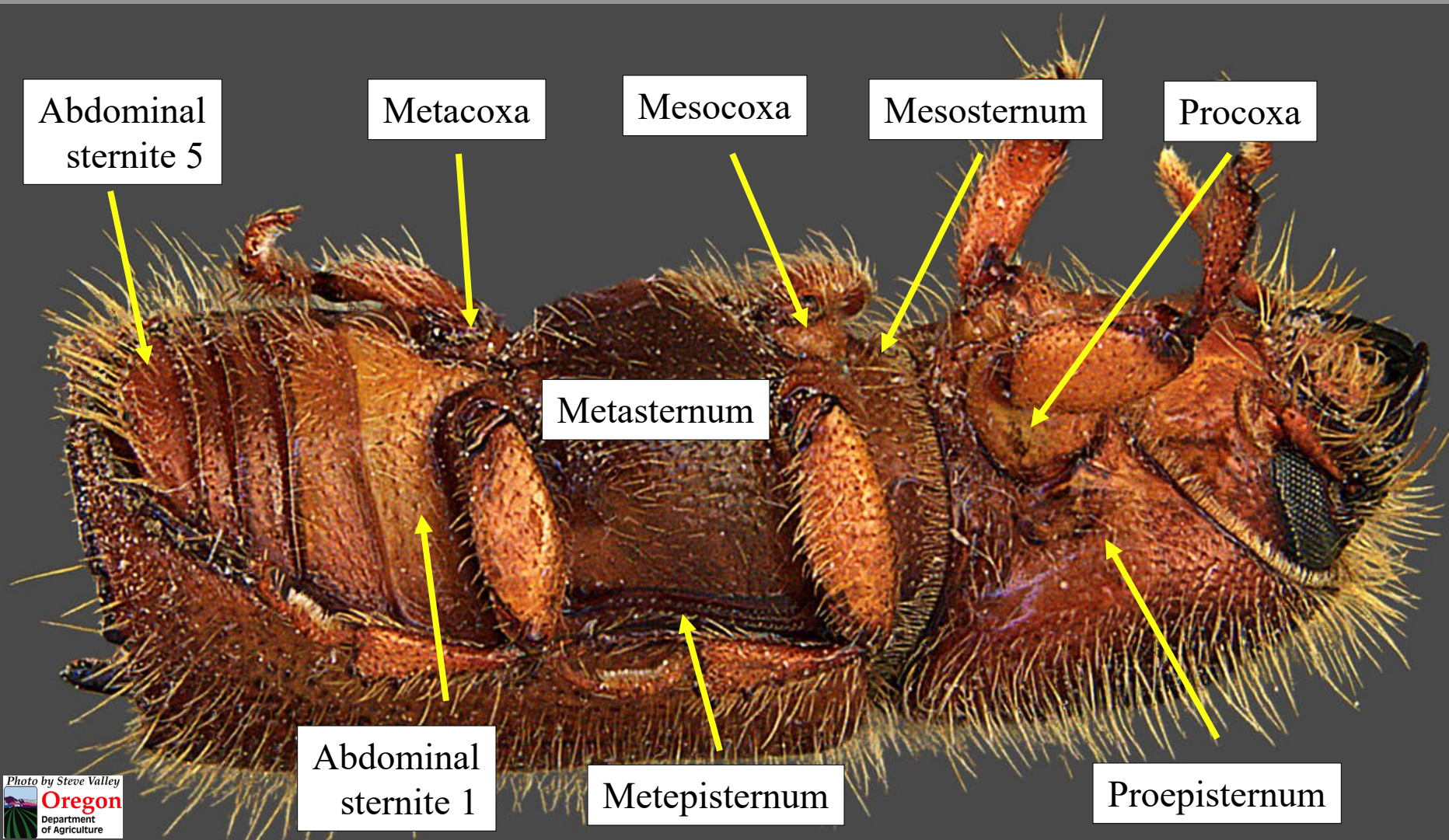
THIS IS VERY IMPORTANT!

It is intended that this aid be used in conjunction with the services of a taxonomist responsible for the identification of any specimens thought to be other than the “common” species treated. The design of the aid is that any species other than the targets for screening will end at a couplet with “STOP, which equals “STOP, Submit specimen to taxonomist”. “STOP” specimens are NOT unimportant or to be discarded - quite the opposite! Any specimen that does not, in the judgment of the user, appear to be a screening target should be forwarded to a cooperating taxonomist for further identification.

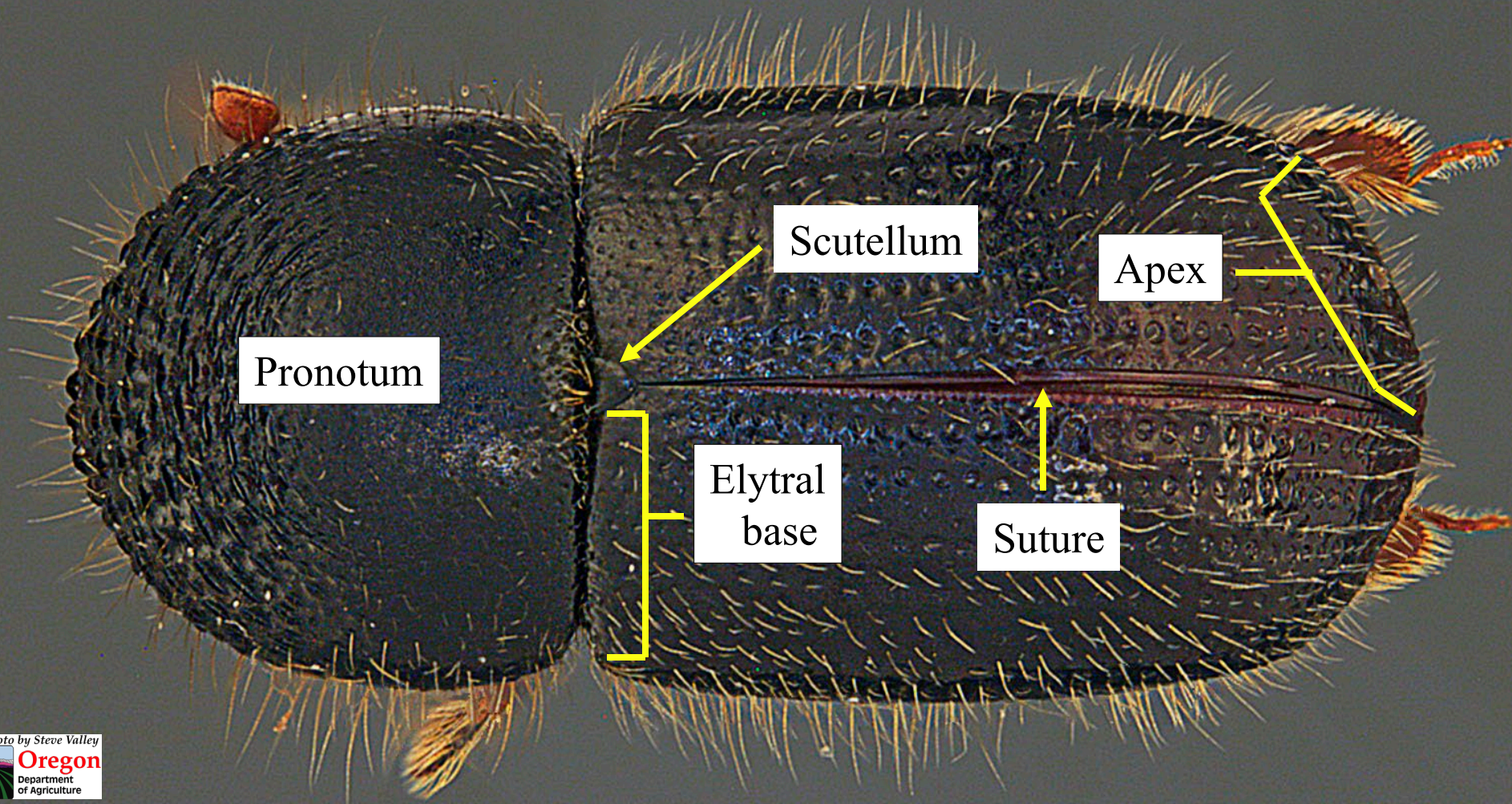
BASIC BODY PARTS OF SCOLYTINAE



BASIC BODY PARTS OF SCOLYTINAE



BASIC BODY PARTS OF SCOLYTINAE



BASIC BODY PARTS OF SCOLYTINAE

Striae are the series of large, linearly arranged, punctures. They (and interstriae) are counted from the suture (sutural stria = 1).

Interstria

Stria

Stria 2

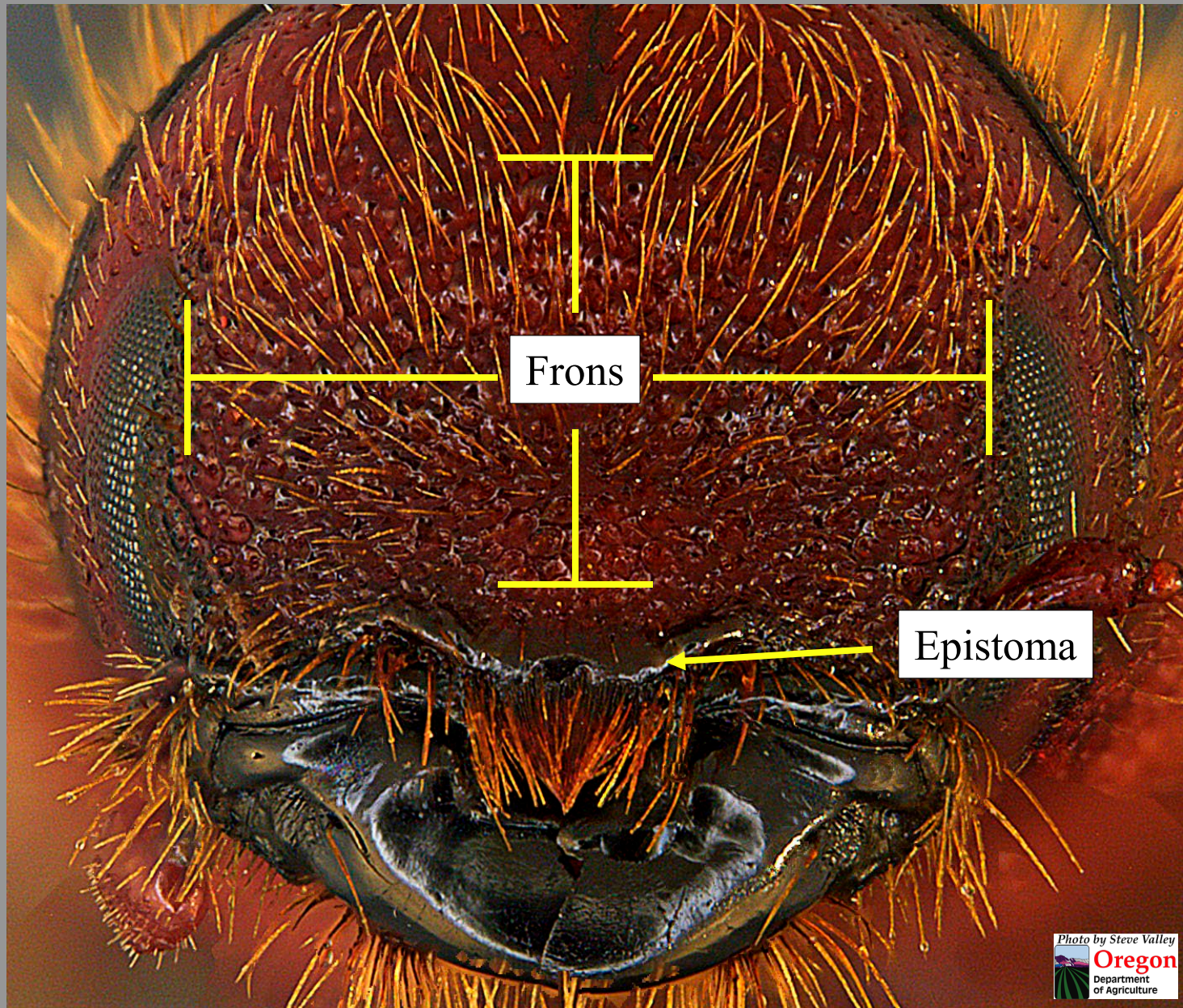
Interstria 2

Stria 1 (sutural)

Interstria 1 (sutural)

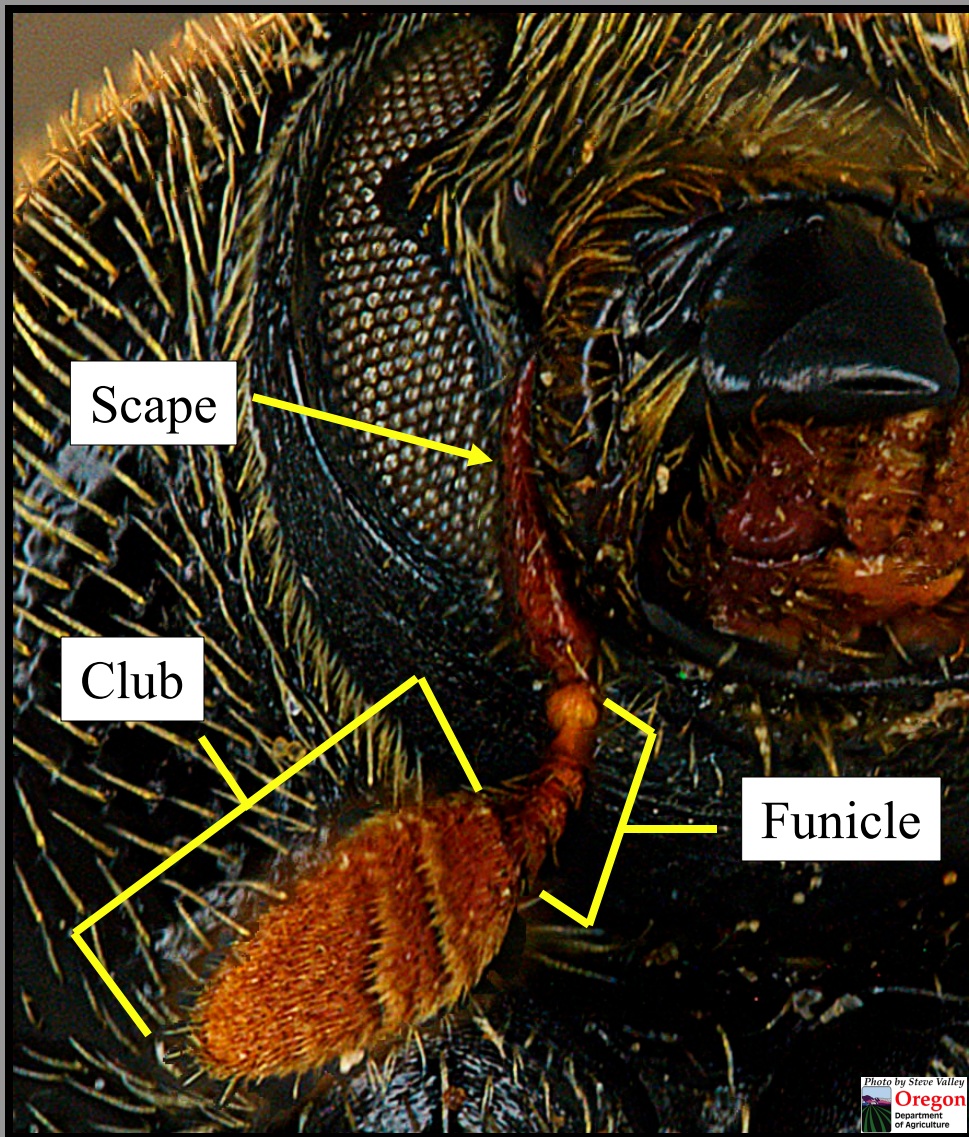
Interstriae are the more-or-less flattened ridges between striae. Interstriae may or may not be punctate - if so, the punctures are normally smaller than those of the striae.

BASIC BODY PARTS OF SCOLYTINAE

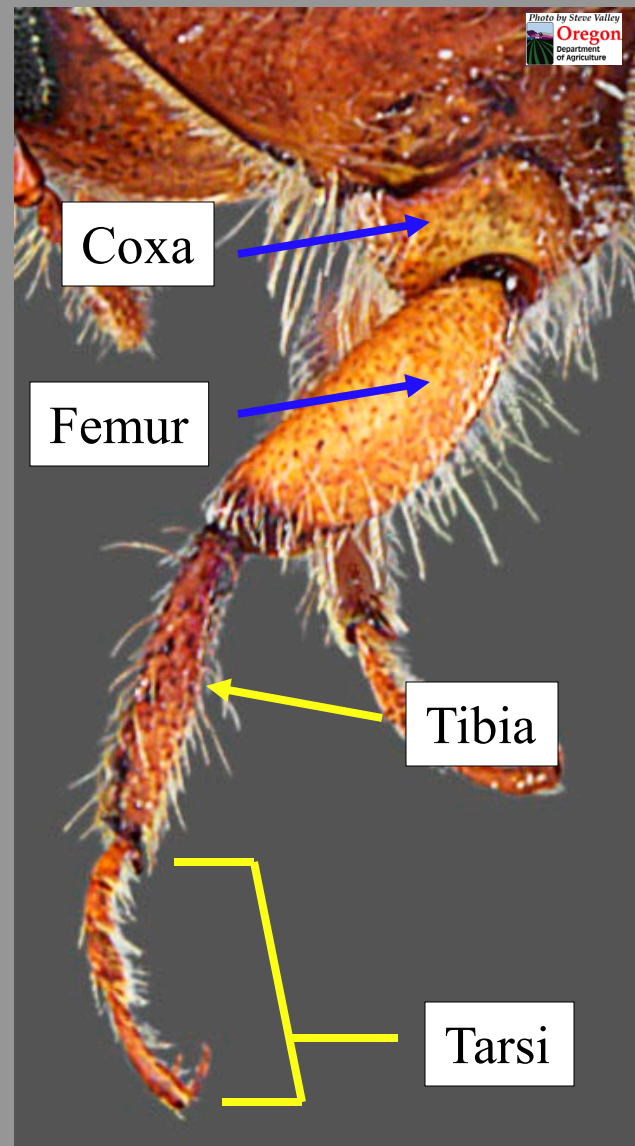


BASIC BODY PARTS OF SCOLYTINAE

Antenna



Leg



A Few Technical Terms

Acuminate: strongly and abruptly tapered to a narrow apex

Asperities: small, sharp elevations or teeth

Contiguous: touching or in contact

Corneous: of a hard, smooth texture

Crenulations: blunt, rounded teeth or scallops

Procurved: curving anteriorly

Recurved: curving posteriorly

Setose: covered with setae

Spine: a thorn-shaped, generally pointed process emerging from a surface, normally longer than wide

Sulcate: channeled or grooved

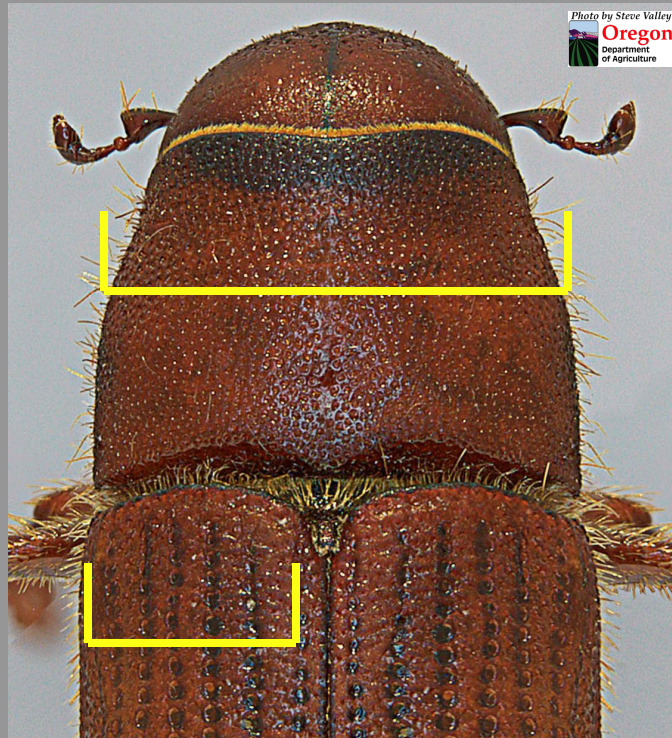
Tubercle: a bump, a generally rounded process emerging from a surface, generally no longer than wide

Vestiture: a clothing of hairs or scales

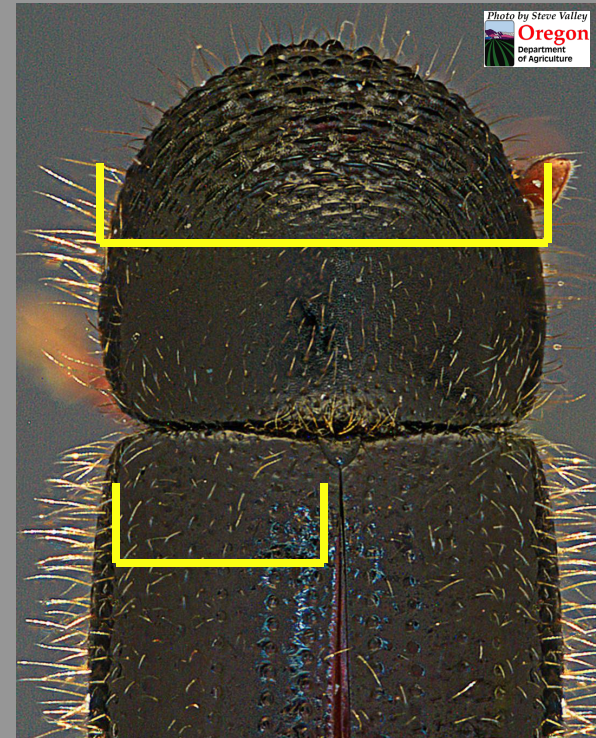
1: Part I

Anterior margins of elytra procurved, with a series of crenulations; pronotum usually unarmed; head visible from above.....2

Anterior margins of elytra truncate and squared off, without crenulations; pronotum often armed by granules or asperities on at least anterior 1/3; head usually concealed from above.....13

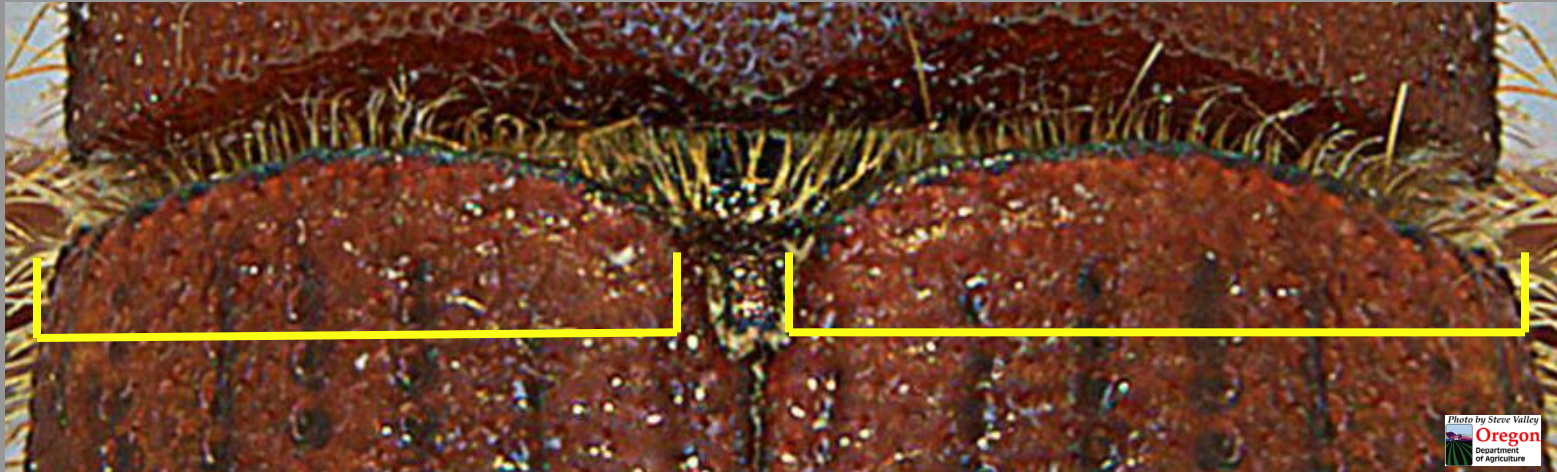


1a1: Anterior elytral margins procurved; pronotum unarmed; head visible.

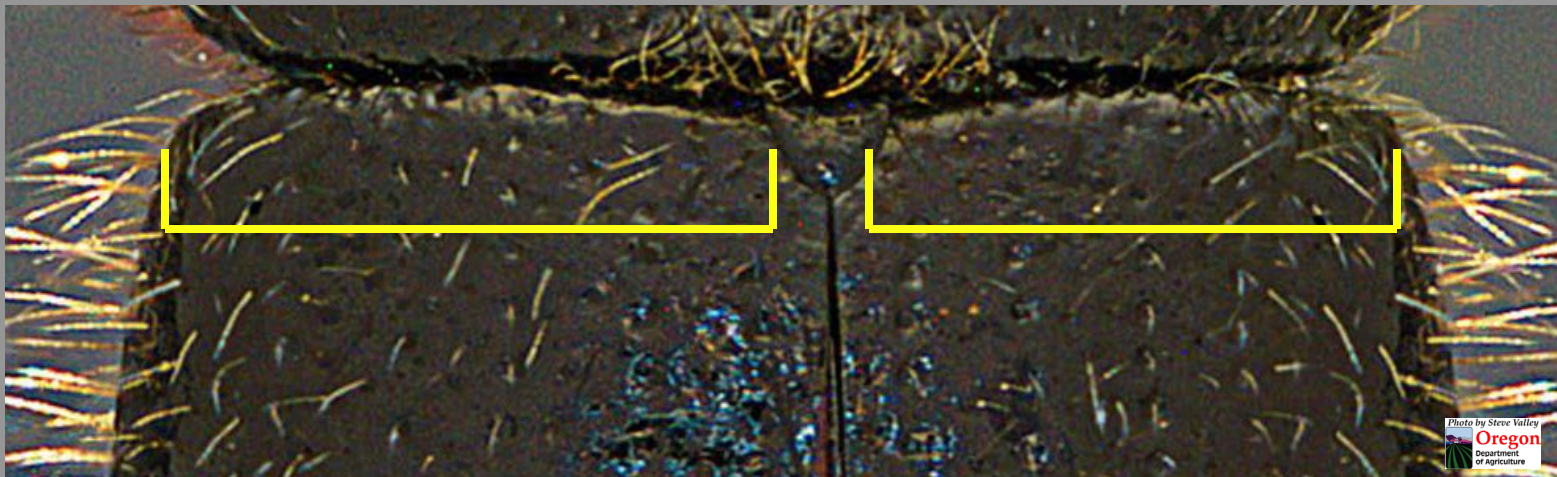


1b1: Anterior elytral margins truncate; pronotum armed; head concealed.

1: Part II



1a2: Anterior elytral margins procurved, with crenulations.

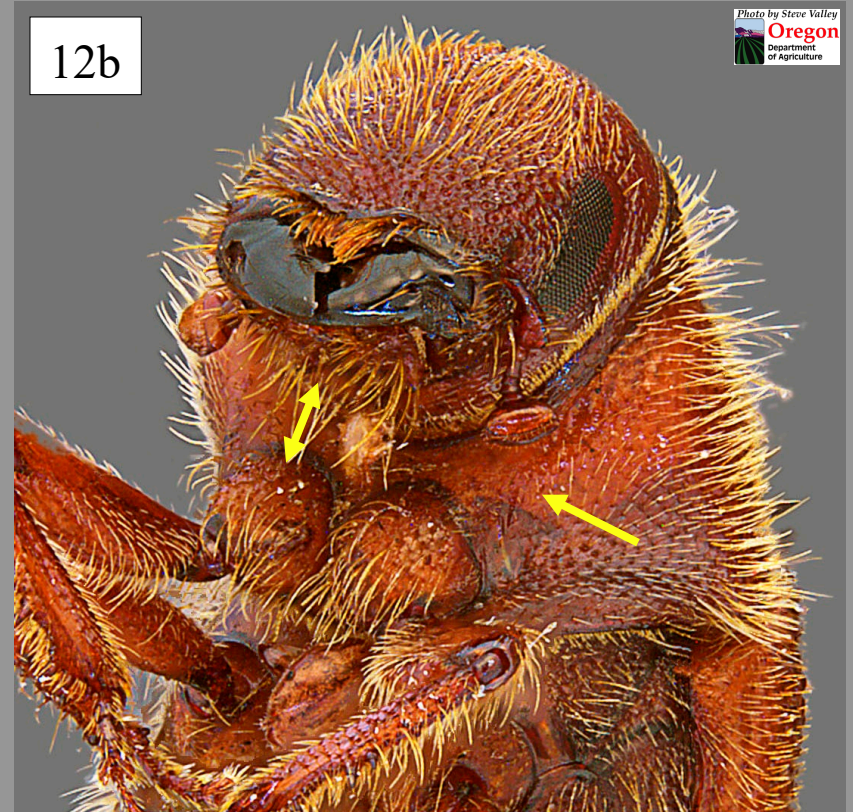


1b2: Anterior elytral margins truncate, without crenulations.

2 (1)

Prothoracic precoxal area long (~ as long as diameter of a procoxa), lateral margin strongly elevated from anterior margin to procoxae.....3

Prothoracic precoxal area short (much shorter than diameter of a procoxa, lateral prosternal ridge poorly developed or absent.....6



3 (2): Part I

Elytra with erect setae in apical half as long or longer than elytral intervals;
pronotal disc with about equal numbers of small and large punctures.....STOP

Elytra with recumbant setae in apical half shorter than elytral intervals; pronotal disc with most punctures uniform in size (a few very small punctures).....4



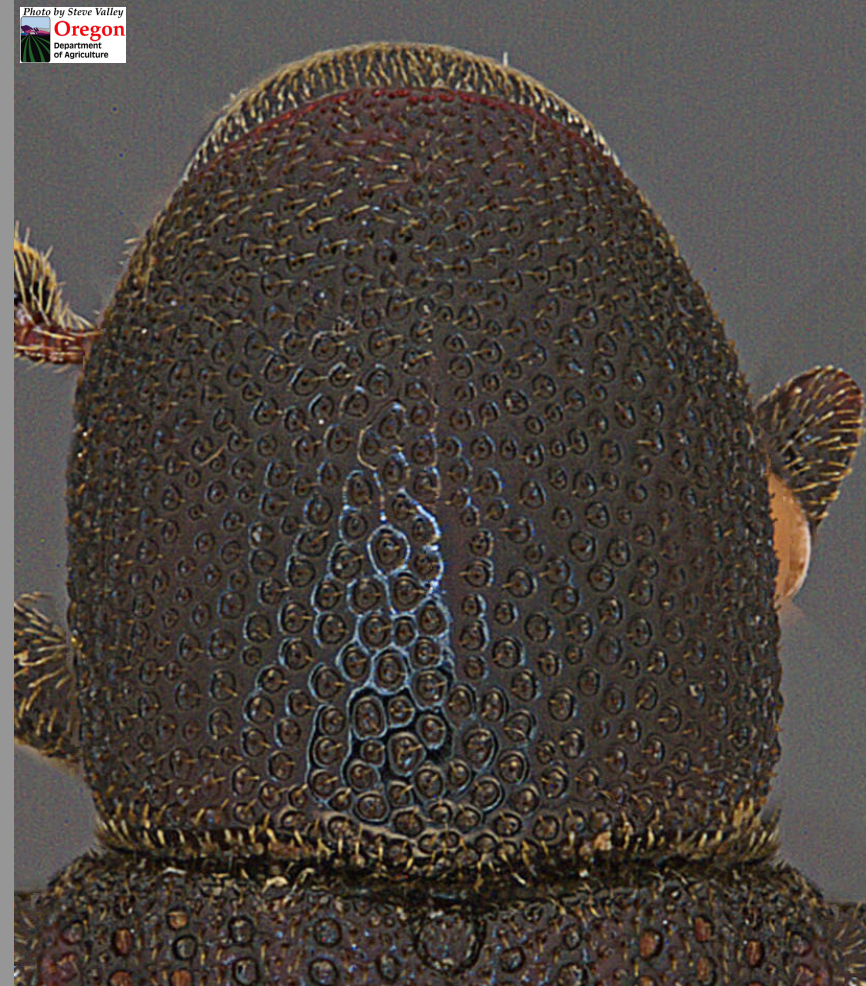
3 (2): Part II

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3a2: Pronotum with mixed puncture sizes.

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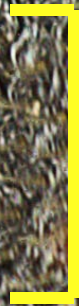
3b2: Pronotum with (mostly) uniform-size punctures.

4 (3)

Frons entirely devoid of median carina; mostly smaller (generally less than 3.0 mm in length).....STOP

Frons with definite median carina; mostly larger (generally greater than 3.3 mm in length).....5

4a: Frons without median carina.



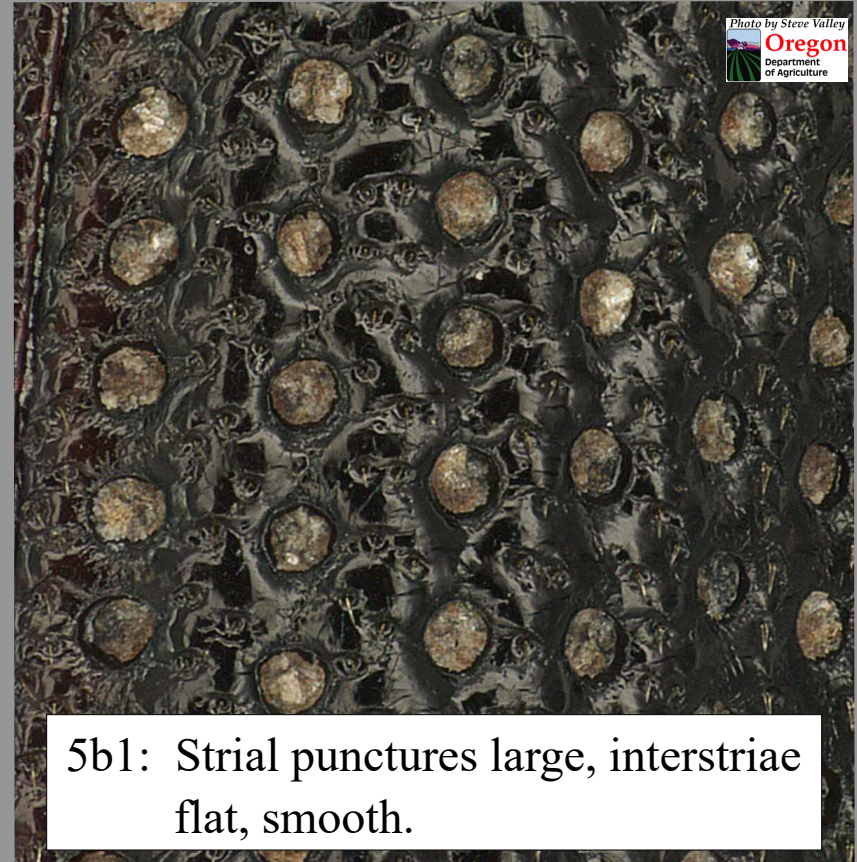
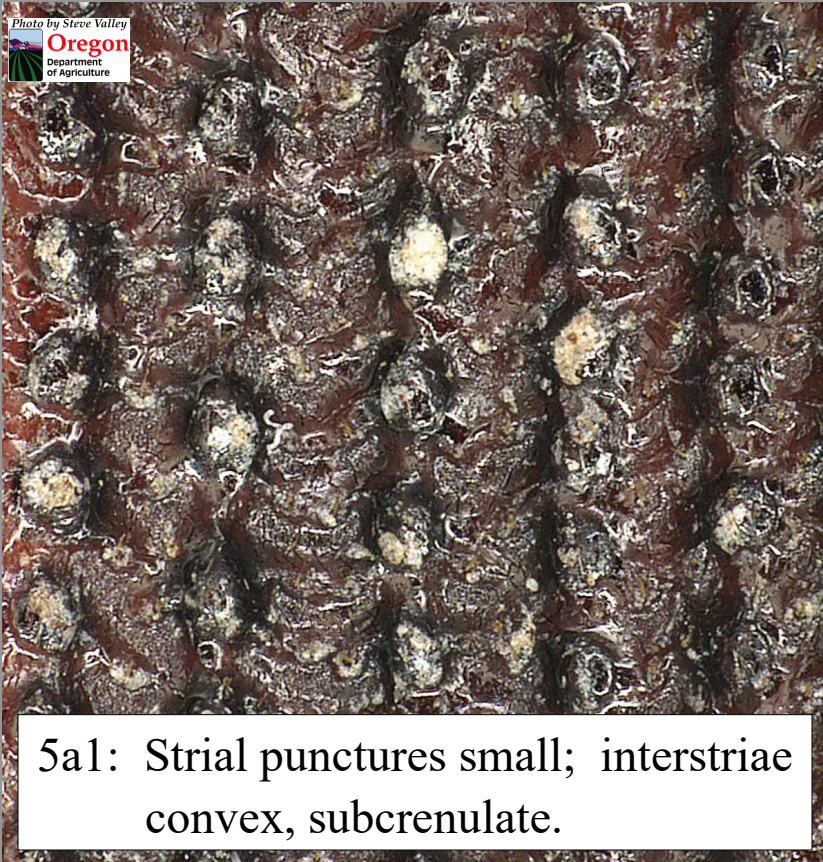
4b: Frons with median carina.



5 (4): Part I

Strial punctures on elytra small, indistinct; interstriae convex, subcrenulate.....*Hylastes salebrosus* Eichoff

Strial punctures on elytra large, distinct; interstriae flat, smooth.....*Hylastes porculus* Erichson



5 (4): Part II

Hylastes salebrosus Eichhoff



5 (4): Part II

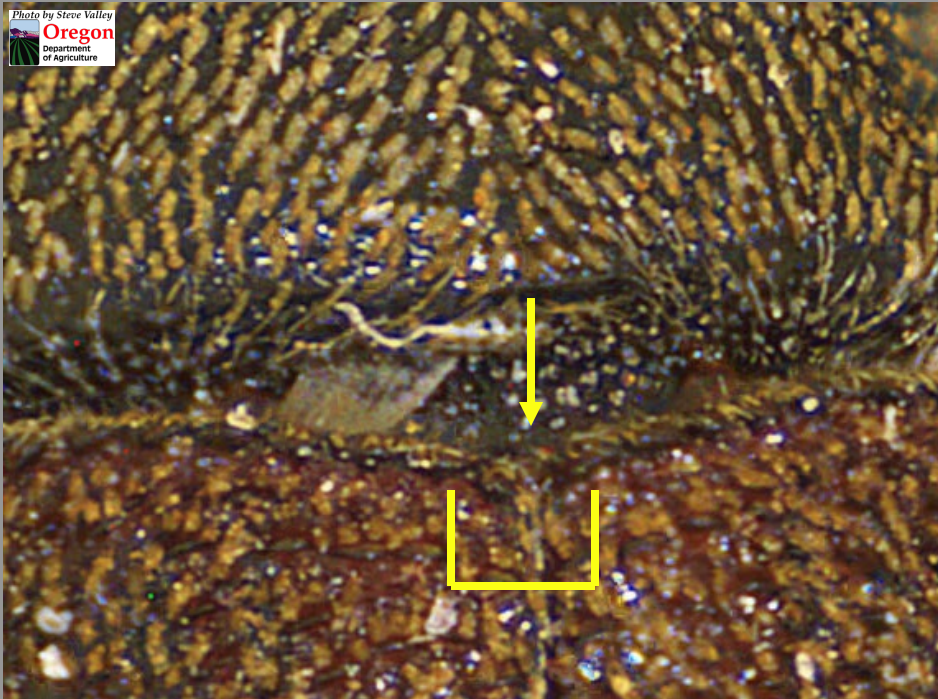
Hylastes porculus Erichson



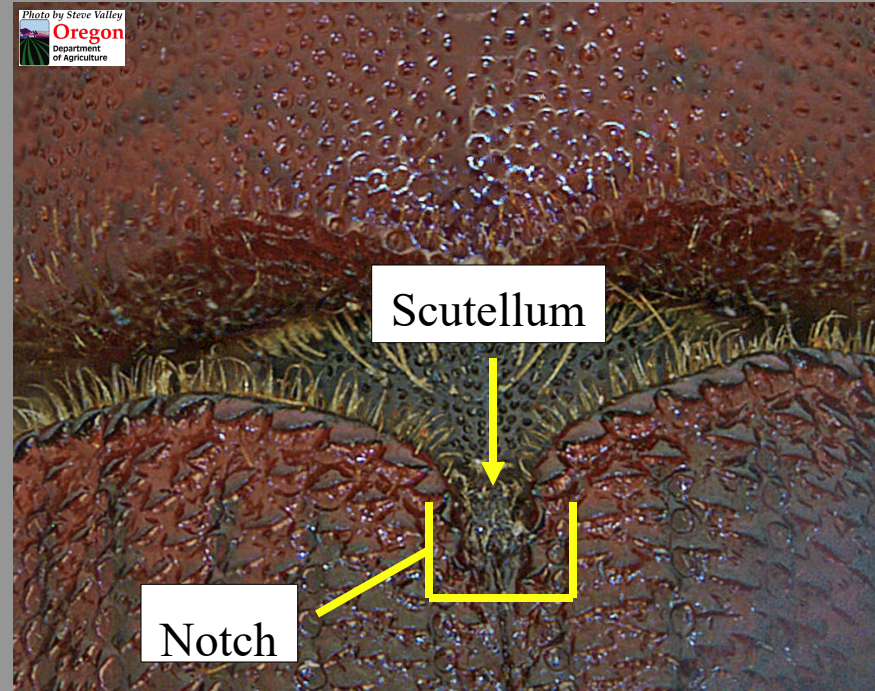
6 (2)

Scutellum not visible, elytral bases NOT notched for its reception.....STOP

Scutellum visible, elytral bases notched for its reception.....7



6a: Scutellum not visible, elytra not notched.



6b: Scutellum visible, elytra notched.

7 (6)

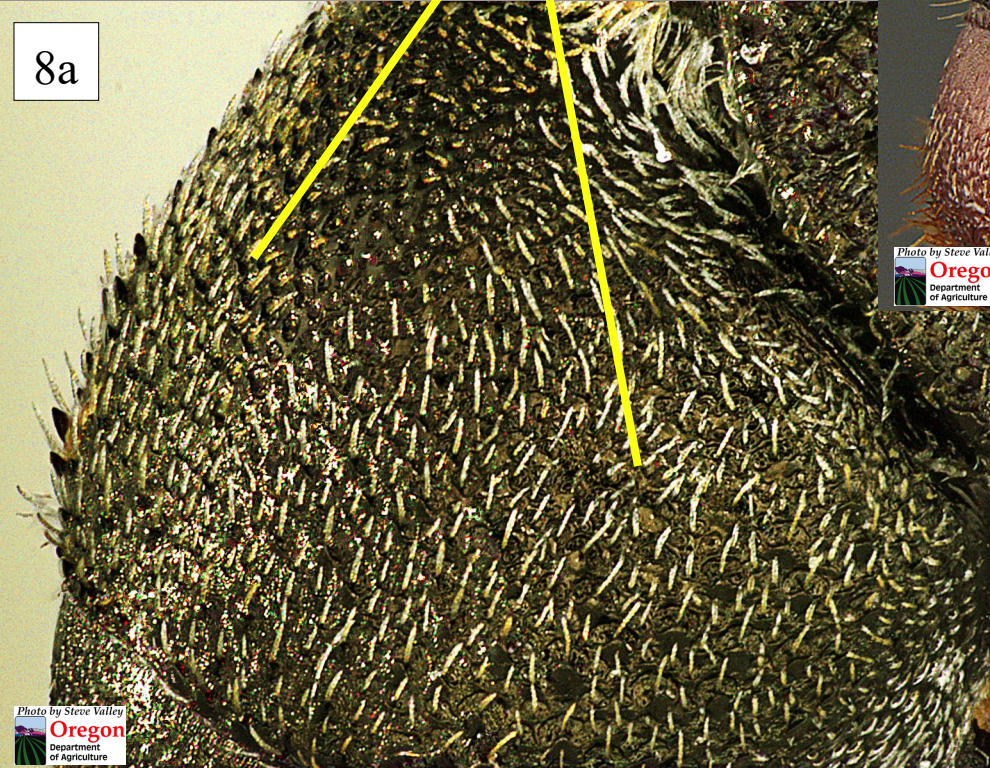
Antennal club asymmetrical or pseudolamellate, sutures oblique or absent...
.....STOP

Antennal club symmetrical, sutures transverse or slightly procurved.....8



8 (7)

Pronotum asperate on anterolateral areasSTOP



Pronotum not asperate antero-laterally.....9

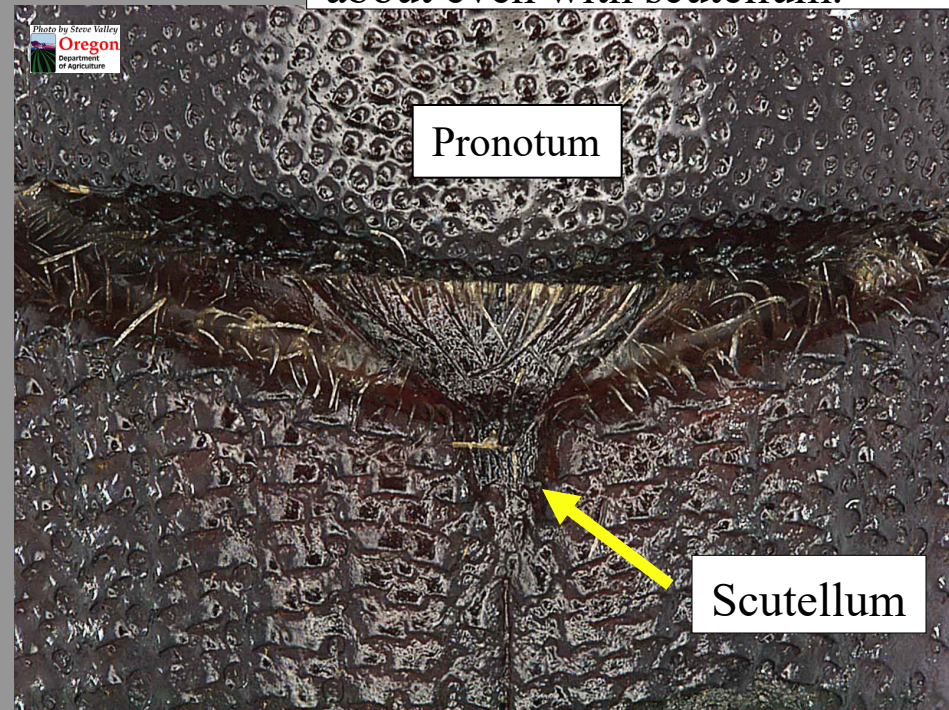
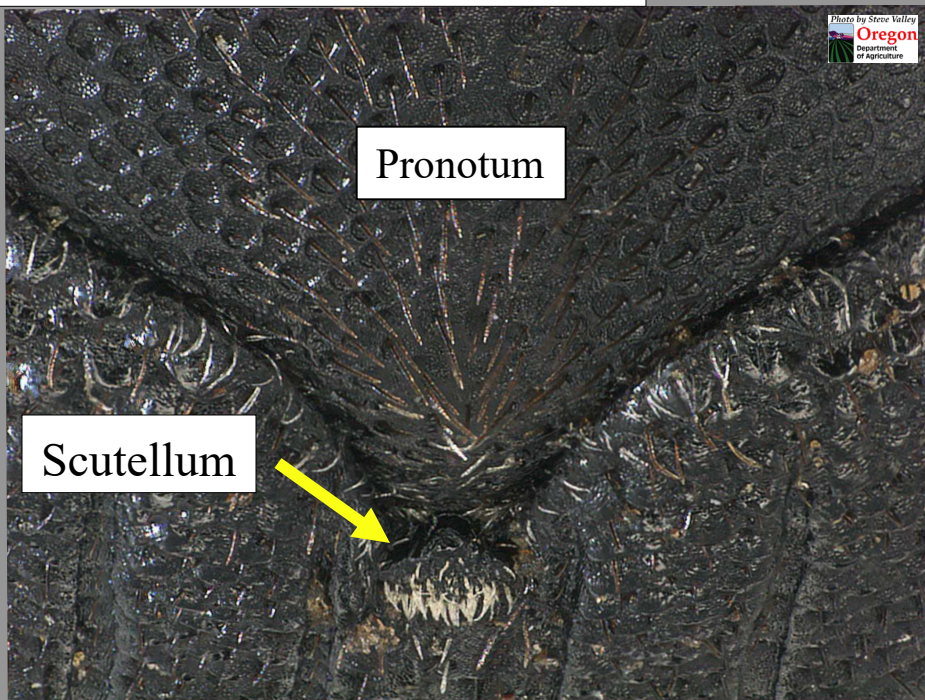
9 (8): Part I

Anterior margins of elytra extend well forward of anterior margin of scutellum; elytra extended anteriorly over pronotum; frons with long setae curving in from the sides to meet medially.....STOP

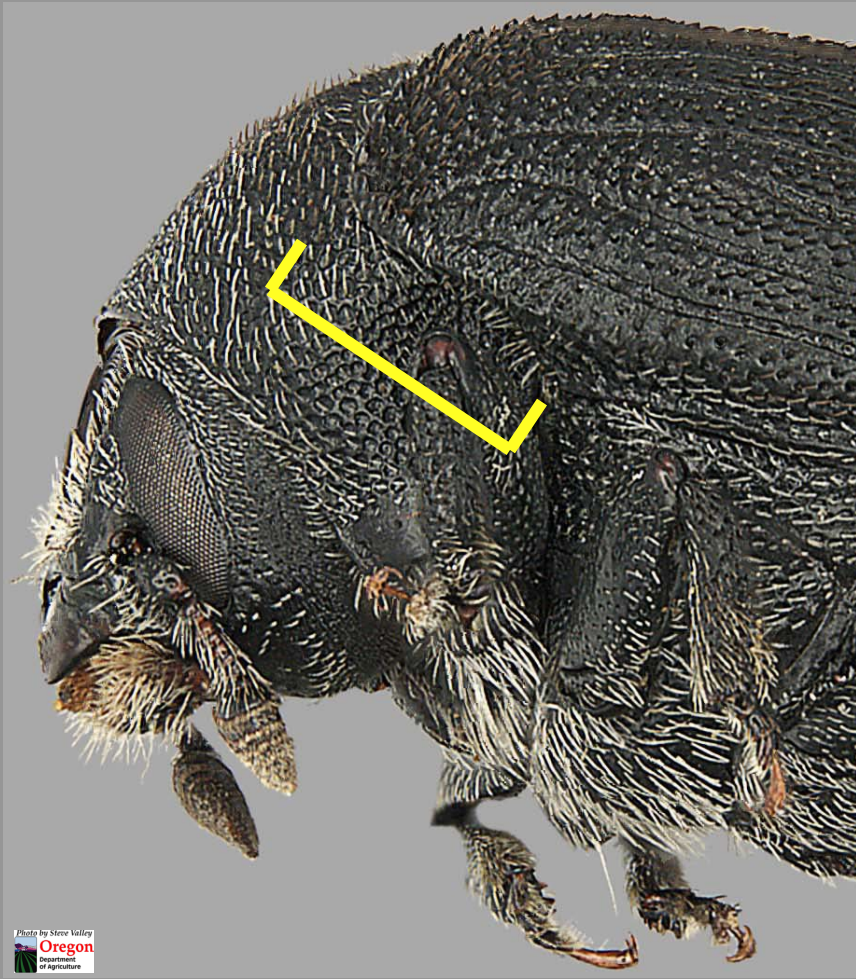
Anterior margins of elytra about even with anterior margin of scutellum; elytra not extended anteriorly over pronotum; setae on frons shorter, not curving in to meet medially.....10

9a1: Anterior margins of elytra extend forward of scutellum.

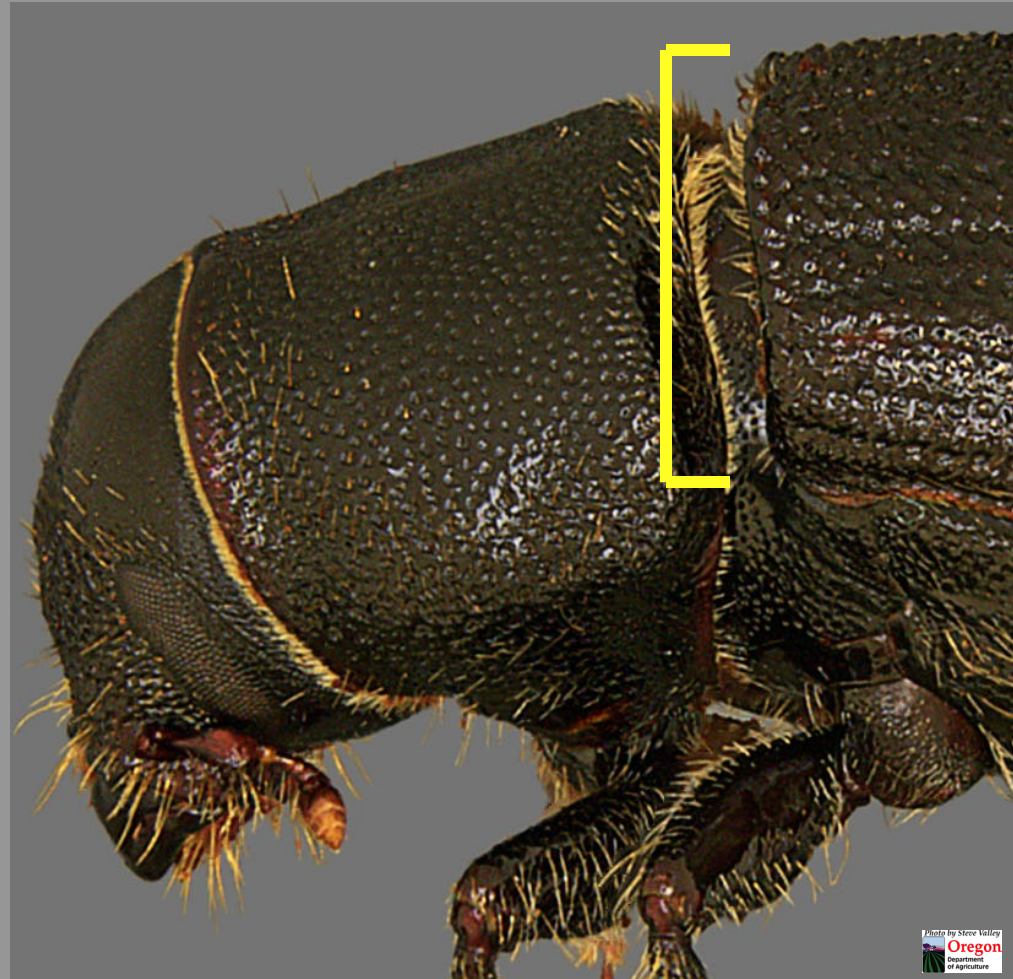
9b1: Anterior margins of elytra about even with scutellum.



9 (8): Part II

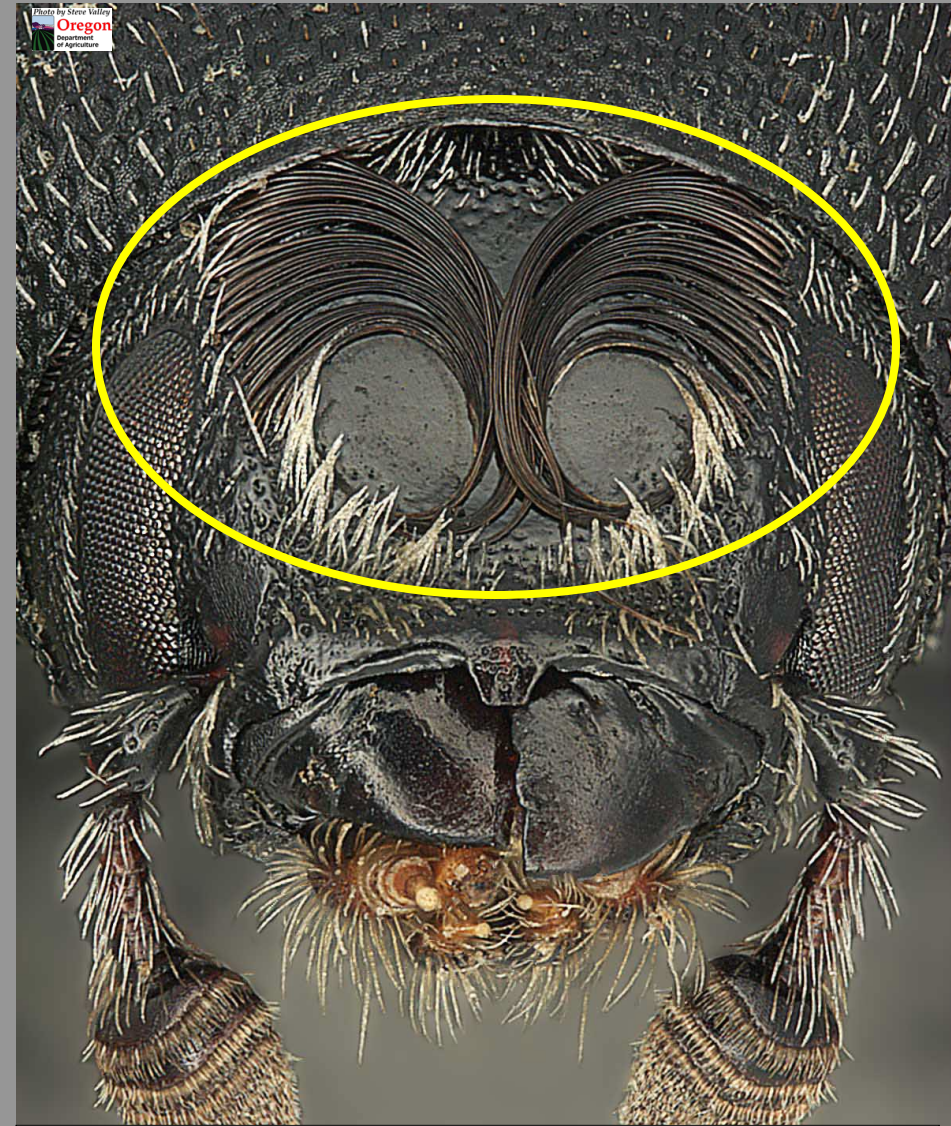


9a2: Elytra extending over pronotum.

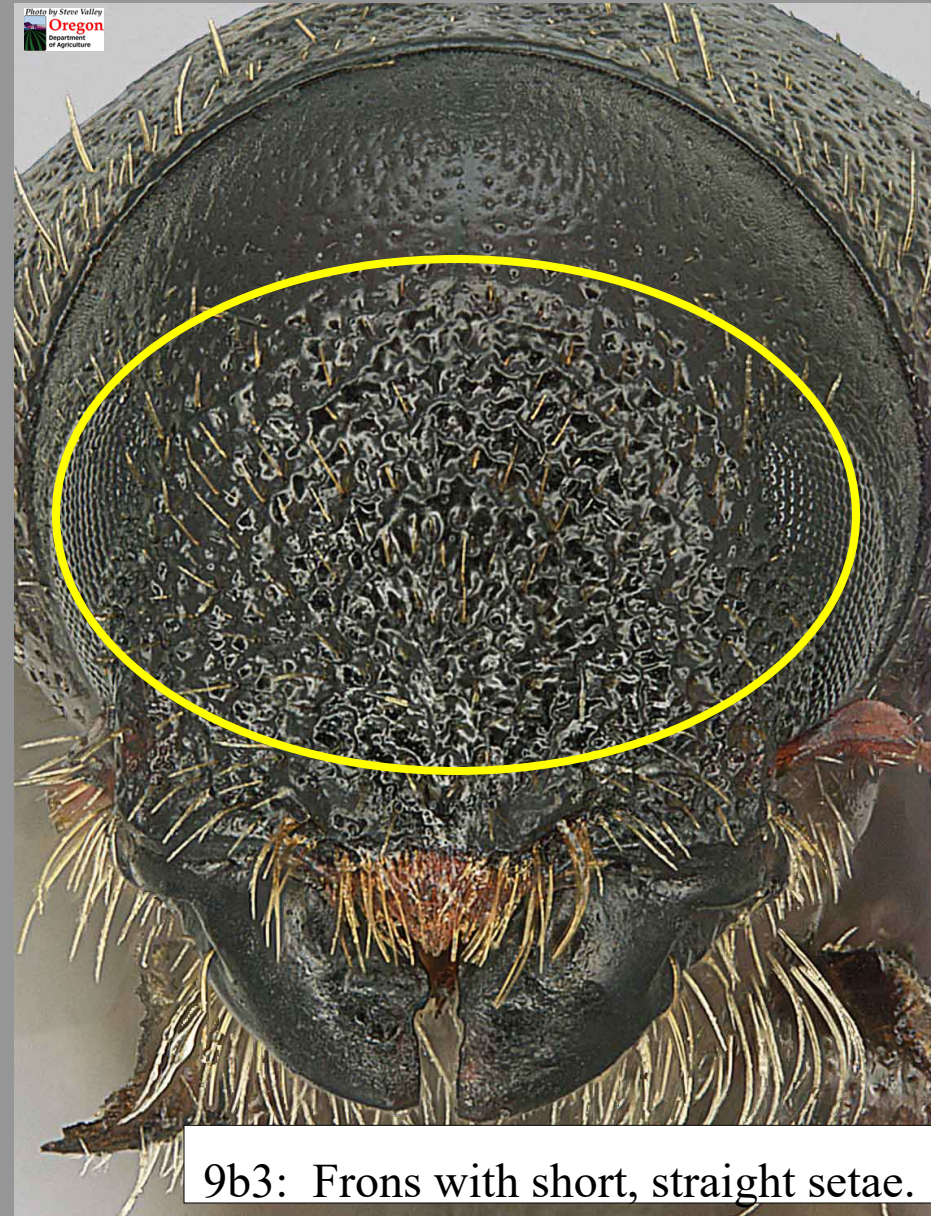


9b2: Elytra not extending over pronotum.

9 (8): Part III



9a3: Frons with long, inwardly curving setae.



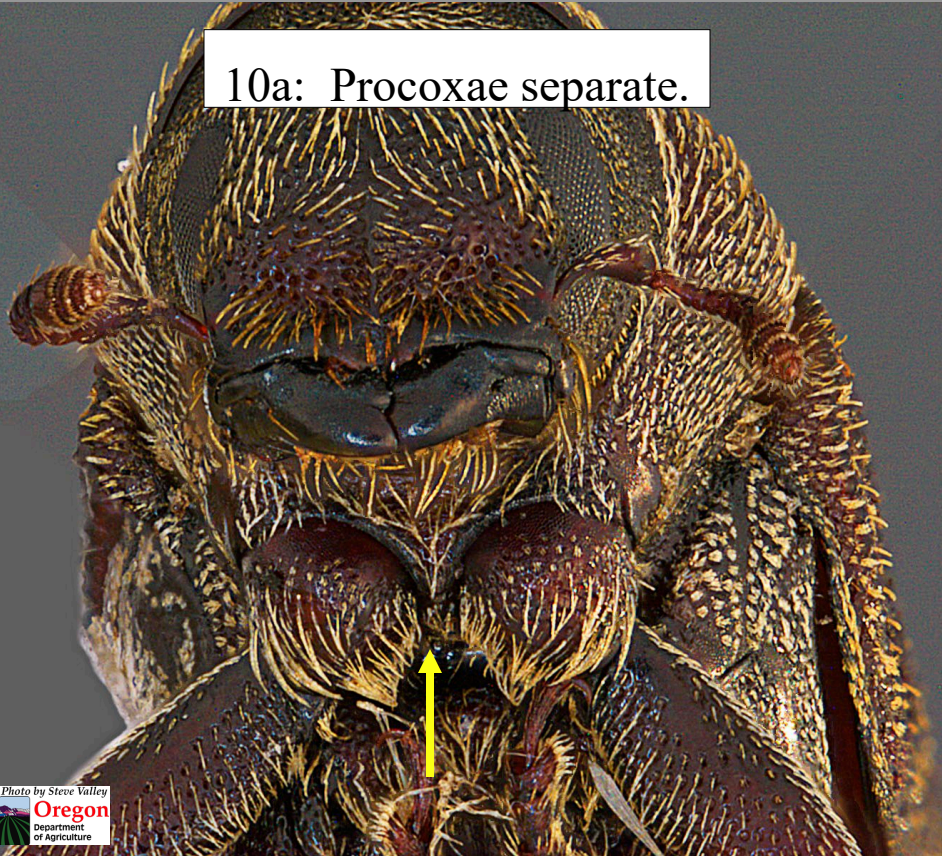
9b3: Frons with short, straight setae.

10 (9)

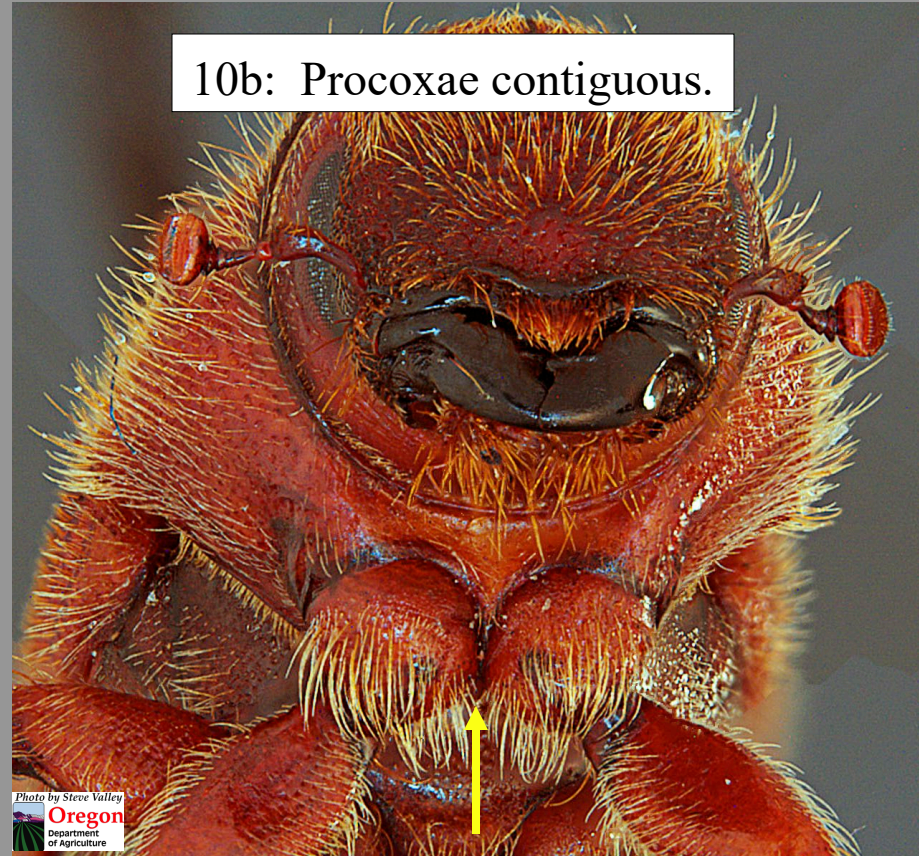
Procoxae distinctly separate.....STOP

Procoxae contiguous or at most very narrowly separate.....11

10a: Procoxae separate.



10b: Procoxae contiguous.

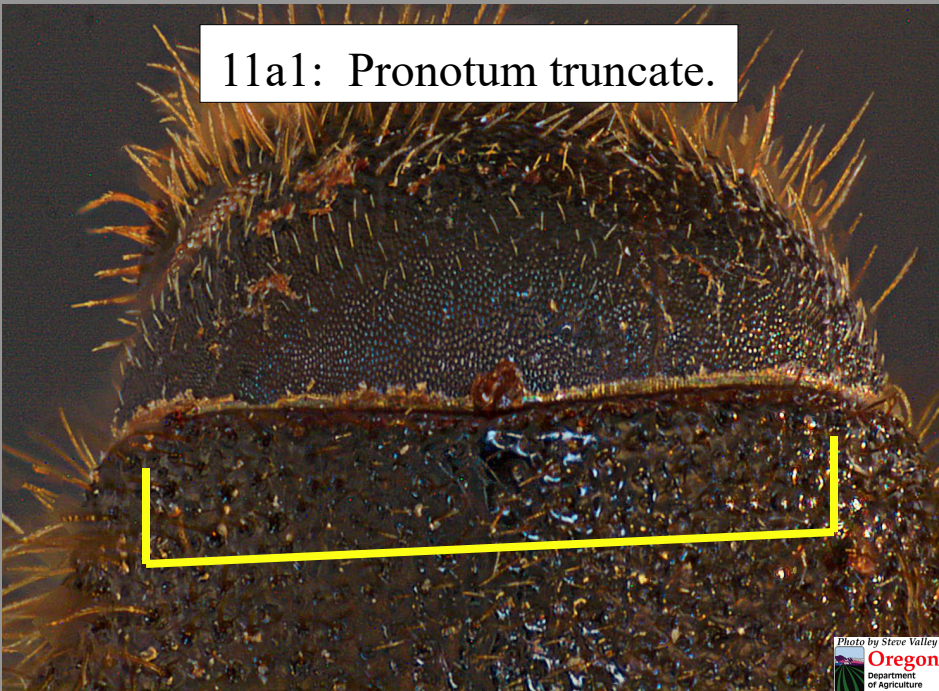


11 (10): Part I

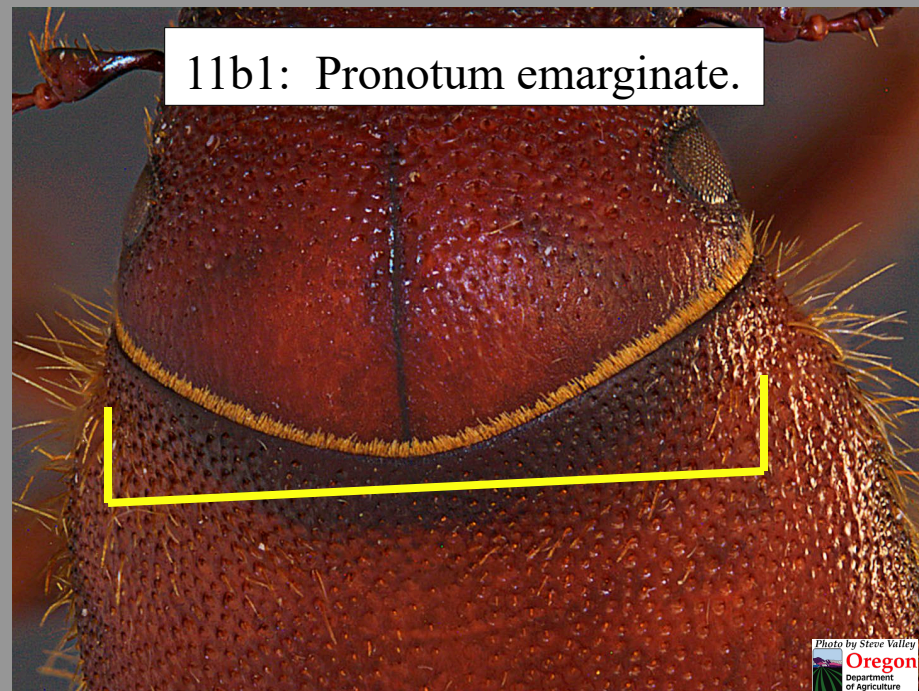
Anterior margin of pronotum truncate; antennal funicle with 6 segments; antennal club sutures transverse.....STOP

Anterior margin of pronotum distinctly emarginate; antennal funicle with 5 segments; antennal club sutures slightly procurved.....12

11a1: Pronotum truncate.

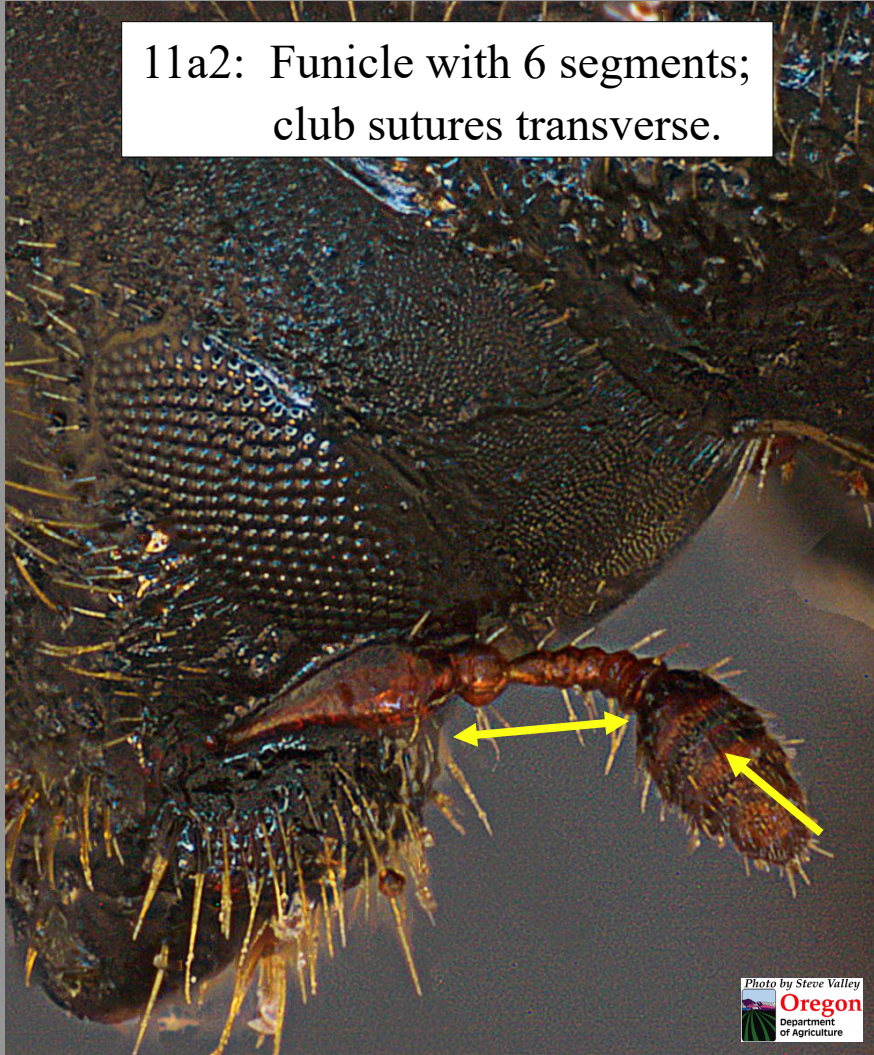


11b1: Pronotum emarginate.

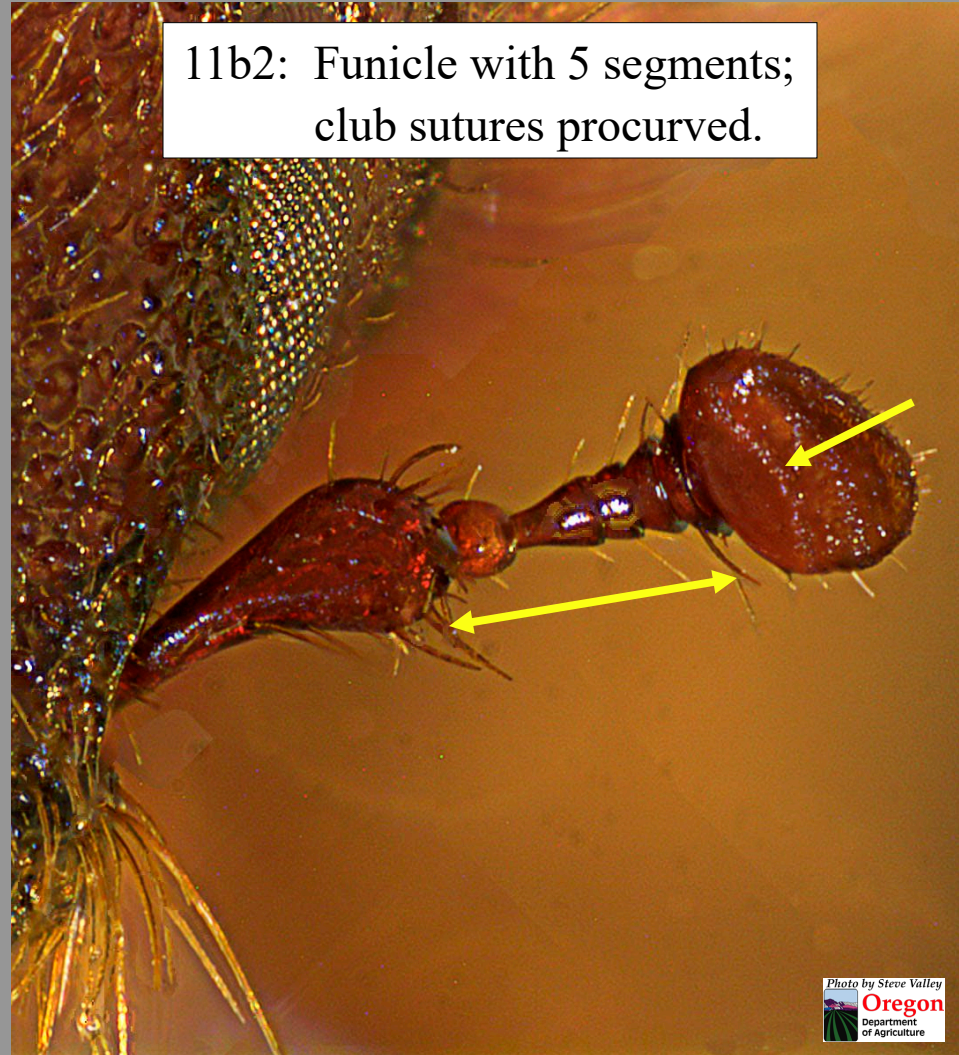


11 (10): Part II

11a2: Funicle with 6 segments;
club sutures transverse.



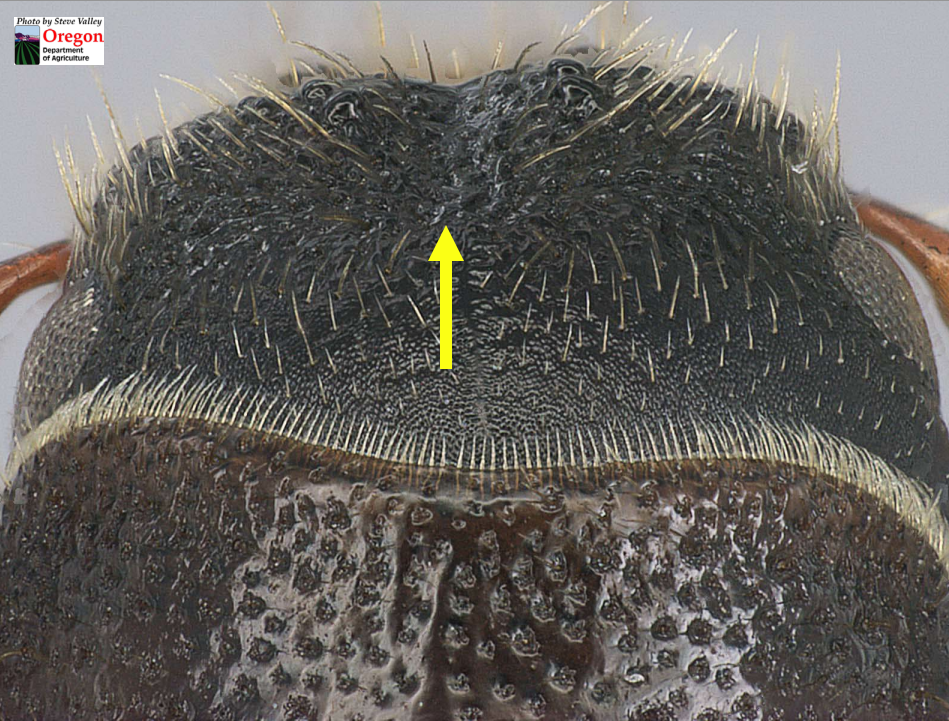
11b2: Funicle with 5 segments;
club sutures procurved.



12 (11): Part I

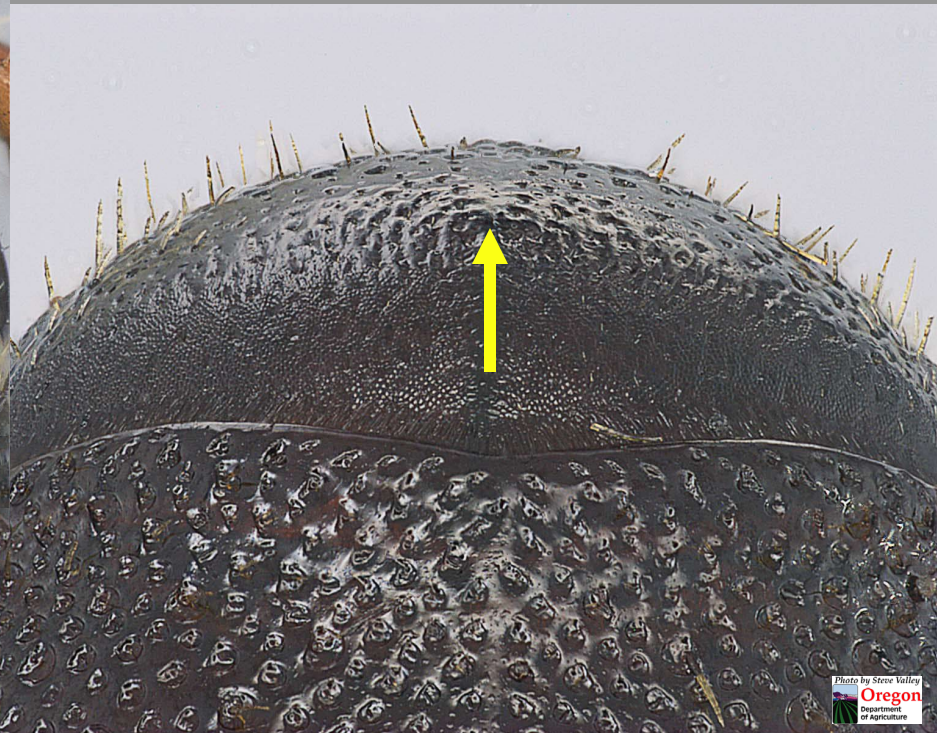
Frons with deep, narrow, median groove between eyes; dorsal vestiture of elytra shorter and dense.....*Dendroctonus frontalis* Zimmerman

Frons without deep median groove between eyes; dorsal vestiture of elytra longer and less dense.....*Dendroctonus terebrans* (Olivier)



12a1: Frons with median groove (dorsal view).

12b1: Frons without median groove (dorsal view).



12 (11): Part II

12b2: Elytral vestiture long, relatively sparse.

12a2: Elytral vestiture short, dense.

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12 (11): Part III

Dendroctonus frontalis Zimmerman



12a3.

12 (11): Part IV

Dendroctonus terebrans (Olivier)

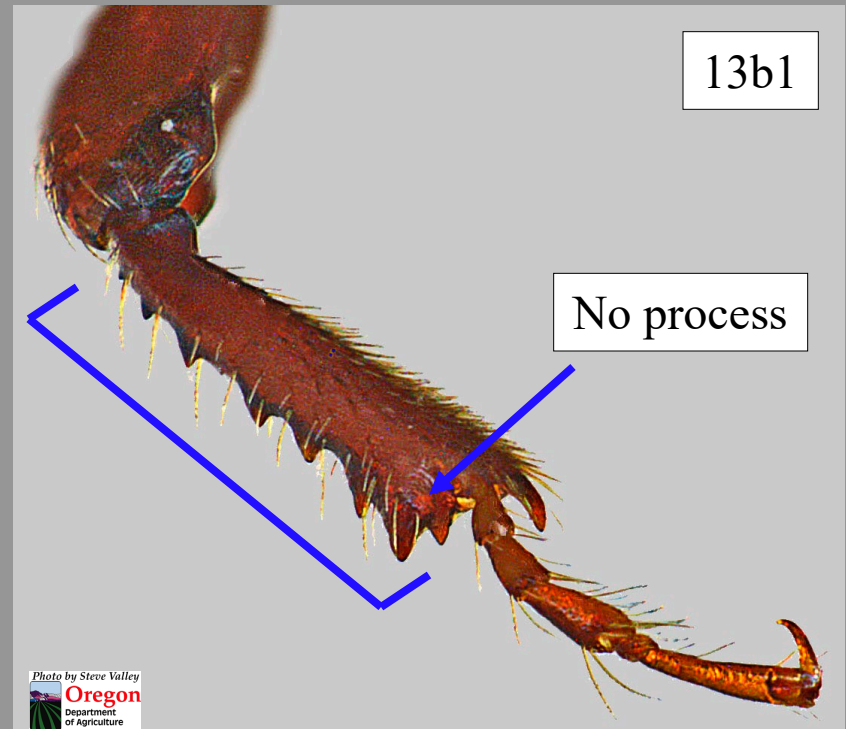
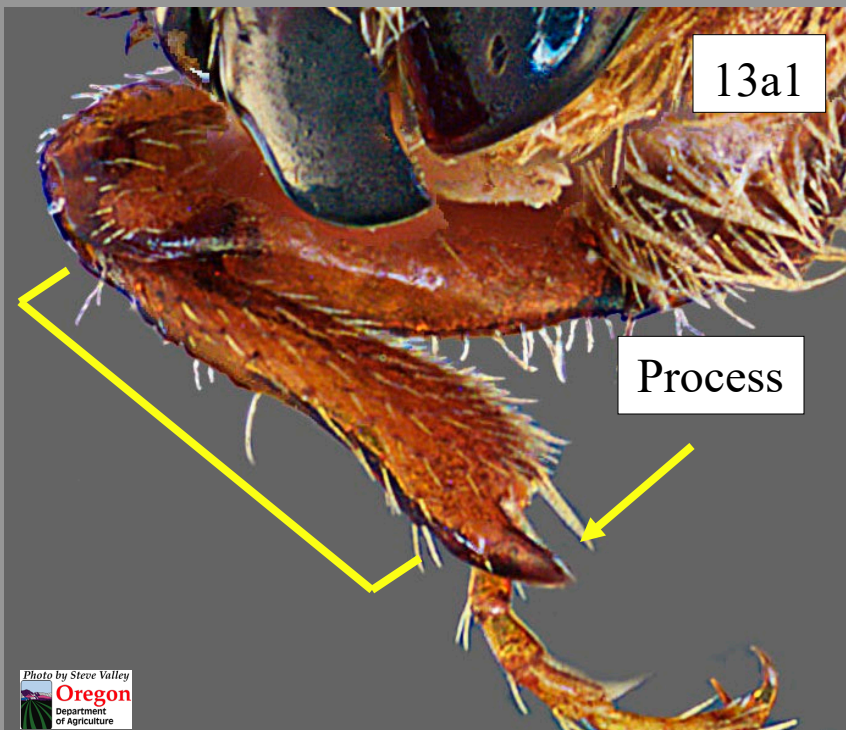


12b3.

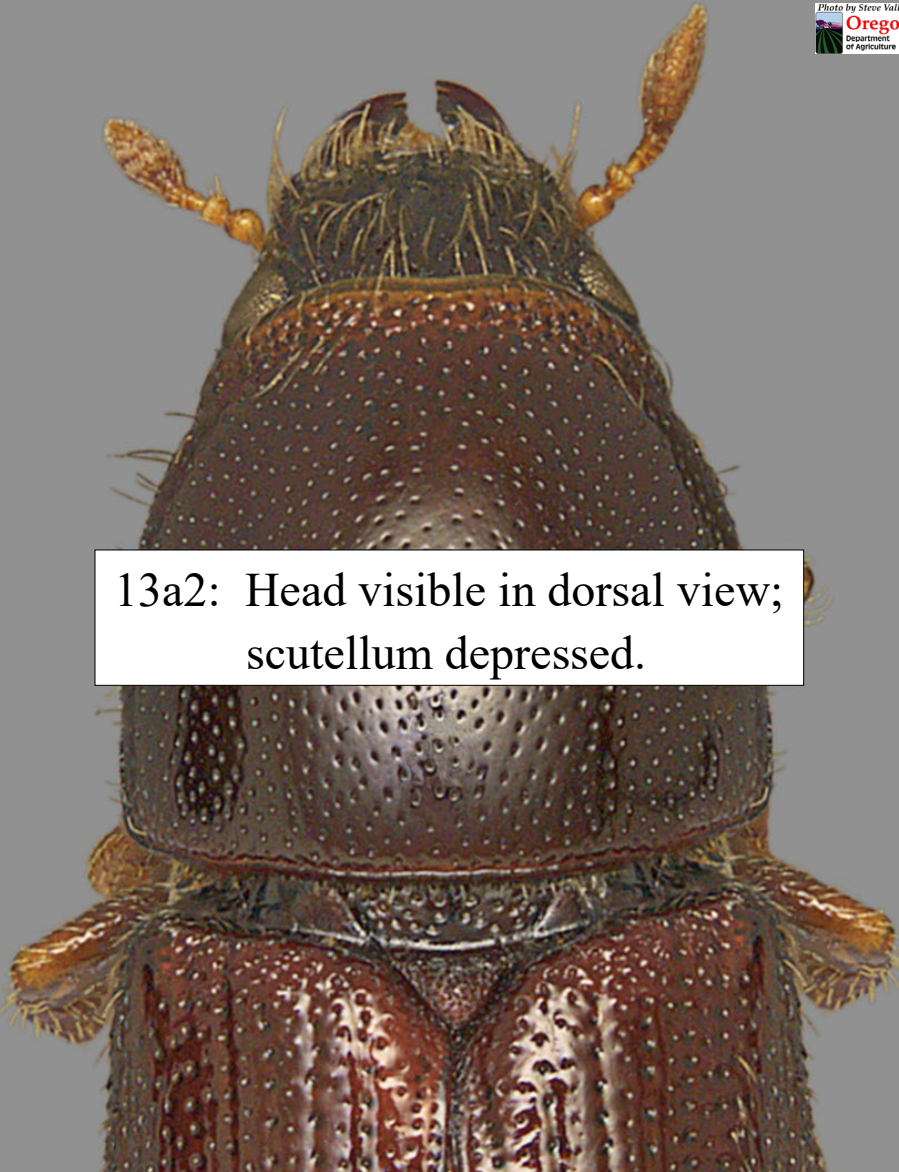
13 (1): Part I

Lateral margin of protibia unarmed except for a single curved process at outer apical angle that curves toward and extends beyond process of inner apical angle; head visible in dorsal view; scutellum depressed; elytra slightly, if at all, declivous, abdomen ascending to meet them.....STOP

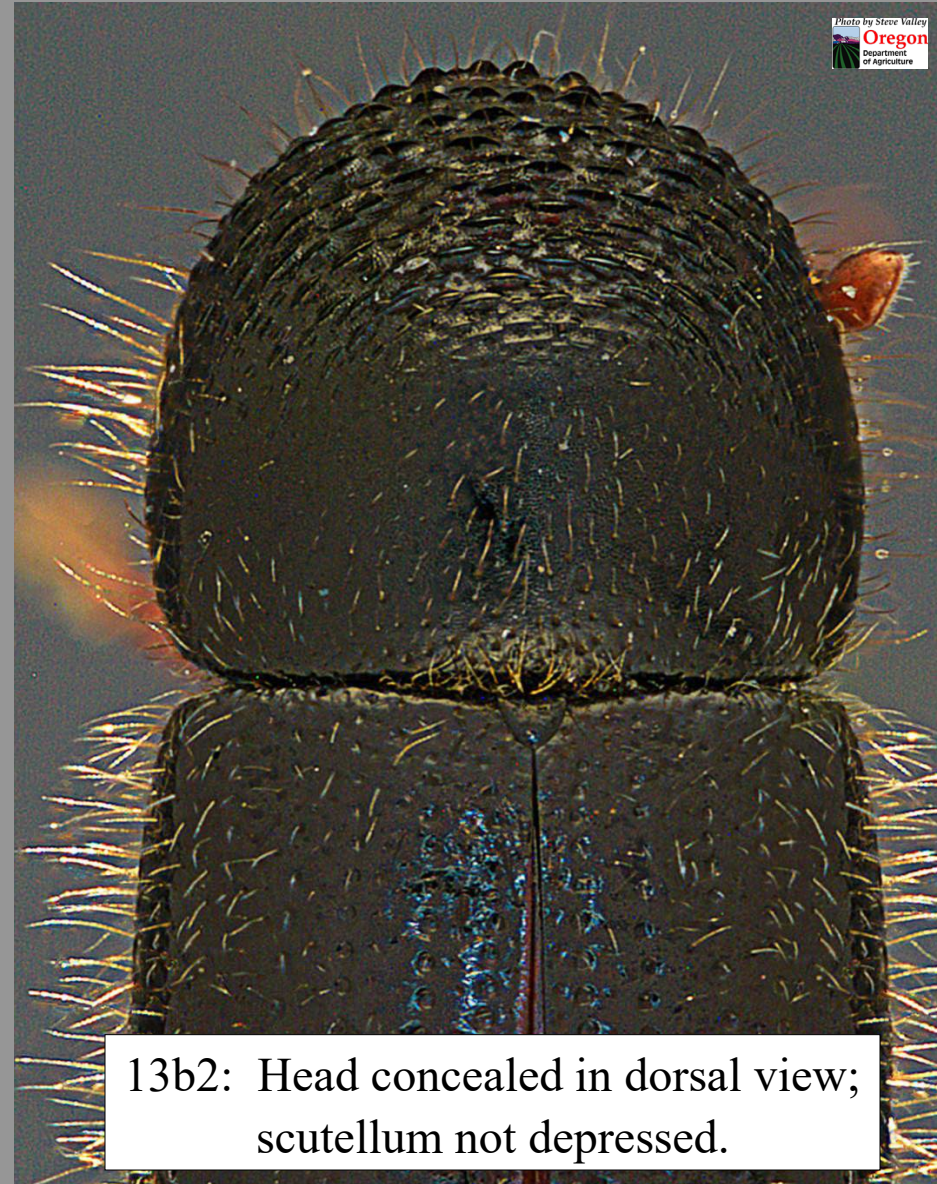
Lateral margin of protibia armed by several teeth, none of which curve toward the inner process; head not visible in dorsal view; scutellum flush with elytral surface; elytral declivity rather steep, descending to meet horizontal abdomen.....14



13 (1): Part II



13a2: Head visible in dorsal view;
scutellum depressed.



13b2: Head concealed in dorsal view;
scutellum not depressed.

13 (1): Part III

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13b3: Elytra steeply declivous,
descending to meet
horizontal abdomen.

13a3: Elytra slightly declivous,
abdomen ascending to
meet them.



Photo by Steve Valley
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of Agriculture

14 (13): Part I

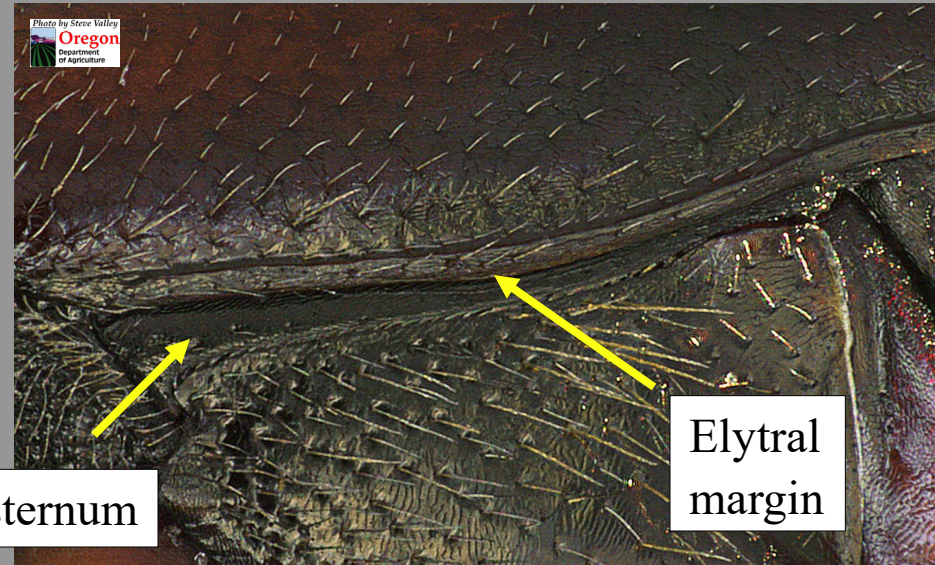
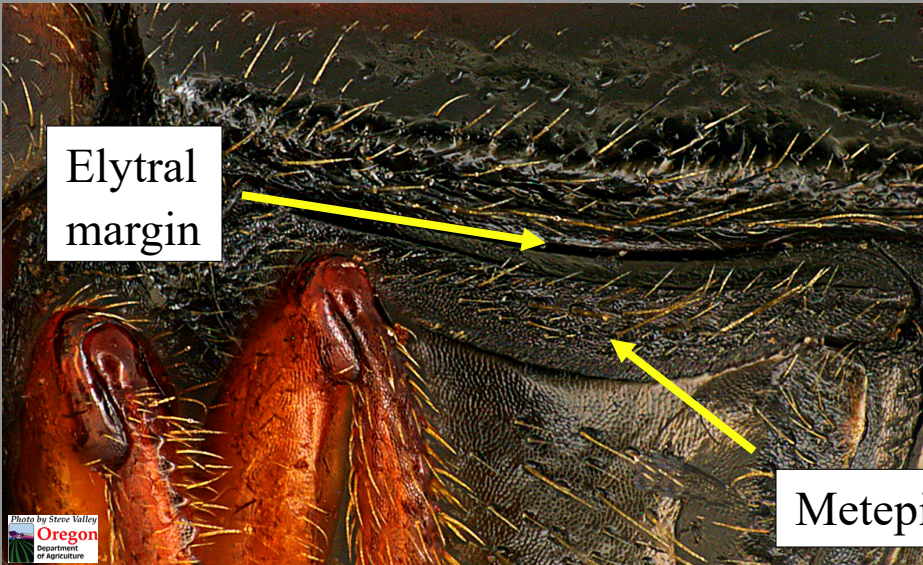
Metepisternum fully visible throughout its length (if the elytra are slightly displaced, this character may be difficult to assess); antennal club varying from flat to obliquely truncate.....15

Metepisternum largely covered by elytra, fully visible only in its anterior portion; antennal club strongly flattened with sutures on both sides, those on posterior surface not strongly displaced apically.....34



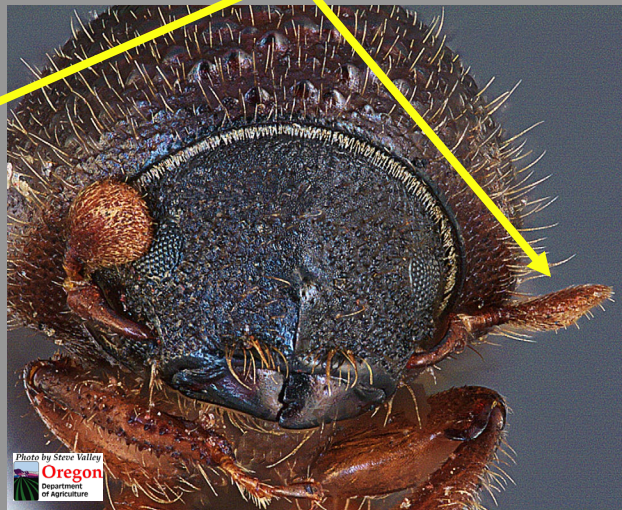
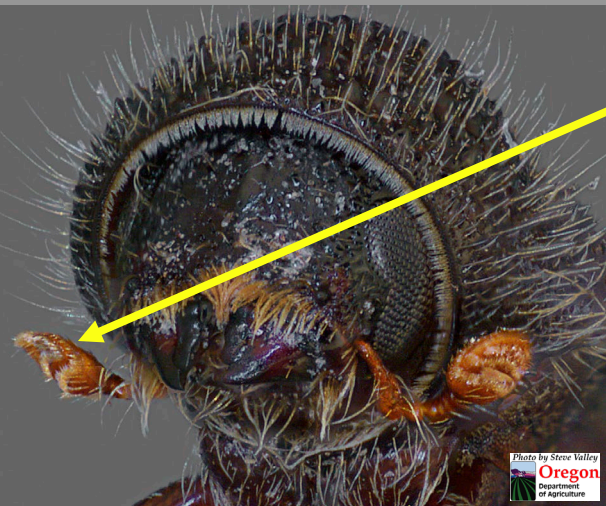
14a1: Metepisternum visible

14b1: Metepisternum obscured

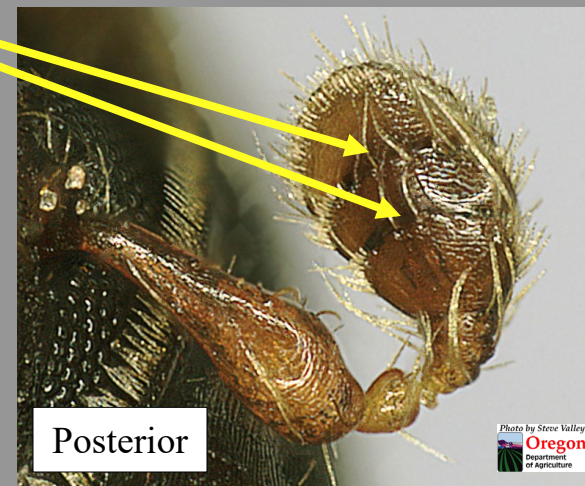
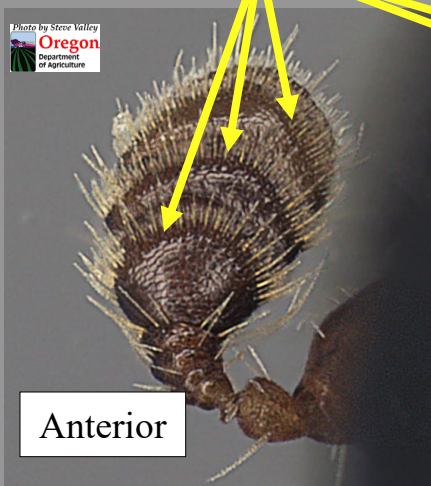


14 (13): Part II

14a2: Antennal club flat to obliquely truncate.



14b2: Antennal club strongly flattened, sutures on both sides, not displaced apically.



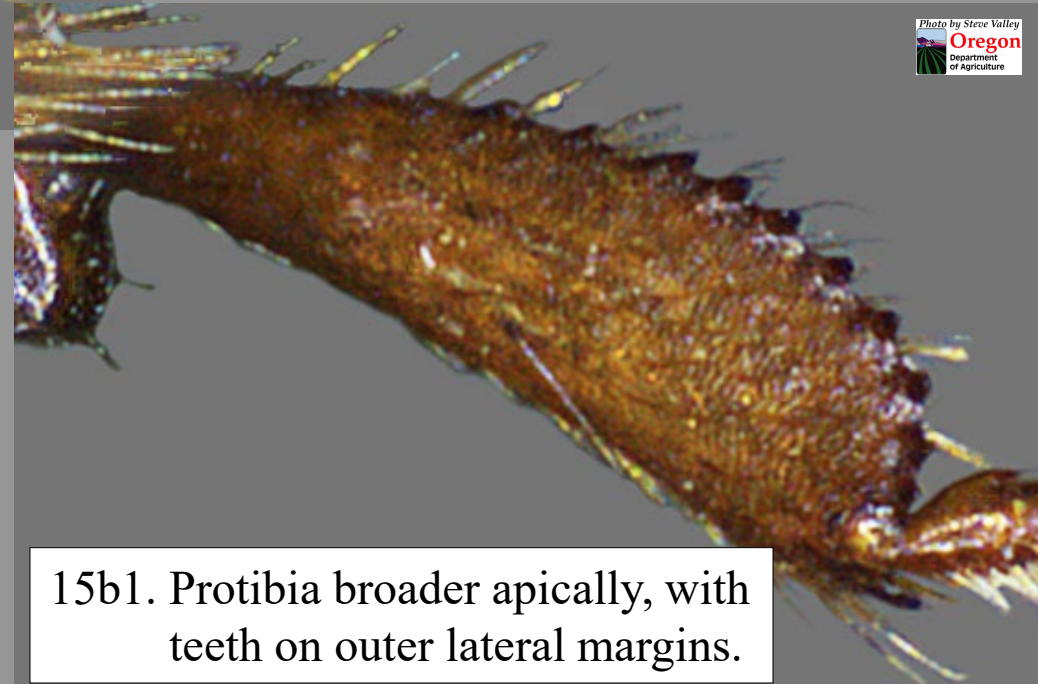
15 (14): Part I



15a1. Protibia with parallel sides, without outer lateral teeth.

Protibiae broader apically, with teeth on outer lateral margins; procoxae contiguous (EXCEPT *Xylosandrus*); lateral margins of pronotum rounded.....16

Protibiae with parallel sides, without outer lateral teeth; procoxae separated; lateral margins of pronotum not rounded.....STOP



15b1. Protibia broader apically, with teeth on outer lateral margins.

15 (14): Part II

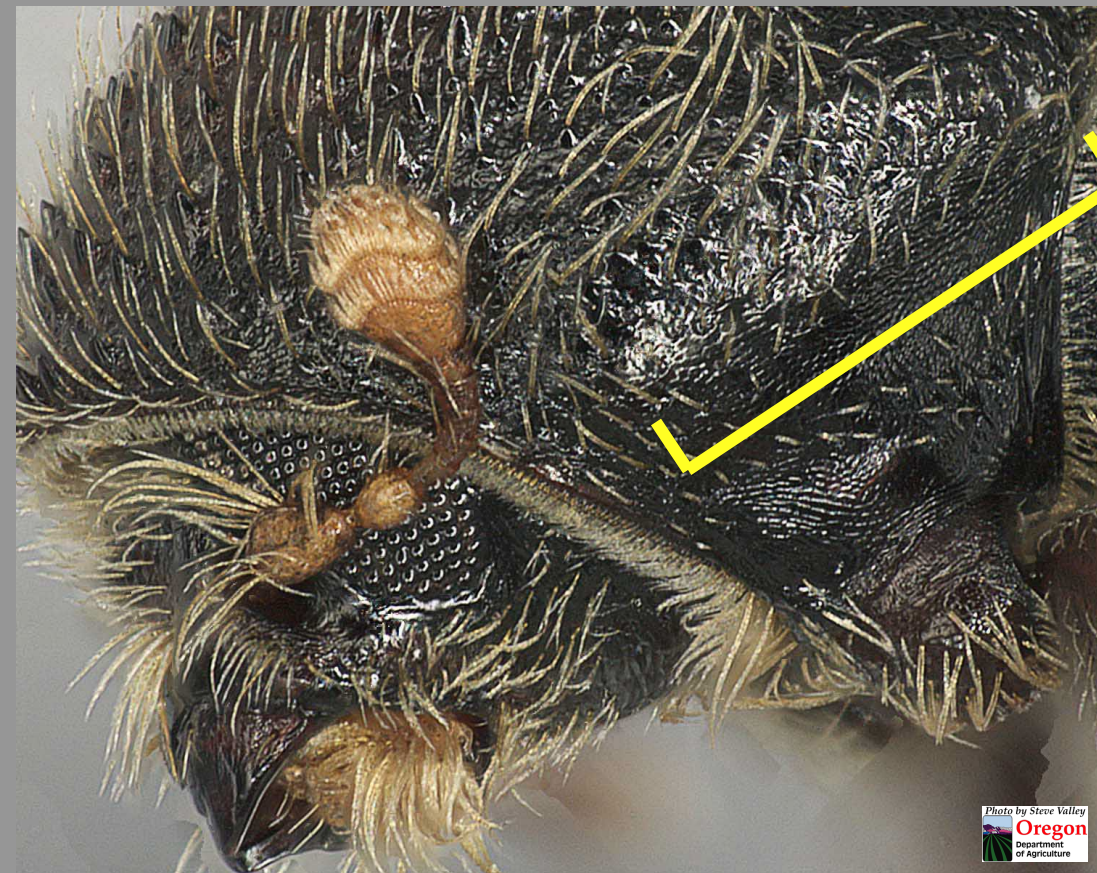


15a2. Procoxae separated.



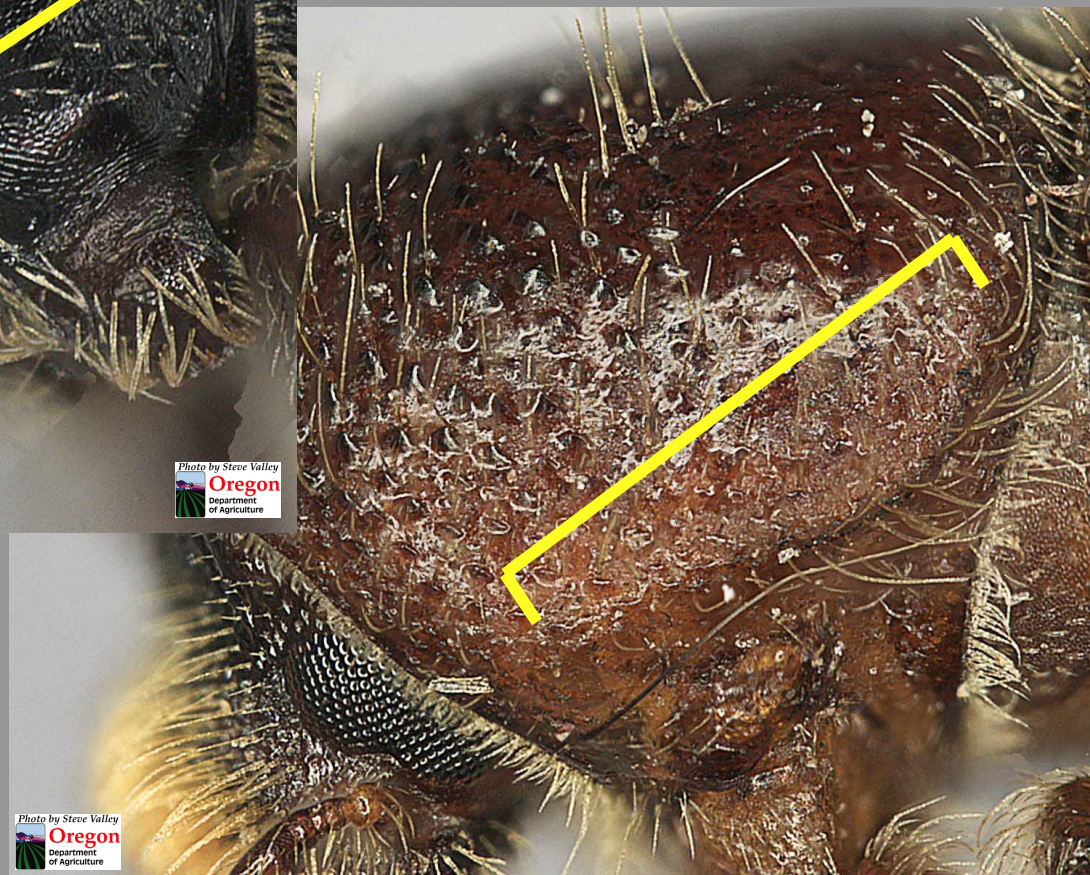
15b2. Procoxae contiguous.

15 (14): Part III



15a3. Lateral margins of pronotum rounded.

15b3: Lateral margins of pronotum not rounded.



16 (15): Part I

Antennal club more strongly flattened, with sutures on both faces, those on posterior face strongly procurved and limited to apical half; costal margins of elytra slightly ascending posteriorly; vestiture scale-like; usually less than 2.0 mm in total length.....17

Antennal club obliquely truncate or at least with sutures of posterior face restricted to less than apical 1/4; costal margins of elytra descending posteriorly; vestiture hairlike setae; usually greater than 2.0 mm in total length.....18



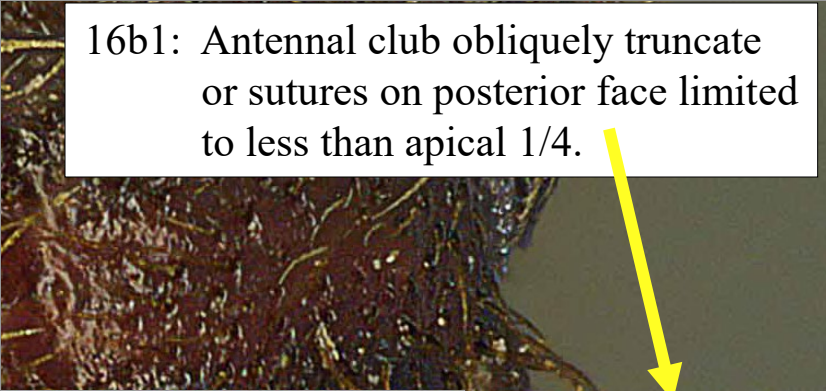
16a1: Antennal club flattened, sutures on both faces, those on posterior not limited to apical 1/4.



Anterior face



Posterior face

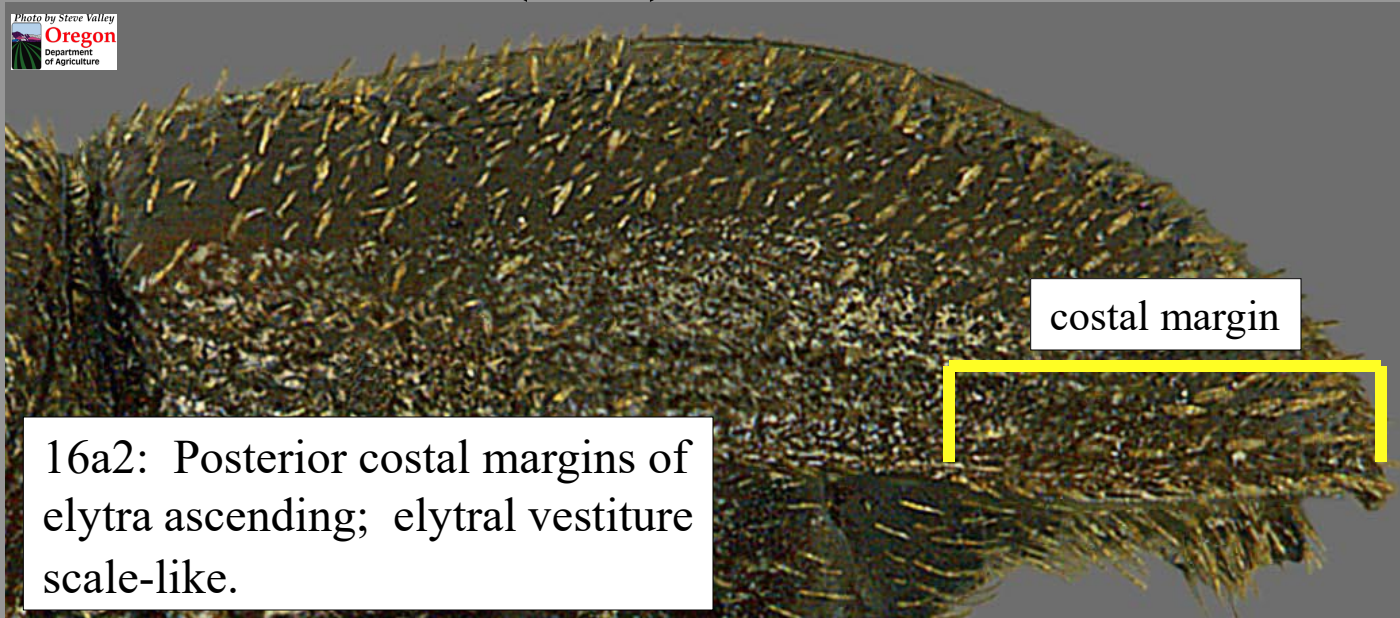


16b1: Antennal club obliquely truncate or sutures on posterior face limited to less than apical 1/4.



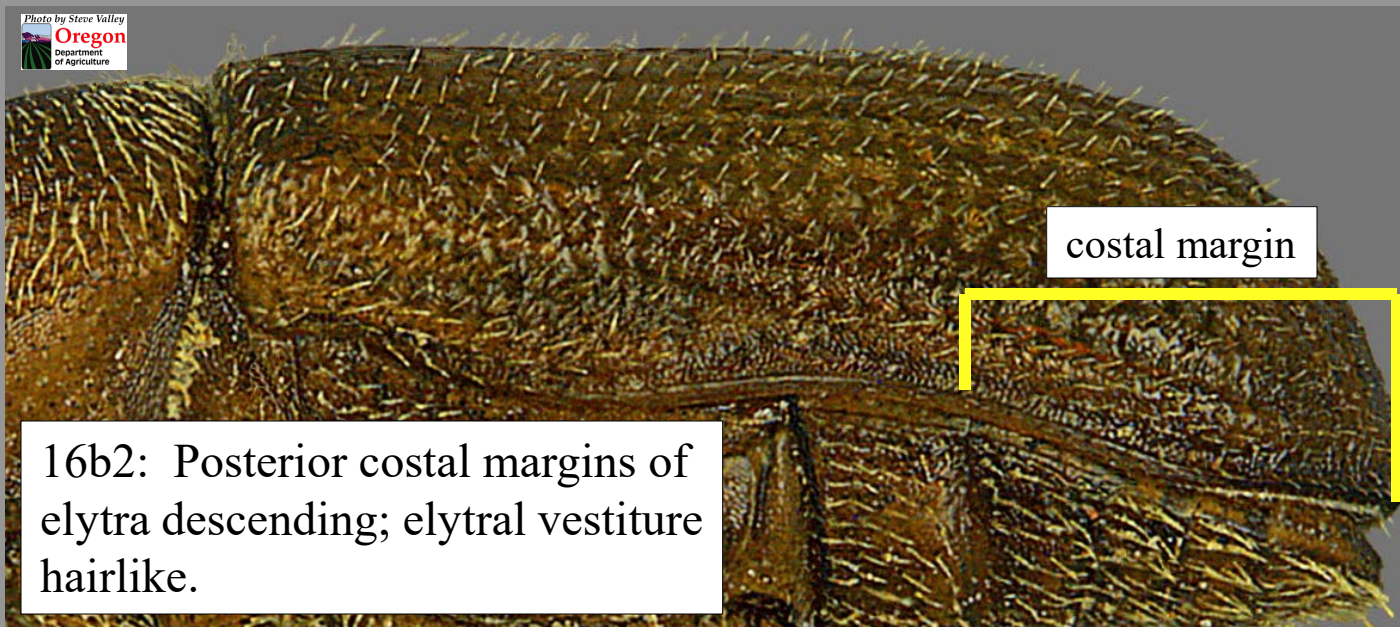
16 (15): Part II

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16a2: Posterior costal margins of elytra ascending; elytral vestiture scale-like.

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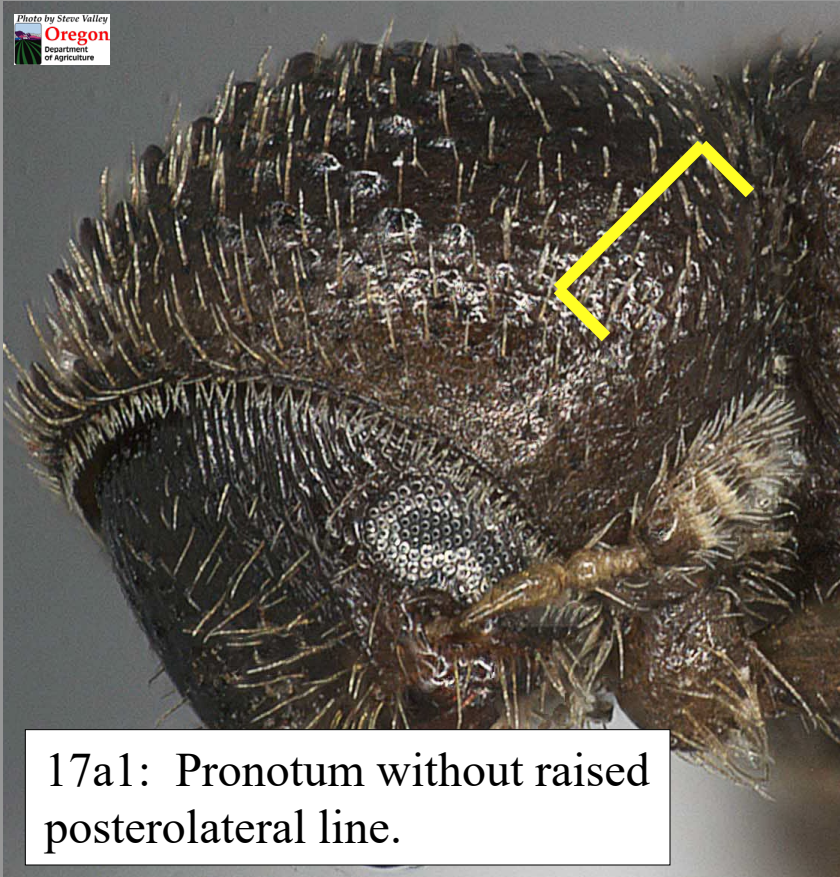


16b2: Posterior costal margins of elytra descending; elytral vestiture hairlike.

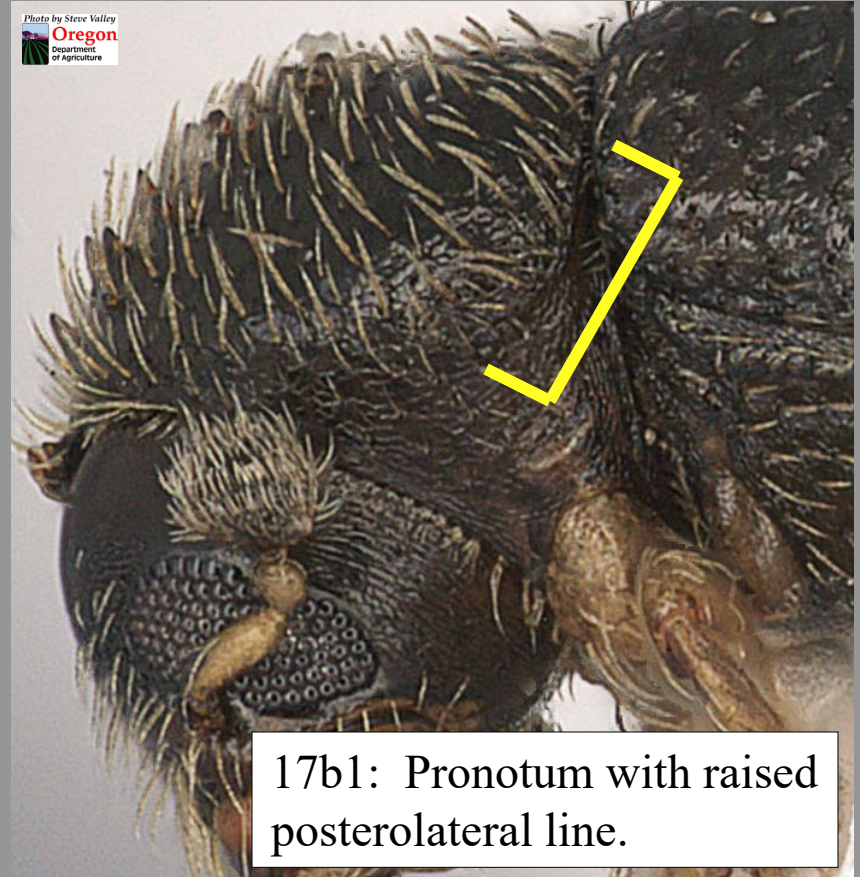
17 (16): Part I

Pronotum without fine, raised posterolateral line; anterior margin of eye at most shallowly emarginate; antennal club longer than broad.....STOP

Pronotum acutely margined at sides and with fine, raised line at least on posterolateral 1/3; anterior margin of eye distinctly emarginate; antennal club about as long as broad.....
.....*Hypothenemus* spp.



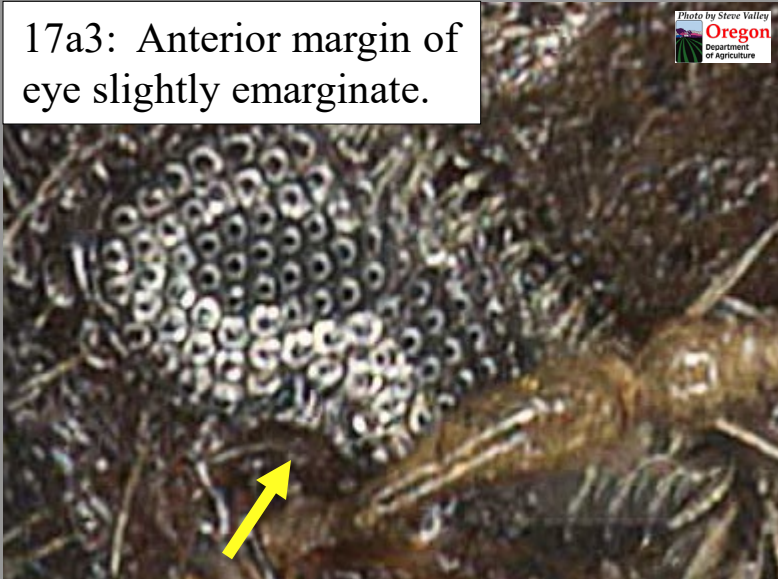
17a1: Pronotum without raised posterolateral line.



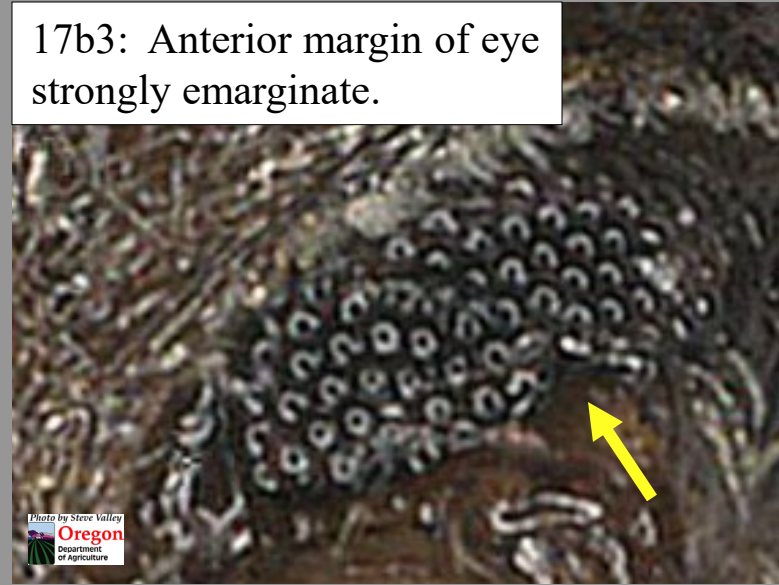
17b1: Pronotum with raised posterolateral line.

17 (16): Part II

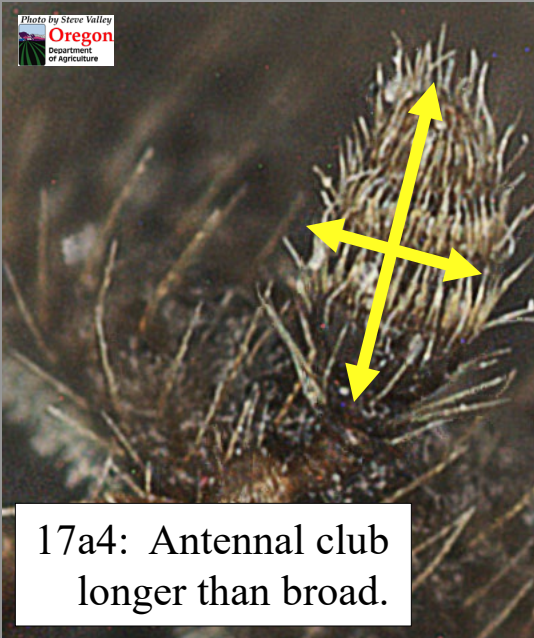
17a3: Anterior margin of eye slightly emarginate.



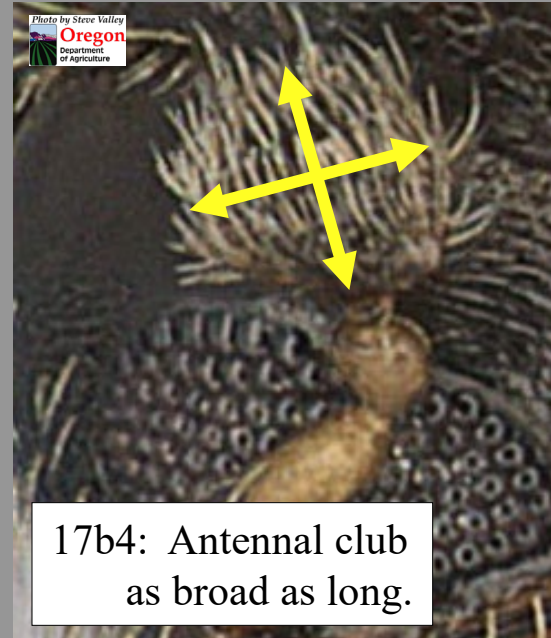
17b3: Anterior margin of eye strongly emarginate.



17a4: Antennal club longer than broad.



17b4: Antennal club as broad as long.



17 (16): Part III

Hypothenemus spp.



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17b5.

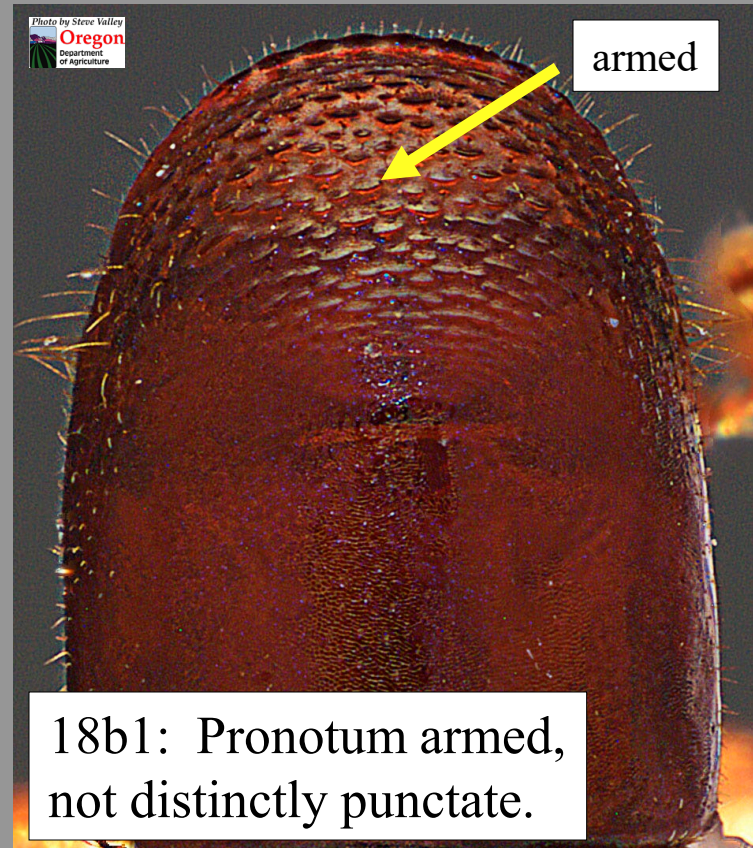
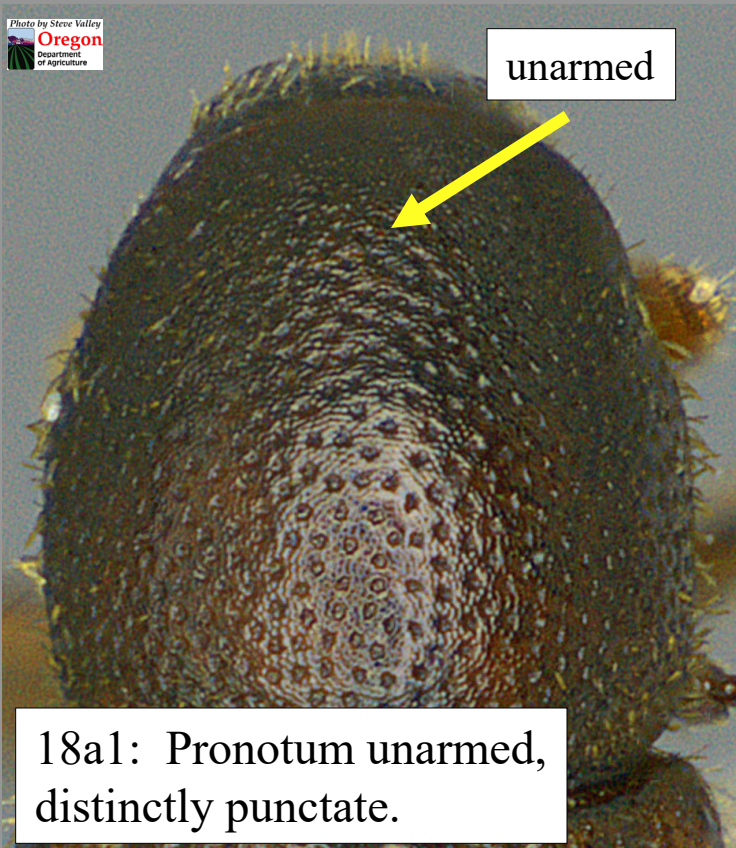


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18 (16): Part I

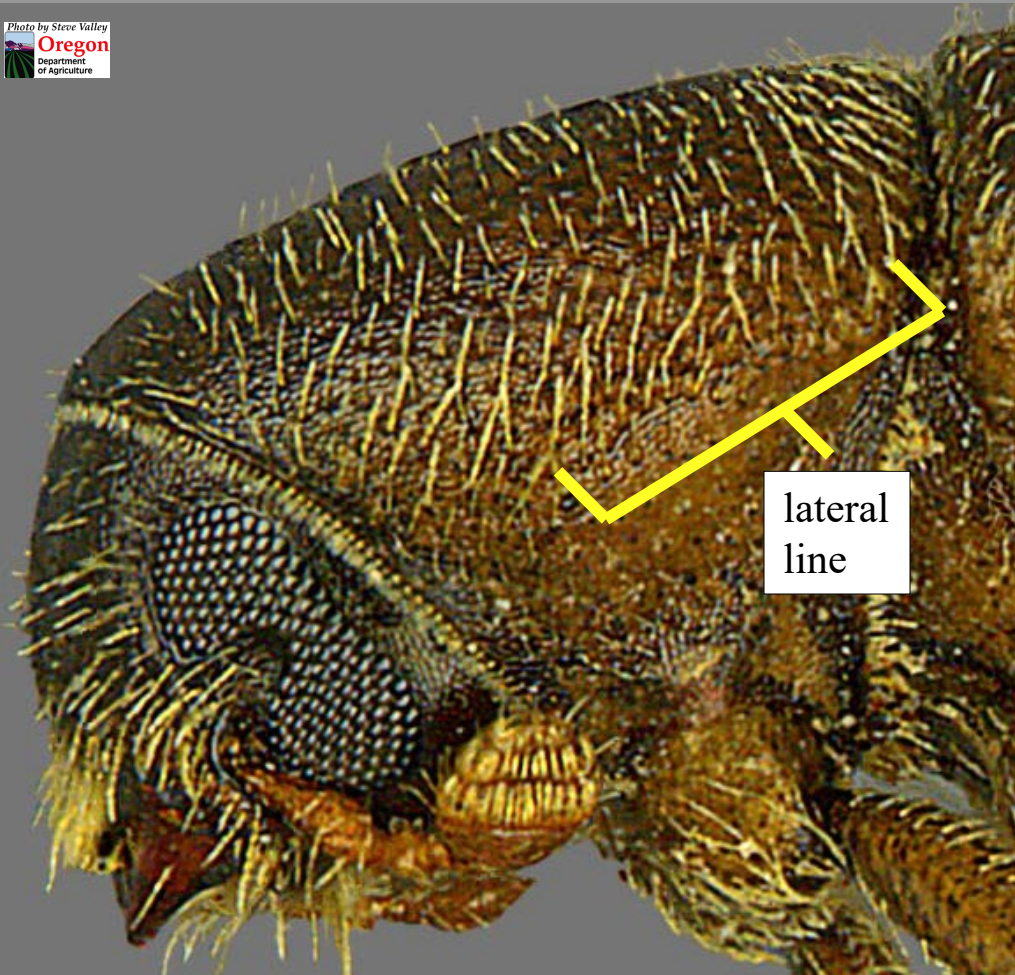
Pronotum unarmed, punctured over entire surface, lateral line not sharply raised; antennal funicle 2- or 3-segmented; length 2.0 mm or less.....STOP

Pronotum usually armed anteriorly with granules or asperities, if unarmed, lateral line sharply raised, at most finely punctate on unarmed surface; antennal funicle 4- or 5-segmented; length usually over 2.0 mm.....19

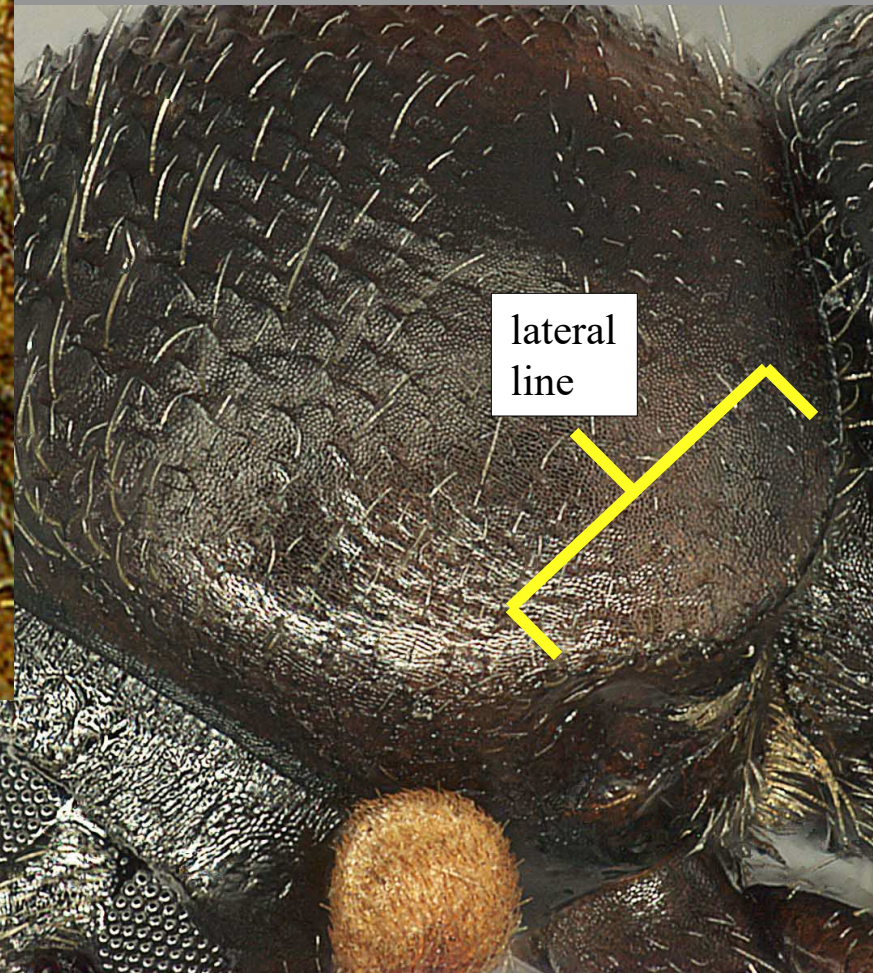


18 (16): Part II

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18b2: Lateral line of pronotum sharply raised.

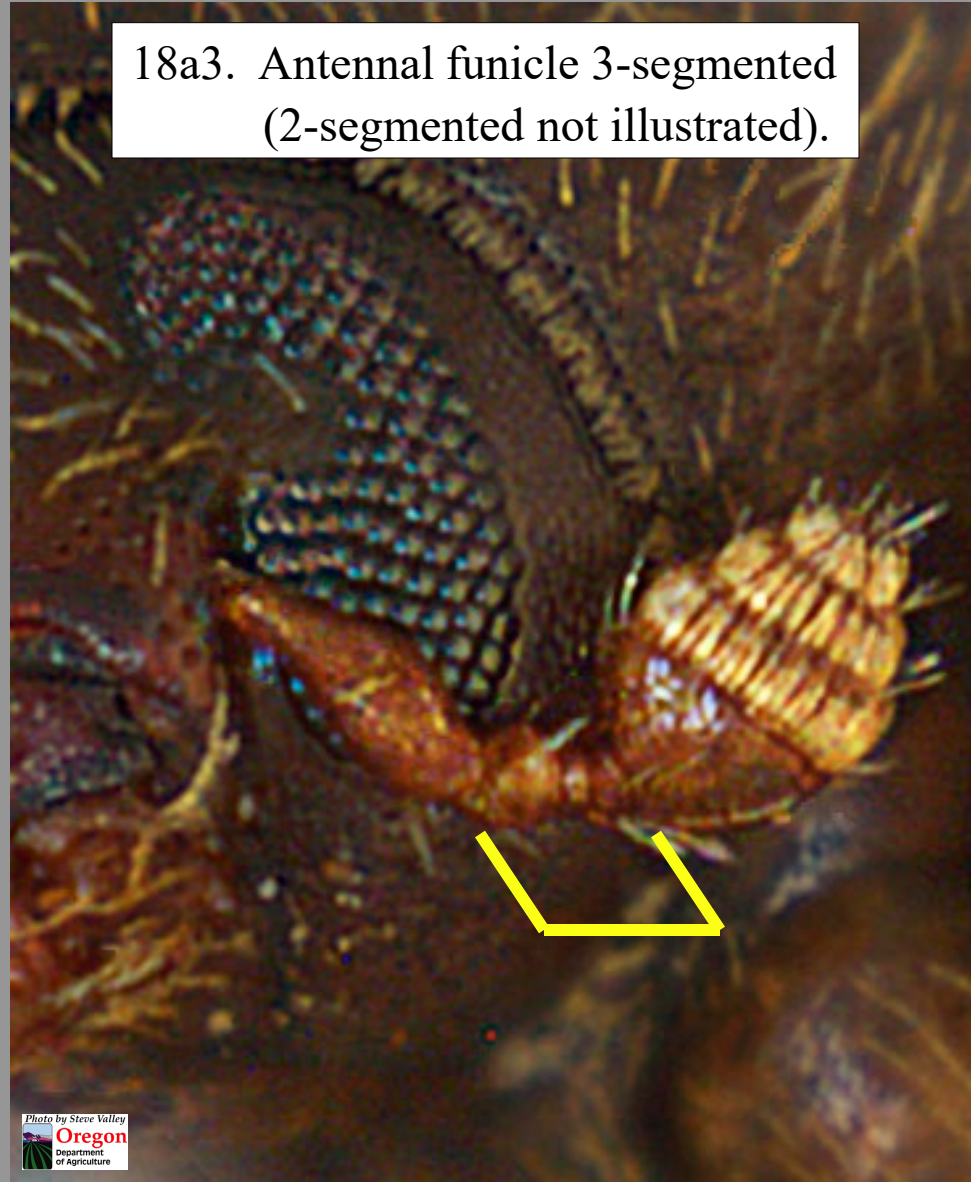


18a2: Lateral line of pronotum not sharply raised.

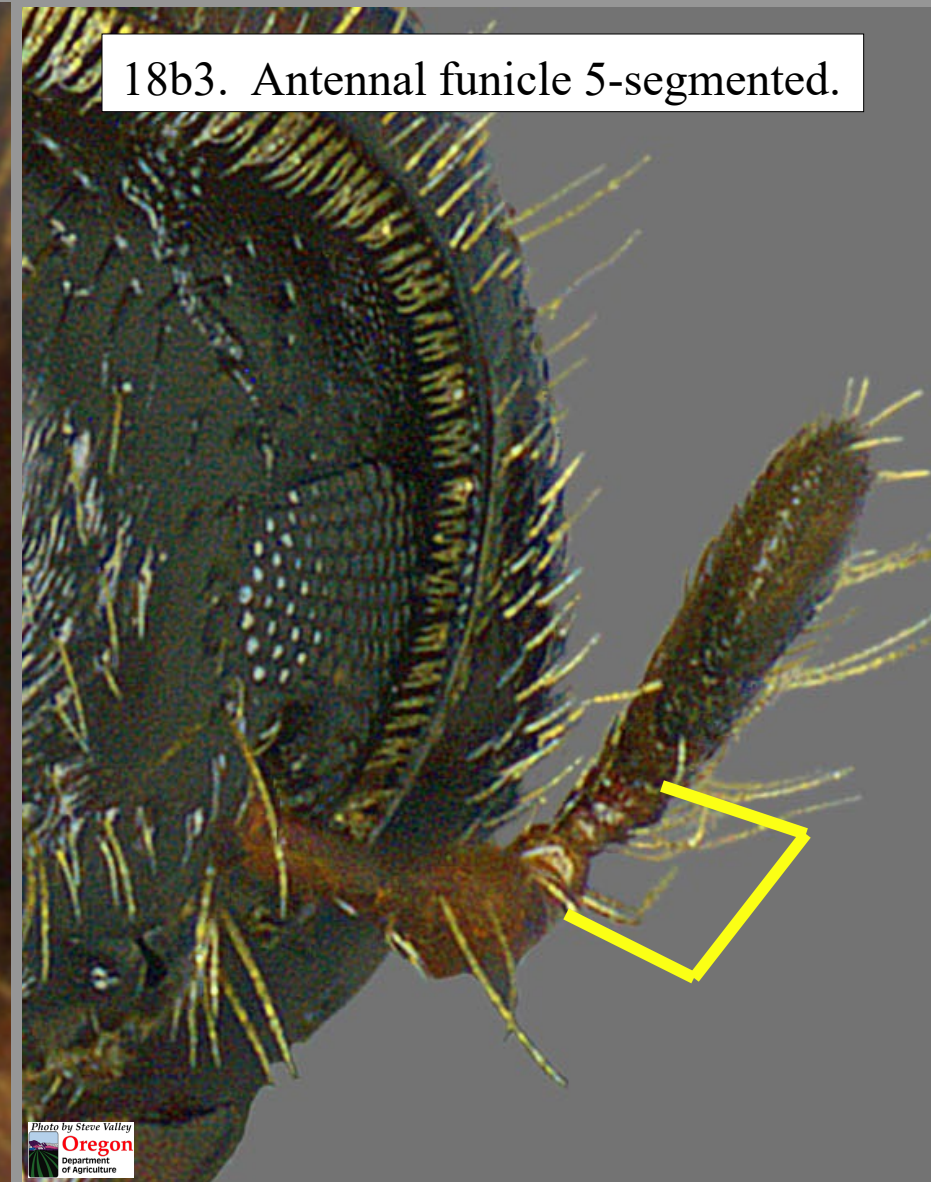
Photo by Steve Valley
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Department
of Agriculture

18 (16): Part III

18a3. Antennal funicle 3-segmented
(2-segmented not illustrated).

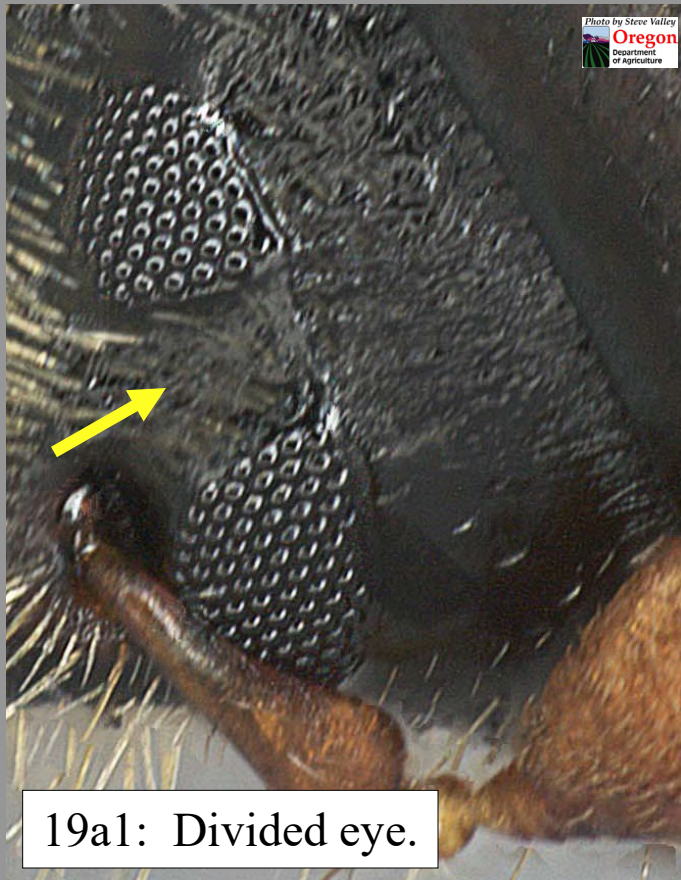


18b3. Antennal funicle 5-segmented.

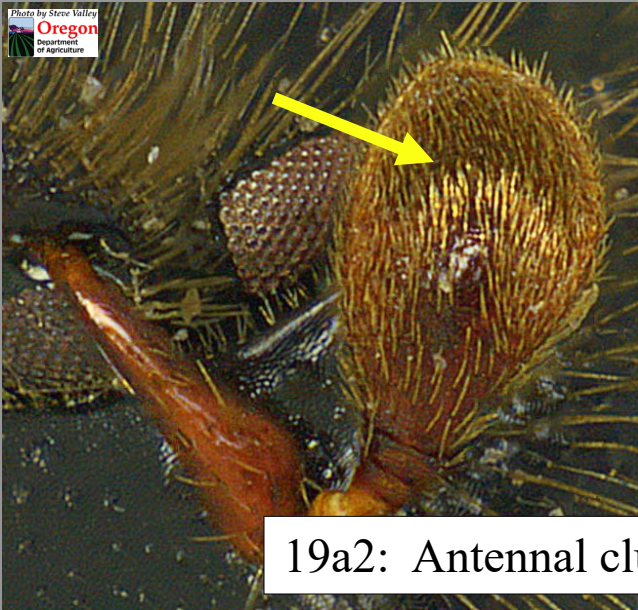


19 (18): Part I

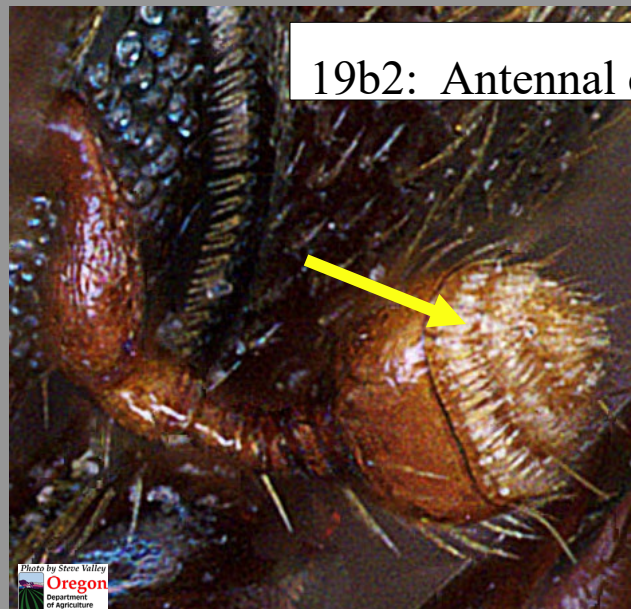
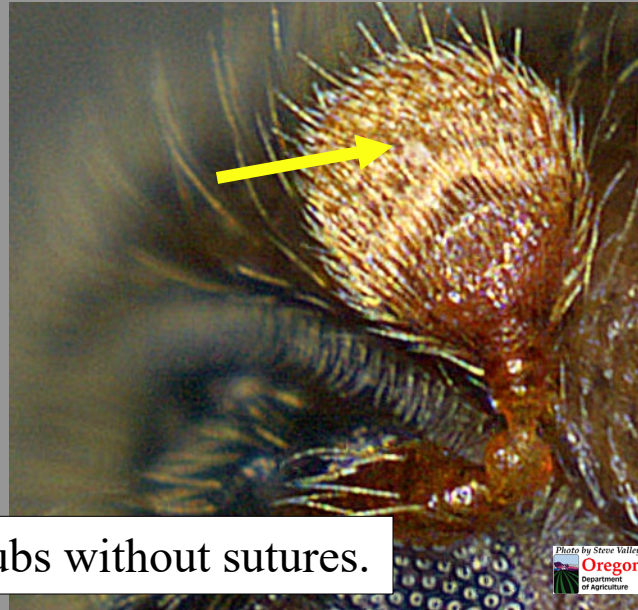
Eye completely divided into two halves; antennal club without distinct sutures.....STOP
Anterior margin of eye sinuate or emarginate, never completely divided; antennal club usually with distinct sutures.....20



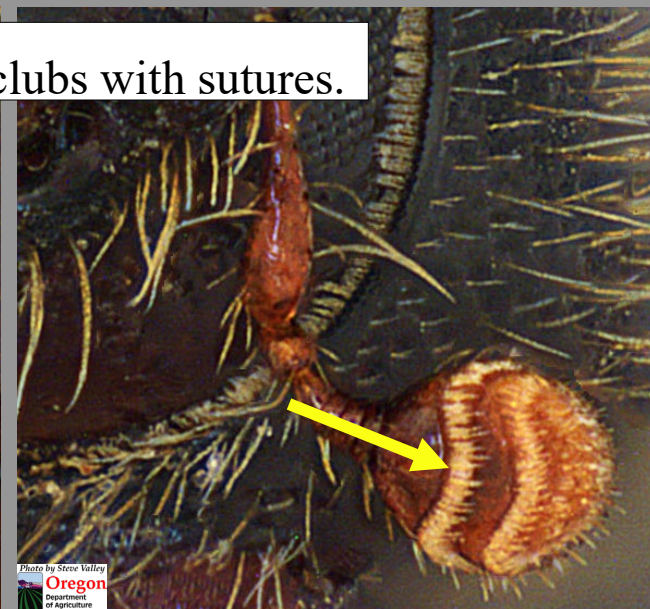
19 (18): Part II



19a2: Antennal clubs without sutures.



19b2: Antennal clubs with sutures.



20 (19): Part I

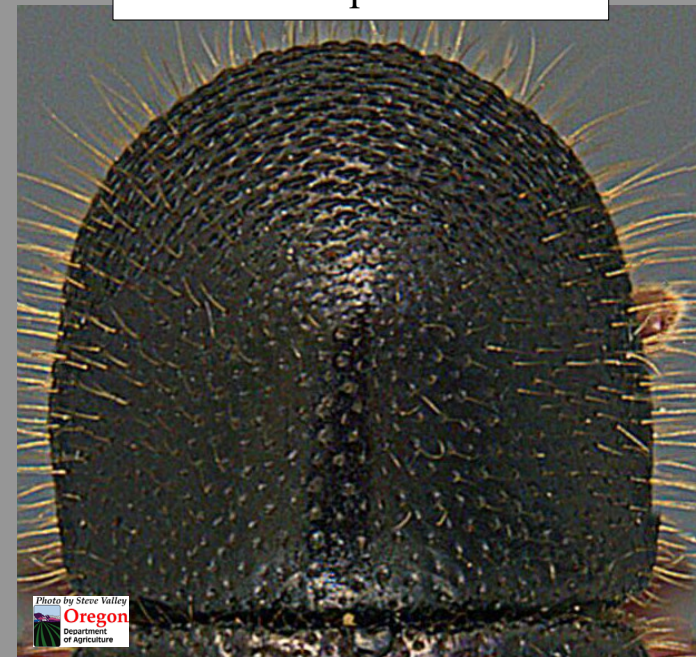
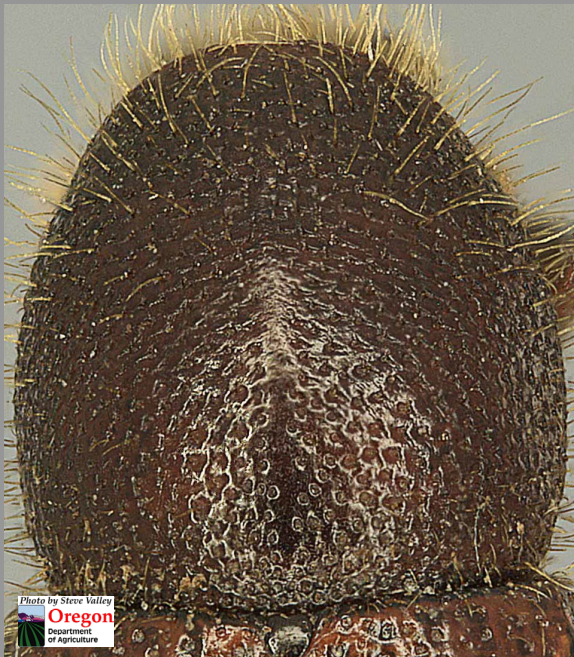
Pronotum either punctate or else finely granulate over almost entire dorsal surface, dorsal profile evenly convex, not strongly anteriorly declivous, anterior margin never armed; tibia usually rather slender and armed by few, coarse teeth; elytral declivity unarmed (some small granules).....STOP

Pronotum coarsely asperate, strongly anteriorly declivous, usually punctate at least on posterior third, anterior margin sometimes armed; tibiae variable; declivity frequently armed by spines.....21

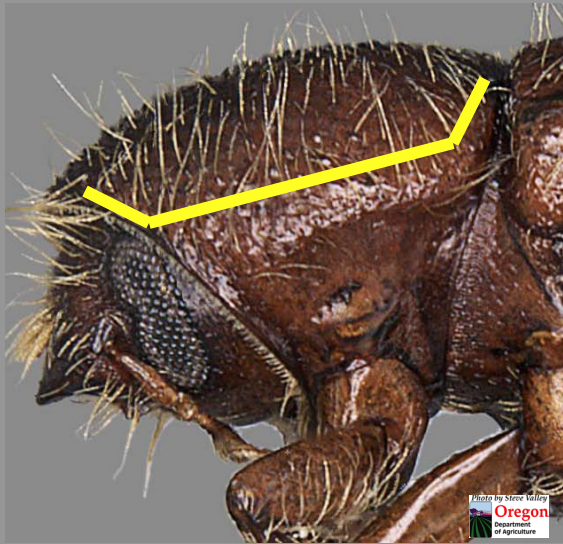
20a1: Pronotum punctate.

20a2: Pronotum granulate.

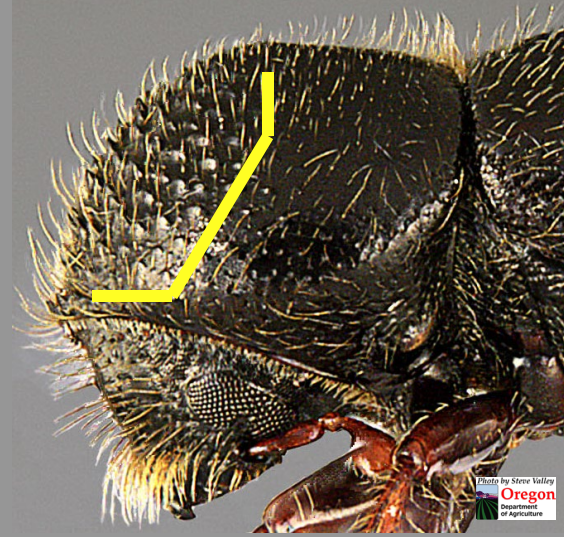
20b1: Pronotum granulate AND punctate.



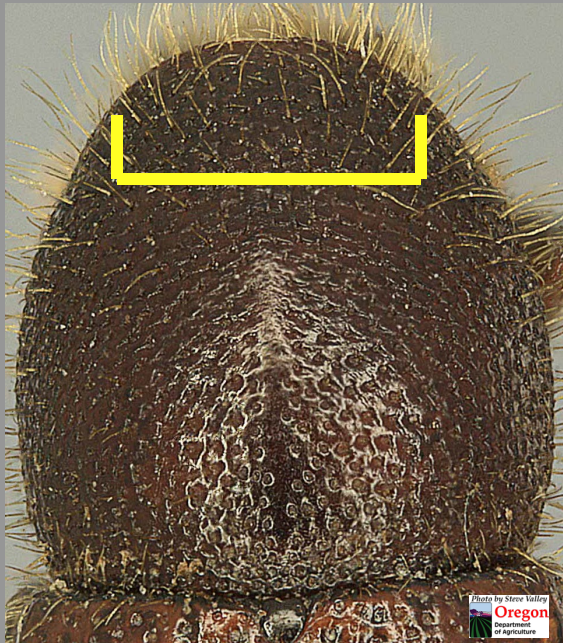
20 (19): Part II



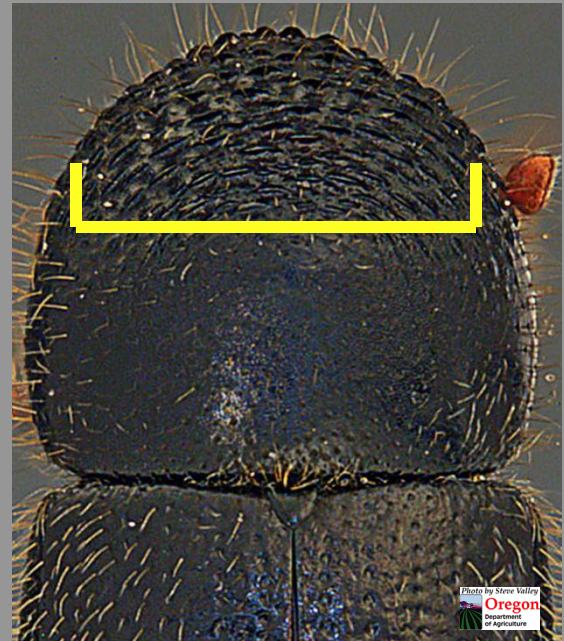
20a3: Dorsal profile of pronotum evenly convex.



20b2: Dorsal profile of pronotum sharply declivous anteriorly.

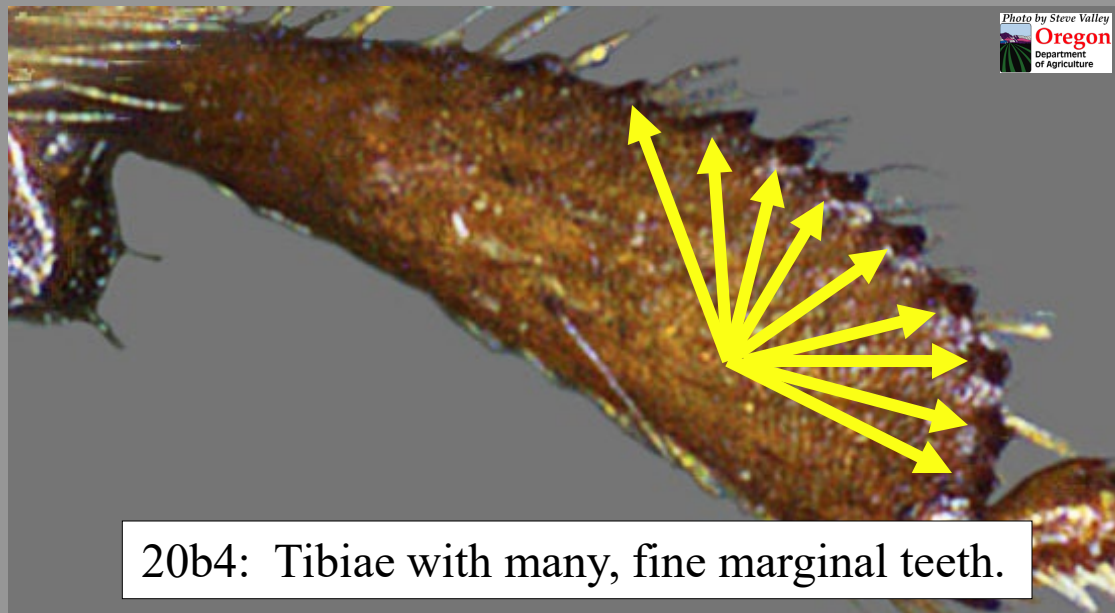
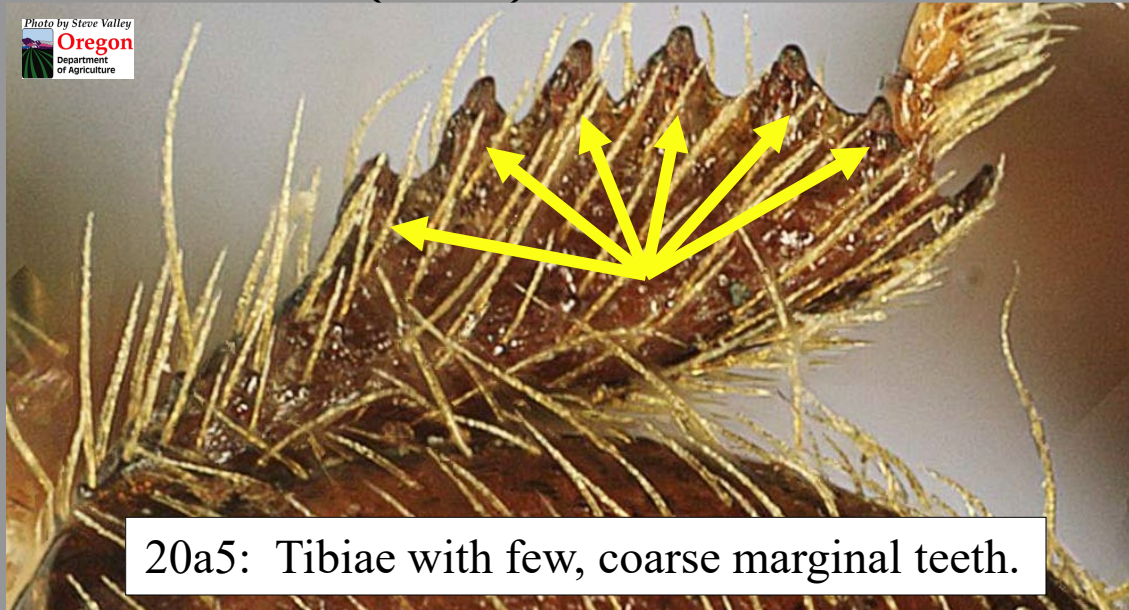


20a4: Anterior margin of pronotum unarmed.



20b3: Anterior margin of pronotum armed.

20 (19): Part III



20 (19): Part IV



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Department of Agriculture

20b5: Elytral declivity with spines.



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21 (20): Part I

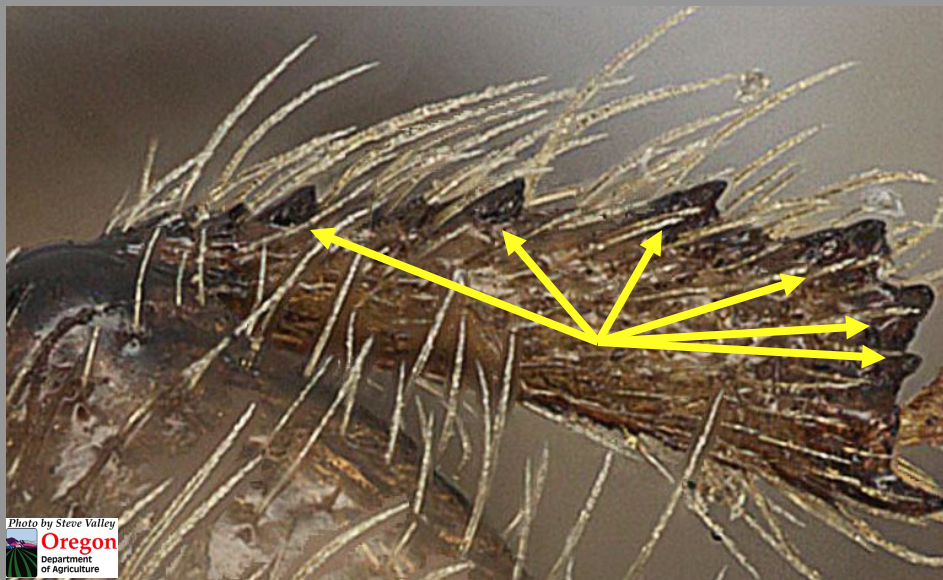
Mid- and hind tibiae rather slender, abruptly truncate apically, armed by a few rather widely spaced coarse teeth; males and females similar in size and appearance.....22

Mid- and hind tibiae rather broadly dilated to a point slightly beyond middle then gradually narrowed to apex, armed by numerous small closely set teeth; males rarely encountered, usually smaller and radically different in appearance from females.....27

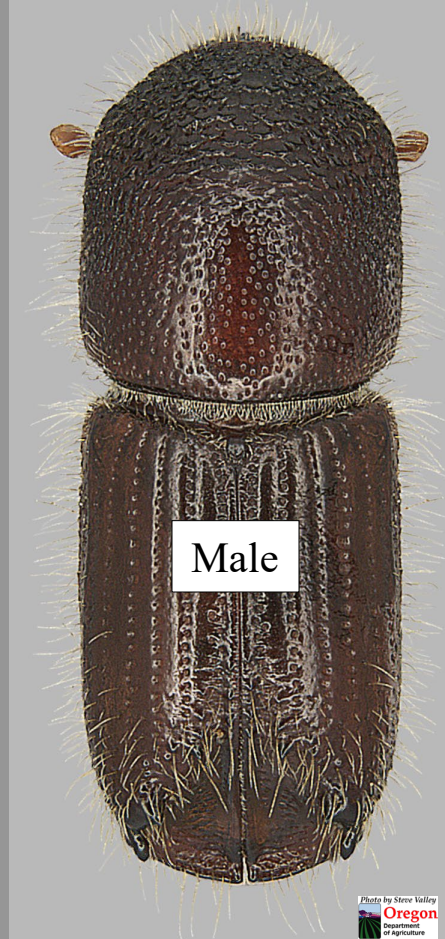
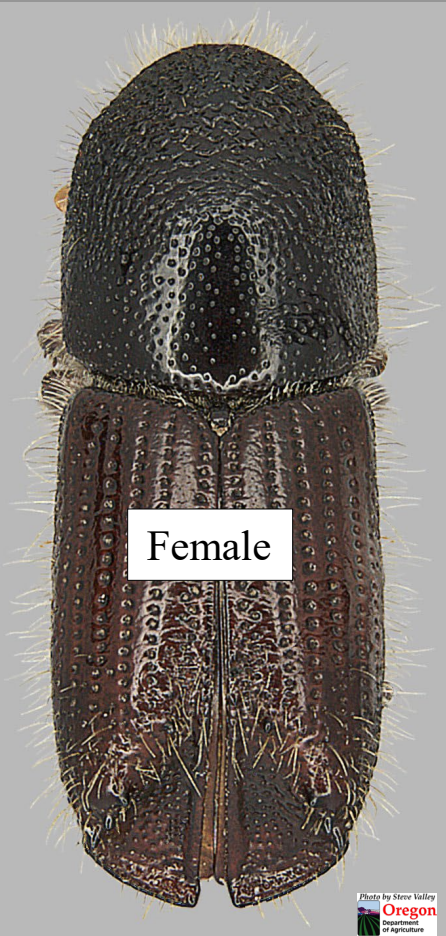


21a1: Narrow tibia with few, coarse teeth.

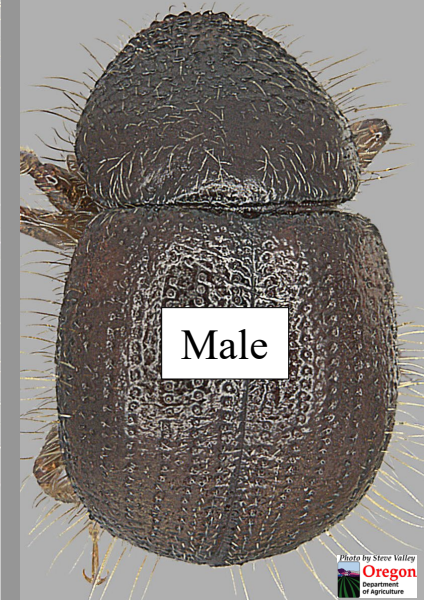
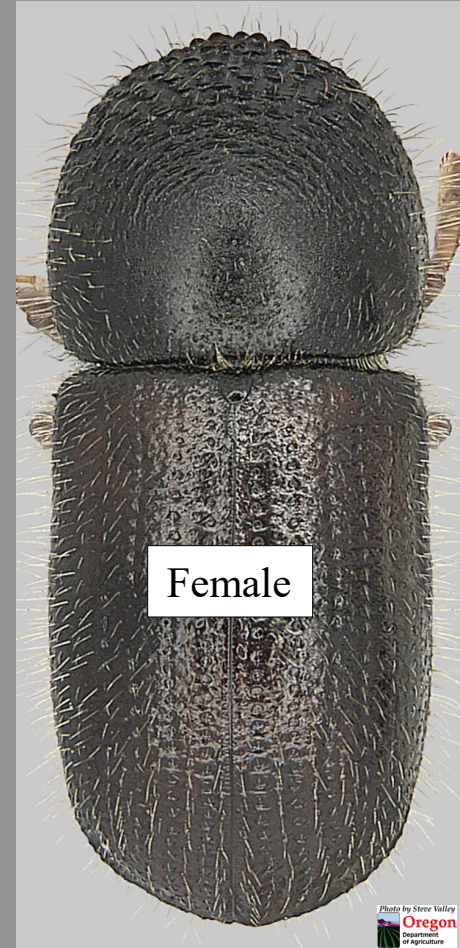
21b1: Broad tibia with many, fine marginal teeth.



21 (20): Part II



21a2: Females and males similar in appearance and size.

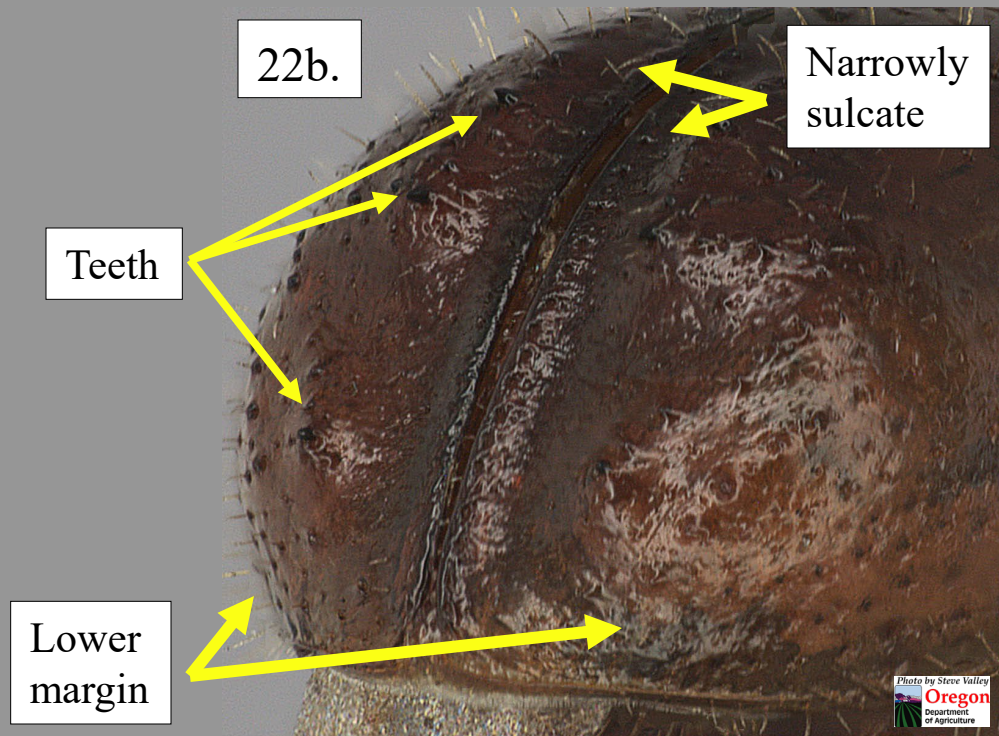
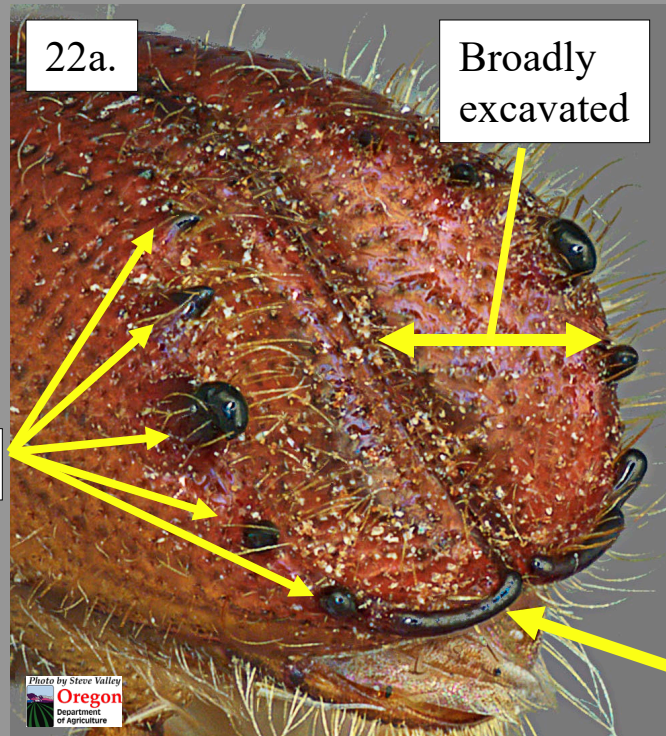


21b2: Females and males different in appearance and size.

22 (21)

Elytral declivity rather narrowly bisulcate, margins moderately elevated, rounded, and armed by no more than 3 teeth, lower margin of declivity rounded; body usually shorter than 3.0 mm.....STOP

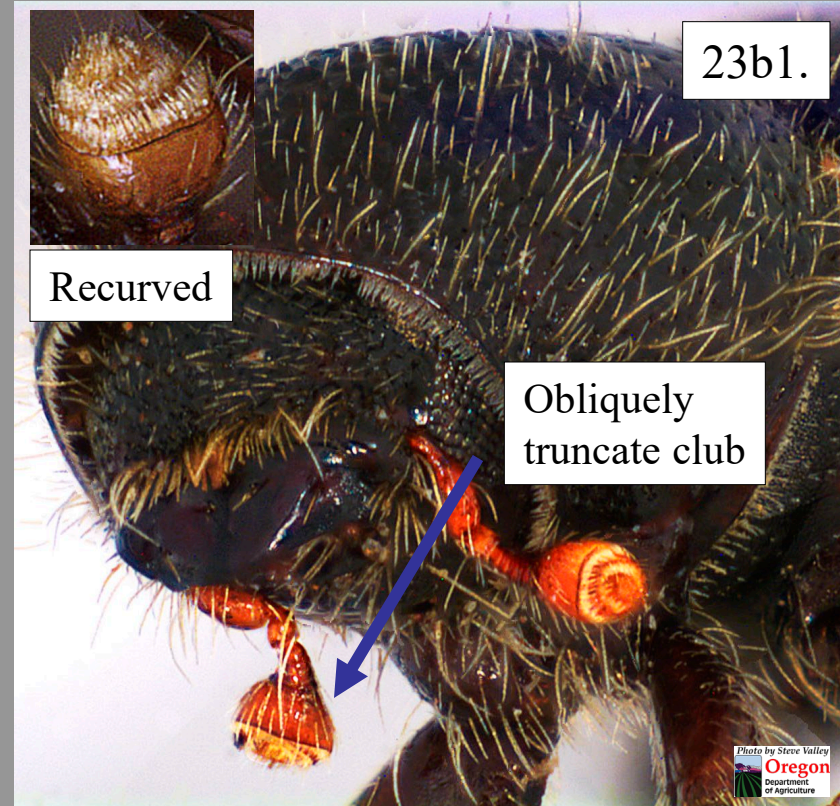
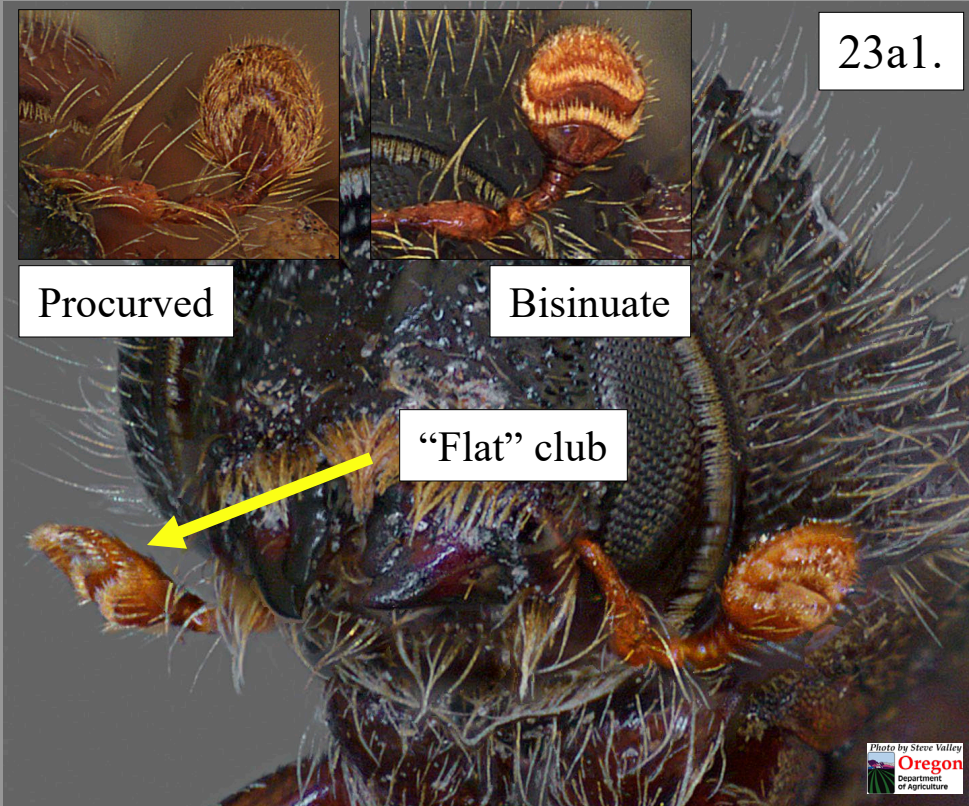
Elytral declivity broadly, rather deeply excavated, margins acutely elevated and armed by 3 or more teeth, lower margin of declivity with an acutely elevated transverse ridge separating declivital excavation from apical margin; body usually longer than 3.0 mm.....23



23 (22): Part I

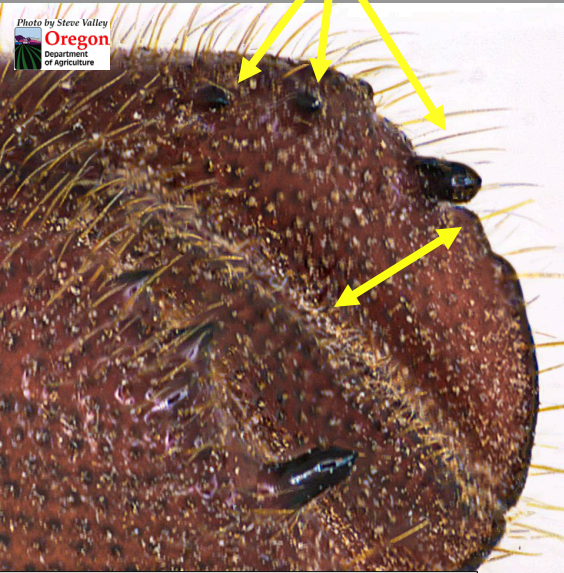
Antennal club obliquely truncate, sutures recurved; elytral declivity less strongly excavated, 3rd tooth displaced mesally, not on summit of declivital margin.....STOP

Antennal club flattened, sutures procurved or strongly bisinuate; elytral declivity broadly excavated, with 3-6 major teeth, all teeth on summit of lateral margin.....24



23 (22): Part II

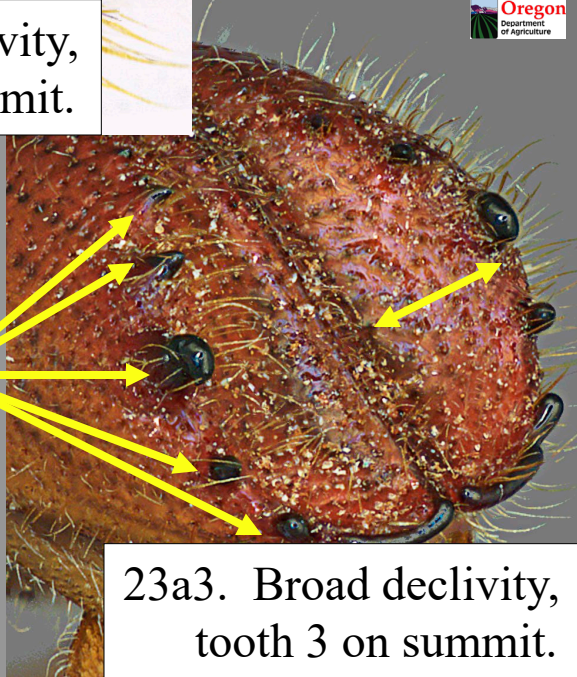
Teeth



*Double arrows denote width of excavation.

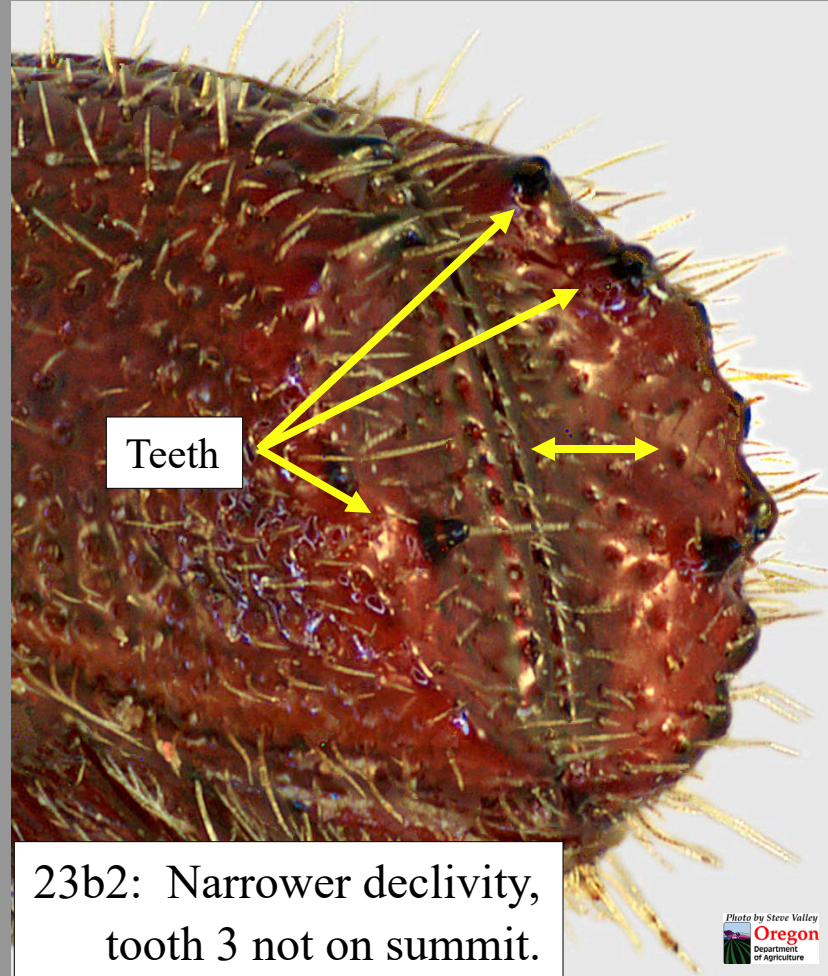
23a2: Broad declivity, tooth 3 on summit.

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23a3. Broad declivity, tooth 3 on summit.

Teeth

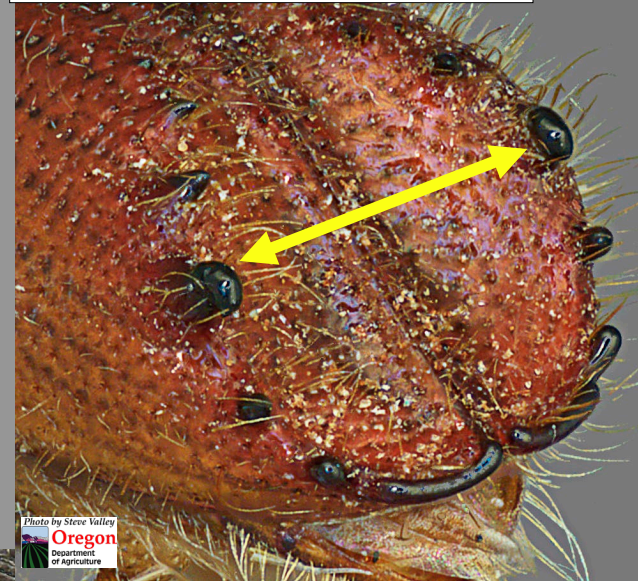


24 (23)

Lateral margins of elytral declivity with 5 or 6 j pairs of spines...
.....25

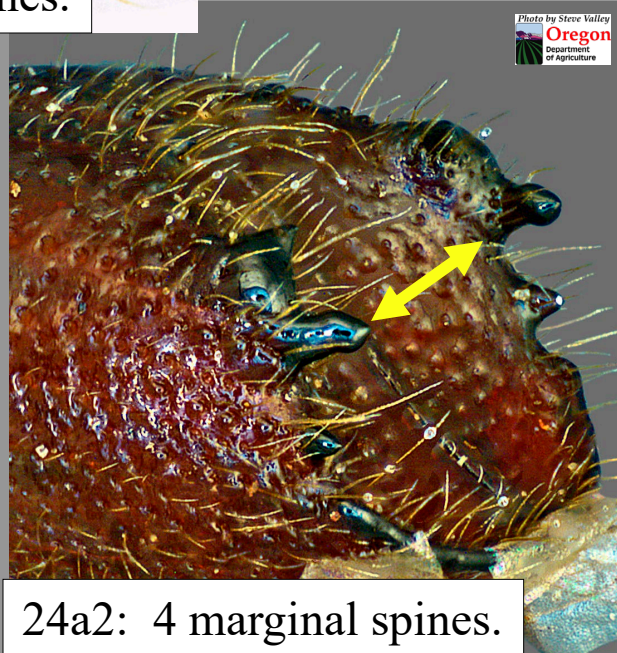
***Double arrows point to 3rd pair of spines**

24b1: 5 marginal spines.

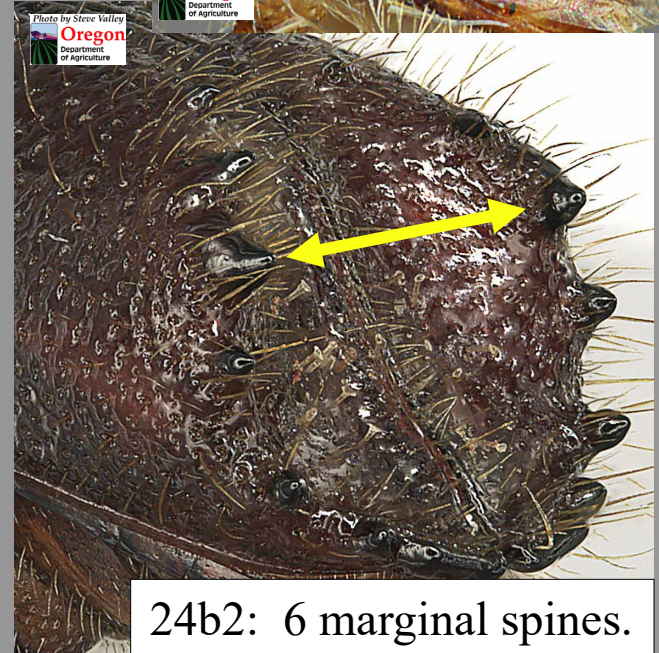


24a1: 3 marginal spines.

Lateral margins of elytral declivity with 3 or 4 pairs of spines..
.....STOP



24a2: 4 marginal spines.



24b2: 6 marginal spines.

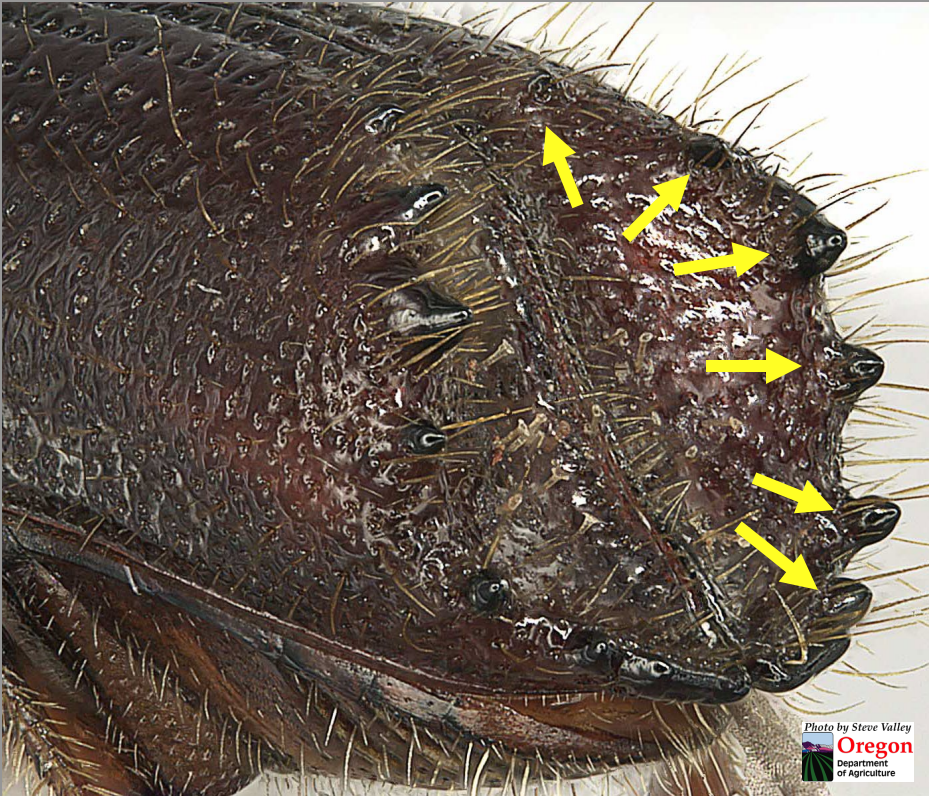
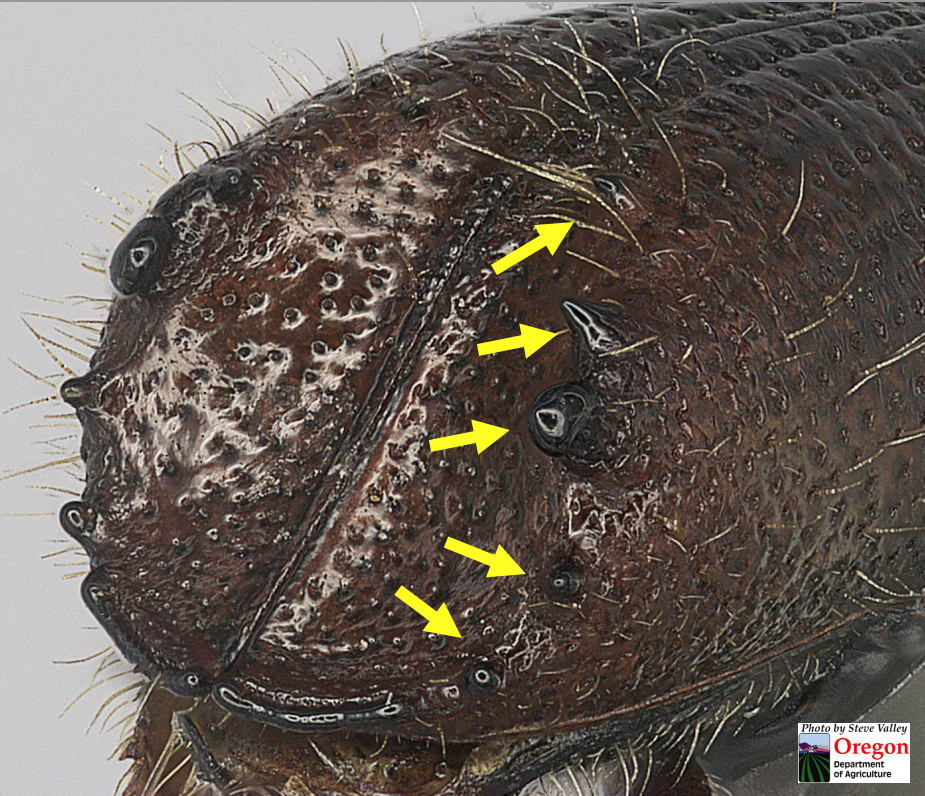
25 (22): Part I

Lateral margins of elytral declivity with 5 pairs of spines.....
.....*Ips grandicollis* (Eichhoff)

Lateral margins of elytral declivity with 6 pairs of spines.....26

25a1: 5 pairs of spines on declivity.

25b1: 6 pairs of spines on declivity.



25 (24): Part II

Ips grandicollis (Eichhoff)

25a2.

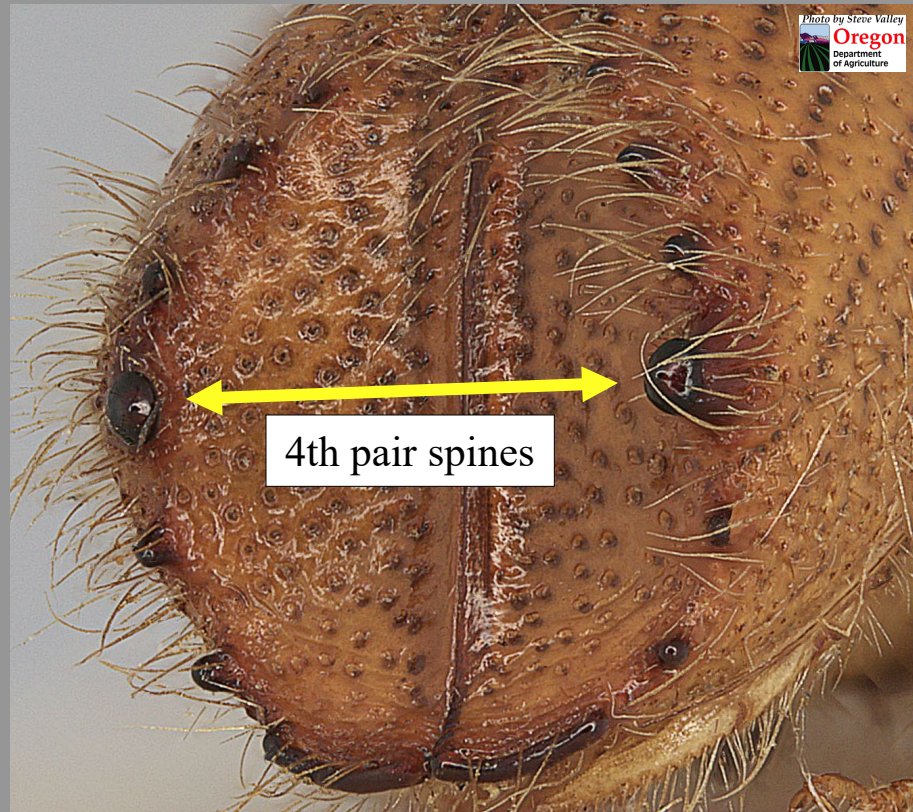


26 (25): Part I

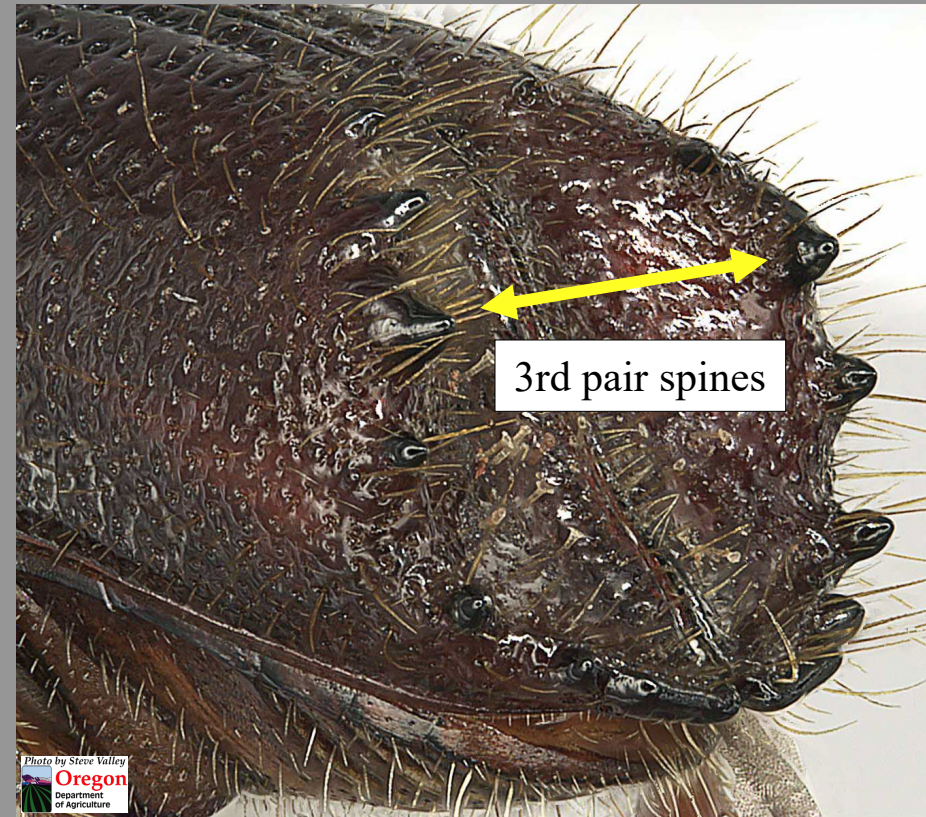
4th pair of declivital spines largest; frons with a short, transverse raised line above median tubercle; smaller, 3.5-5.9 mm in length.....STOP

3rd pair of declivital spines largest; frons without a raised line above the median tubercle; larger, 5.5-8.2 mm in length...*Ips calligraphus* (Germar)

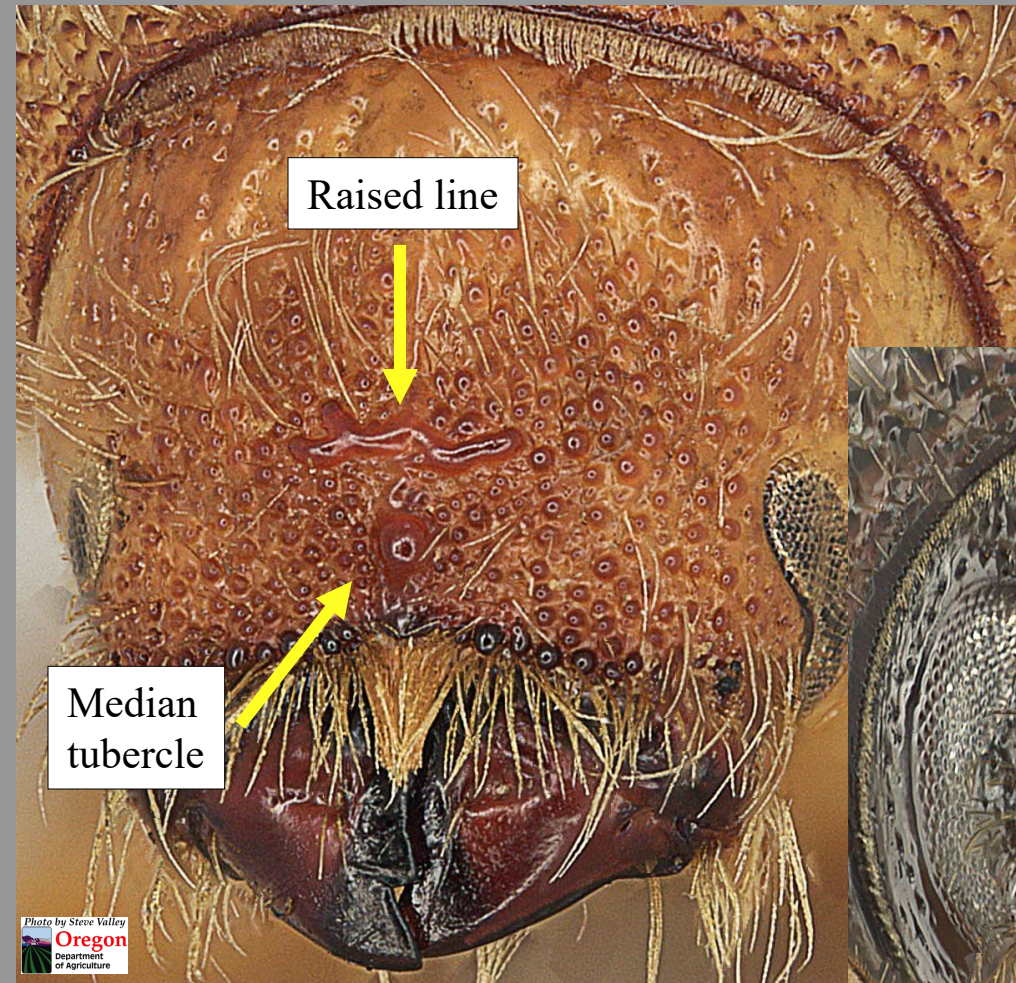
26a1: 4th pair declivital spines largest.



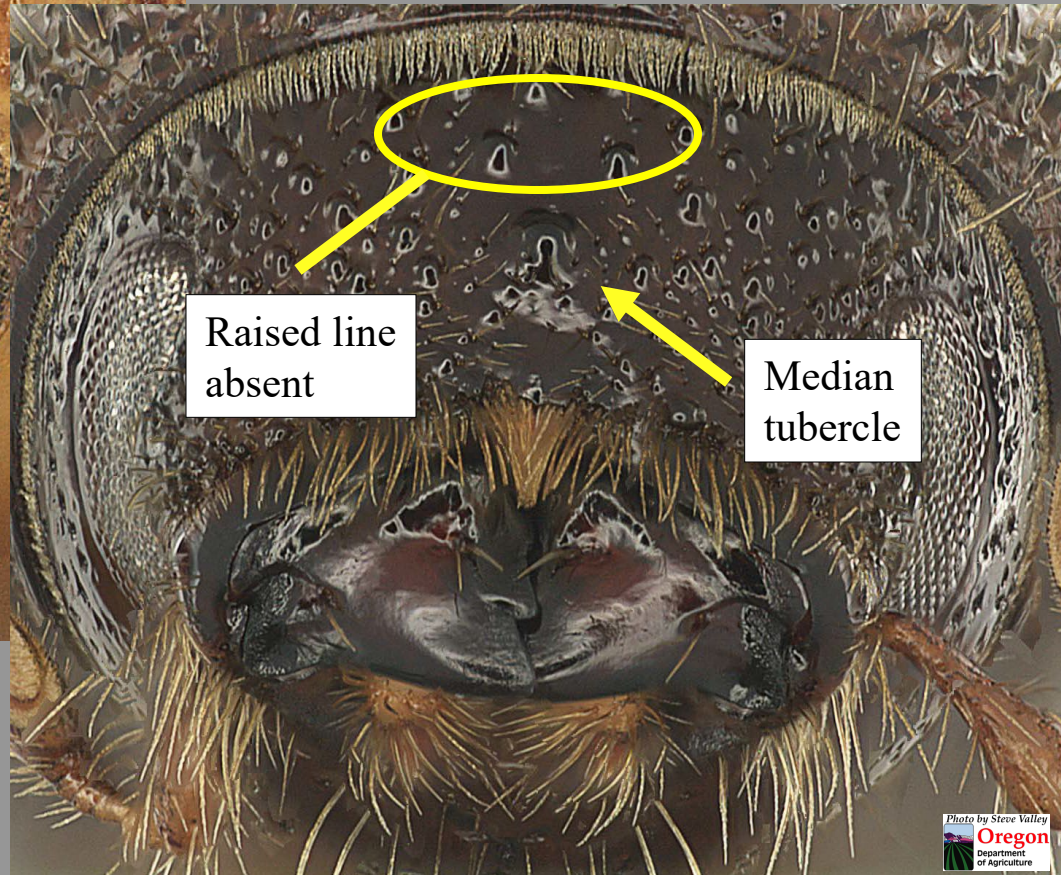
26b1: 3rd pair declivital spines largest.



26 (25): Part II



26b2: Frons without transverse raised line above median tubercle.



26a2: Frons with transverse raised line above median tubercle.

26 (25): Part III

Ips calligraphus (Germar)



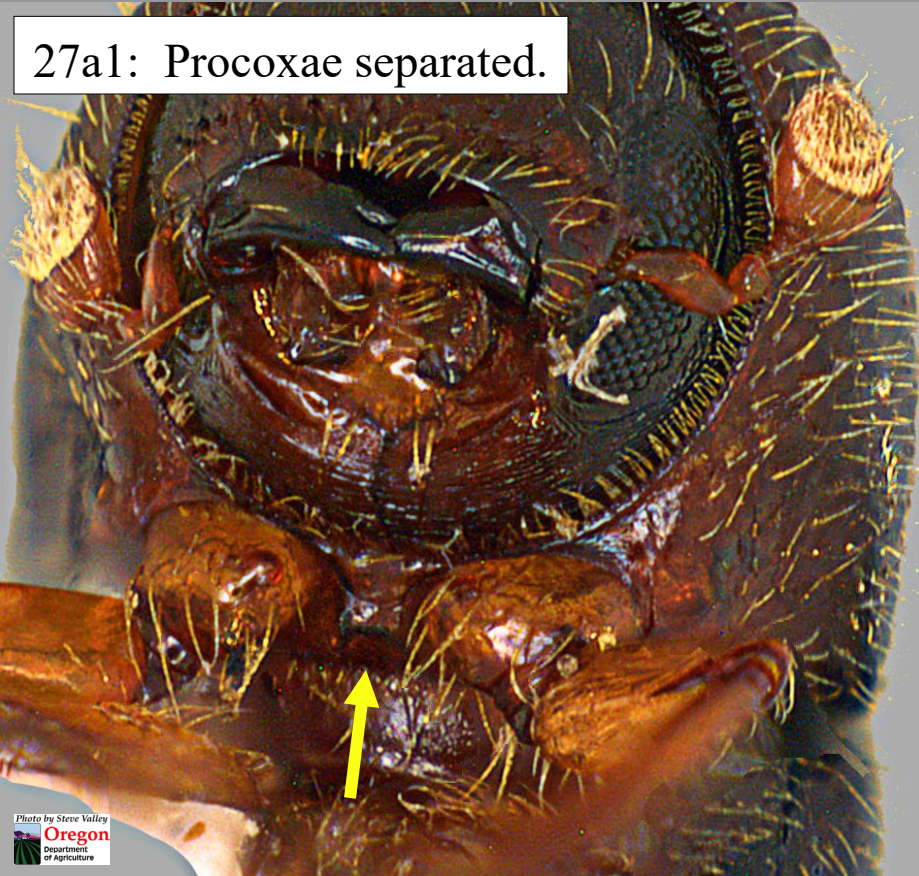
26b3.

27 (21): Part I

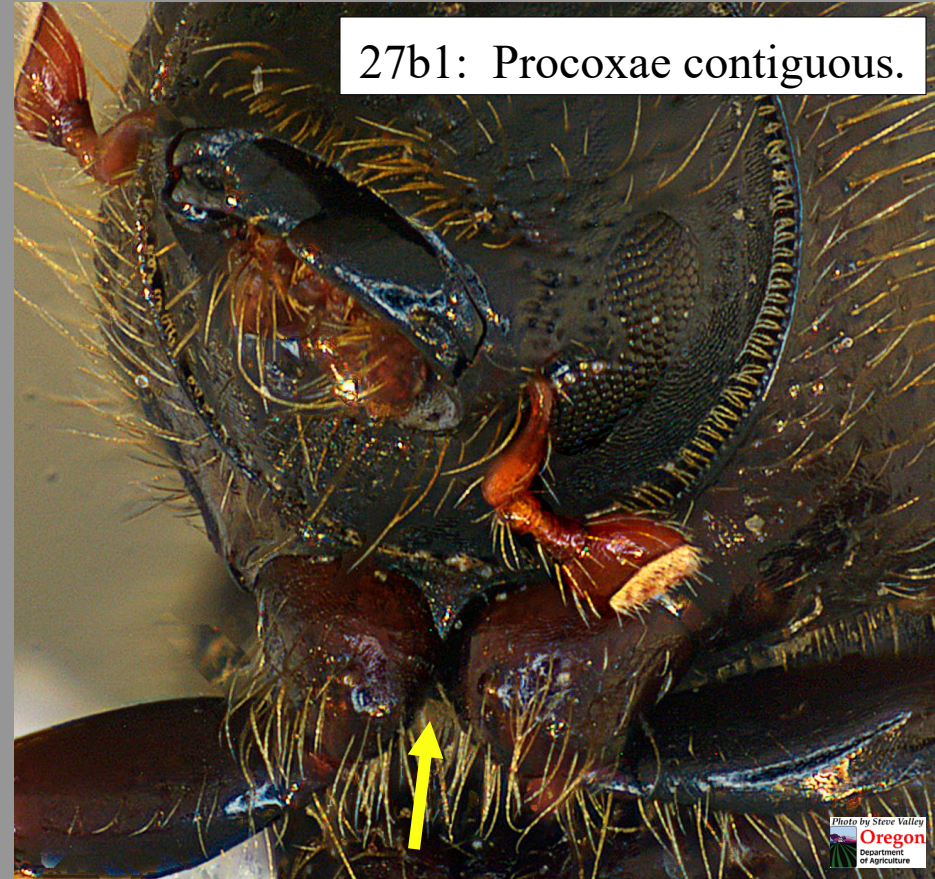
Procoxae widely separated; posterolateral margins of elytral apex sharply and distinctly carinate; body stout.....28

Procoxae contiguous; posterolateral margins of elytral apex not or feebly raised; body often elongate (some stout) and slender.....31

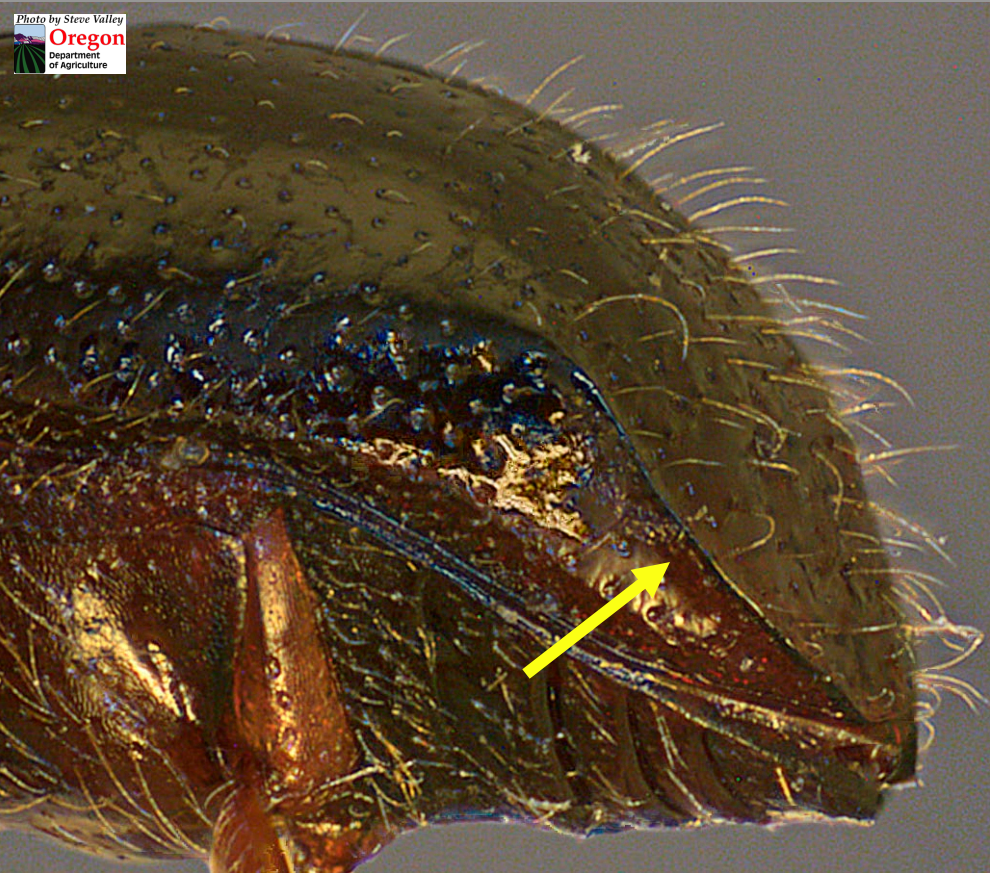
27a1: Procoxae separated.



27b1: Procoxae contiguous.



27 (21): Part II



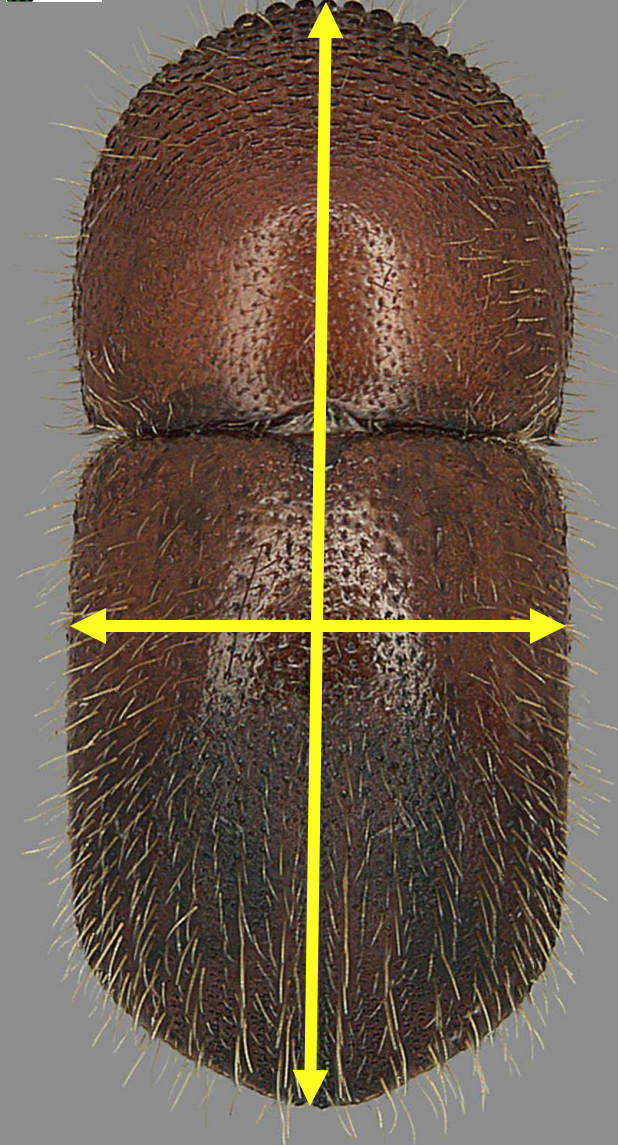
27a2: Elytral apex with sharp carina.

27b2: Elytral apex without sharp carina.



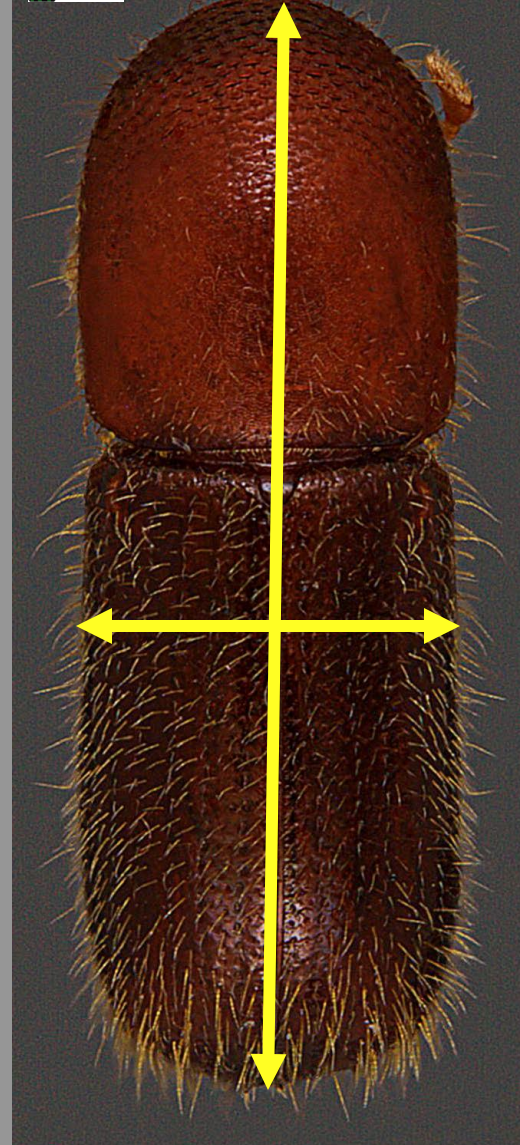
27 (21): Part III

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27a3:
Body
stout.

Photo by Steve Valley
Oregon
Department
of Agriculture



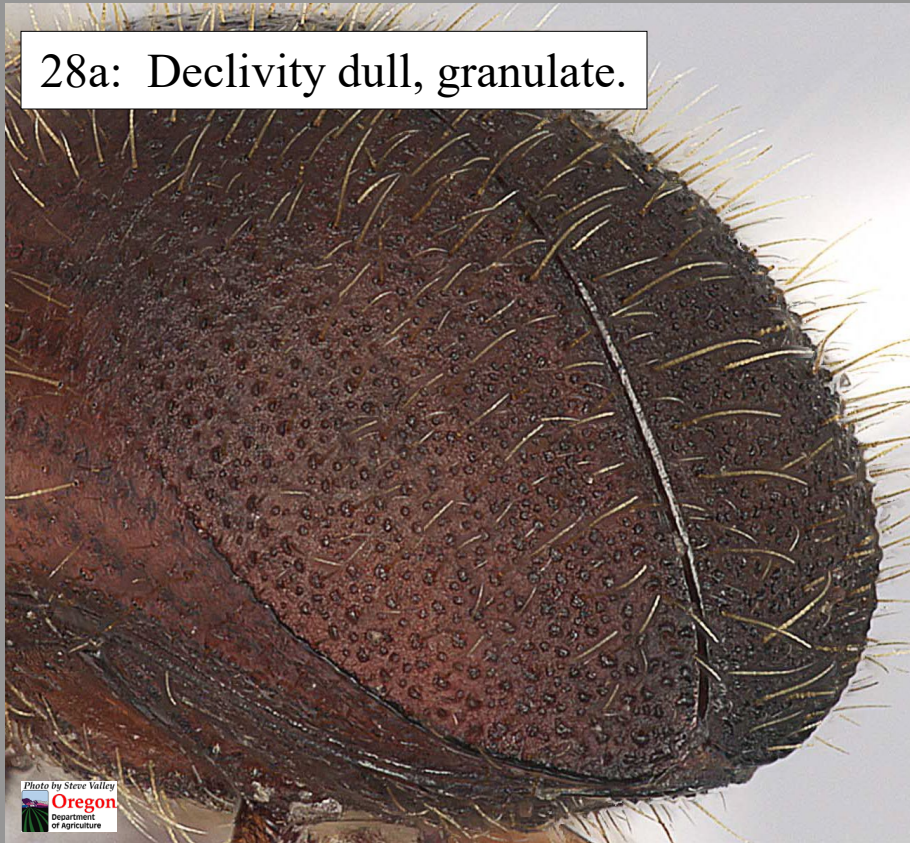
27b3:
Body
slender.

28 (27)

Declivity without punctures, surface granulate, dull; total body length longer than 2.3 mm.....29

Declivital striae with distinct, clearly impressed rows of punctures; declivital surface shining, granules (if present) in sparse rows; total body length less than 2.3 mm.....30

28a: Declivity dull, granulate.



28b: Declivity shiny, striate.



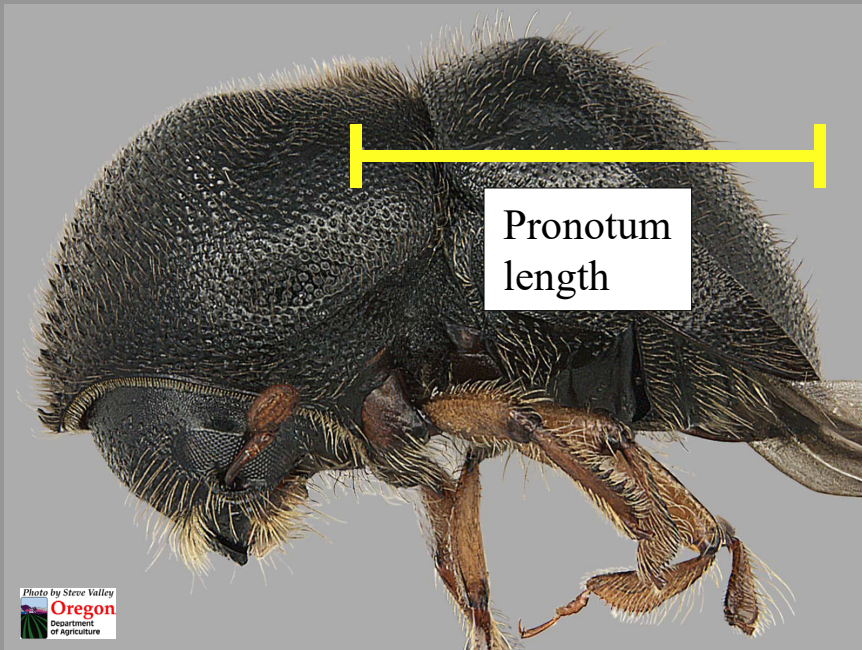
29 (28): Part I

Body very stout, elytra shorter than pronotum; declivity longer, with raised carina around lower 3/4; total body length greater than 3 mm.....STOP

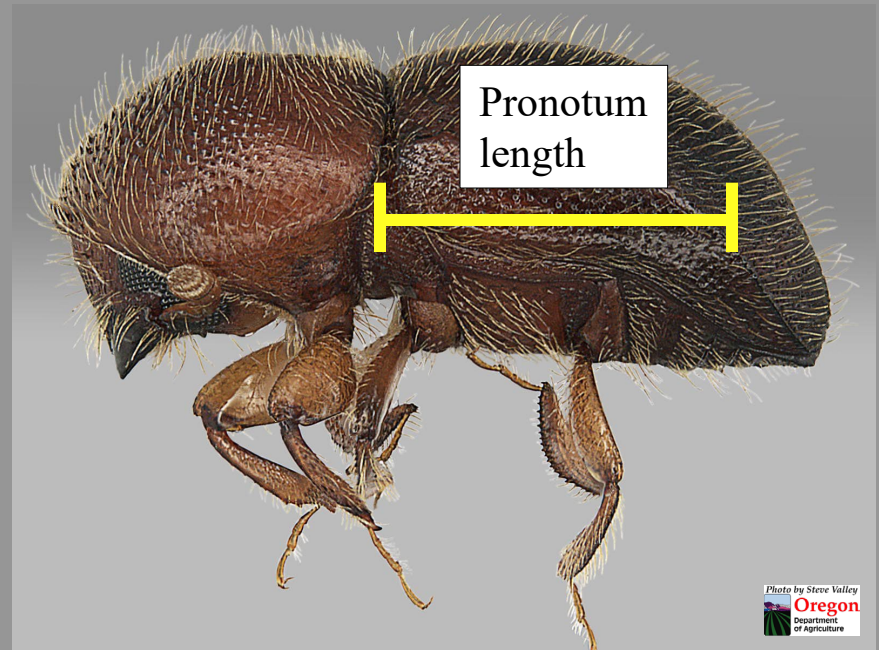
Body less stout, elytra longer than pronotum; declivity shorter, with carina around lower 1/2; total body length less than 3 mm.....

.....*Xylosandrus crassiusculus* (Motschulsky)

29a1. Elytra shorter than pronotum.



29b1. Elytra longer than pronotum.



29 (28): Part II

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29b2: Declivity shorter, carina
along bottom 1/2.

29a2: Declivity longer, carina
along bottom 3/4.

Photo by Steve Valley
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of Agriculture

29 (28): Part III

Xylosandrus crassiusculus (Motschulsky)



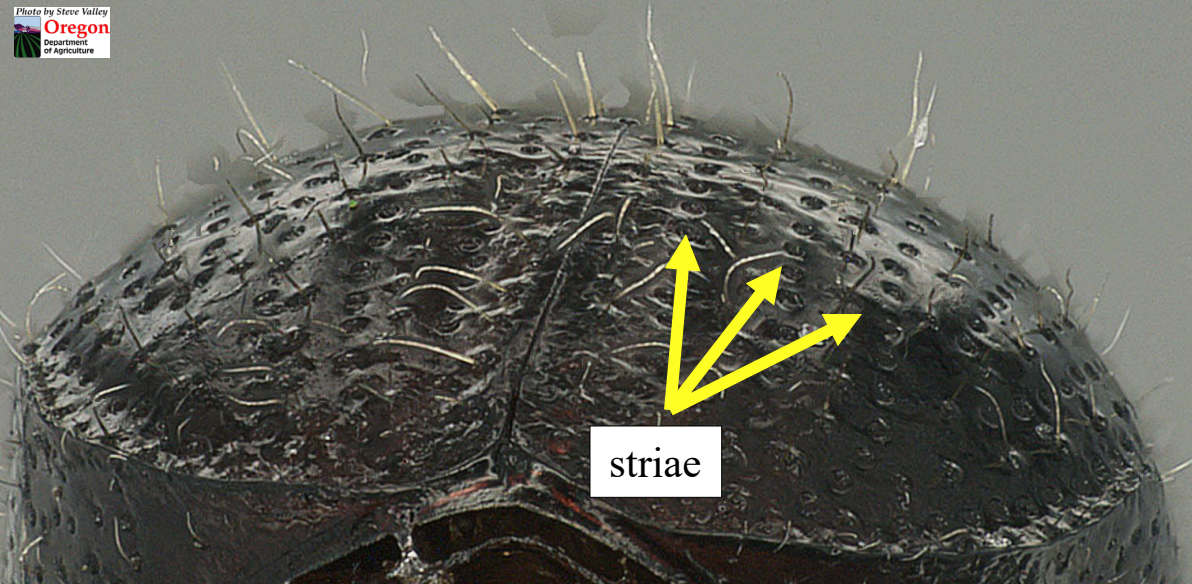
29b3.

30 (29): Part I

Larger, 2.0-2.3 mm total length; strial setae on elytral declivity absent, striae at least feebly impressed, interstriae very slightly convex.....*Xylosandrus germanus* (Blandford)

Smaller, 1.7 mm or less in length; strial setae on elytral declivity present (at least 1/3 as long as those on interstriae), striae not impressed, interstriae flat.....
.....*Xylosandrus compactus* (Eichoff)

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30b1: Declivital strial setae present.

30a1: Declivital strial setae absent.

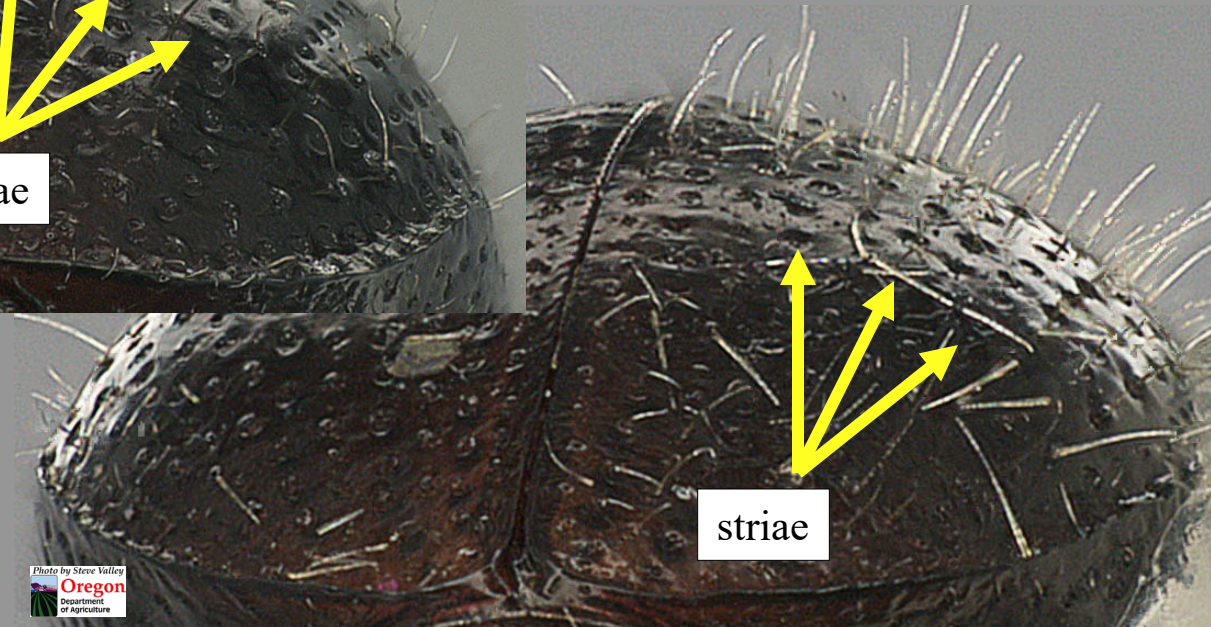


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30 (29): Part II

Photo by Steve Valley
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of Agriculture

30b2: Striae not impressed, interstriae flat.

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30a2: Striae impressed, interstriae convex.



30 (29): Part III

Xylosandrus germanus (Blandford)



30 (29): Part IV

Xylosandrus compactus (Eichhoff)

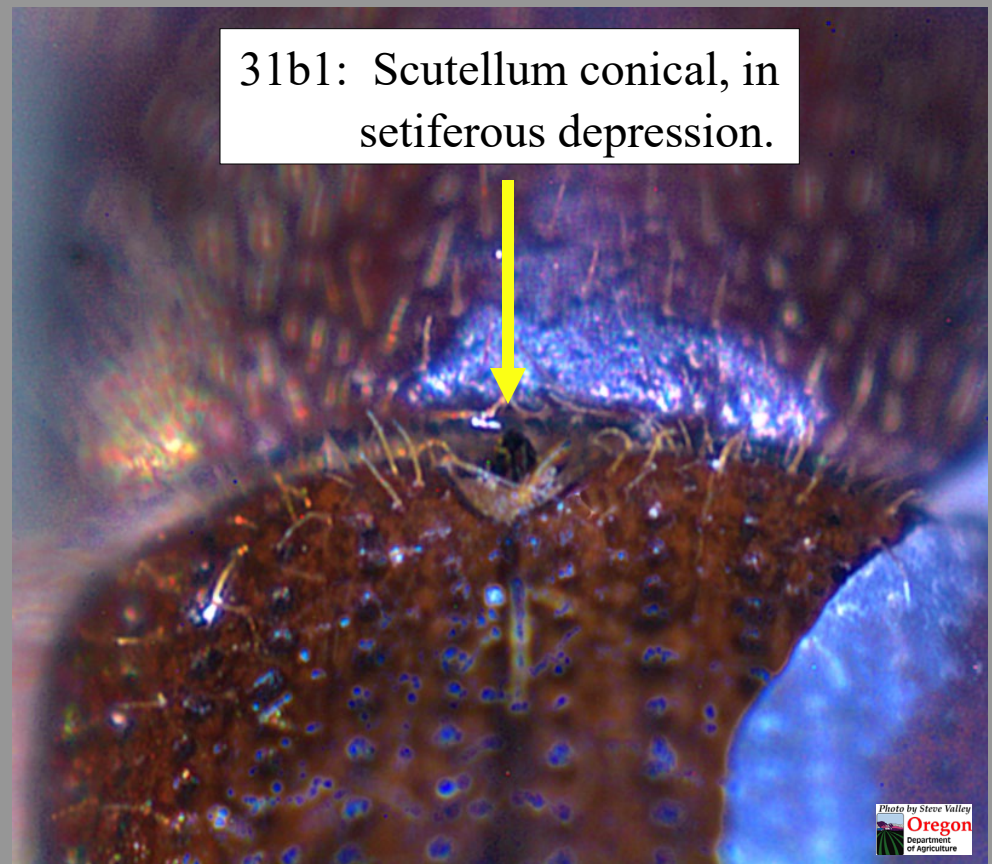
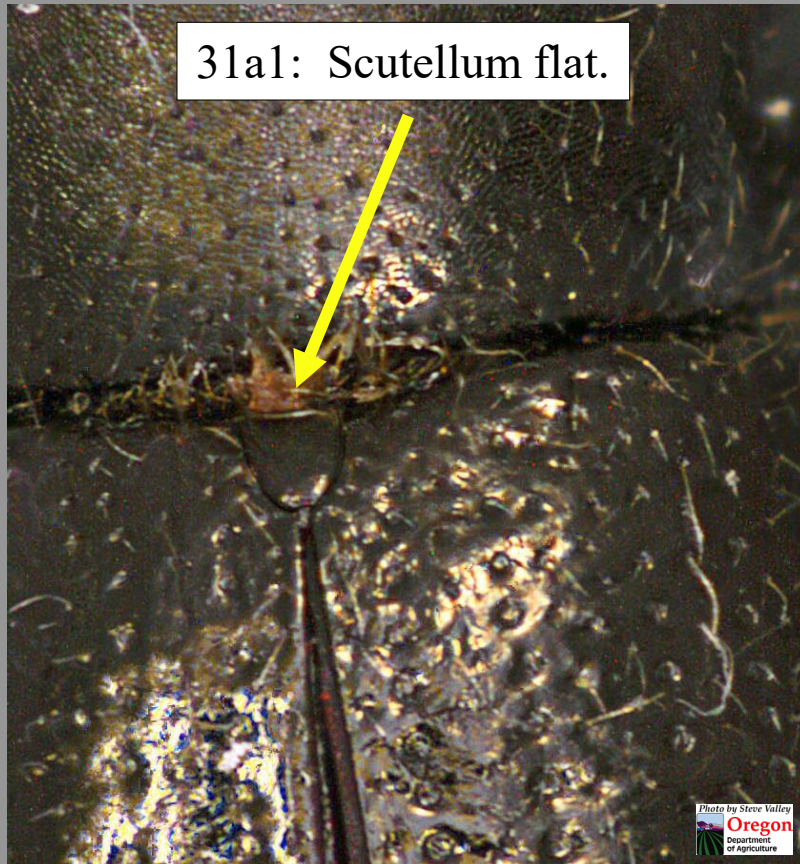


30b3.

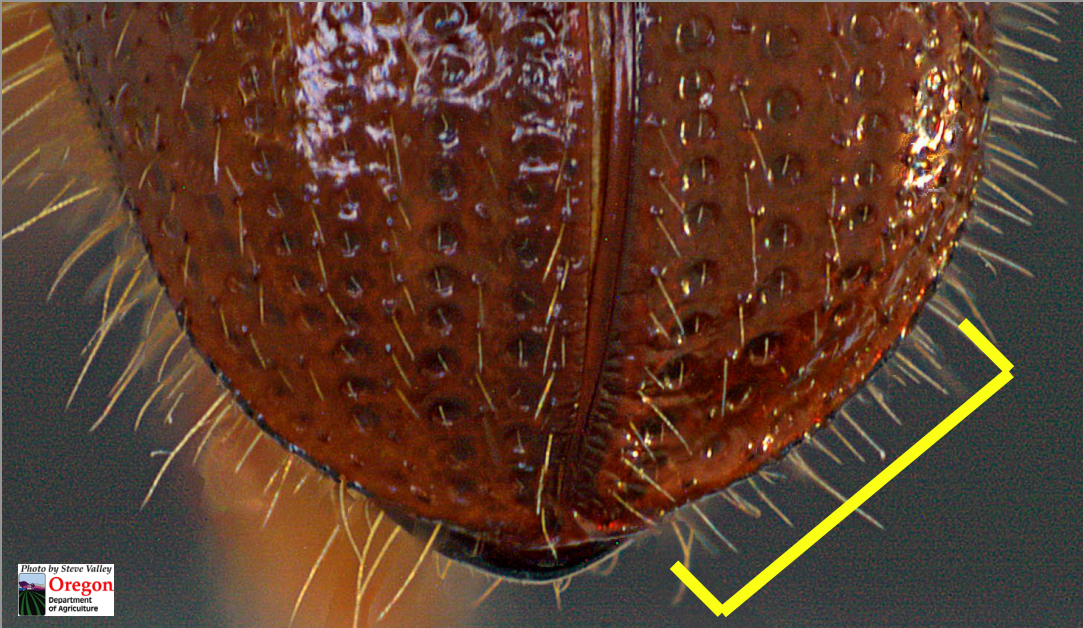
31 (27): Part I

Scutellum flat, in same plane as elytral bases; lower margin of elytral declivity without spines.....STOP

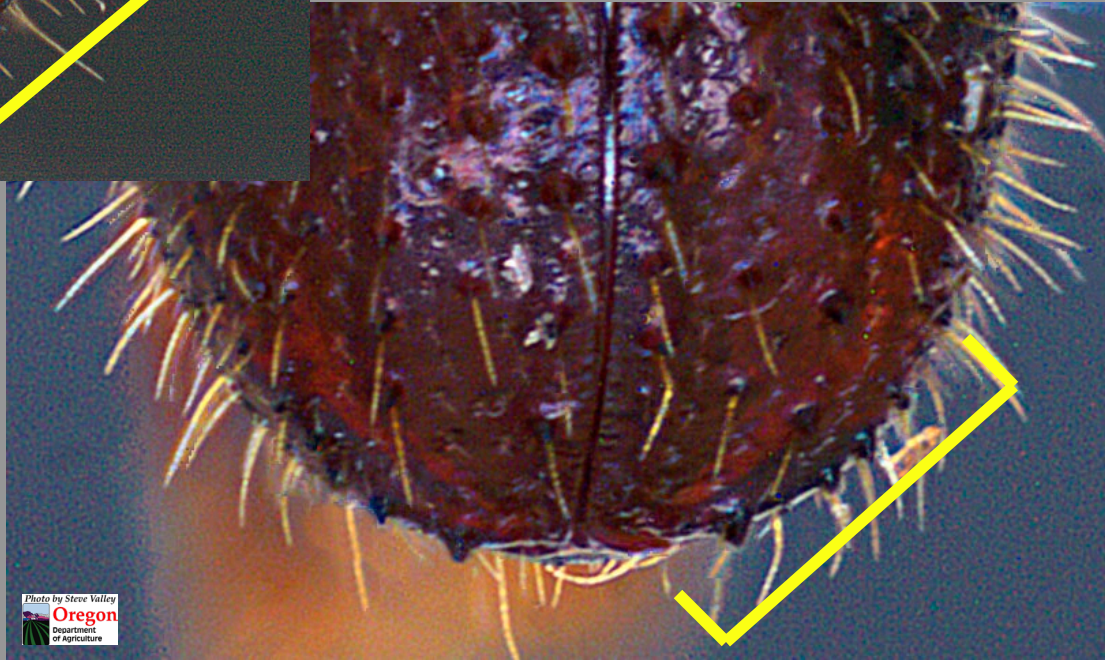
Scutellum conical, within setiferous depression between elytral bases; lower margin of elytral declivity (beginning about interstria 7) with small spines, the largest (at interstria 2) nearest the suture32



31 (27): Part II



31a2: Declivital margin without spines.

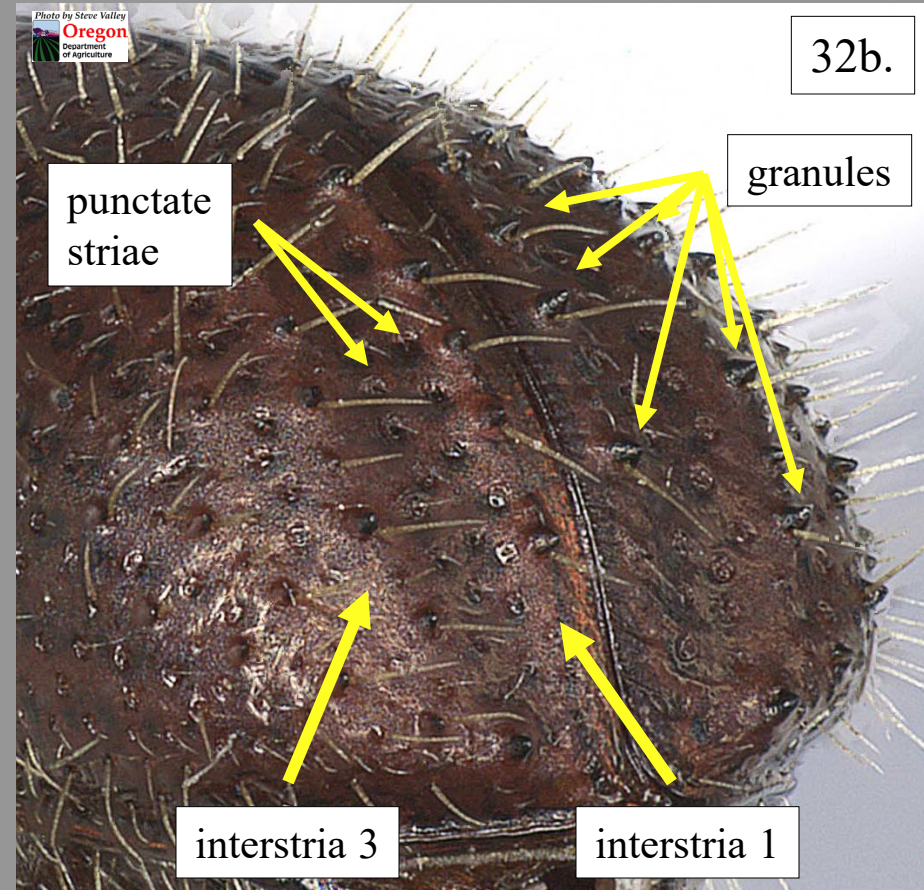
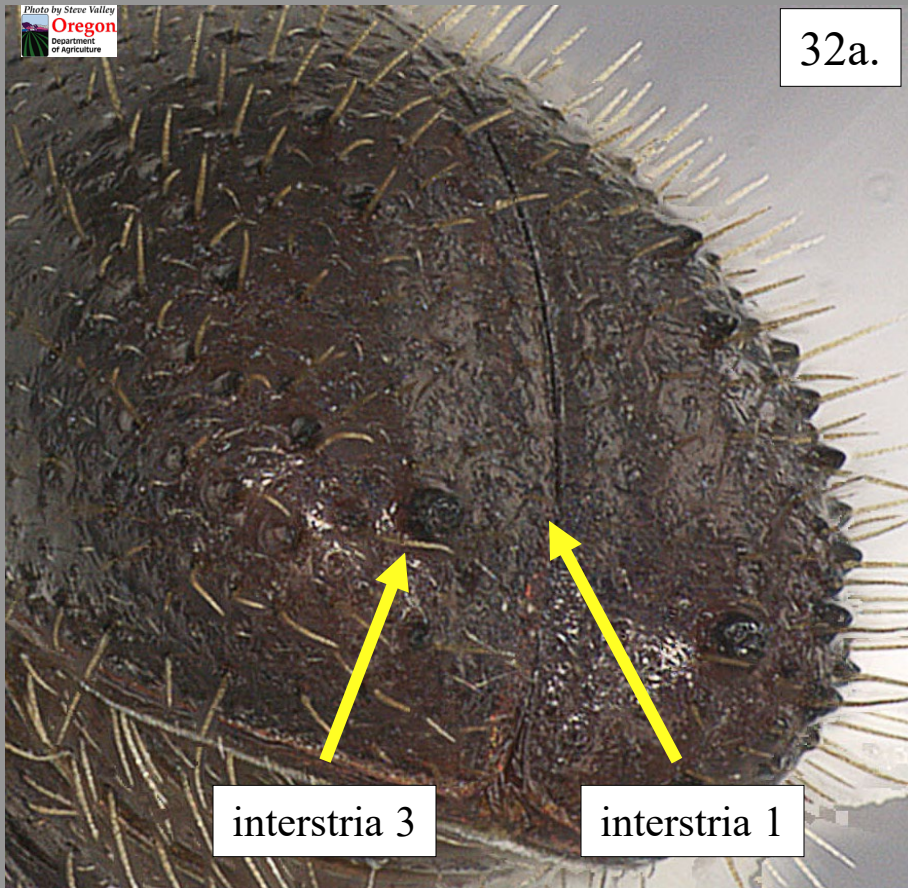


31b2: Declivital margin with spines.

32 (31)

Declivital interstriae 1 without granules, 3 with granule near apex, 1 and 3 not elevated; declivital striae not punctate; smaller, 1.6-1.9 mm.....STOP

Declivital interstriae 1 and 3 with small granules, 1 and 3 weakly elevated; declivital striae punctate; slightly larger, 2.0-2.8 mm.....33



33 (32): Part I

Granules on declivital interstriae 1 and 3 and ventrolateral margin larger, slightly hooked at apex (especially the largest); larger, 2.5-2.8 mm.....STOP

Granules on declivital interstriae 1 and 3 and ventrolateral margin conical, not hooked at apex; smaller, 2.0-2.4 mm.....*Xyleborinus saxesenii* (Ratzeburg)



33 (32): Part III

Xyleborinus saxesenii (Ratzeburg)



33b2.

34 (14)

Antennal club very large, > 3X funicle length; funicle 1- or 2-segmented.....35

Antennal club smaller, < 2X funicle length; funicle 5-segmented37

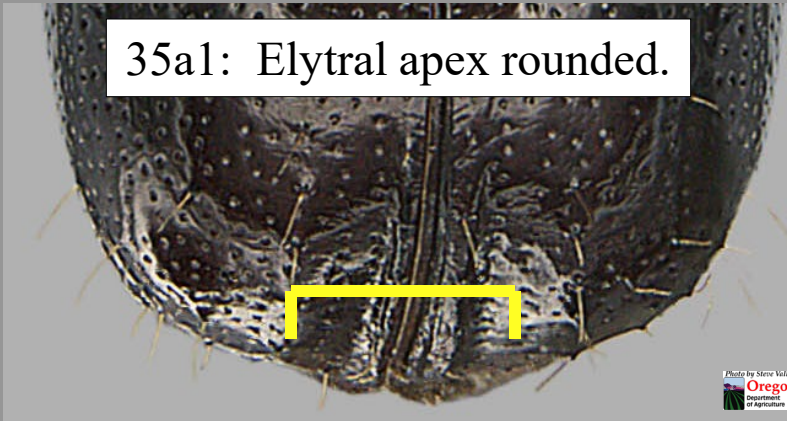


35 (34): Part I

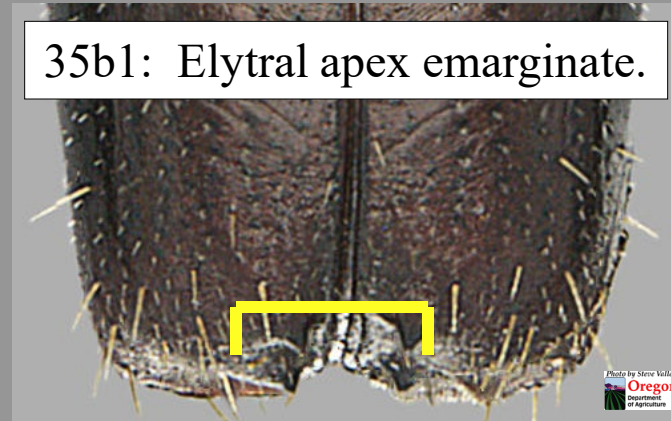
Elytral apex rounded at suture (dorsal view); posterior surface of protibia smooth; antennal funicle 1-segmented; body stout.....STOP

Elytral apex emarginate at suture (dorsal view); posterior surface of protibia tuberculate; antennal funicle 2-segmented (the 2nd segment is small and hard to see); body slender.....36

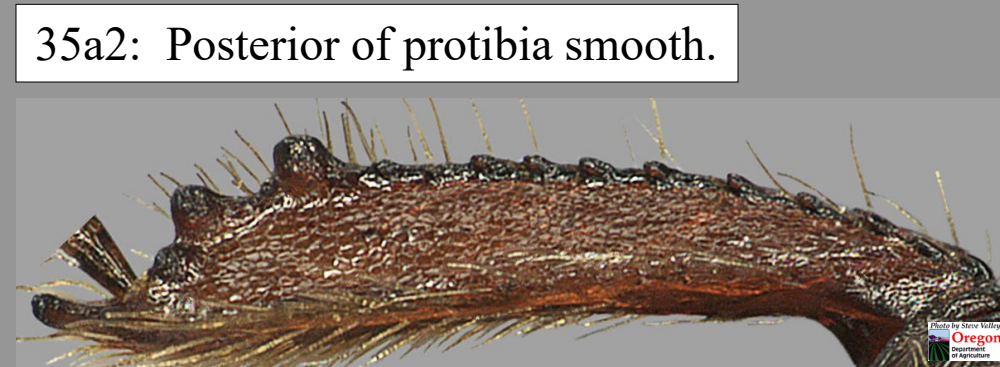
35a1: Elytral apex rounded.



35b1: Elytral apex emarginate.



35a2: Posterior of protibia smooth.

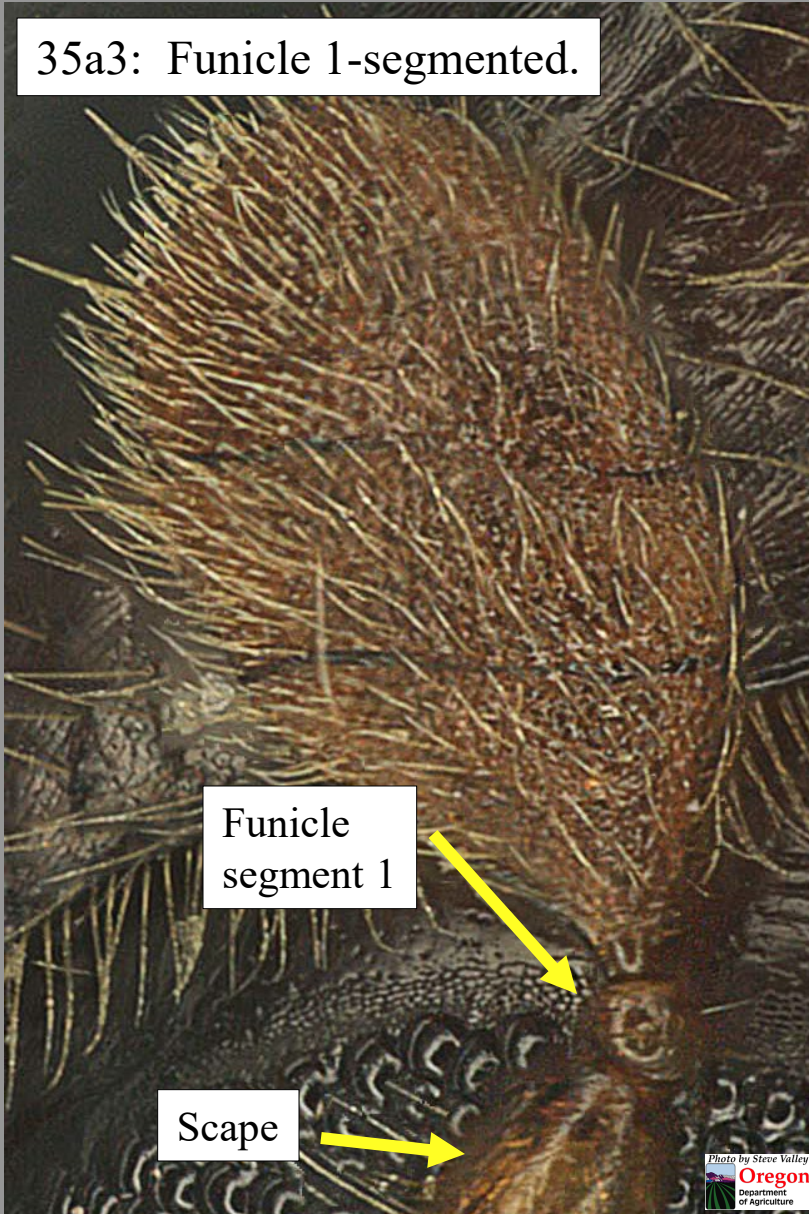


35b2: Posterior of protibia roughened.

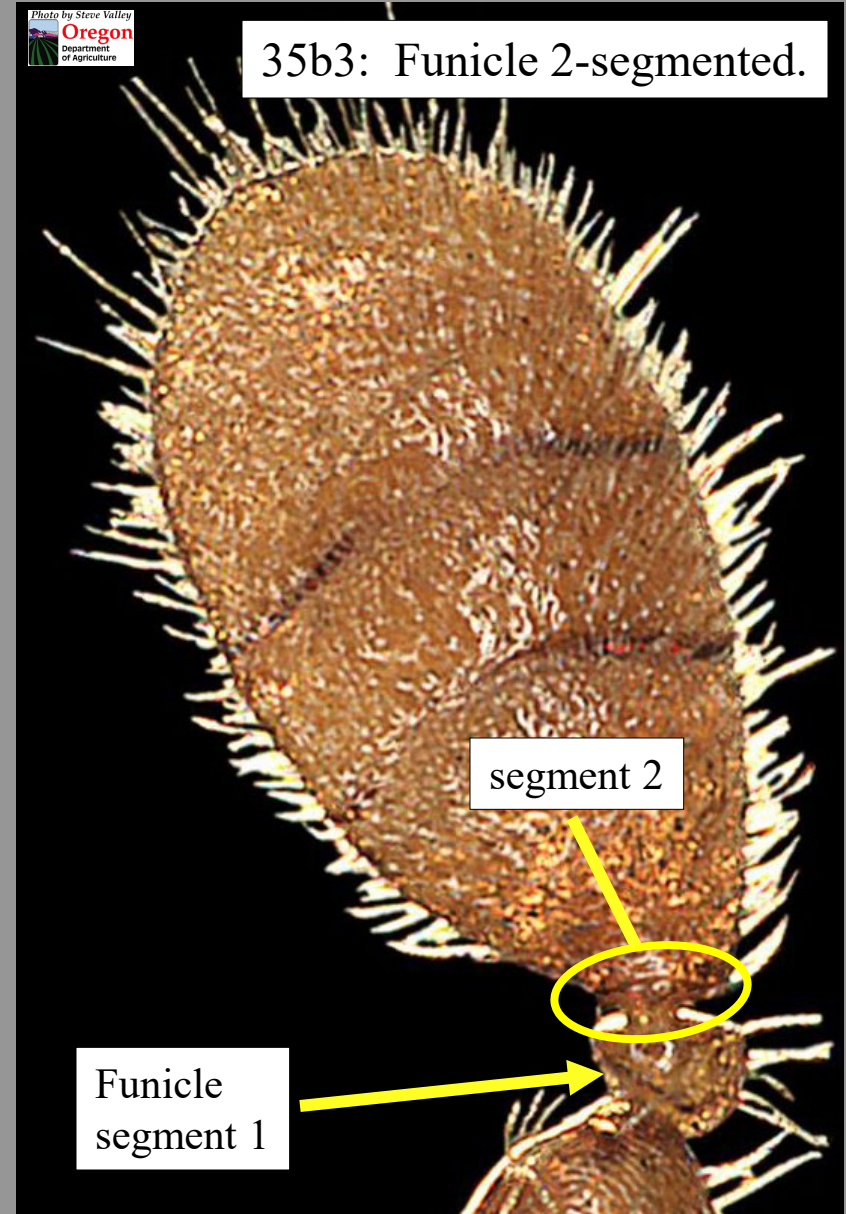


35 (34): Part II

35a3: Funicle 1-segmented.

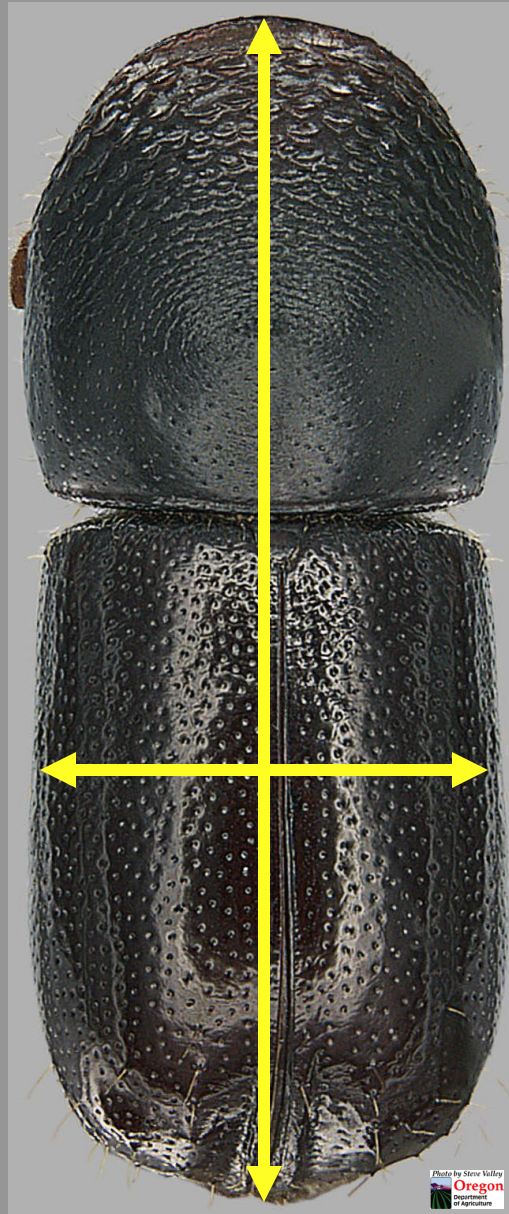


35b3: Funicle 2-segmented.

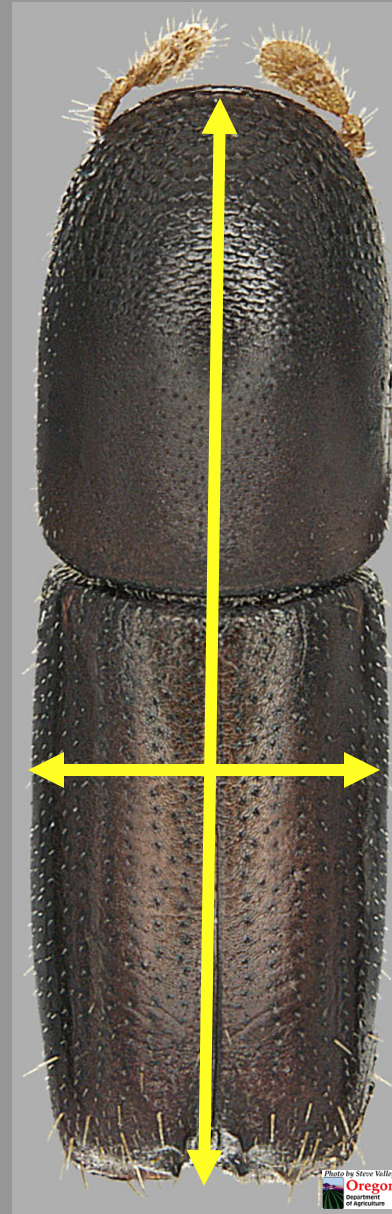


35 (34): Part III

35a4: Body stout.



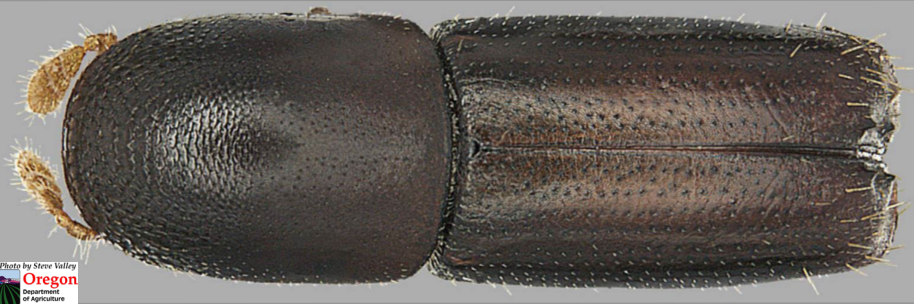
35b4: Body slender.



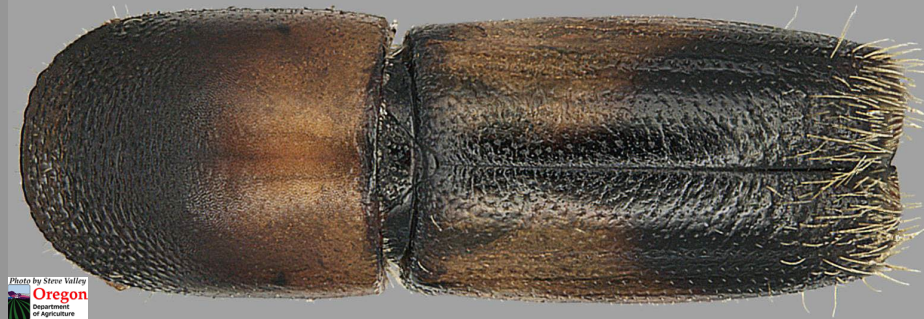
36 (35): Part I

Elytra and pronotum uniformly brown; declivity with 2 pairs of widely separated tubercles and few seta.....*Monarthrum mali* (Fitch)

Posterior of pronotum and anterior of elytra pale yellow, rest brown; declivity with a single pair of small tubercles and many setae.....
.....*Monarthrum fasciatum* (Say)



36a1: Elytra and pronotum brown.



36b1: Elytra and pronotum bi-colored.



36 (35): Part II

Photo by Steve Valley
Oregon
Department
of Agriculture

tubercles

tubercles

36b2: Declivity with single pair of tubercles and many setae.

36a2: Declivity with 2 pairs of tubercles and few setae.

Photo by Steve Valley
Oregon
Department
of Agriculture

tubercles

36 (35): Part III

Monarthrum mali (Fitch)



36a3.

36 (35): Part IV

Monarthrum fasciatum (Say)



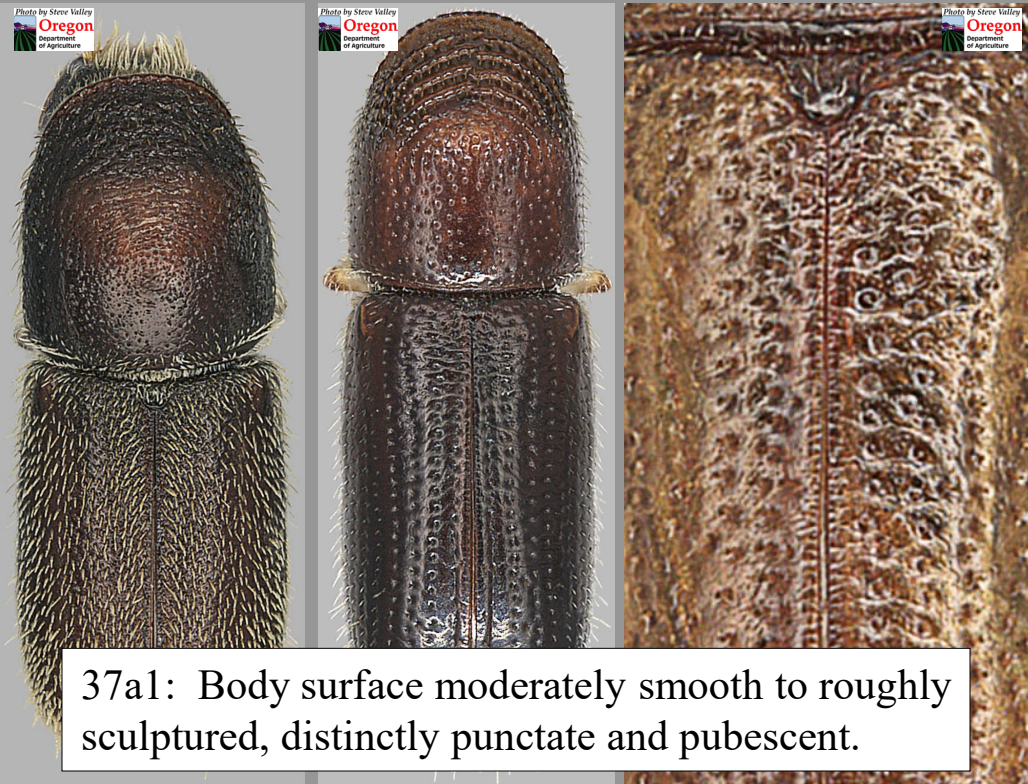
36b4.

37 (34): Part I

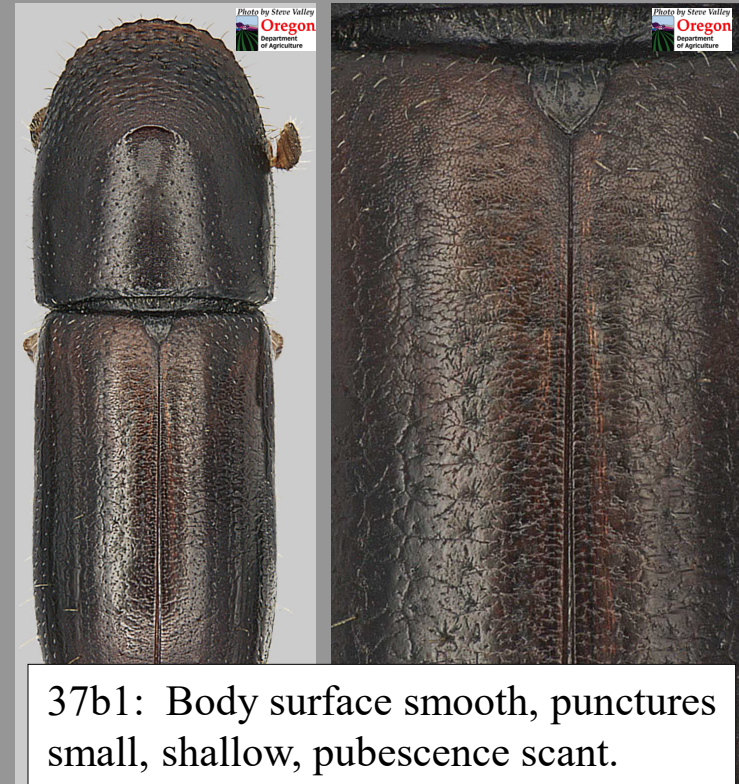
Body surface moderately smooth to rough, distinctly punctured and pubescent (some with scales); antennal club and funicle of female devoid of special pubescence; body slender.....STOP

Body surface smooth, punctures small and shallow, pubescence scant; antennal club and funicle of female with long, curved setae; body very slender.....

.....*Gnathotrichus materiarius* (Fitch)



37a1: Body surface moderately smooth to roughly sculptured, distinctly punctate and pubescent.



37b1: Body surface smooth, punctures small, shallow, pubescence scant.

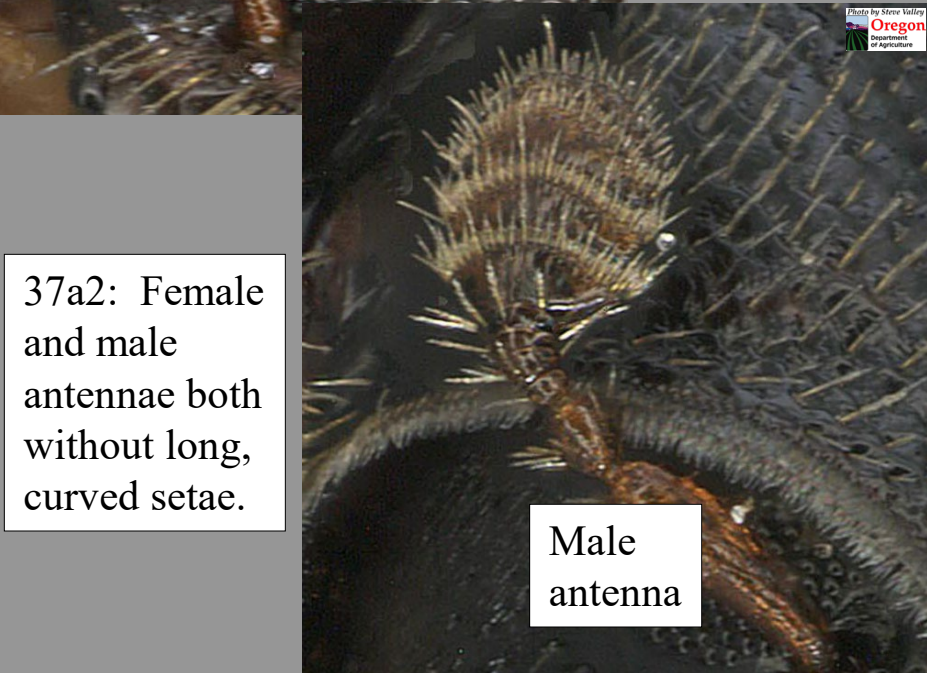
37 (34): Part II



Female antenna



37b2: Female antenna with long setae.



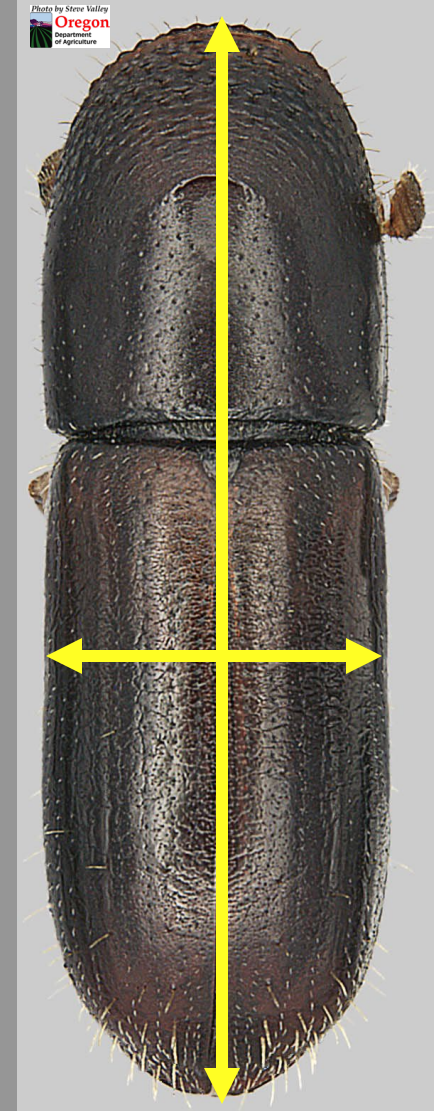
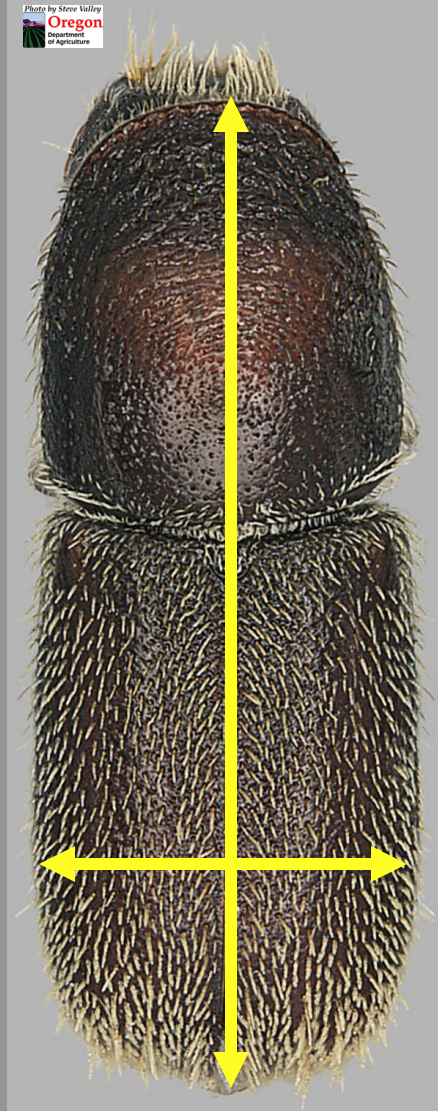
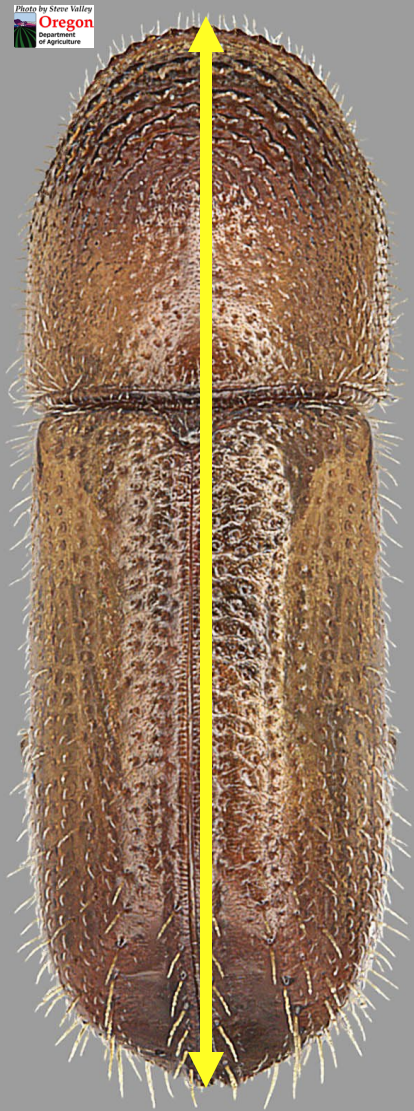
37a2: Female and male antennae both without long, curved setae.

Male antenna



37b2: Male antenna with short setae.

37 (34): Part III



37a3: Body slender to stout.

37b3: Body always very slender.

37 (34): Part III

Gnathotrichus materiarius (Fitch)

