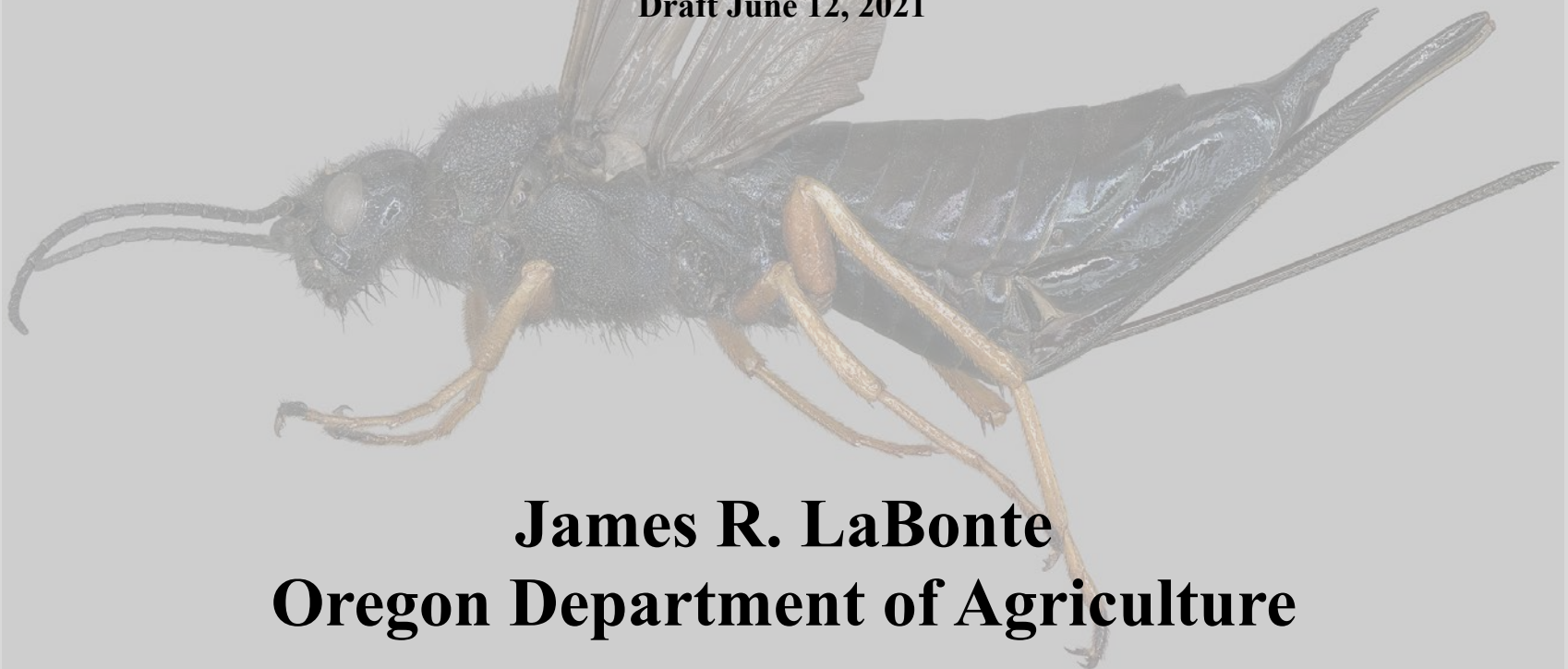


# **Identification of Siricidae of North America (north of Mexico)**

**\*Females Only**

**Draft June 12, 2021**



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Oregon Department of Agriculture**

# Introduction: I

# KEY

As a consequence of the detection of the exotic and potentially damaging European wood wasp, *Sirex noctilio* Fabricius, in North America in 2005, the first complete treatment of the Siricidae of North America was published in 2006 (Schiff et al.). At the time this book was produced, the authors knew the state of North American siricid taxonomy was in flux but an identification guide for this family was needed to support survey and research. A definitive treatment of the family for the Western Hemisphere was published in 2012 (Schiff et al.), followed by a revision of the *Xeris* of the world (Goulet et al. 2015). These are excellent and scholarly documents. However, such comprehensive treatments can be challenging for non-taxonomists. The following identification aid is in no way intended to replace either Goulet et al. (2015) or Schiff et al. (2012). It is merely an effort to provide a key to North American Siricidae that is easier to use.

This aid includes some exotic target species of Siricidae as well as native species. It is designed to be used by individuals with a wide range of taxonomic expertise. Images of all character states are provided. In general, the most obvious or reliable characters come first in a couplet half, followed by those that are less so. Where possible and efficient, taxonomic jargon has been kept to a minimum. Unfamiliar terms and character states should be explained via the images and associated labels.



# Introduction: II

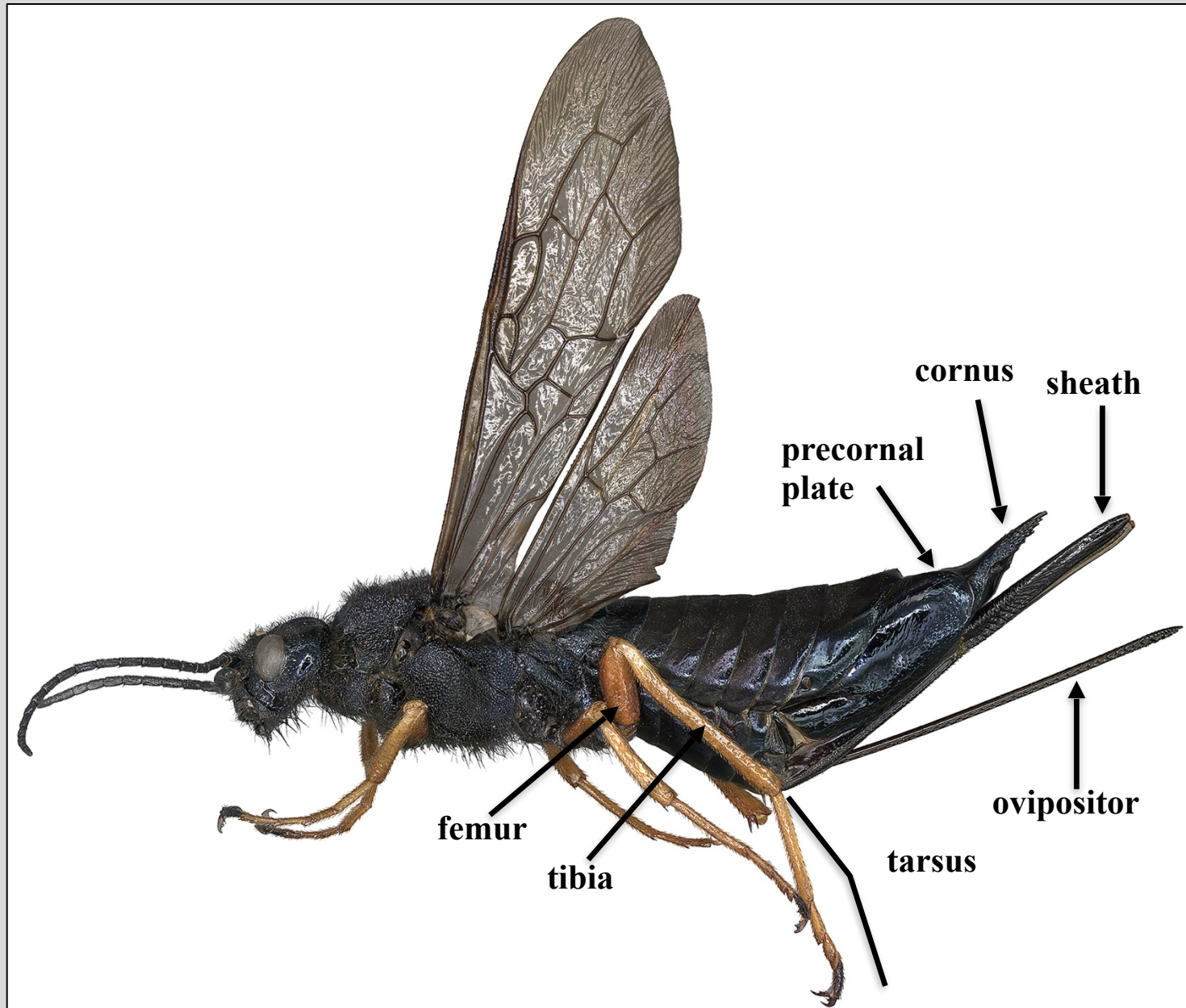
The first several slides following this introduction illustrate the basic body parts of Siricidae and the terms applied to them.

This screening aid functions much like traditional dichotomous keys, with couplets. However, action buttons link non-sequential couplets and enable return to the originating couplet. Names of exotic species are followed by the 🙄 symbol.

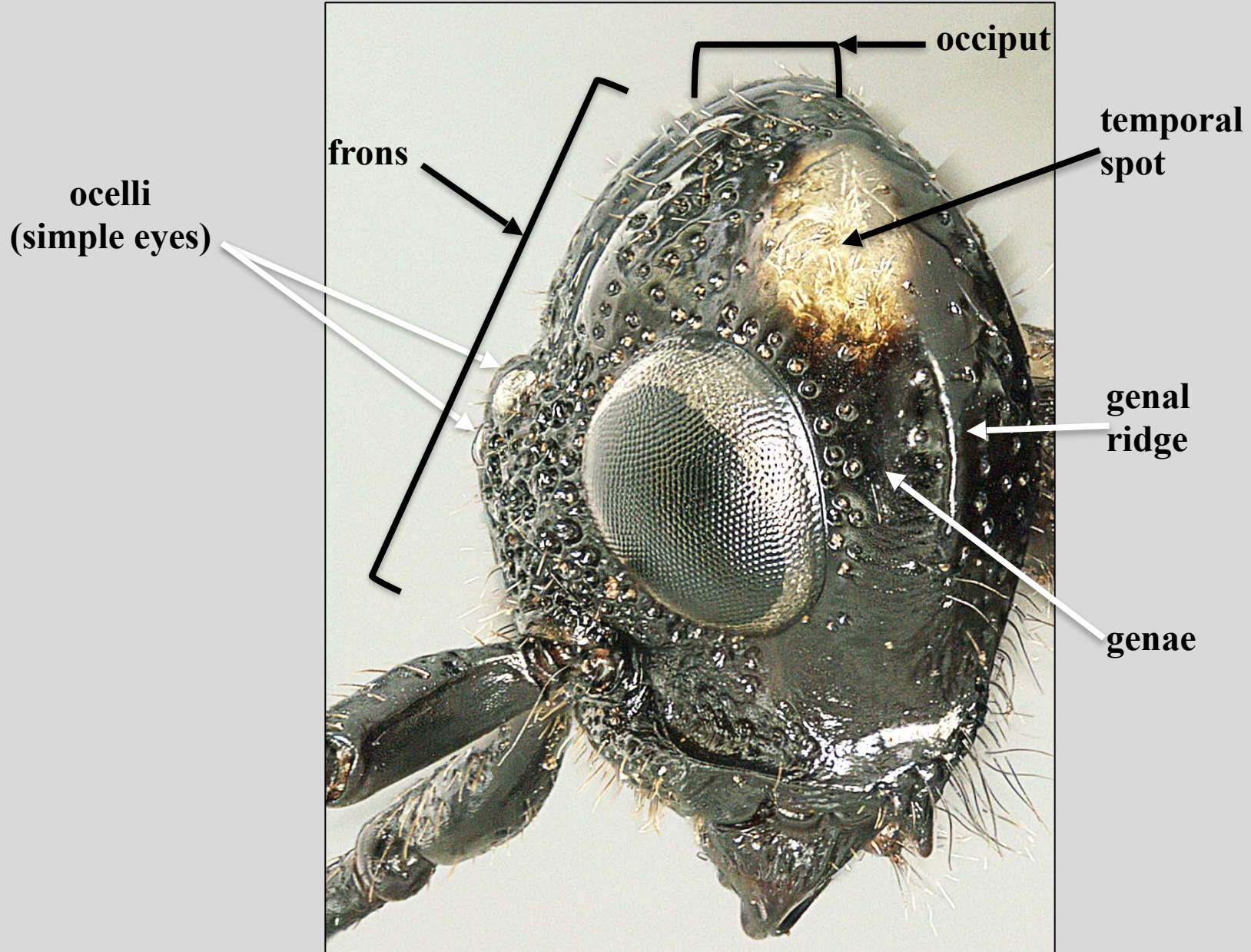
As is true of all insect identification based on external characters, good illumination is essential. Ring lights are particularly good for assessing punctuation, surface texture and features, and vestiture. Many features, especially punctuation, are best viewed at an oblique angle or with oblique lighting. It is important to maintain a reference collection of identified specimens (preferably confirmed by a cooperating taxonomist) to ensure correct understanding of the necessary characters. Although the images within this identification aid are of very high quality, there is no substitute for actual specimens.

Several of the *Sirex* and *Xeris* species can only be reliably identified via DNA. Some *Xeris* species are highly variable in coloration of the body and appendages. Also, dorsal portrait images were not available for several of the *Xeris* species.

# Siricid Morphology: I



# Siricid Morphology: II





# 1

Abdomen with long ovipositor (females) (a).....2

Abdomen without long ovipositor (males) (b).....**Males\***

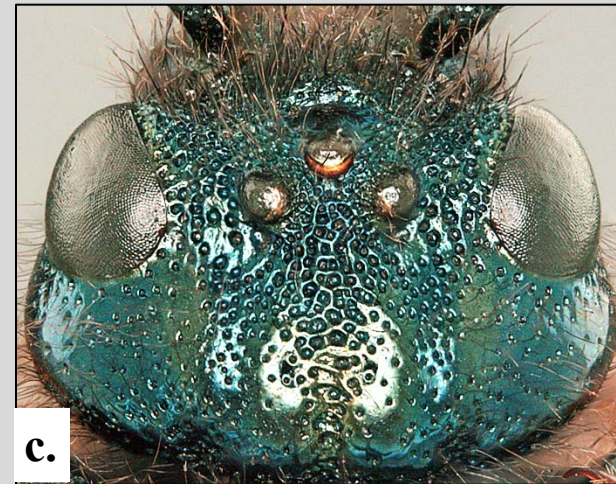
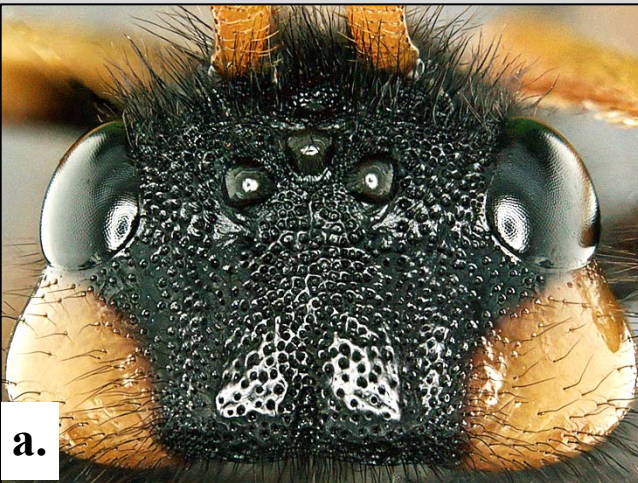
\*Males are rarely encountered or collected. Consequently, they will not be included in this key.



## 2 (1): Part I

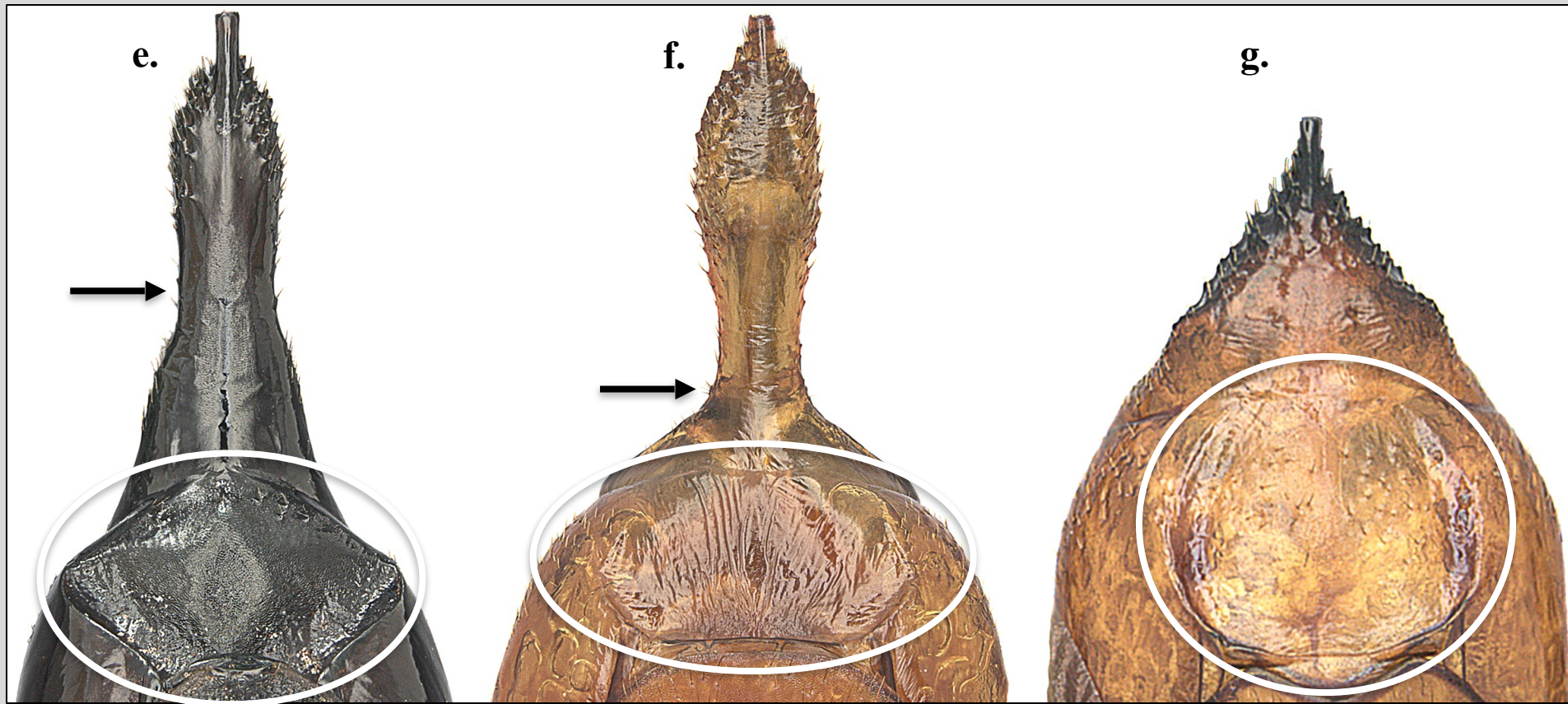
Head with pale temporal spot (**a-b**); cornus elongate, narrowed at middle (**e**) or at base (**f**), precornal plate pentagonal (**e-f**).....3

Completely dark behind each eye, without temporal spot (**c**) or entirely pale behind each eye (**d**); cornus broad and triangular (sometimes narrower than shown) (**g**), precornal plate round or oval.....17





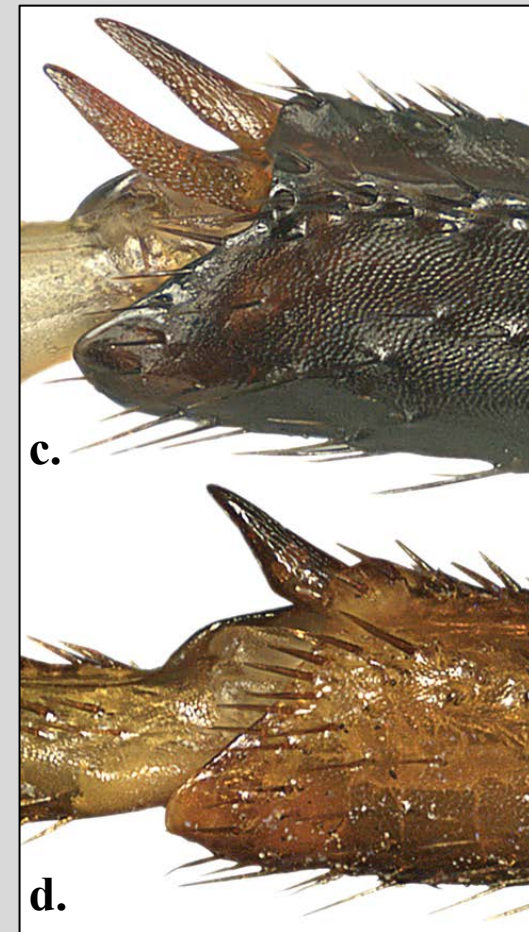
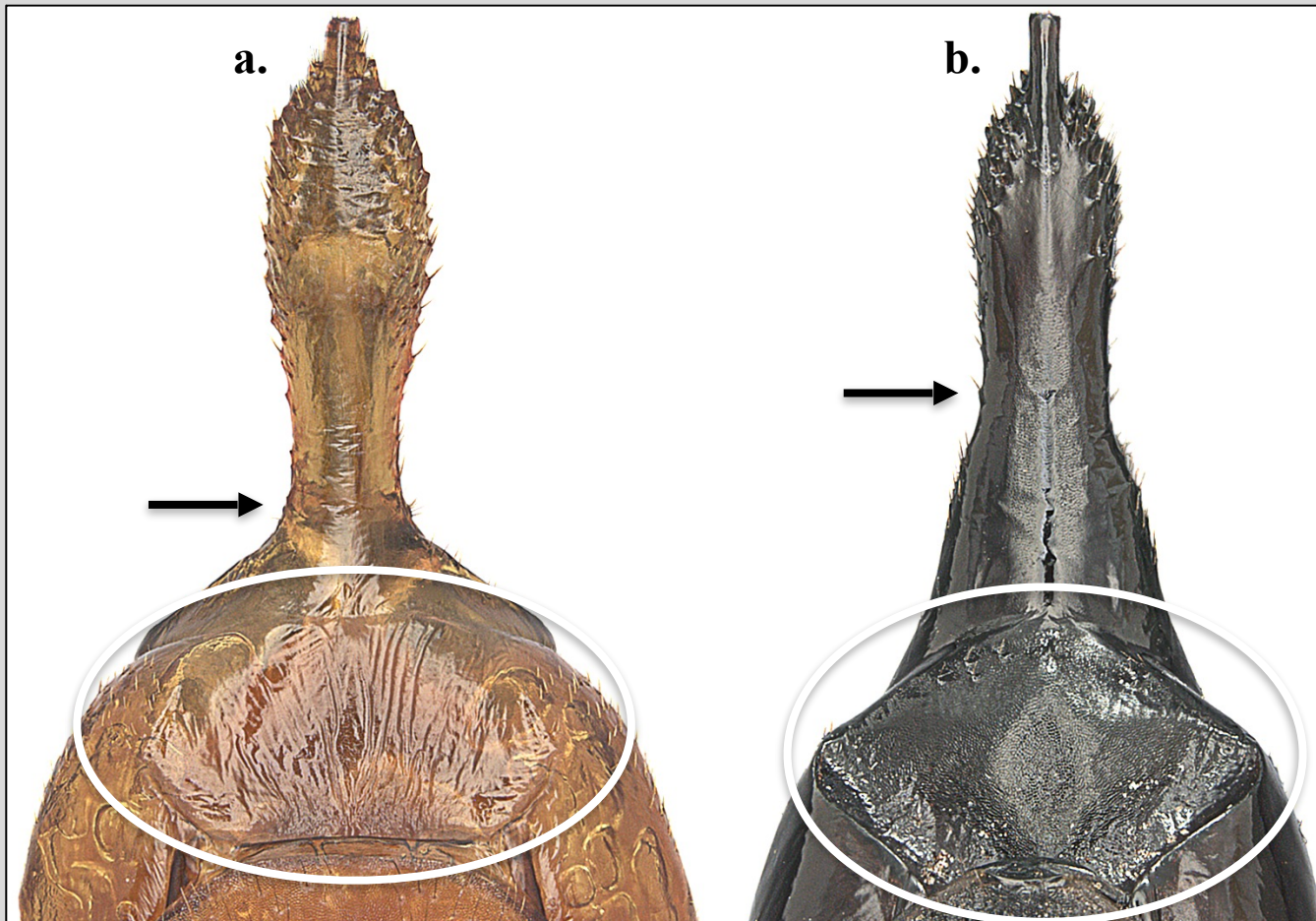
## 2 (1): Part II



# 3 (2)

Cornus narrowed at base, posterior margin of precornal plate shallowly convex (a); hind tibia with two apical spurs (c).....*Urocerus* 4

Cornus narrowed at middle, posterior margin of precornal plate angulate (b); (b), hind tibia with one apical spur (d).....*Xeris* 10





# 4 (3)

Antennae bicolored dark and pale (**a-b**); wings dark, with dark & opaque veins: all brown (**d**) to all very dark brown (**e**).....5

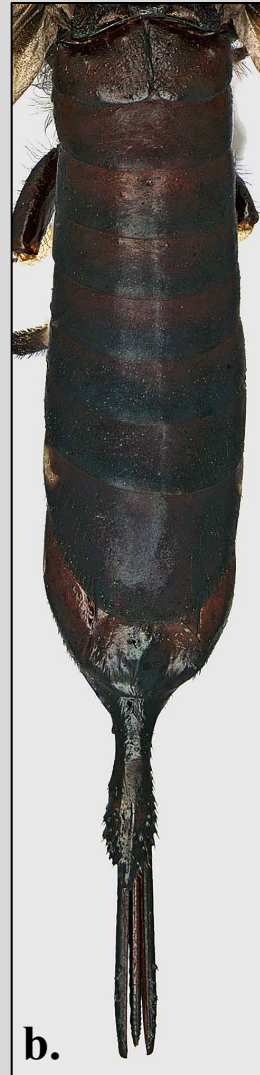
Antennae all pale-dark brown (scape sometimes darker) (**c**); wings pale, with pale & translucent veins: clear with darker areas (**f**) or all yellow (**g**).....7



# 5 (4)

At least posterior half of abdomen pale (a).....*Urocerus cressoni* Norton

Abdomen black (sometimes with pale lateral markings) (b-c).....6





# *Urocerus cressoni* Norton





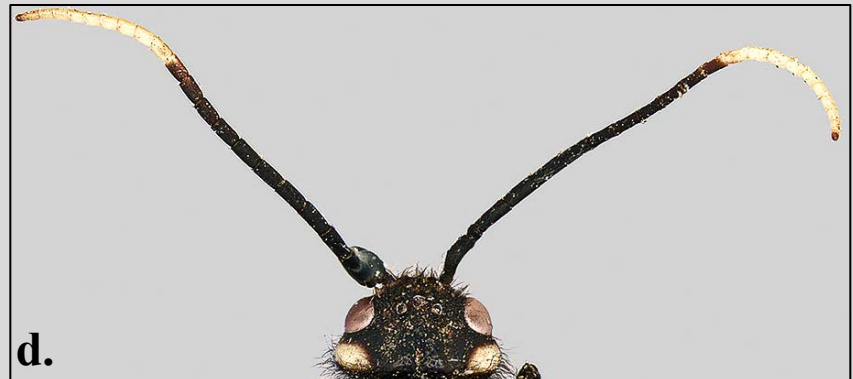
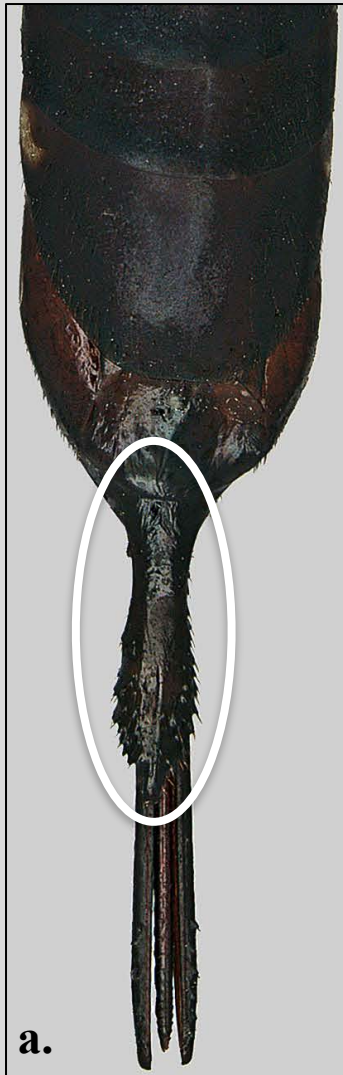
# *Urocerus cressoni* Norton



# 6 (5)

Cornus black (a); antennae pale in middle (c).....*Urocerus albicornis* (Fabricius)

Cornus pale (b); antennae pale apically (d).....*Urocerus taxodii* (Ashmead)



# *Urocerus albicornis* (Fabricius)





# *Urocerus albicornis* (Fabricius)



# *Urocerus taxodii* (Ashmead)





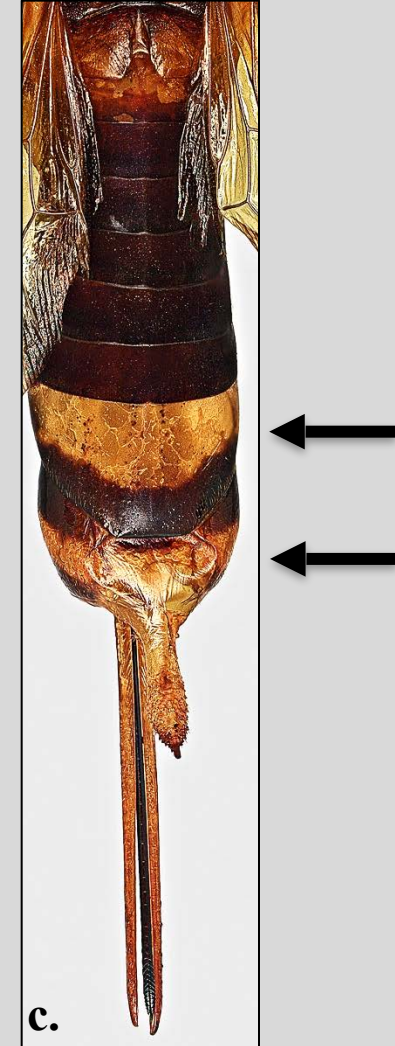
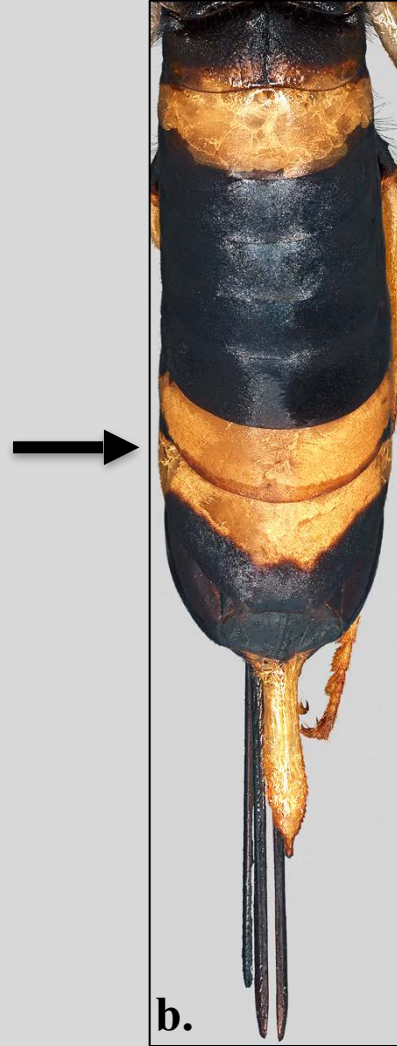
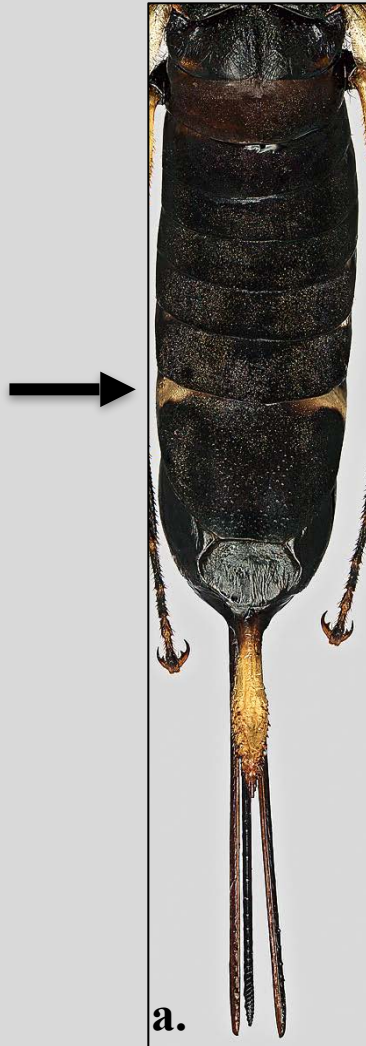
*Urocerus taxodii*  
(Ashmead)



# 7 (4)

Abdomen without broad pale bands in posterior half, at most only a narrow pale band present (a).....*Urocerus californicus* Norton

Abdomen with broad pale banding in posterior half (b-c).....8



# *Urocerus californicus* Norton






# *Urocerus californicus* Norton



# 8 (7)

Abdominal segment 7 dark and pronotum pale (a).....*Urocerus sah* (Mocsary) 😞  
(exotic established in SE Canada and NE U.S.)

Abdominal segment 7 pale and pronotum at least mostly dark (b-c).....9 





# *Urocerus sah* (Mocsary)



# *Urocerus sah* (Mocsary)

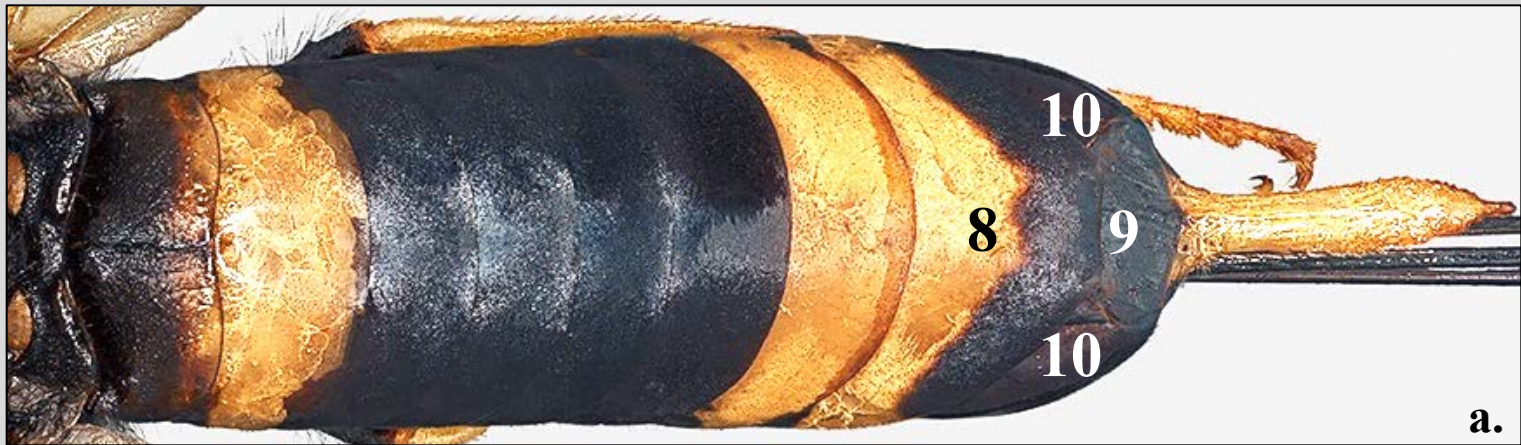


# 9 (8)

Apical half of abdominal segment 8, all of 9, and all of segment 10 (except for the cornus) dark (a).....*Urocerus flavicornus* (Fabricius)

Abdominal segment 8 except for anterior lateral angles (visible in lateral portrait), posterior half of 9, and all of 10 pale (b).....*Urocerus gigas* (Linnaeus) 😞

**\*Frequently intercepted exotic not known to be established in North America.**





# *Urocerus flavicornus* (Fabricius)



# *Urocerus flavicornus* (Fabricius)





*Urocerus*  
*gigas*  
(Linnaeus)



# *Urocerus gigas* (Linnaeus)

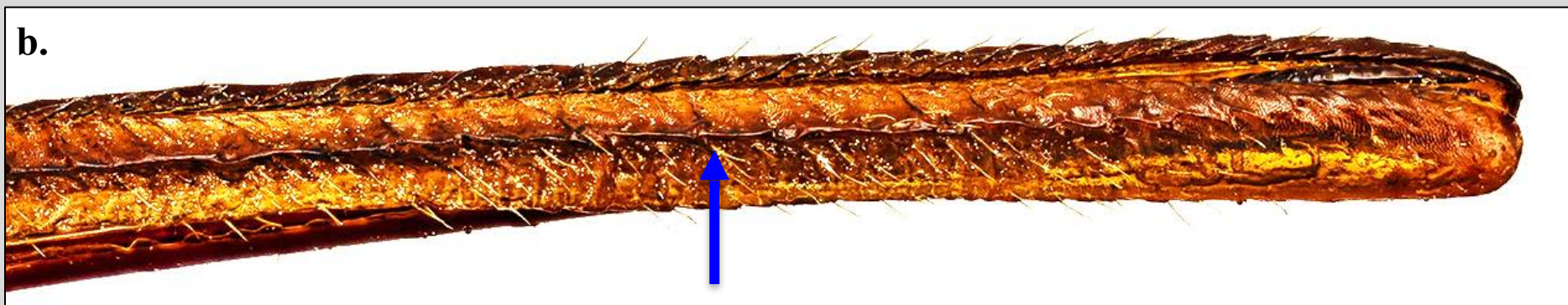




# 10 (3): Part I

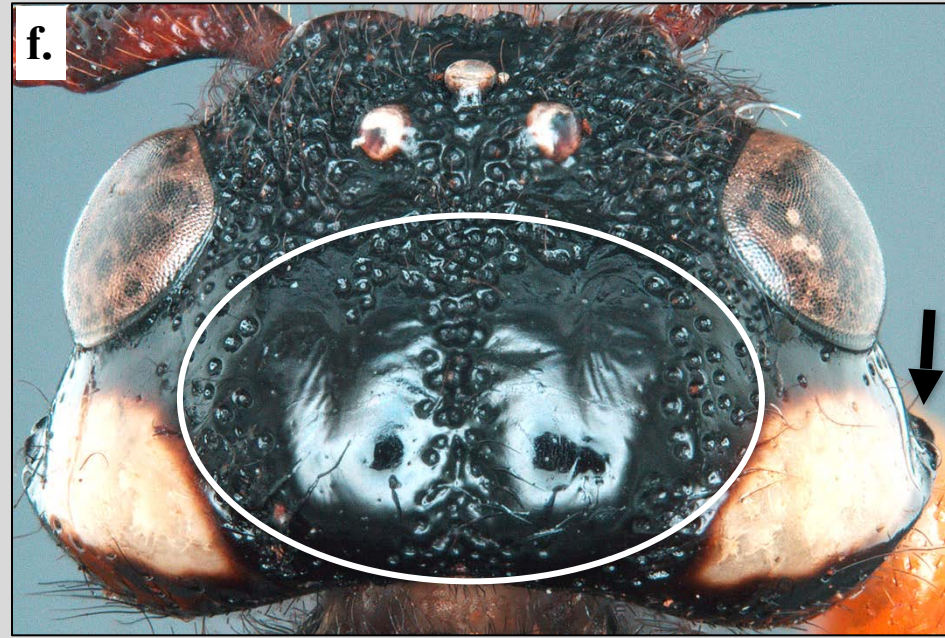
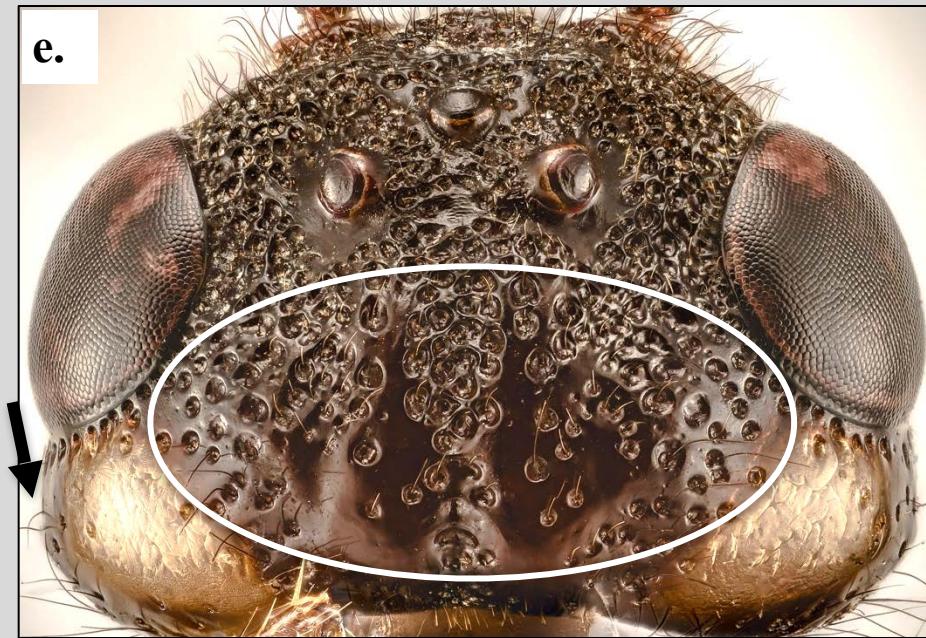
Ovipositor sheath without lateral longitudinal carina (a); genal carinae not visible from front view (c), genae not extending beyond lateral margins of eyes (c, e); upper portion of head coarsely and contiguously punctate and with only narrow medial carinae apunctate (e).....*Xeris tarsalis* (Cresson)

Ovipositor sheath with lateral longitudinal carina (b); genal carinae clearly visible from front view (d), genae extending beyond lateral margins of eyes (d, f); upper portion of head with sparse small punctures and with large apunctate areas (f).....11





# 10 (3): Part II

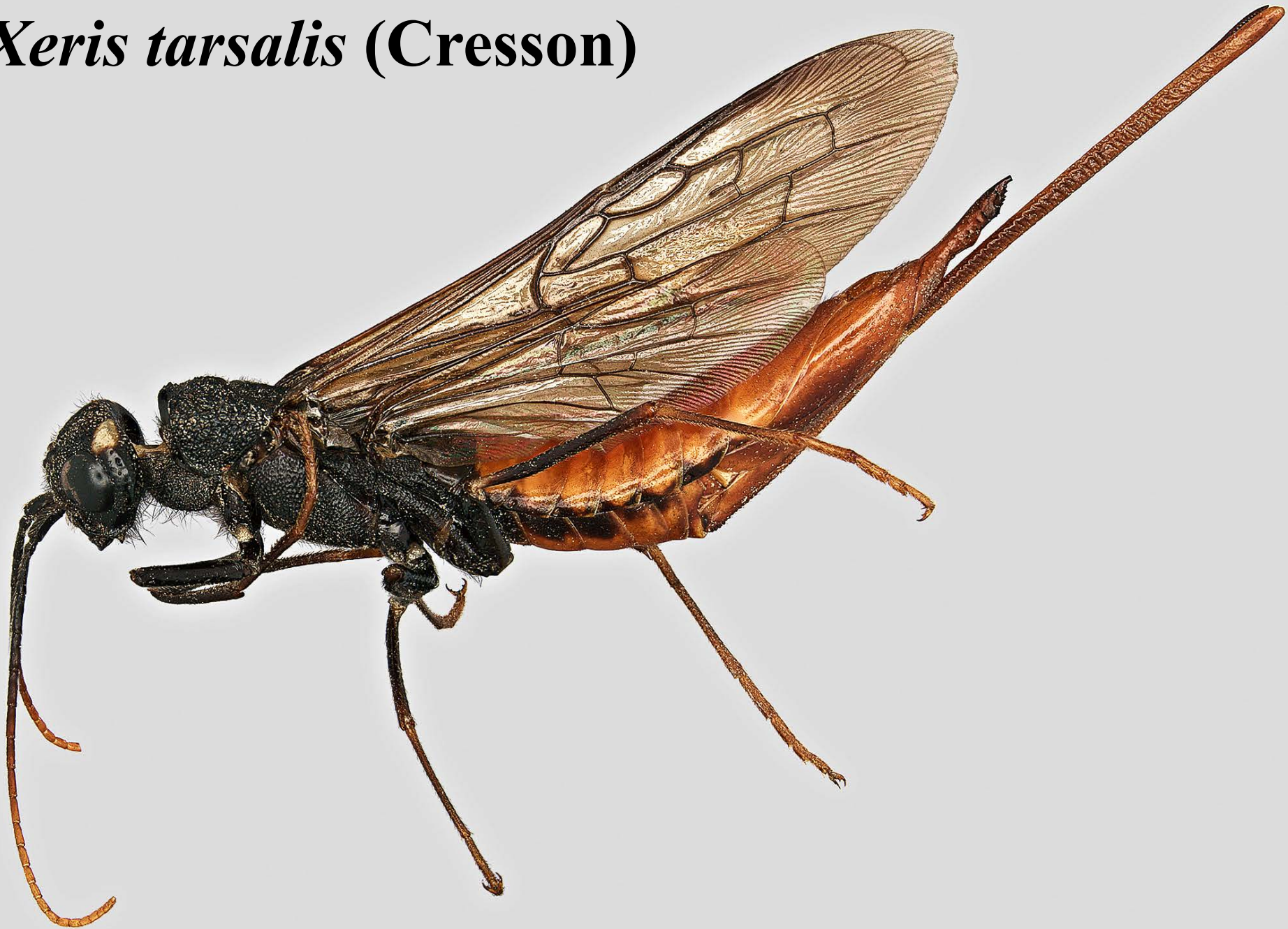




# *Xeris tarsalis* (Cresson)



*Xeris tarsalis* (Cresson)

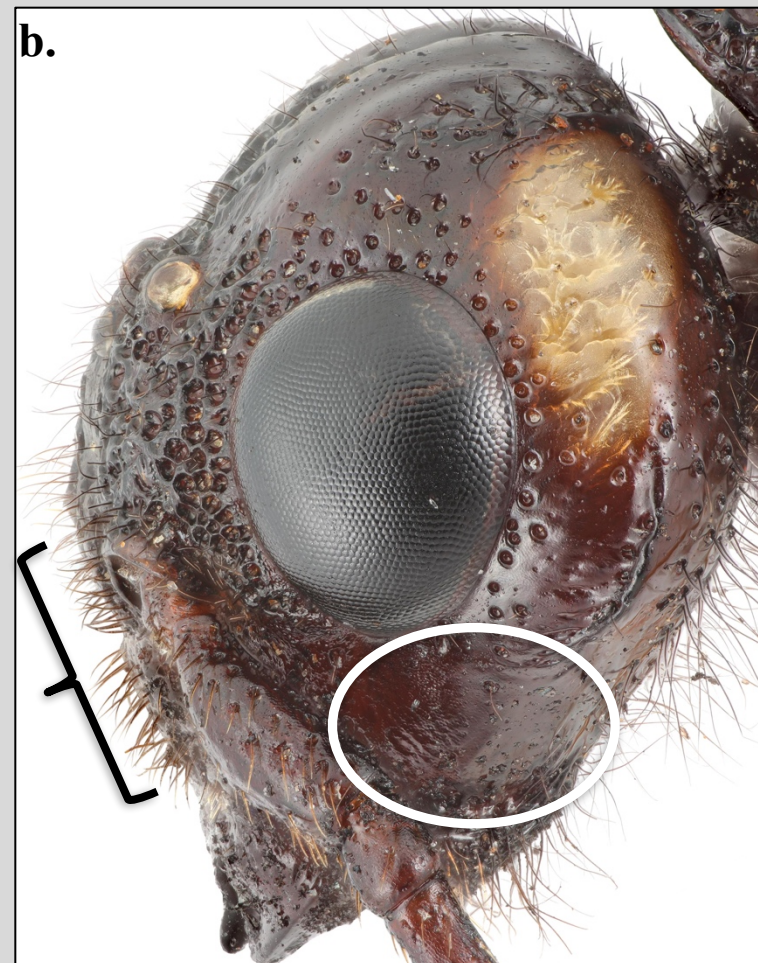
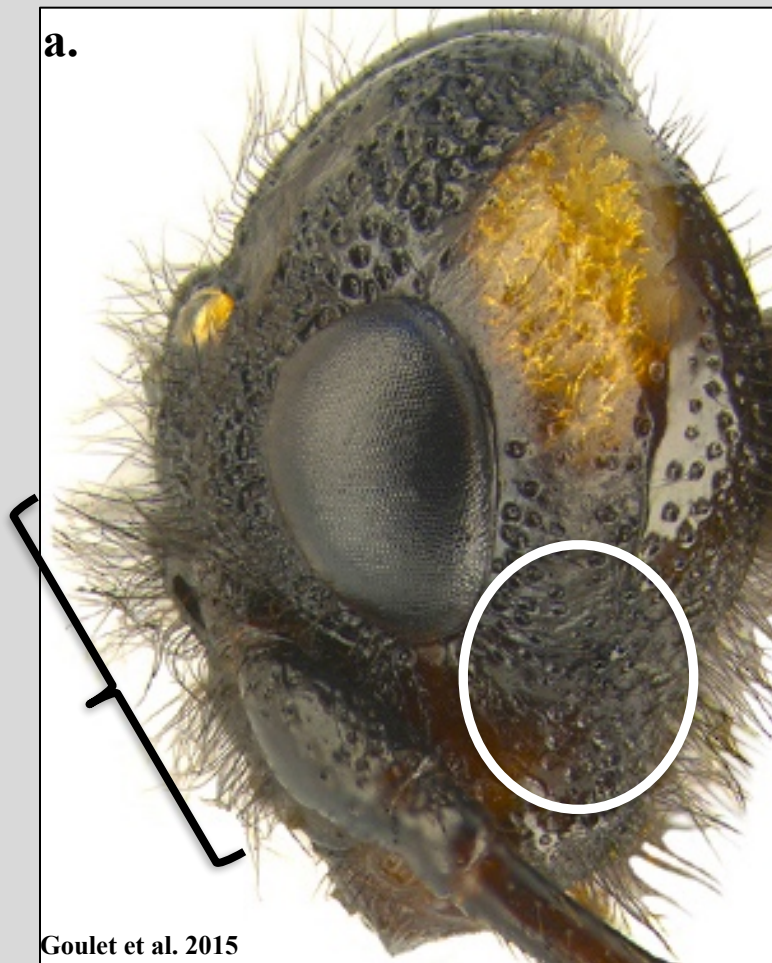




# 11 (10)

Genae below eyes & genal ridge densely punctate; clypeus & lower frons with long setae (**a**) (known only from Arizona & Colorado)...*Xeris chiricahua* Smith

Genae below eyes & genal ridge with only a few punctures; clypeus & lower frons with short setae (**b**).....12



# *Xeris chiricahua* Smith

Dorsal – No Image Available

# *Xeris chiricahua* Smith



Schiff et al. 2012

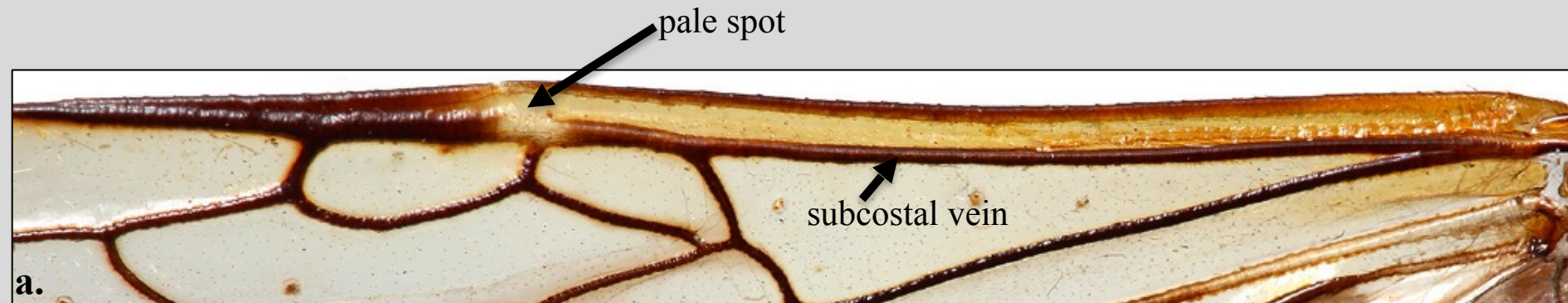


# 12 (11)

Costal cell of forewing with a sharply contrasting pale spot at the base of the stigma in the subcostal vein (a).....*Xeris spectrum* (Linnaeus) 😞

**\*Frequently intercepted exotic not known to be established in North America.**

Costal cell of forewing without a sharply contrasting pale spot at the base of the stigma in the subcostal vein (b).....13



Goulet et al. 2015



# *Xeris spectrum* (Linnaeus)

Dorsal – not available



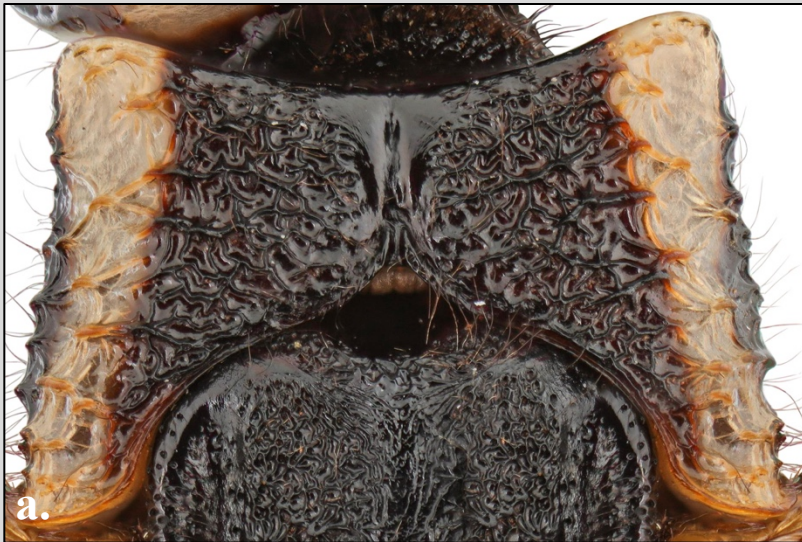
# *Xeris spectrum* (Linnaeus)



# 13 (12): Part I

Pronotum in dorsal view with pale stripe along each lateral margin (a), rarely incomplete (b); genae with at most few and scattered small punctures (e)...14

Pronotum in dorsal view without pale stripe along each lateral margin (c) or with at most a very small pale spot at each anterior angle (d); genae with dense and larger punctures (f).....15





# 13 (12): Part II



e. genae with at most few and scattered small punctures



f. genae with dense and larger punctures

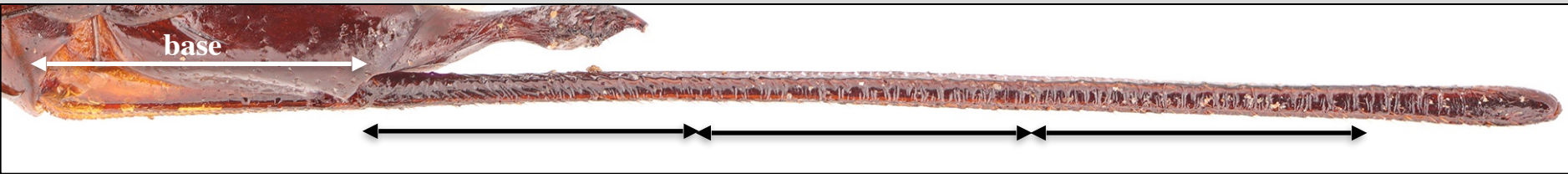


# 14 (13): Part I

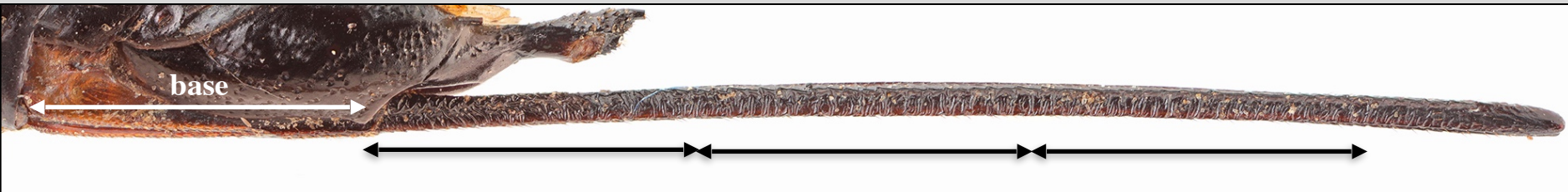
Sheath with basal section generally less than 0.25 times length of apical section; (a, b) if this measurement is 0.25–0.27, tergum 10 normally without meshes of microsculpture on laterobasal angle in dorsal view (d, e).....*Xeris caudatus* Cresson

Sheath with basal section generally more than 0.27 times length of apical section (c); if this measurement is 0.25–0.27, tergum 10 normally with distinct microsculpture on laterobasal angle in dorsal view (f, g).....*Xeris melancholicus* (Westwood)

\*These two species are very difficult to reliably identify except via the CO1 barcode sequence. In general, *X. caudatus* is western and *X. melancholicus* is eastern, but the ranges overlap in Alberta and Saskatchewan.

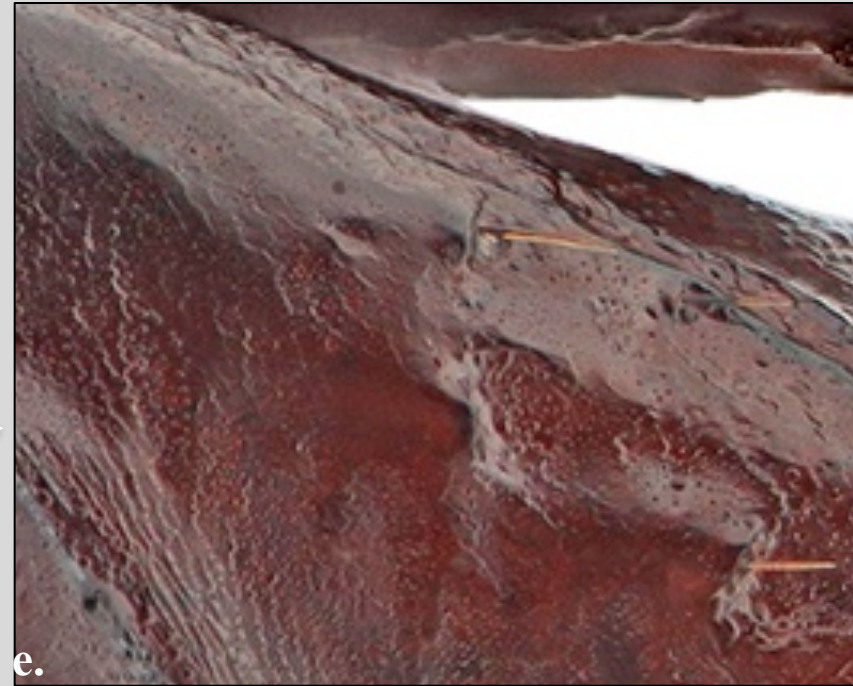
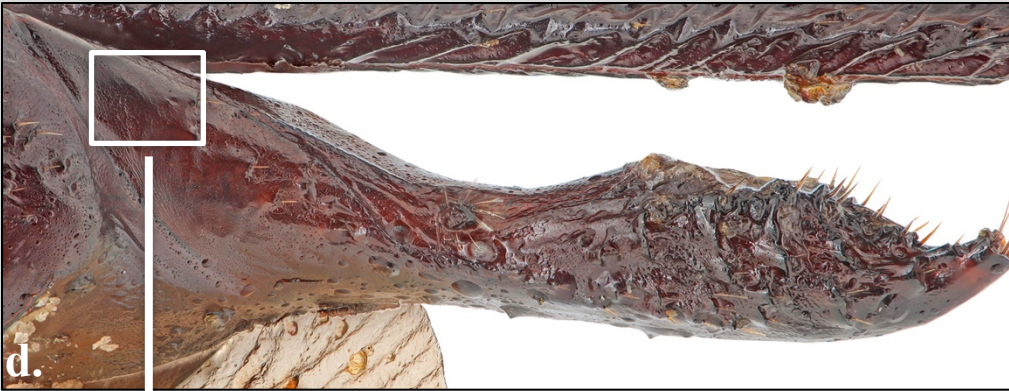


**a & b.** Small (top) and large *Xeris caudatus*, with slightly varying ovipositor proportions.



**c.** *Xeris melancholicus* ovipositor

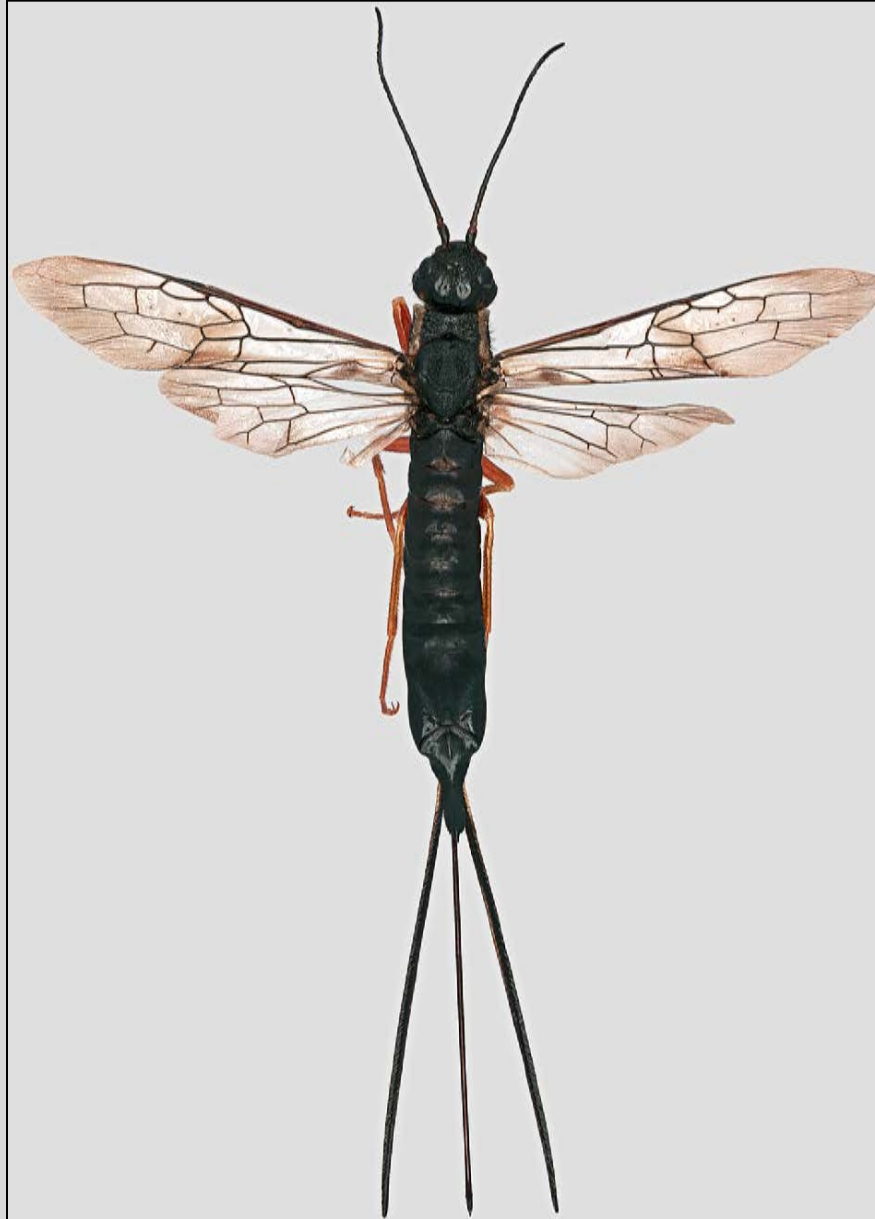
# 14 (13): Part II





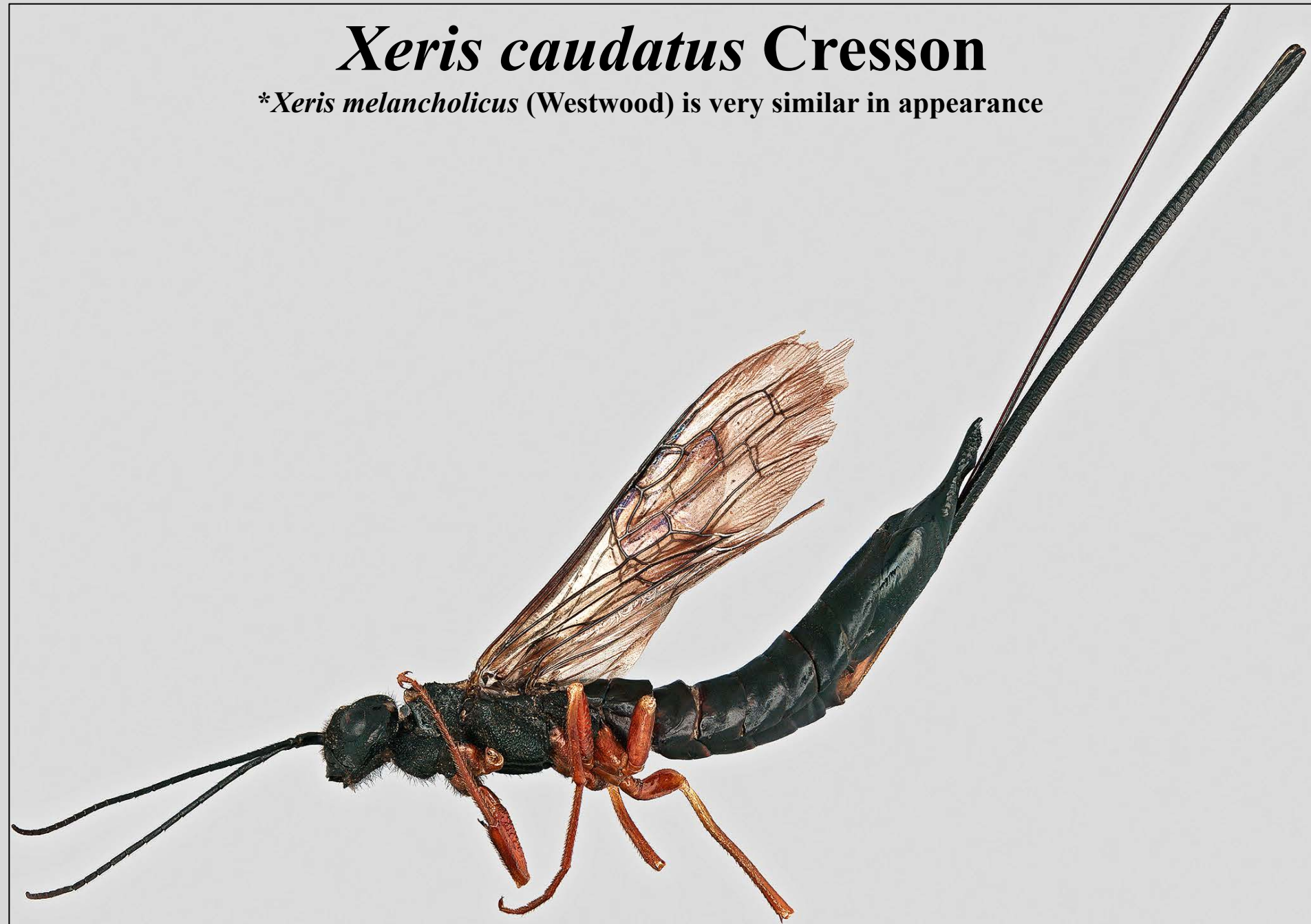
# *Xeris caudatus* Cresson

\**Xeris melancholicus* (Westwood) is very similar in appearance



# *Xeris caudatus* Cresson

*\*Xeris melancholicus* (Westwood) is very similar in appearance



# *Xeris melancholicus* (Westwood)

*\*Xeris caudatus* Cresson is very similar in appearance

Dorsal – not available



# *Xeris melancholicus* (Westwood)

\**Xeris caudatus* Cresson is very similar in appearance



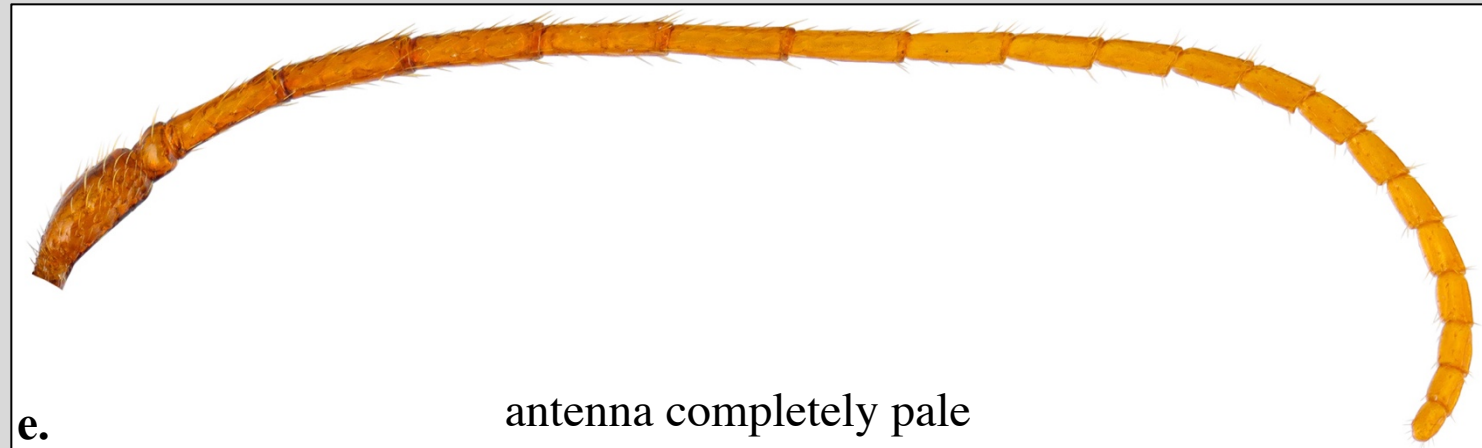
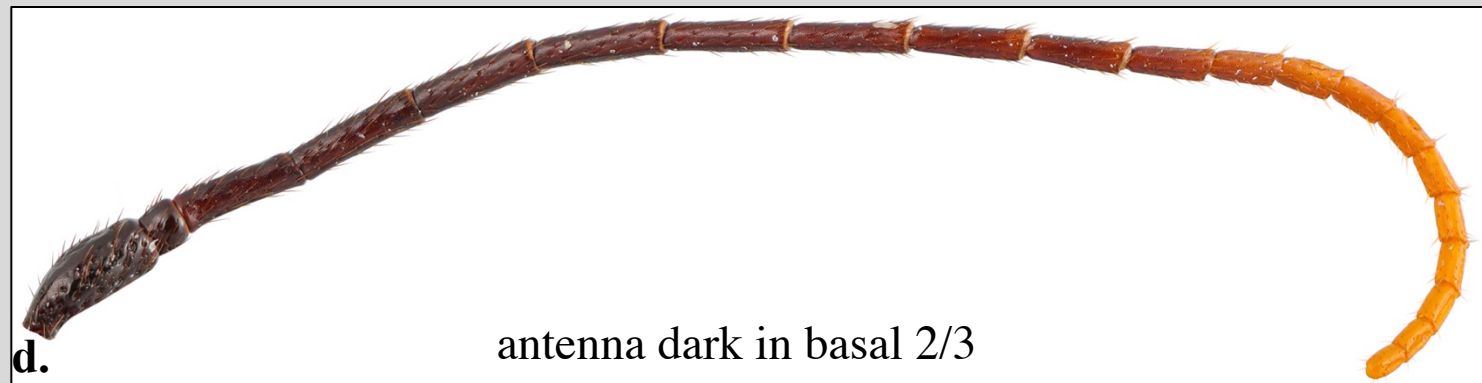
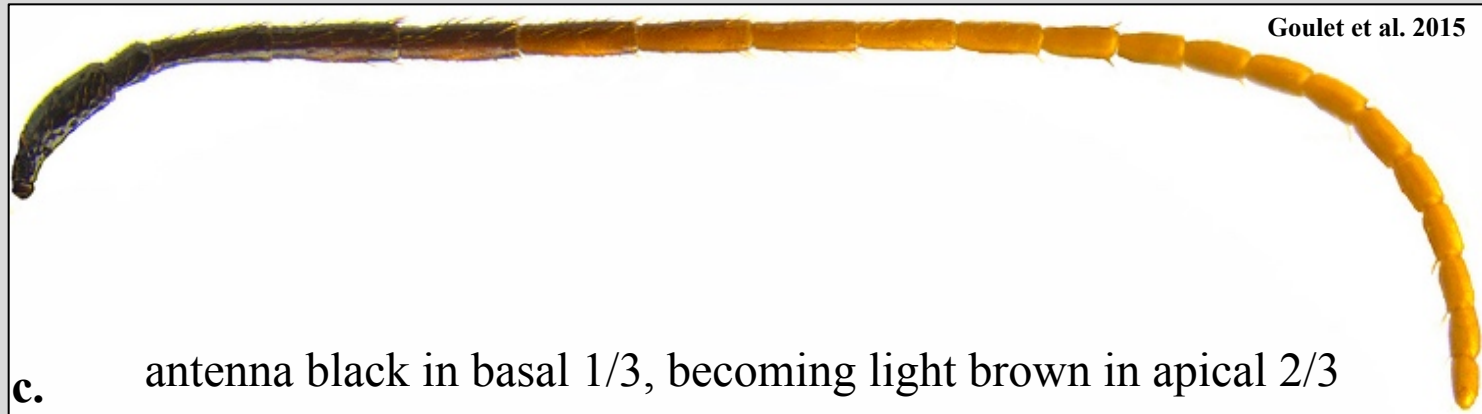
# 15 (13): Part I

Trochanters and femora black (a); antennae black in basal third, becoming light brown in apical two-thirds (c) (known only from Arizona and Colorado). *Xeris morrisoni* (Cresson)

Trochanters and femora light brown (b); antennae black in basal two-thirds and light brown in apical third (d), or completely light brown (e).....16



# 15 (13): Part II





# *Xeris morrisoni* (Cresson)

Dorsal –not available

# *Xeris morrisoni* (Cresson)





# 16 (15)

Forewing completely dark (**a**); abdomen light brown (**portrait**) (known only from South Dakota but may also be present in Arizona & Utah).....*Xeris degrooti* Goulet

Forewing with dark central and apical bands (**b**); abdomen light brown (**portraits – pale form**) or black (**portraits – dark form**) (\*rare specimens with all dark wings and brown abdomens cannot be distinguished from *X. degrooti* except by genetic analysis).....  
.....*Xeris indecisus* (MacGillivray)



# *Xeris degrooti* Goulet

Dorsal –not available

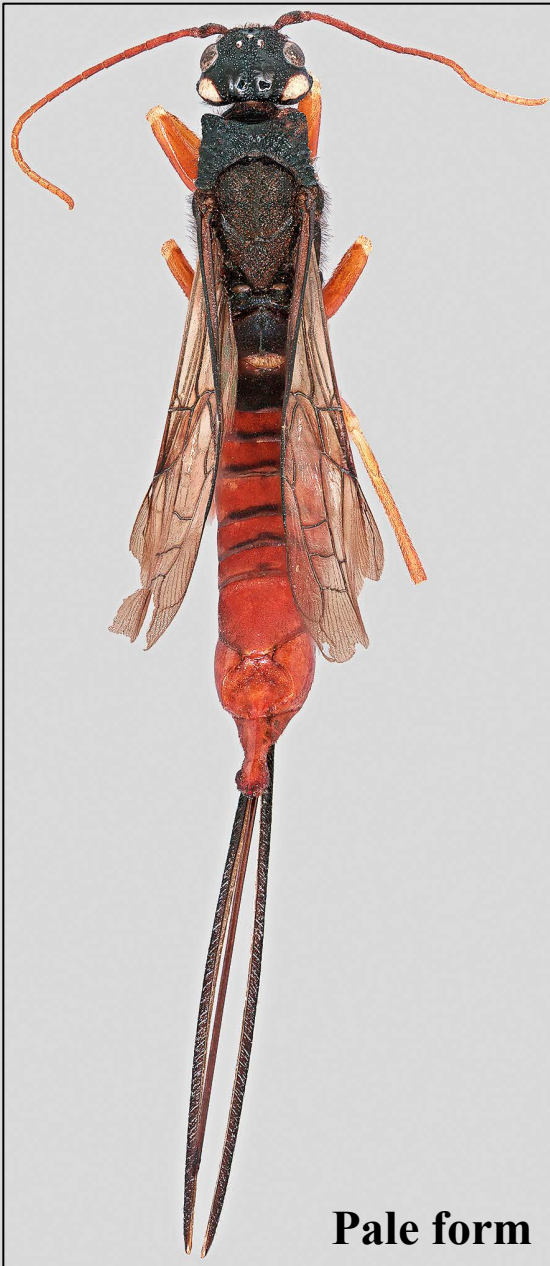
# *Xeris degrooti* Goulet



Goulet et al. 2015



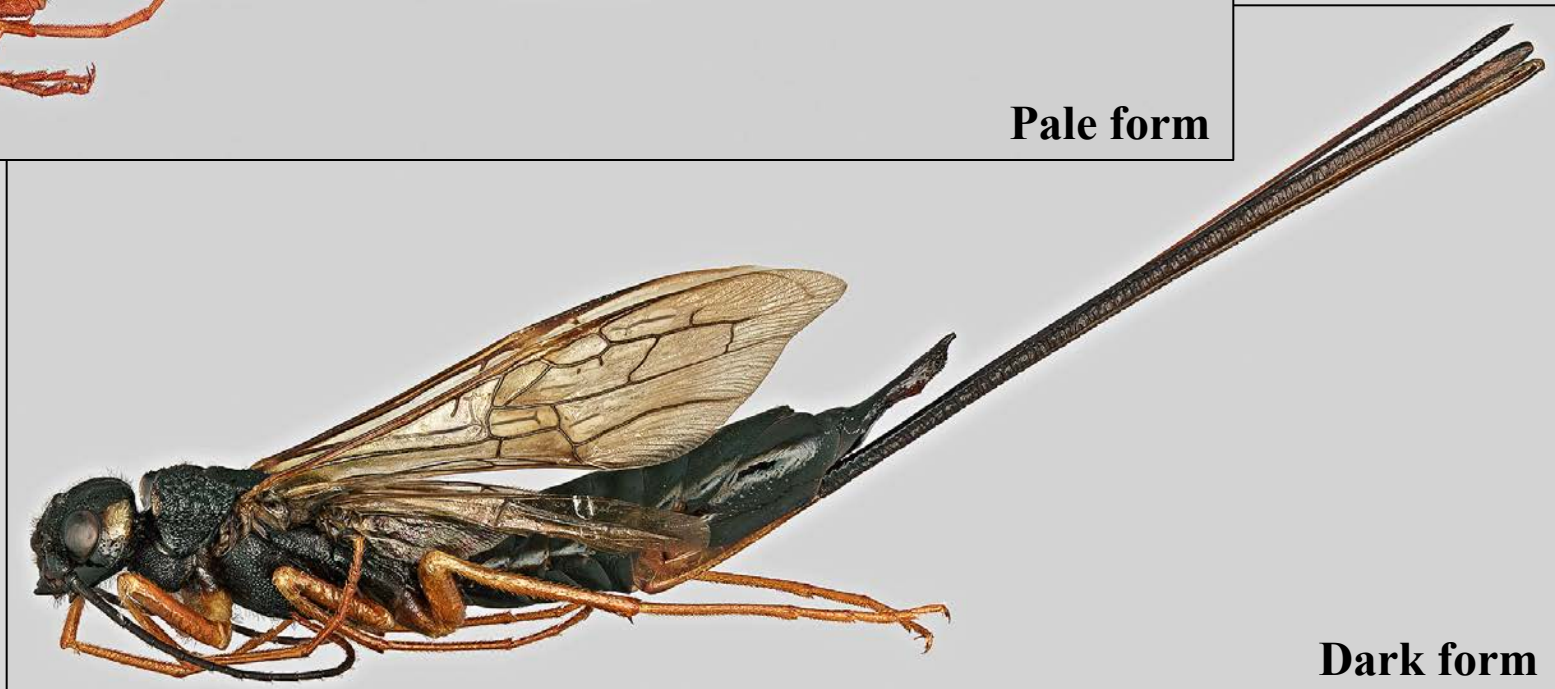
# *Xeris indecisus* (MacGillivray)



# *Xeris indecisus* (MacGillivray)



Pale form



Dark form



# 17 (2)

Hind tibia with one apical spur (a).....18

Hind tibia with two apical spurs (b).....*Sirex* 20

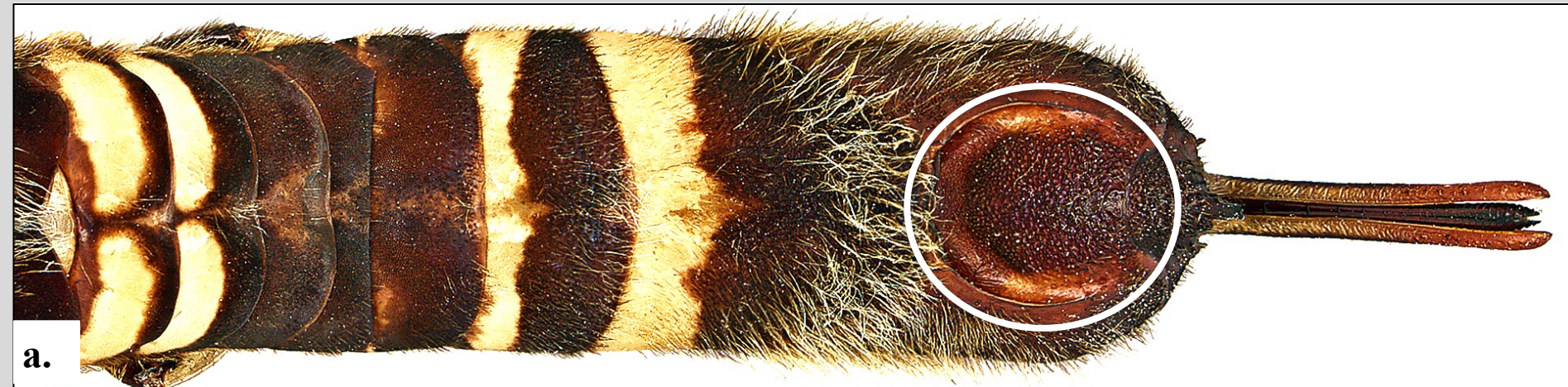




# 18 (17)

Dorsum of abdomen, particularly the posterior segments, with dense, long, pale setae, and precornal impression coarsely punctate and rugose (a).....*Eriotremex formosansus* (Matsumura) 😞 (exotic established in southeastern U.S.)

Dorsum of abdomen without long setae and precornal impression finely micro-sculptured and without obvious punctures (b).....*Tremex* 19



# *Eriotremex formosansus* (Matsumura)





# *Eriotremex formosansus* (Matsumura)



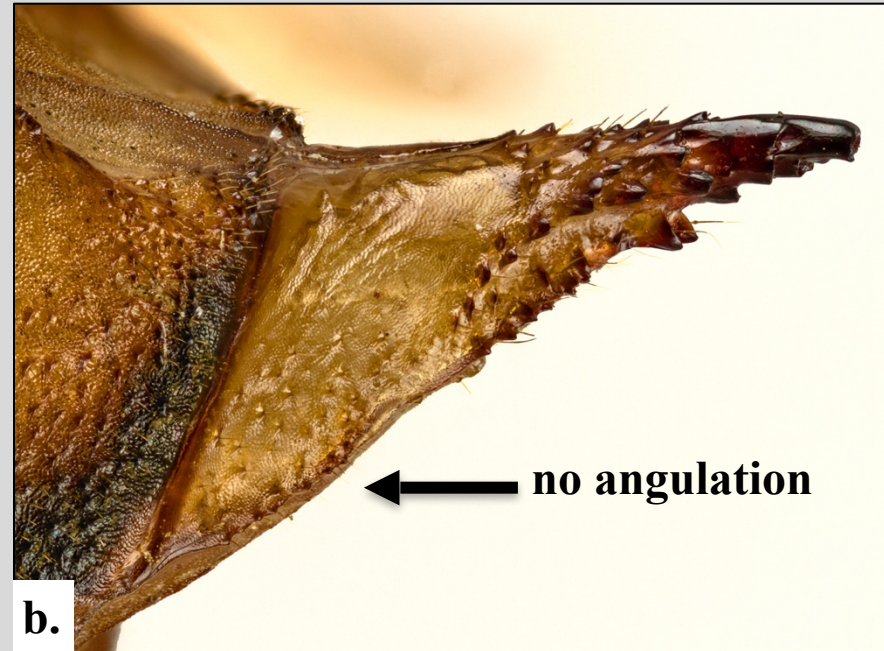
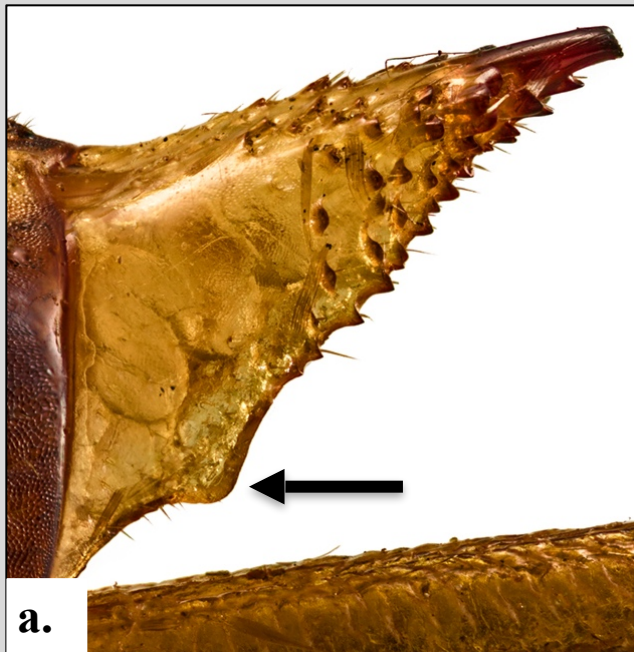


# 19 (18): Part I

Each lateral margin of cornus angulate near base (a); dense setae on frons short and mostly from middle of eyes to bottom thereof, posterior margin of head with dark setae (c); setose punctures on ventrolateral margins of last tergite clearly separate from each other and finely asperate (e).....*Tremex columba* (Linnaeus)

Each lateral margin of cornus evenly oblique (b); dense setae on frons long and throughout frons and dorsum of head, posterior margin of head with pale setae (d); setal punctures on ventrolateral margins of last tergite contiguous and coarsely asperate (f).....*Tremex fuscicornis* (Fabricius) 😞

**\*Frequently intercepted exotic not known to be established in North America.**





# 19: Part II

dark setae

pale setae

short  
setae

long  
setae

c.

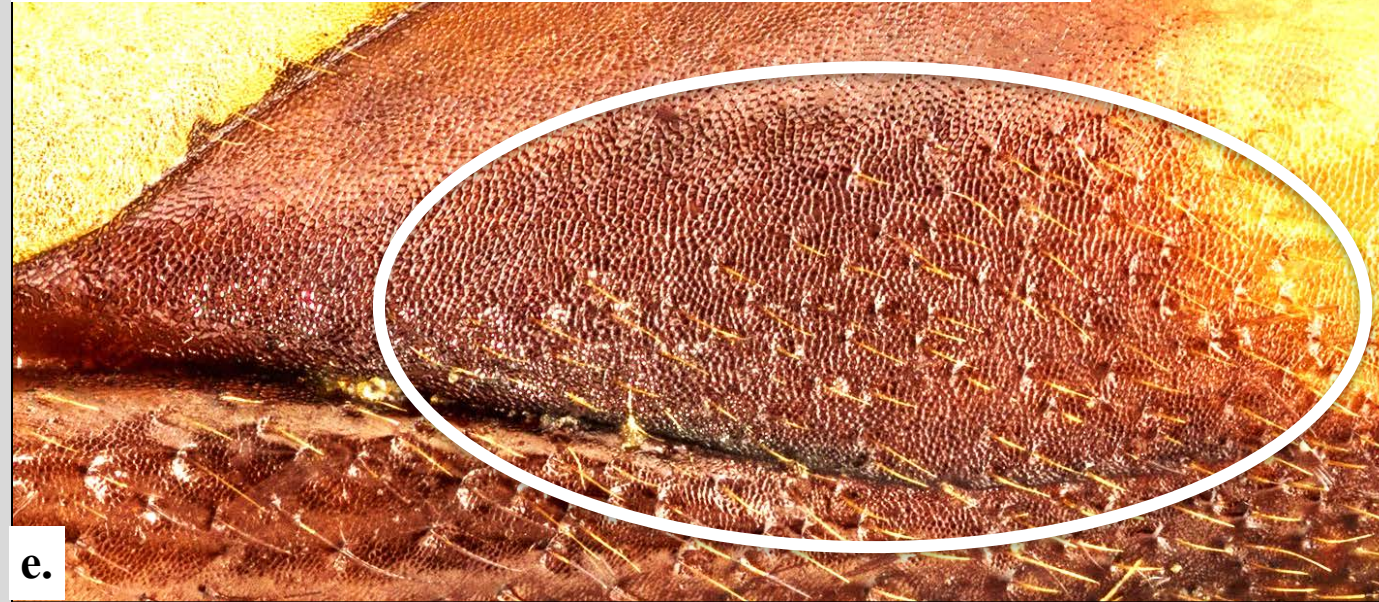
d.





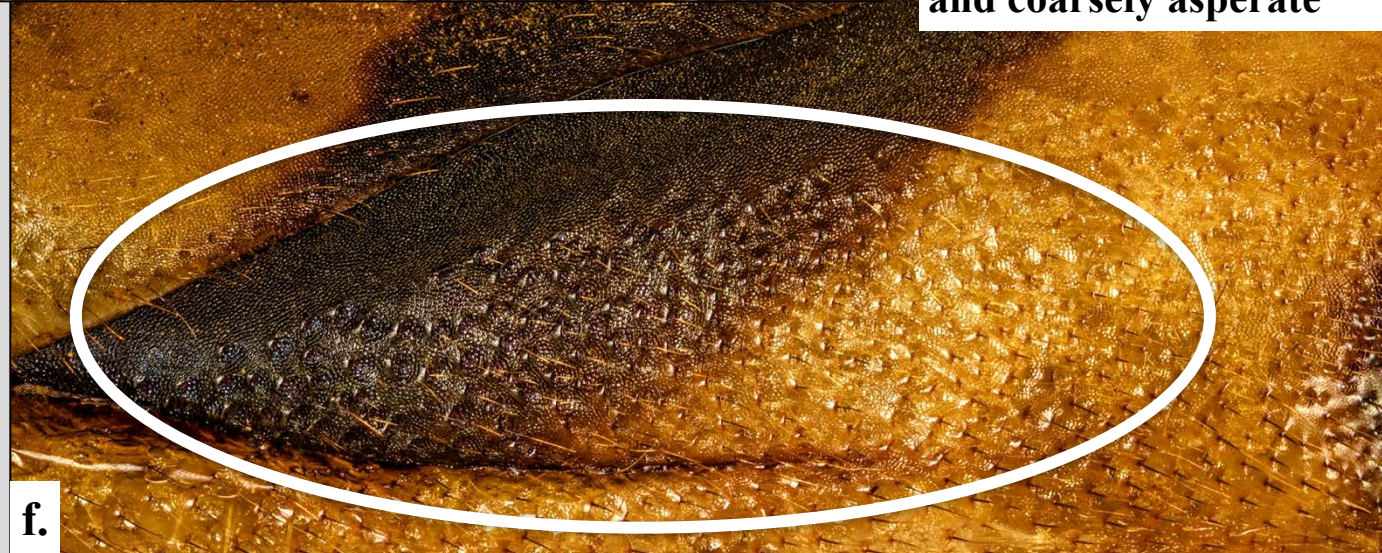
# 19: Part III

**setose punctures on ventrolateral margins of last tergite  
clearly separate from each other and finely asperate**



**e.**

**setal punctures on  
ventrolateral margins of  
last tergite contiguous  
and coarsely asperate**



**f.**



*Tremex columba* (Linnaeus) (note: highly variable in color)



*Tremex columba* (Linnaeus) (note: highly variable in color)



# *Tremex fuscicornis* (Fabricius) 🙄





# *Tremex fuscicornis* (Fabricius) 🙄



# 20 (17)

Abdomen mostly pale brown (at least dorsally) or reddish (**a-b**).....21

Abdomen dark, black or bluish/greenish black (**c-d**).....22

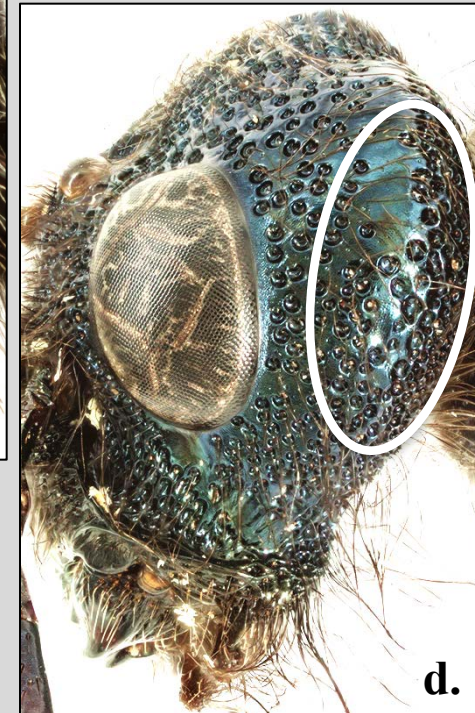
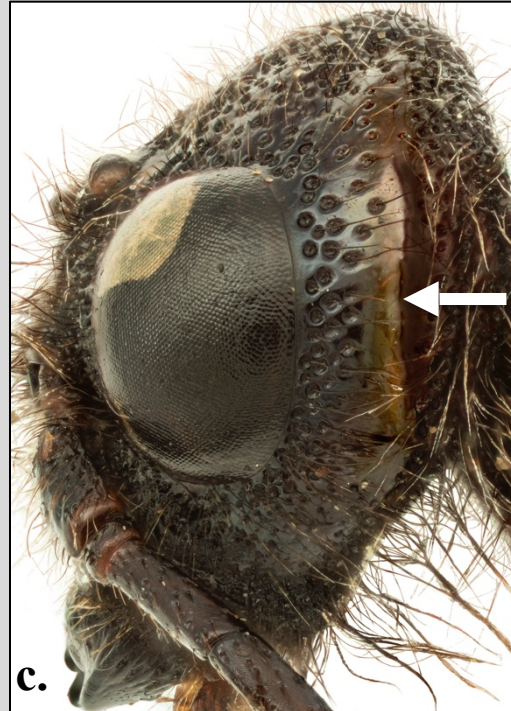
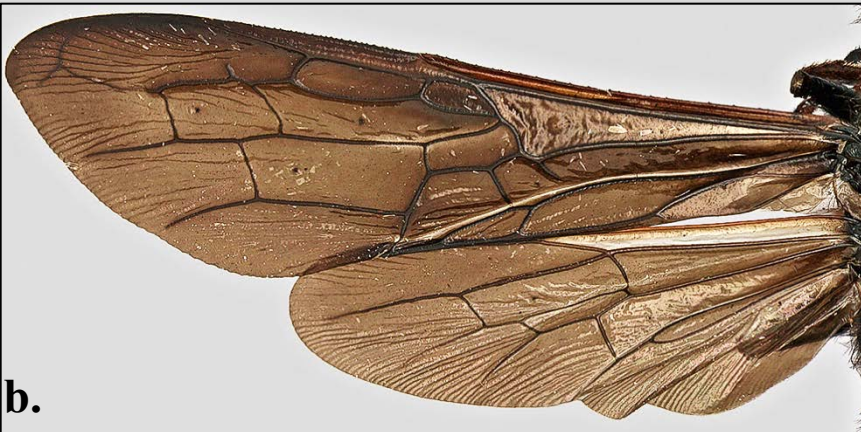
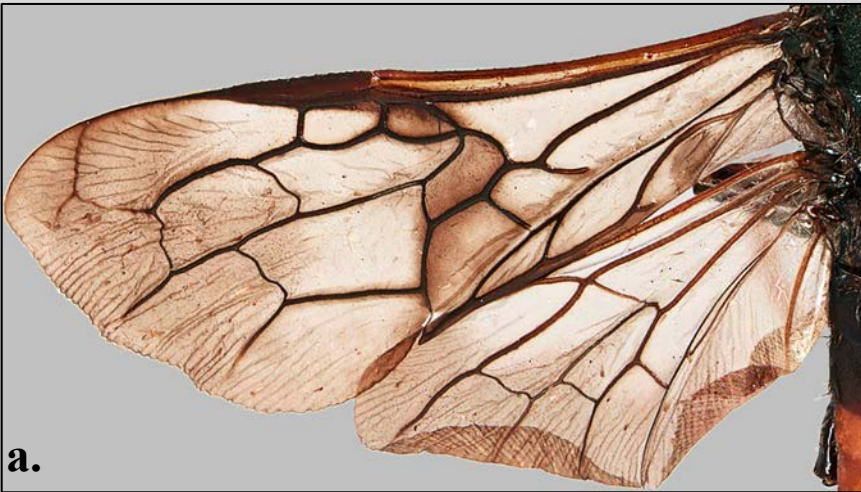




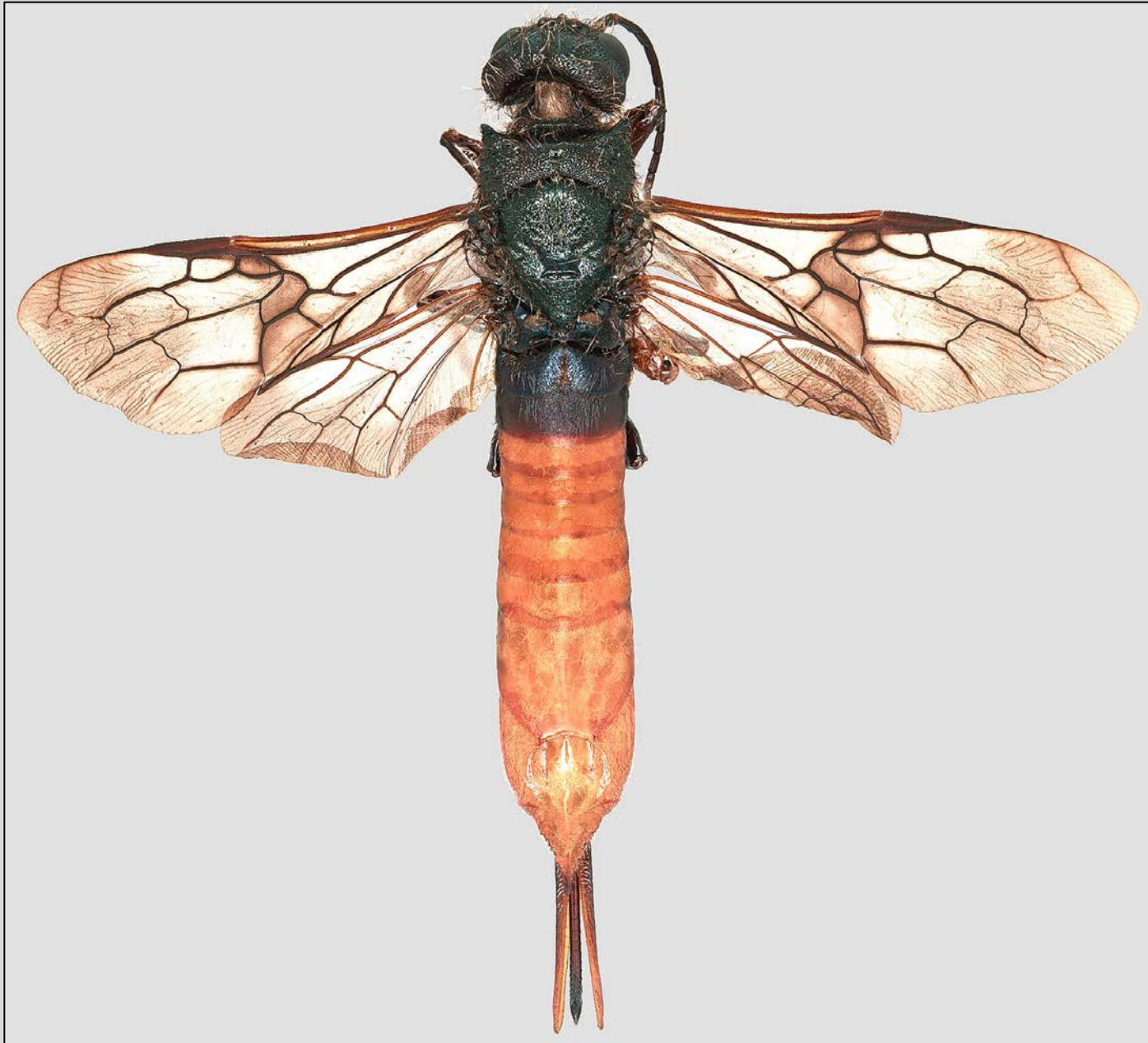
# 21 (20)

Wings banded (a); gena behind eye with distinct ridge (c).....  
.....*Sirex behrensii* (Cresson)

Wings all dark (b); gena behind eye without distinct ridge (b).....  
.....pale form *Sirex nigricornis* Fabricius



# *Sirex behrensii* (Cresson)





# *Sirex behrensii* (Cresson)



# *Sirex nigricornis* Fabricius: Pale form





# *Sirex nigricornis* Fabricius: Pale form



22 (20)

Ovipositor length medium or long (a-b).....23

Ovipositor length short (c).....24





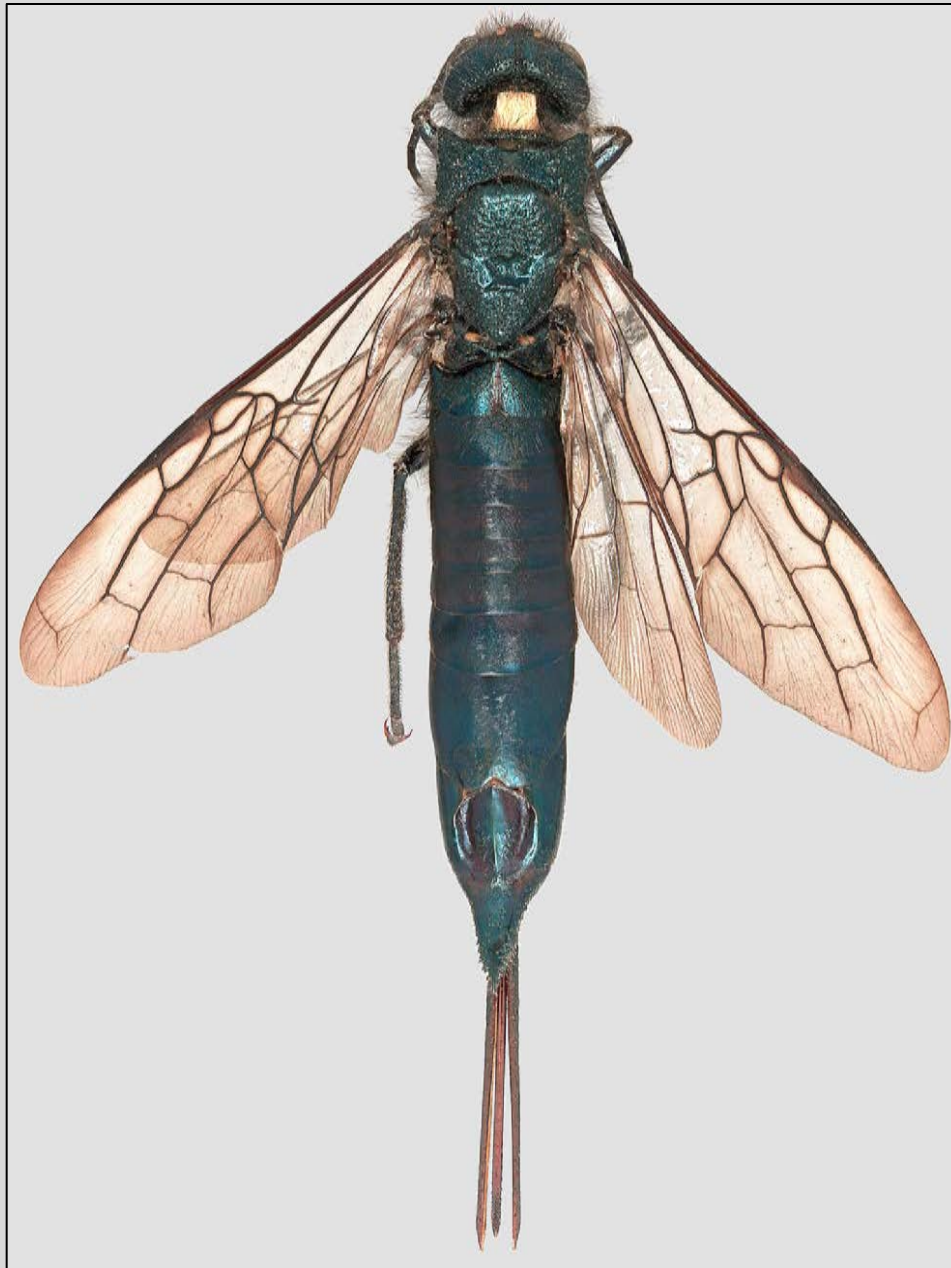
# 23 (22)

Legs all black (a)..... *Sirex areolatus* (Cresson)

Tibiae and tarsi pale (b).....*Sirex longicauda* Middlekauff



# *Sirex areolatus* (Cresson)

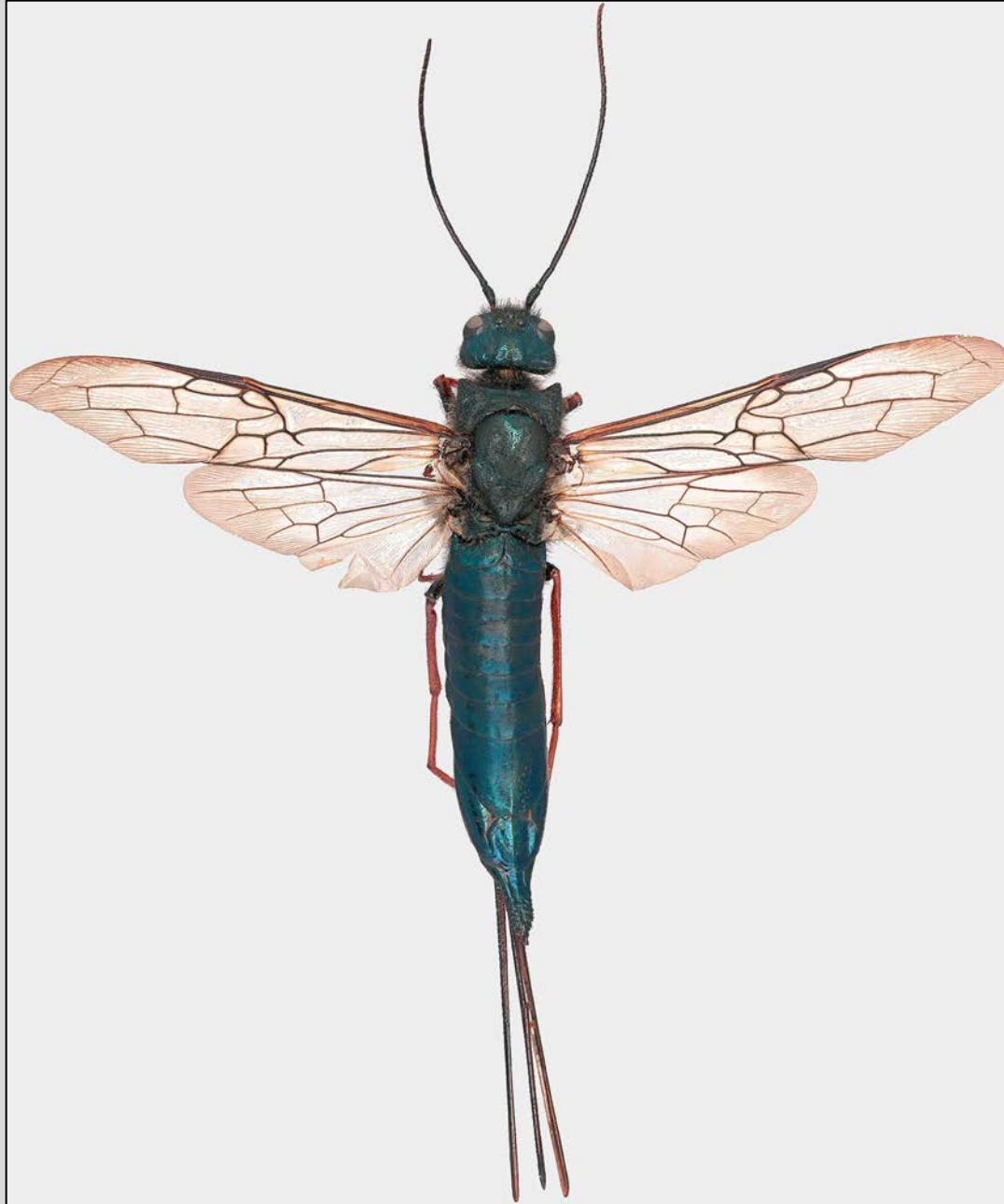




# *Sirex areolatus* (Cresson)



# *Sirex longicauda* Middlekauf





# *Sirex longicauda* Middlekauf



# 24 (22)

Metafemur black (a).....25

Metafemur pale (b).....29 





# 25 (24): Part I

Tibiae and tarsi pale (a); metatarsomere 2 with ventral pad slightly shorter than length of tarsomere 2 (c).....*Sirex nitidus* (T.W. Harris) w/dark femora

Tibiae and tarsi dark (b); metatarsomere 2 with ventral pad about half the length of tarsomere 2 (d).....26



# 25 (24): Part II





***Sirex nitidus* (T.W. Harris)**  
**with dark femora**



*Sirex nitidus* (T.W. Harris)  
with dark femora



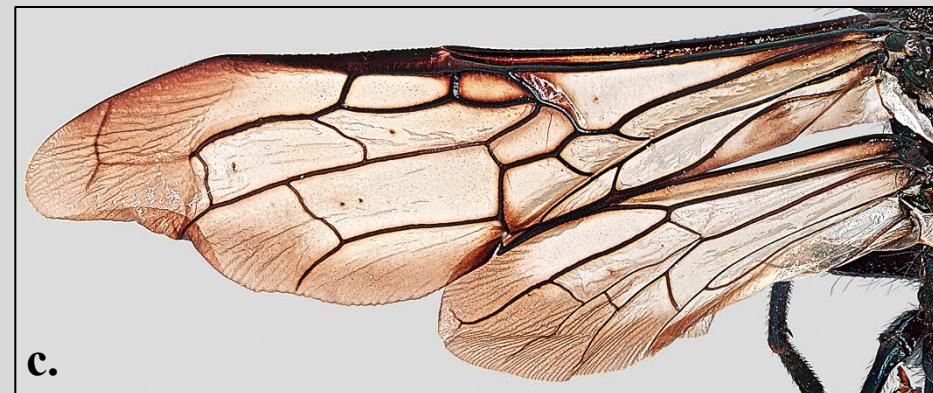
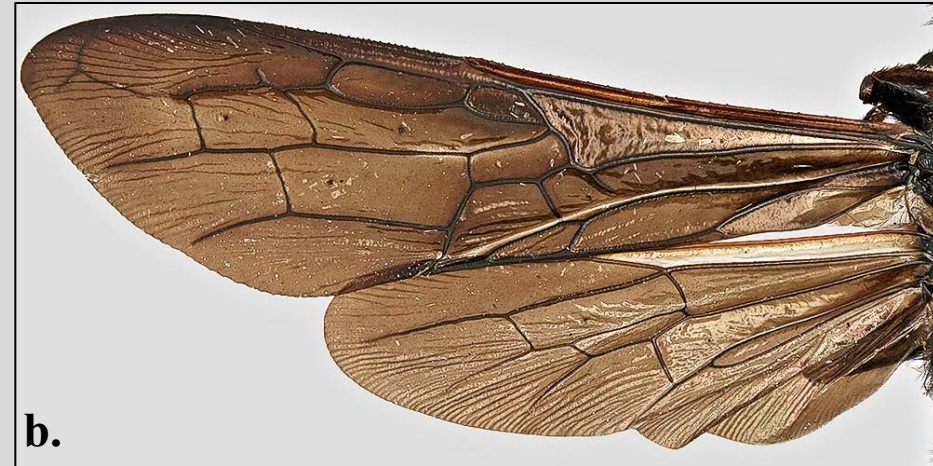


# 26 (25)

Wings clear and slightly yellow tinted (a) (known from CO, UT, MX)

.....*Sirex xerophilus* Schiff

Wings dark (b) or clear with dark bands (c).....27



# *Sirex xerophilus* Schiff

Dorsal –not available



# *Sirex xerophilus* Schiff





# 27 (26): Part I

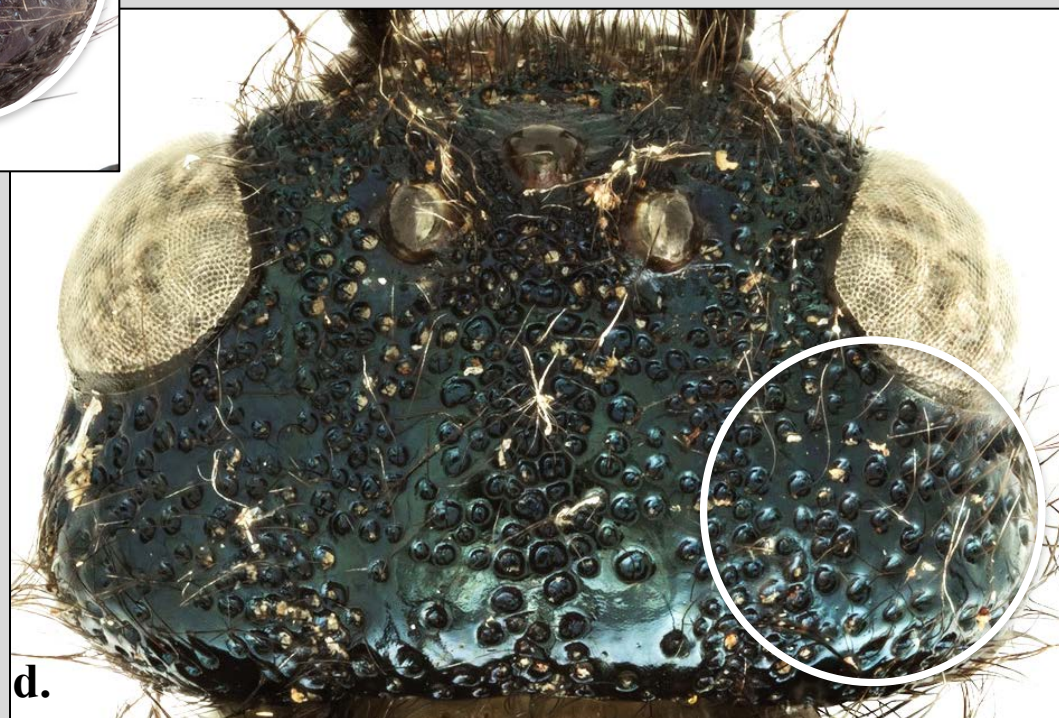
Punctuation on upper genae (a) and tempora (c) smaller and more widely dispersed .....*Sirex californicus* (Ashmead) with dark legs

Punctuation on upper genae (b) and tempora (d) larger and denser.....28





# 27 (26): Part II

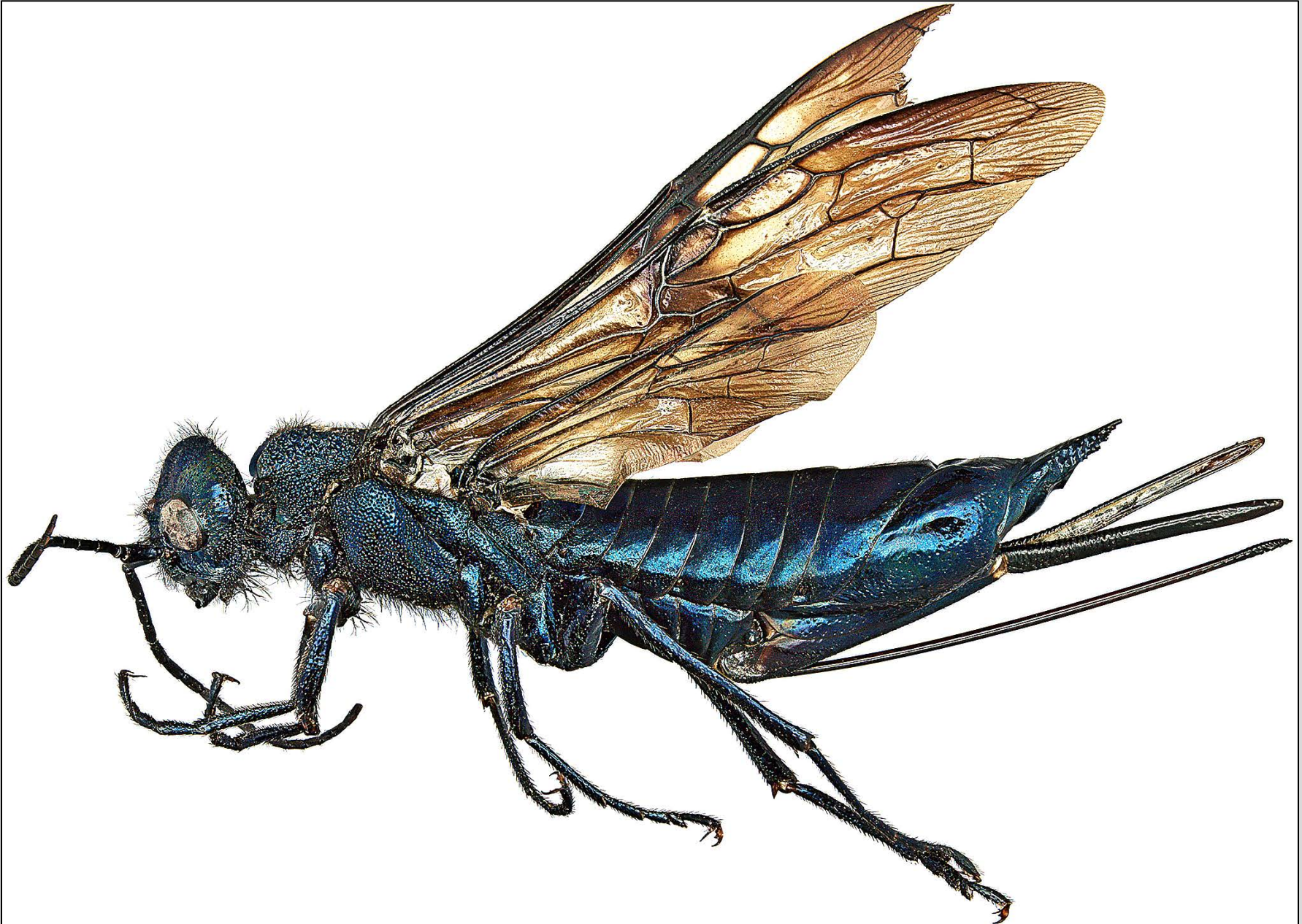


*Sirex californicus* (Ashmead) with dark legs





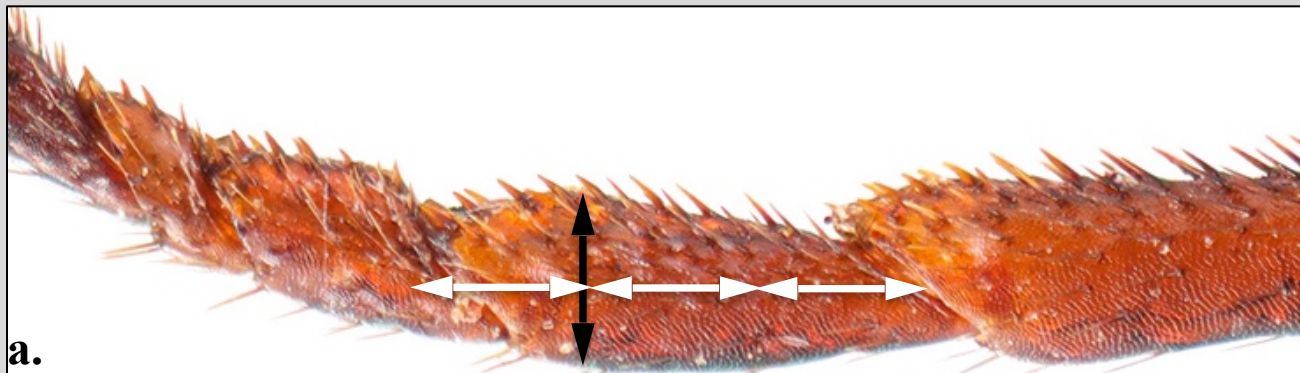
*Sirex californicus* (Ashmead) with dark legs



## 28 (27): Part I

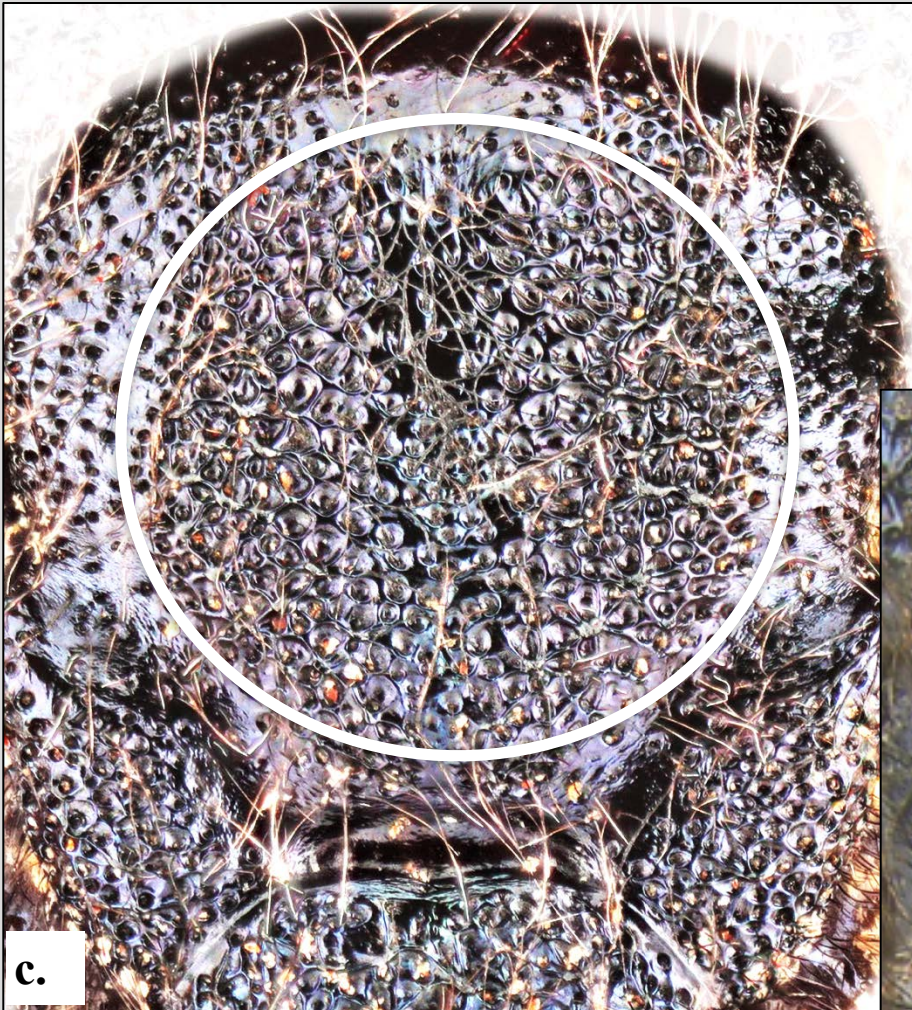
Metatarsomere 2 in lateral view almost 3 times as long as high (pale-legged Example shown) (a); mesoscutum (portion of dorsal thorax where wings attached) rugosely, contiguously punctate with puncture margins forming a reticulate pattern (c).....*Sirex nigricornis* Fabricius (with black legs)

Metatarsomere 2 in lateral view about 2 times as long as high (b); mesoscutum with punctures more widely dispersed and with margins at most forming a few irregular transverse carinae (d).....*Sirex obesus* Bradley





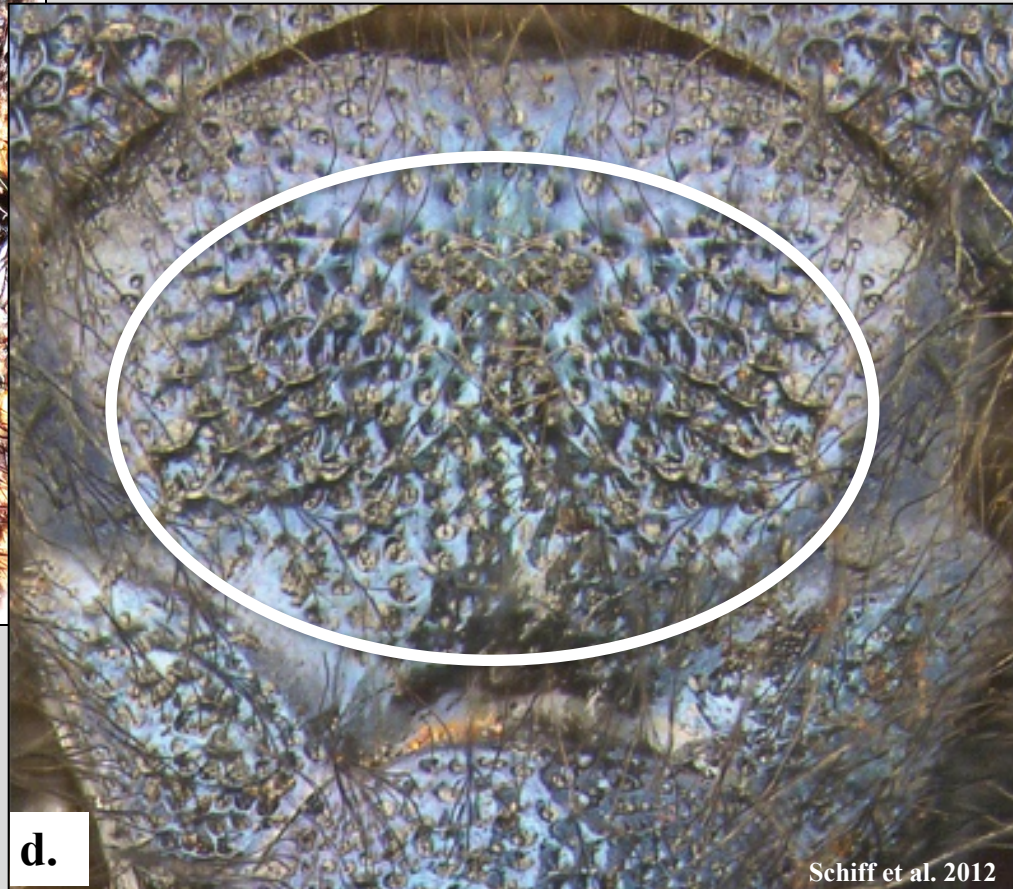
## 28 (27): Part II



c.

*Sirex nigricornis* mescoscutum - rugosely, contiguously punctate with puncture margins forming a reticulate pattern.

*Sirex obesus* mescoscutum - fewer, larger punctures with margins at most forming a few transverse carinae.



d.



# *Sirex nigricornis* Fabricius with black legs





# *Sirex nigricornis* Fabricius with black legs



# *Sirex obesus* Bradley





# *Sirex obesus* Bradley



## 29 (24): Part I

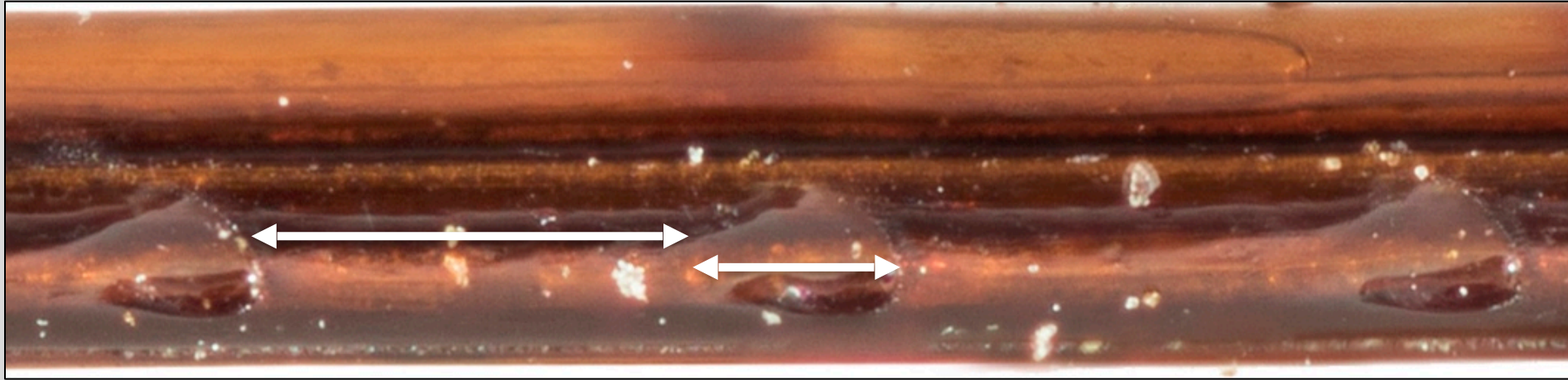
Dark blue metallic reflections on at least metatibiae and often femora and other tibiae (a) (rare specimens with entirely pale legs can be differentiated from *S. noctilio*, the most important species to distinguish, by the size and dispersion of the pits on the middle of the ovipositor (c-d)).....*Sirex varipes* Walker

Legs entirely pale (b).....30

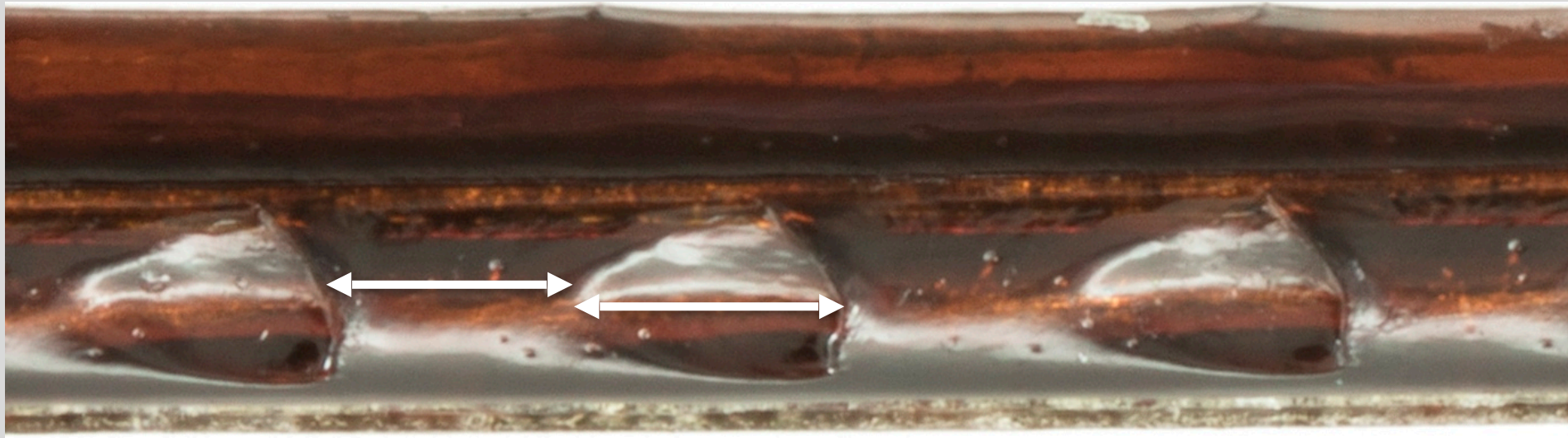




## 29 (24): Part II



c. Ovipositor of *Sirex varipes*: length of pits in middle portion about half the length from one puncture to another.



d. Ovipositor of *Sirex noctilio*: length of pits in middle portion about as long as the length from one puncture to another.

*Sirex varipes*  
Walker






# *Sirex varipes* Walker



## 30 (29): Part I

Mesoscutum with most pits round, lateral portion of mesoscutum much smoother (a); ovipositor with length of pits in middle portion about the length from one pit to another (c).....*Sirex noctilio* Fabricius 😞

**\*Exotic species established in NE US and SE Canada.**

Mesoscutum with most pits irregular in shape, lateral portion of mesoscutum rugose and roughened, especially posteriorly (b); middle portion of ovipositor with pit length much less than the distance between adjacent pits (d-e).....31 

**To enable usable image size  
all diagnostic images are on  
slides 28: Parts II and III**



# 30 (29): Part II

a. Mesoscutum (right ½ shown) with most pits round, lateral portion of mesoscutum much smoother.



b. Mesoscutum (right ½ shown) with most pits irregularly shaped, lateral portion of mesoscutum rugose and roughened, especially in posterior.



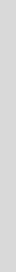


# 30 (29): Part III



c.

Ovipositor of *Sirex noctilio*: length of pits in middle portion about as long as the length from one pit to another.



d.

Schiff et al. 2012



e.

d-e. Middle portion of ovipositor with pit length much less than the distance between adjacent pits.



# *Sirex noctilio* Fabricius 🙄



*Sirex noctilio*  
Fabricius 😞

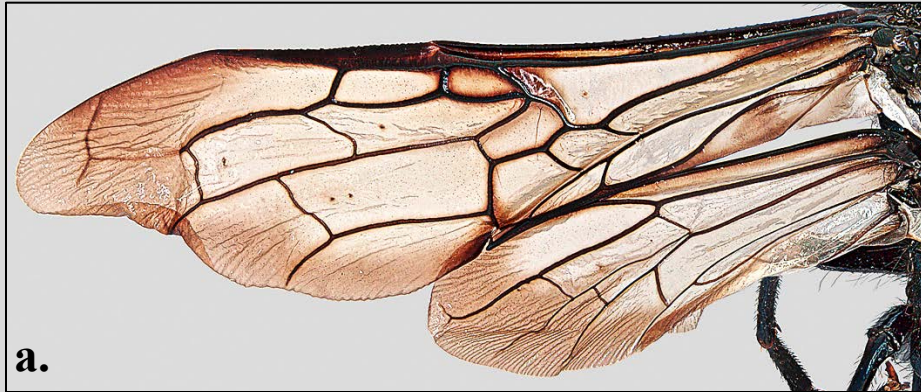




# 31 (30): Part I

Fore wings clear with dark bands at both middle and apex or completely dark (a); metatarsomere 5 completely black (c); ventral pad of metatarsomere 2 about half as long as tarsomere (f).....*Sirex californicus* (Ashmead) with pale legs

Fore wings clear with no more than a dark apical band (b); metatarsomere 5 pale (d) or dark in apical half (e); ventral pad of metatarsomere 2 almost as long as tarsomere (g).....32

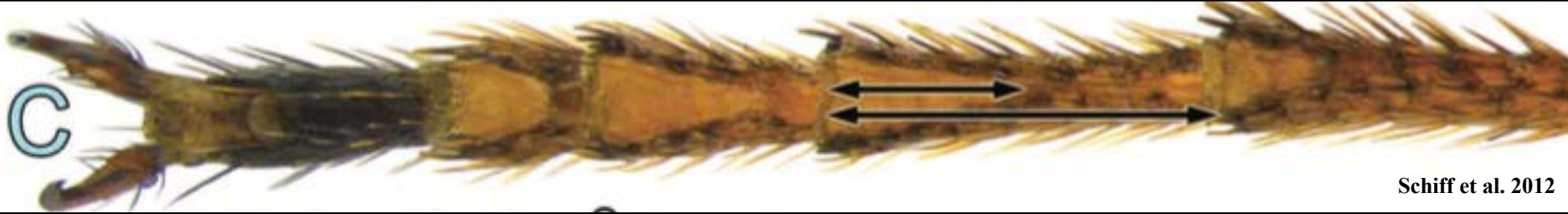


# 31 (30): Part II

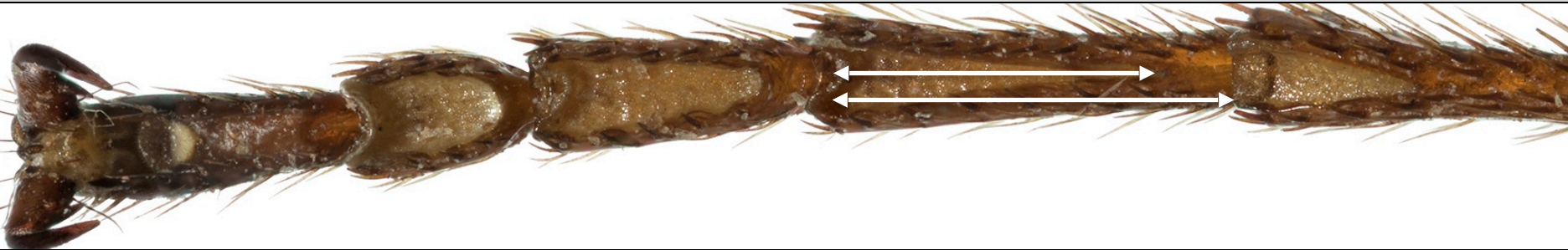




# 31 (30): Part III



f. Ventral pad of tarsomere 2 about half as long as tarsomere.



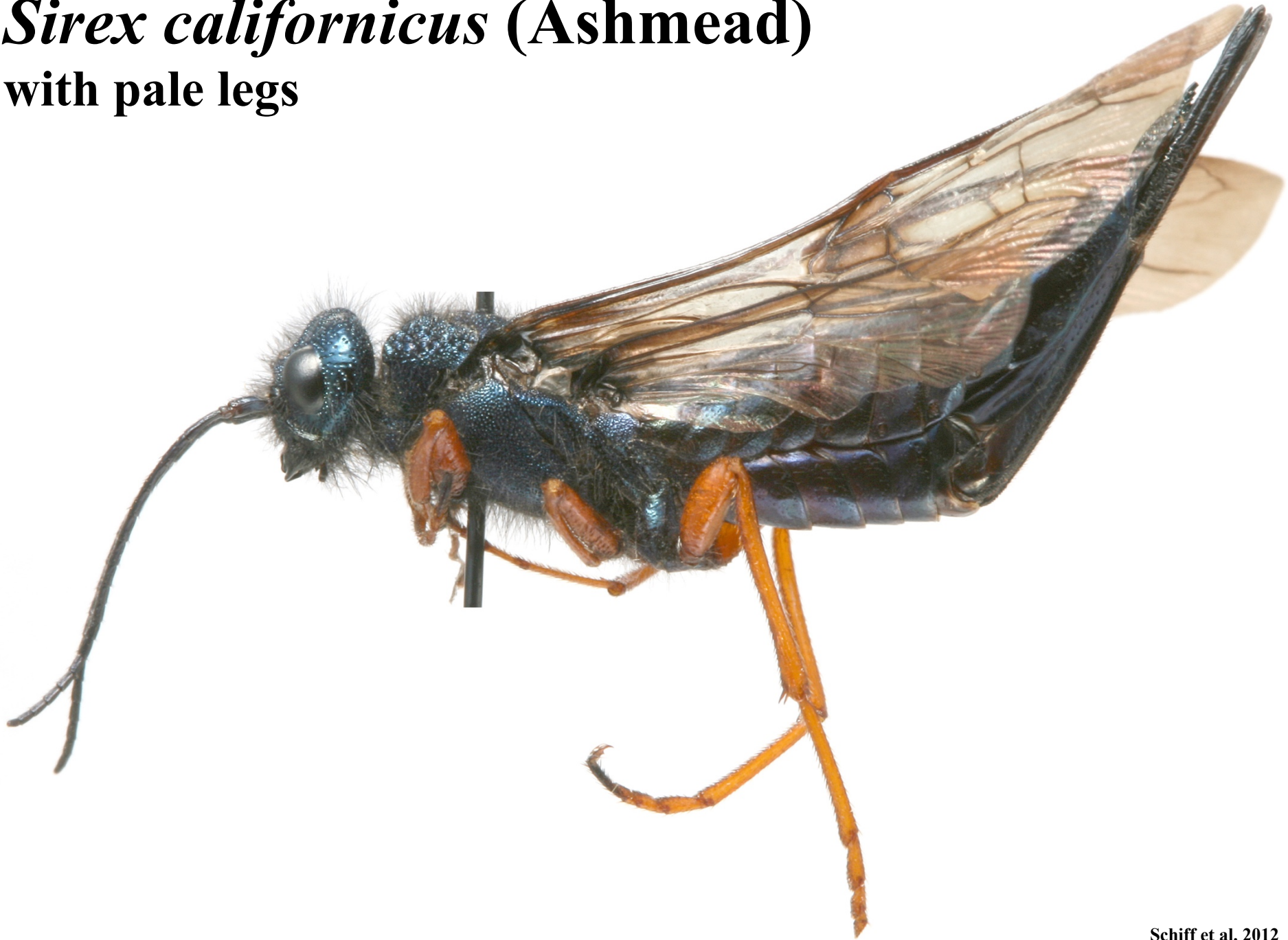
g. Ventral pad of tarsomere 2 almost as long as tarsomere.

# *Sirex californicus* (Ashmead) with pale legs

Dorsal –not available




*Sirex californicus* (Ashmead)  
with pale legs



## 32 (31): Part I

**Based on Schiff et al. 2012, it appears the following species can only be reliably identified via characters on the ovipositor, distribution, or molecular means.**

Pit present even at very base of ovipositor (a); pits larger, length of pits near middle of ovipositor more than half the distance between pits (c).....  
.....*Sirex nitidus* (T.W. Harris) with pale legs  
**\*Range overlaps with both of the following species.**

No pit at very base of ovipositor (b); pits smaller, length of pits near middle of ovipositor less than one-third the distance between pits (d).....33 

**To provide usable image sizes, all diagnostic images are on Part II.**



# 32 (31): Part II

a. pit at base of ovipositor



*Sirex nitidus*

b. no pit at base of ovipositor



*Sirex abietinus*

c. pits at middle of ovipositor larger, length of pits more than half the distance between pits



*Sirex nitidus*

d. pits at middle of ovipositor smaller, less than one-third the distance between pits



*Sirex abietinus*



*Sirex nitidus* (T.W. Harris) with pale legs





*Sirex nitidus* (T.W. Harris) with pale legs

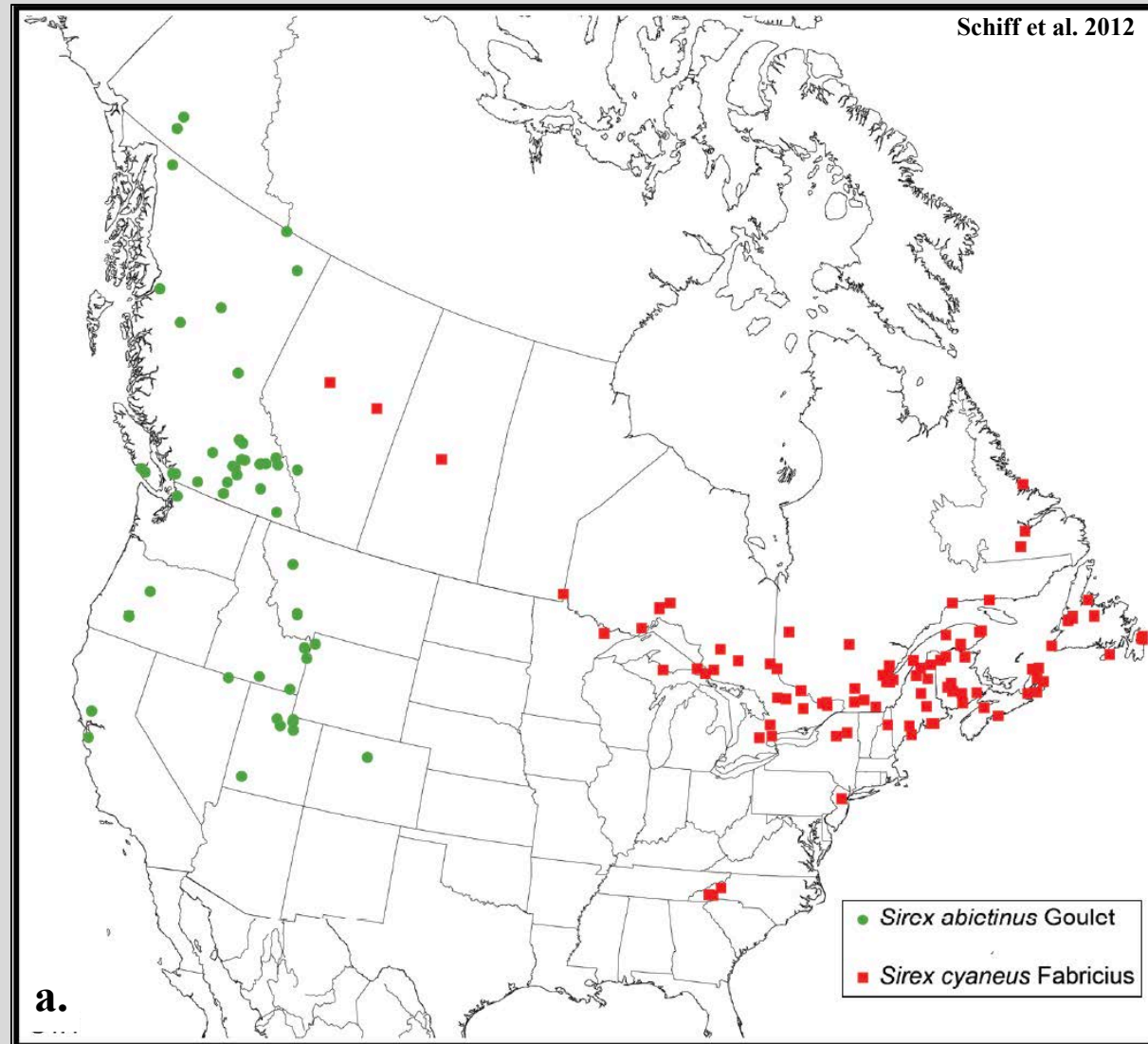


33 (32)

Range Western – see map (a).....*Sirex abietinus* Goulet

Range Eastern – see map (a).....*Sirex cyaneus* Fabricius

**Based on the characters used in Schiff et al. 2012, I do not believe it is possible to reliably discriminate between these species based upon morphology.**

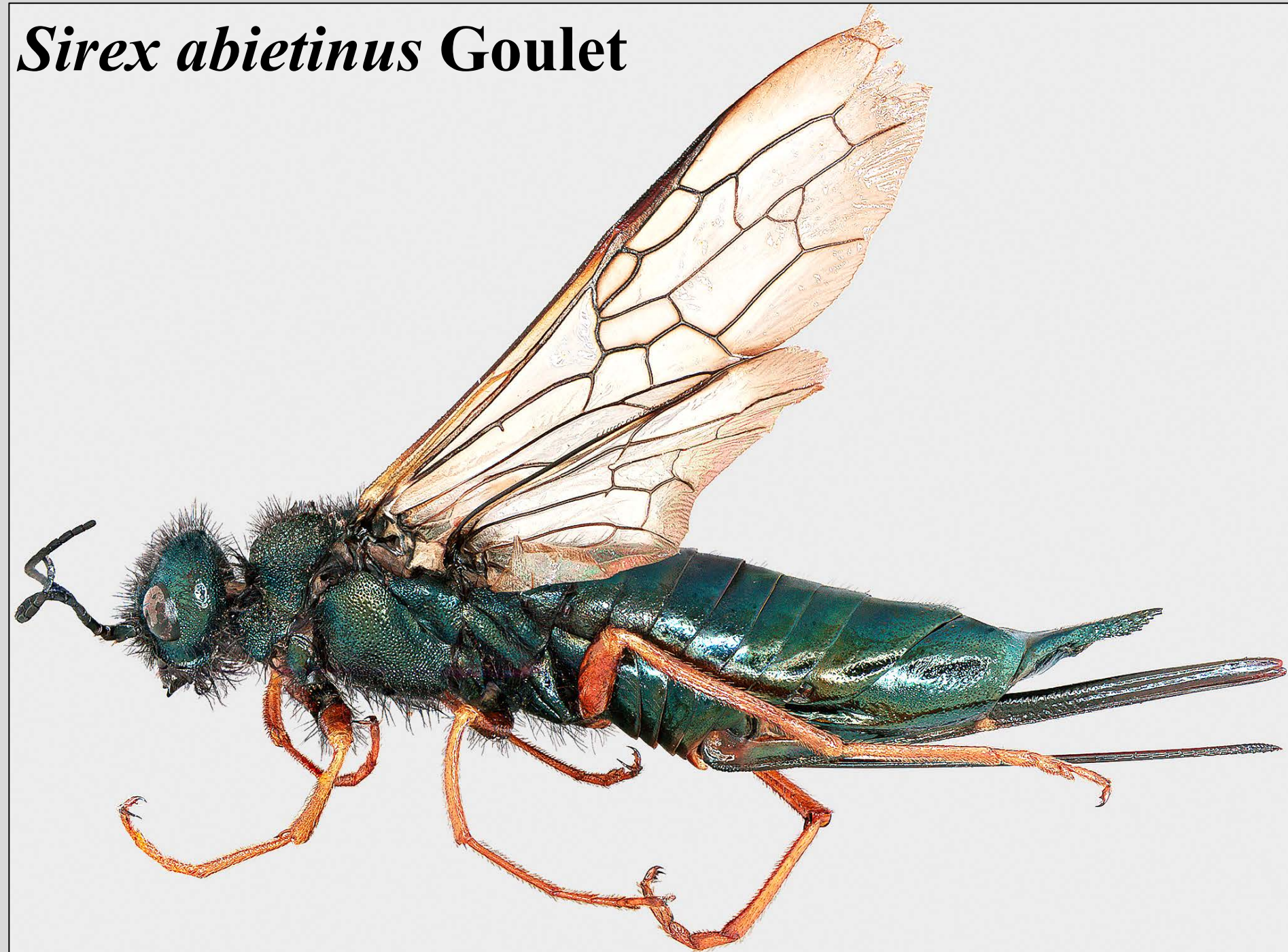




*Sirex abietinus*  
Goulet



# *Sirex abietinus* Goulet





*Sirex*  
*cyaneus*  
Fabricius



J. Orr WSDA

# *Sirex cyaneus* Fabricius





# Literature Cited

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Schiff, N.M., H. Goulet, D.R. Smith, C. Boudreault, A.D. Wilson, and B.E. Scheffler. 2012. Siricidae (Hymenoptera: Symphyta: Siricoidea) of the Western Hemisphere. Canadian Journal of Arthropod Identification 21. 270 pp.

Schiff, N.M, S.A. Valley, J.R. LaBonte, and D.R. Smith. 2006. Guide to the Siricid Woodwasps of North America. FHTET-w006-15, USDA Forest Service, Forest Health Technology Enterprise Team, Morgantown, WV. 102 pp.