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Recharacterization of *Stenaspis* Audinet-Serville, 1834 with a new species from Mexico (Coleoptera: Cerambycidae: Cerambycinae: Trachyderini)

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Recharacterization of *Stenaspis* Audinet-Serville, 1834 with a new species from Mexico (Coleoptera: Cerambycidae: Cerambycinae: Trachyderini)

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Abstract. The genus *Stenaspis* Audinet-Serville, 1834 (Coleoptera: Cerambycidae: Cerambycinae: Trachyderini) is recharacterized by providing additional morphological features to enhance the definition of this genus. *Stenaspis plagiata* Waterhouse, 1877 is transferred to *Crioprosopus* Audinet-Serville, 1834, **new combination**, and the latest key to species of *Crioprosopus* is modified. A key to the genera of Group III-Stenaspes with "abruptly separated anteocular space," and a key to species of *Stenaspis* is provided. Color illustrations of the available species are included. *Stenaspis lingafelteri* Eya, **new species**, from Mexico is described.

Key words. Identification key, America, taxonomy.

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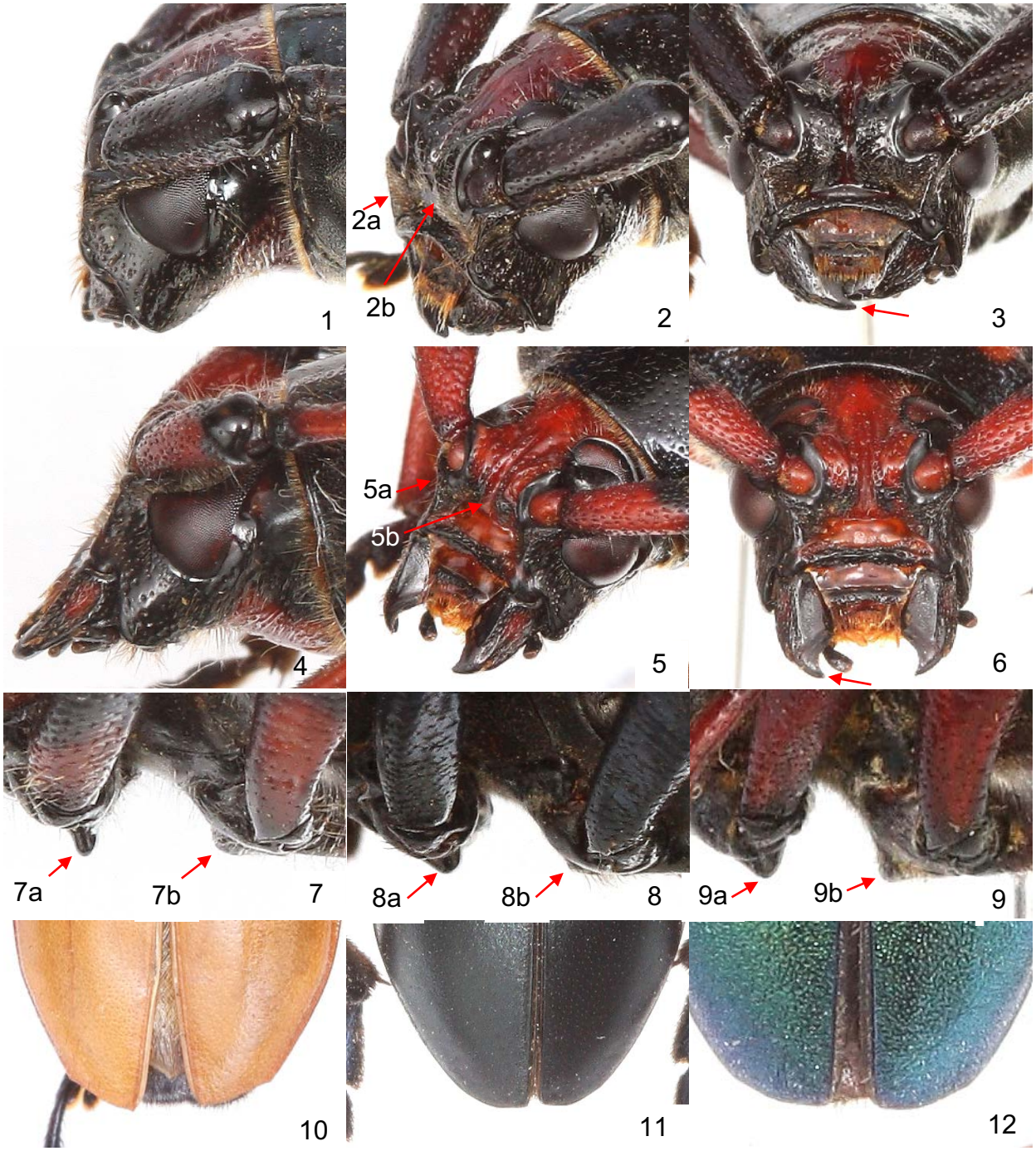
Introduction

As currently defined, the genus *Stenaspis* Audinet-Serville, 1834 contains six species (*Stenaspis castaneipennis* Dupont, 1838, *S. plagiata* Waterhouse, 1877, *S. solitaria* (Say, 1824), *S. superba* Aurivillius, 1908, *S. validicornis* Casey, 1912 and *S. verticalis* Audinet-Seville, 1834) distributed from Texas and Arizona (United States) to Bolivia. Based on comments made by Bates (1880: 76), the genus *Stenaspis* is "restricted to those species in which the prosternal process is produced at its upper edge and presents a vertical face to the mesosternum, according to the intention of the founder Audinet-Serville." Linsley (1962: 91) in his "Key to the North American Genera of Purpuricenini" further characterized *Stenapsis* as a group of species that are large, robust and 20 mm or more in length with apices of mandibles acute or simple (Fig. 1–6), prosternum that is protuberant or ridged between coxae and vertical or concave behind and mesosternum that is not protuberant (Fig. 7–9), elytra with unarmed apices (Fig. 10–12), and legs of moderate length, with posterior femora falling short of apices of elytra. The palpi are short, and the last segments are not expanded, and the pronotum is angulate or tuberculate at the sides. The apices of mandibles of *Stenaspis* are acute in *S. castaneipennis*, *S. superba* and *S. verticalis*; however, *S. solitaria* has apices that are simple but blunt and rounded or narrowly truncate.

According to LeConte and Horn (1883: 297) *Stenaspis* belongs to a group of trachyderine categorized as "Group III-Stenaspes", which includes *Crioprosopus* Audinet-Serville, 1834, *Tragidion* Audinet-Serville, 1834, *Purpuricenus* Dejean, 1821 and *Aethecerus* Chevrolat, 1862a (or *Aethecerinus* Fall and Cockerell, 1907) with frons large, square, perpendicular, abruptly separated from the anteocular spaces, and *Mannophorus* LeConte, 1854, *Entomosterna* Chevrolat, 1862b, *Amannus* LeConte, 1858 and *Batyle* Thomson, 1864 with frons moderate, short, declivous, and not abruptly defined on each side of genae. Stenaspes along with "Group I-Megaderi" (or *Megaderus* Dejean 1821) and "Group II-Trachyderes" have mandibles that are acute or simple at the apices. These three groups are separated from "Group IV-Tyloses" with emarginate-truncate mandibles, which were reviewed previously along with the revision of the genus *Deltaspis* Audinet-Serville, 1834 (Eya 2019). Stenaspes is differentiated from Megaderi and Trachyderes by the posterior margins of pronotal discs that are not lobed and sometimes sinuate, while the latter groups have the posterior margin of the pronotal disc broadly and distinctly lobed.

Most of the *Stenaspis* species were described in the 1800s to early 1900s and were defined by few characteristics, mainly the apex of the prosternal process being vertical behind, which was considered unique for this genus



Figures 1–12. Characteristics of the head, sternum and elytra of *Stenaspis*. **1–3)** *S. veritcalis*, male, Puebla, MEX. **4–6)** *S. verticalis*, female, Jalisco, MEX. **7, 10)** *S. castaneipennis*, male, Oaxaca, MEX. **8, 11)** *S. solitaria*, male Cochise Co., AZ, USA). **9, 12)** *S. verticalis*, male, Nuevo Leon, MEX. **1–6)** Characteristics of the head, i.e "frons large, square, perpendicular, abruptly separated from anteocular space," **1, 4)** Gena large, quadrate; mandibles well separated from lower eye lobe. **2: 2a; 5: 5a)** Dorsal anterior margins of genae ridged. **2: 2b; 5: 5b)** Frons perpendicular to vertex and recessed between "anteocular space" (i.e., recessed between the dorsal anterior margins of genae). **3, 6)** Apex of mandibles acute, simple. **7–9: 7a, 8a, 9a)** Prosternal intercoxal process with apex protuberant, ridged between coxae, abruptly declivous behind. **7–9: 7b, 8b, 9b)** Mesosternum not protuberant, level with coxae. **10–12)** Elytra with apices unarmed.

based on relatively few specimens available for comparison. However, as the number of species grew over time in Group III-Stenaspes, the distinction between some of the genera, especially between *Crioprosopus* and *Stenaspis*, became vague due to the phenotypic diversity exhibited by the species within these two genera. *Crioprosopus* is distinguished from *Stenaspis* by having the apex of the prosternal process arcuate (LeConte and Horn 1883: 299), and the type species of *Stenaspis* (i.e., *Stenaspis verticalis* Audinet-Serville 1834: 52) is described as having, "Présternum ayant entre l'insertion des deux permières cuisses une saillie cunéiforme et comprimée" or prosternum with intercoxal process cuneiform (wedge-shaped) and compressed. As an example, during the revision of *Crioprosopus* (Eya 2015: 360), a species of *Stenaspis* (i.e., *Stenaspis pilosella* Bates 1892: 173) and another species from *Crioprosopus* (i.e., *Crioprosopus lateralis* LeConte 1884: 22) were transferred into a new genus *Pilostenaspis* Eya (Eya 2015). The species in *Pilostenaspis* are characterized by having integument, including the head, coarsely contiguously punctate, the entire body covered with long erect hairs, and lateral margins of the pronotum and elytra narrowly reddish. Bates placed *Pilostenaspis pilosella* (Bates) in *Stenaspis* based on his comment: "Pro- et mesosternum alte convexa, hoc antice verticale" or pro- and mesosternal processes as elevated convex, and the fronts vertical, and stated that "the species is undoubtedly a *Stenaspis*. Dupont (1838) described *Stenaspis* as a genus having "prosternum convexum, latius, inter pedes tuberculo compresso praeditum", and subsequently, Bates may have interpreted the prosternal process of *Stenaspis* as being convex. Similarly, LeConte (1884) placed *Pilostenaspis lateralis* (LeConte) in *Crioprosopus* without any description of the prosternal process other than noting that the mesosternum was suddenly declivous. Closer examination of *P. lateralis* and *P. pilosella*; however, revealed that the pro- and mesocoxal processes have apices that are both slightly produced below the coxae and abruptly declivous (Eya 2015: 399). The apex of the prosternal process of *P. lateralis* is cuneiform resembling *Stenaspis* while the prosternal process of *P. pilosella* is convex as in *Crioprosopus* (Fig. 13–14).

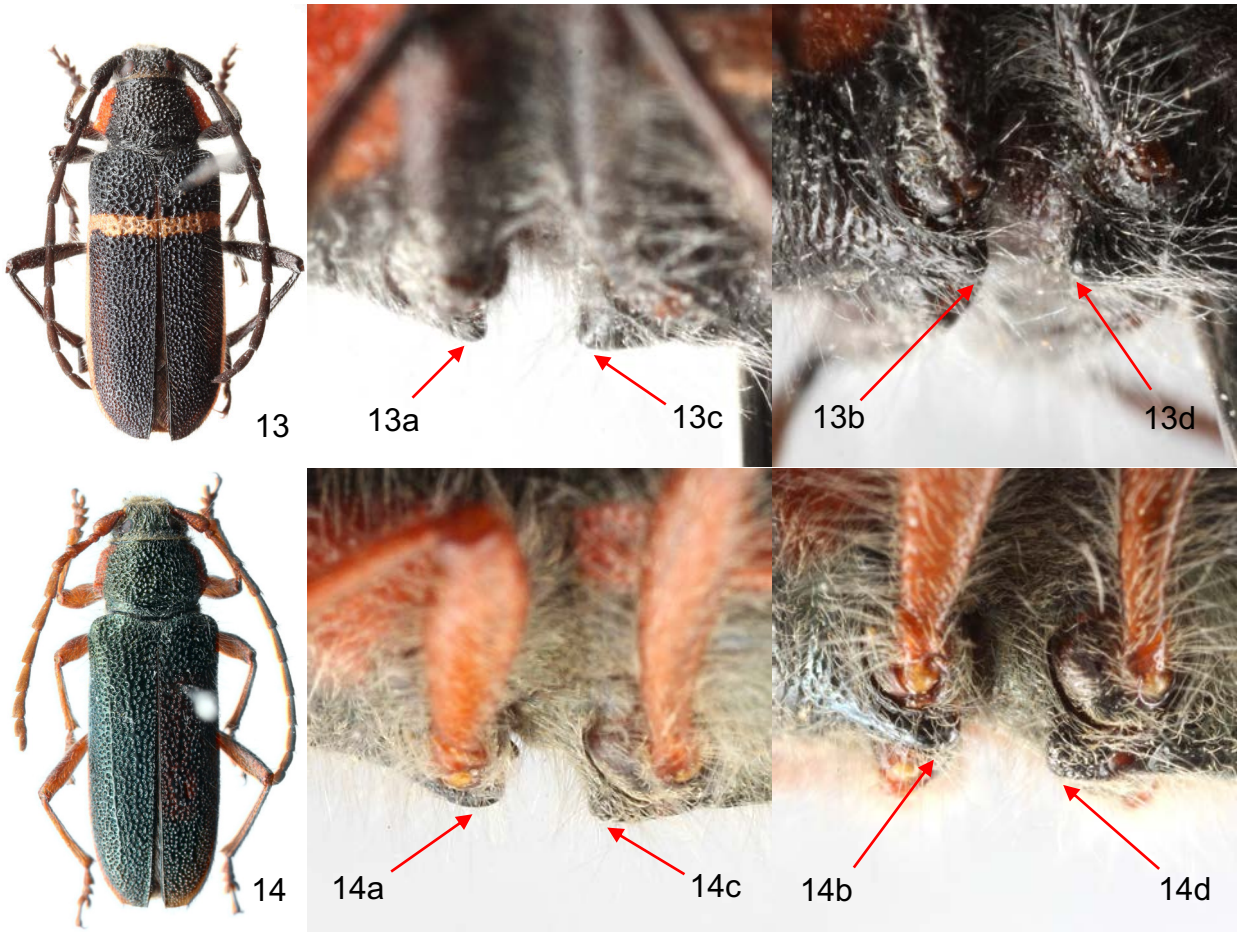
This study assigns additional characters to *Stenaspis* to define this genus further and to resolve the discrepancies in species placement in Group III-Stenaspes genera (i.e., *Callistochroma* Eya (Eya 2015), *Crioprosopus*, *Pilostenaspis* and *Stenaspis*). Also, while identifying and revising cerambycids from Mexico and Central America, subsequent arrival of an interesting new species of *Stenaspis* (i.e., *Stenaspis lingafelteri* Eya, **new species**) was discovered. Because of the unique nature of this species, a description is provided. Furthermore, a key to Group III-Stenapses with "abruptly separated anteocular space," and additional amendments to the key to species of the genus *Crioprosopus* (Eya 2015: 376; 2020: 4) are provided with an inclusion of *Crioprosopus plagiatus* (Waterhouse) **new combination**, which is transferred from *Stenaspis*. Also, a key to the species of the genus *Stenaspis*, which includes all known species (i.e., *S. castaneipennis*, *S. solitaria*, *S. superba* and *S. verticalis*), and *S. lingafelteri* **new species** is included in this article.

Materials and Methods

Specimens from the following collections were examined and their acronyms are used throughout the manuscript:

BKEC Bryan K. Eya Collection, Davis, CA, USA
DJHC Daniel J. Heffern Collection, Huston, TX, USA
EMEC Essig Museum of Entomology, University of California, Berkeley, CA, USA
LGBC Larry G. Bezark Entomological Collection, Sacramento, CA, USA
NHRS Swedish Museum of Natural History, Stockholm, Sweden

This study was performed based on detailed examination of the external structures. To preserve the integrity of the borrowed materials, comparative morphological examination of the endoskeleton, wings, and terminalia were not performed. Articles by Hubweber and Schmitt (2006, 2010) should be consulted for a discussion concerning examination and use of genitalia for the taxonomy of this group of beetles. Each taxon name in this article is followed by author(s), publication year (if applicable), and new status (if applicable) in keys and figure captions abbreviated as follows: **comb. nov.** (*combinatio nova* or new combination); and **sp. nov.** (*species nova* or new species). The parenthetical abbreviations following the page are as follows: biology (biol.); biological distribution (dist.); catalogue (cat.); host plant (host); lectotype (lect.); and synonymy (syn.). Also, the following three letter abbreviations for the country and two letter abbreviations for the state within United States are used for the figure



Figures 13–14. Prosternal and mesosternal intercoxal process of *Pilostenaspis*. **13)** *Pilostenaspis lateralis* (LeConte, 1884), female, dorsum, Pecos Co., TX, USA). **13: 13a–13b)** *P. lateralis*, prosternal intercoxal process cuneiform, resembling *Stenaspis*. **13: 13c–13d)** *P. lateralis*, mesosternal intercoxal process. **14)** *Pilostenaspis pilosella* (Bates, 1892), female, dorsum, Mexico D.F., MEX. **14: 14a–14b)** *P. pilosella*, prosternal intercoxal process convex, resembling *Crioprosopus* **14: 14c–14d)** *P. pilosella*, mesosternal intercoxal process.

captions: Bolivia (BOL); Ecuador (ECU); Guatemala (GTM); Honduras (HND); Mexico (MEX); Panama (PAN); United States of America (USA); and Arizona (AZ) and Texas (TX).

Photographs of the specimens were acquired using a Canon EOS 40D digital camera equipped with an EF 100 mm f/2.8 Macro USM lens or MP-E 65 mm f/2.8 Macro lens at speed of 1/200 sec. aperture f/13 with Canon MT-24EX Macro Twin Lite Flash set at ¼ or ½ power using Kaiser Flash Shoes and Macrolite Adapter 72C mounted on a Beseler CS-14 copy stand. Each specimen was photographed on a layer of cotton placed on a unit tray as a background or was mounted on a Styrofoam microscope stage. References to photographs from a website (e.g., Bezark 2020) are provided with the identification number after the year in the following format: (Bezark 2020, id: #).

The information in the "Type Material" and "Material Examined" sections are provided in the following general order: 1) the country of origin; 2) name of province or state; 3) specific location where collected; 4) date as it appeared on each label; 5) name of collector(s); 6) number of male(s) and/or female(s) collected; 7) the abbreviation of collection where the specimen(s) was (were) procured; and 8) any serial number originally provided if found on the label. The data for each specimen examined were transcribed as they were found on each label if feasible.

Results

Stenaspis Audinet-Serville, 1834

Type species: *Stenaspis verticalis* Audinet-Serville, 1834 (monobasic).

Stenaspis Audinet-Serville 1834: 51; Dupont 1838: 50; Castelnau 1840: 419; Blanchard 1845: 145; LeConte 1854: 441; Strauch 1861: 127; Thomson 1861: 211, 1864: 208, 434; Lacordaire 1869: 171; Chenu 1870: 311; Gemminger and von Harold 1872: 2967; LeConte 1873a: 314; Bates 1880: 76; LeConte and Horn 1883: 299; Leng 1886: 60; Casey 1912: 318; Aurivillius 1912: 458; Bradley 1930: 241; Zajciw 1960: 144, 1961: 401; Arnett 1962: 863, 881; Linsley 1962: 98; Monné 1994: 34; Monné 2005: 642; Monné 2012: 62; Eya 2015: 361.

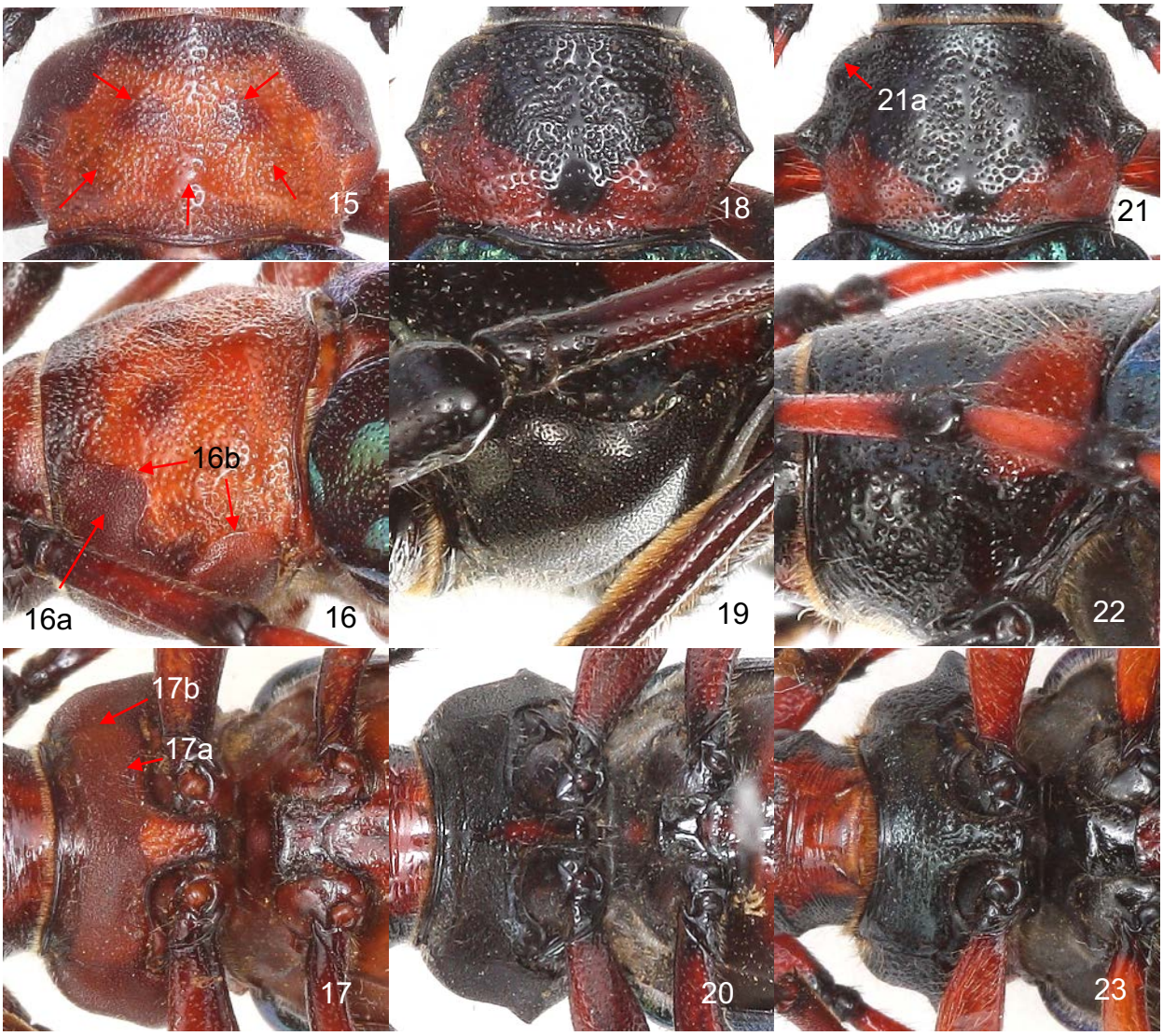
Smileceras LeConte 1850: 8; Thomson 1861: 380, 1864: 208, 434.

Redescription. Form, robust, parallel-sided to slightly tapered posteriorly, dorsum sparsely pubescent. Head with frons square, perpendicular, abruptly separated from anteocular space, impressed transversely above clypeus with deep pit on each side of transverse impression, median line canaliculate, extending to vertex between eyes, vertex and frons rugulose, irregularly punctate (Fig. 1–6); mandible arcuate, striate-punctate, outer edge excavate, apices simple; palpi short, subequal, last segment not expanded, outer edge impressed, apex truncate; gena quadrate, lower lobe of eye well separated from base of mandible (Fig. 1, 4); antennal tubercles prominent; eyes moderately large, finely faceted, upper lobes small, well separated; antennae elongate, 11-segmented, scape conical (without excavated or impressed area in basal half), apices of antennomere 3–7 darker, slightly enlarged and expanded, 11th antennomere appendiculate. Pronotum broader than long, narrower than base of elytra at humeri, sides rounded, angulate or tuberculate; anterior angles inflated, broadly rounded or with obtuse callus; prosternum with intercoxal process narrower than coxal cavity, apex protuberant, ridged between coxae, subvertical, abruptly declivous behind (Fig. 7a–9a), coxal cavities wide open behind; mesosternal intercoxal process not protuberant, about level with top of coxae (Fig. 7b–9b) and abruptly declivous and concave in front. Scutellum triangular, elongate toward apex, acutely pointed, glabrous. Elytra with apices unarmed, rounded to suture (Fig. 10–12). Legs slender, hind femora linear, compressed, not attaining apex of elytra; hind tarsi with tarsomeres triangular, explanate, first tarsomere shorter than following two together, third tarsomere cleft to base.

Discussion. According to Audinet-Serville (1834: 52), *Stenaspis* is a genus with a thorax that is laterally dilated, almost transverse, square (especially in males), tuberculate on each side at the middle, and obliquely tapered from the tubercle to the posterior angle. The pronotal disc is glabrate with sides irregularly punctate. The scutellum is large, elongate triangular, and narrowly acute at the apex. The antennae are glabrous, longer than the body in males and is described as having 12 articles with the second segment short, globular, and segments 3–8 cylindrical, and the following segments flattened, elongate and the terminal segment longest.

The antennae of four species of *Stenaspis* (i.e., *S. castaneipennis*, *S. solitaria*, *S. superba* and *S. verticalis*) examined are 11-segmented with the last antennomere appendiculate as described later by Linsley (1962: 98). The intercoxal process of the prosternum is cuneiform, compressed and protruding (Fig. 7a, 8a, 9a). The mandibles are short and thick. The elytra are almost parallel-sided, slightly narrowed apically, the humeral angles are rounded, and the apices are rounded and unarmed. The legs are medium length, the femora are clubbed and elongate. The body of *Stenaspsis* is glabrate and more or less shining.

The prothorax of *Stenaspis* is sexually dimorphic as in *Crioprosopus* and *Callistochroma*. Linsley (1962: 98–99) described the two males of North American *Stenaspis* (i.e., *S. verticalis* and *S. solitaria*) as having the dorsal surface of the pronotum coarsely, irregularly punctate, the lateral surface finely, densely punctate, and the prosternum with transverse subrectangular impressed areas on each side of the middle that are finely and densely punctate. Furthermore, he stated that females of both species have the pronotum coarsely, irregularly punctate on the lateral surface, and the prosternum coarsely punctate and transversely rugose. The sides of the male pronotum (or the prosternal episternum or proepisternum) are finely, densely punctate and inflated (Fig. 15, 16a), and this finely punctate area is clearly demarcated from the coarsely punctate dorsum of the disc (Fig. 16b), and is vaguely divided from the subrectangular impressed area of the prosternum (Fig. 17a–b). There is considerable variation in the shape of the male pronotum in *S. verticalis* and *S. castaneipennis* (Fig. 15, 18, 24, 27). Some individuals have rounded sides due to well developed and inflated anterior angles (or proepisternum, Fig. 15–16, 24–25), which merges over the lateral tubercles behind middle, whereas other males with

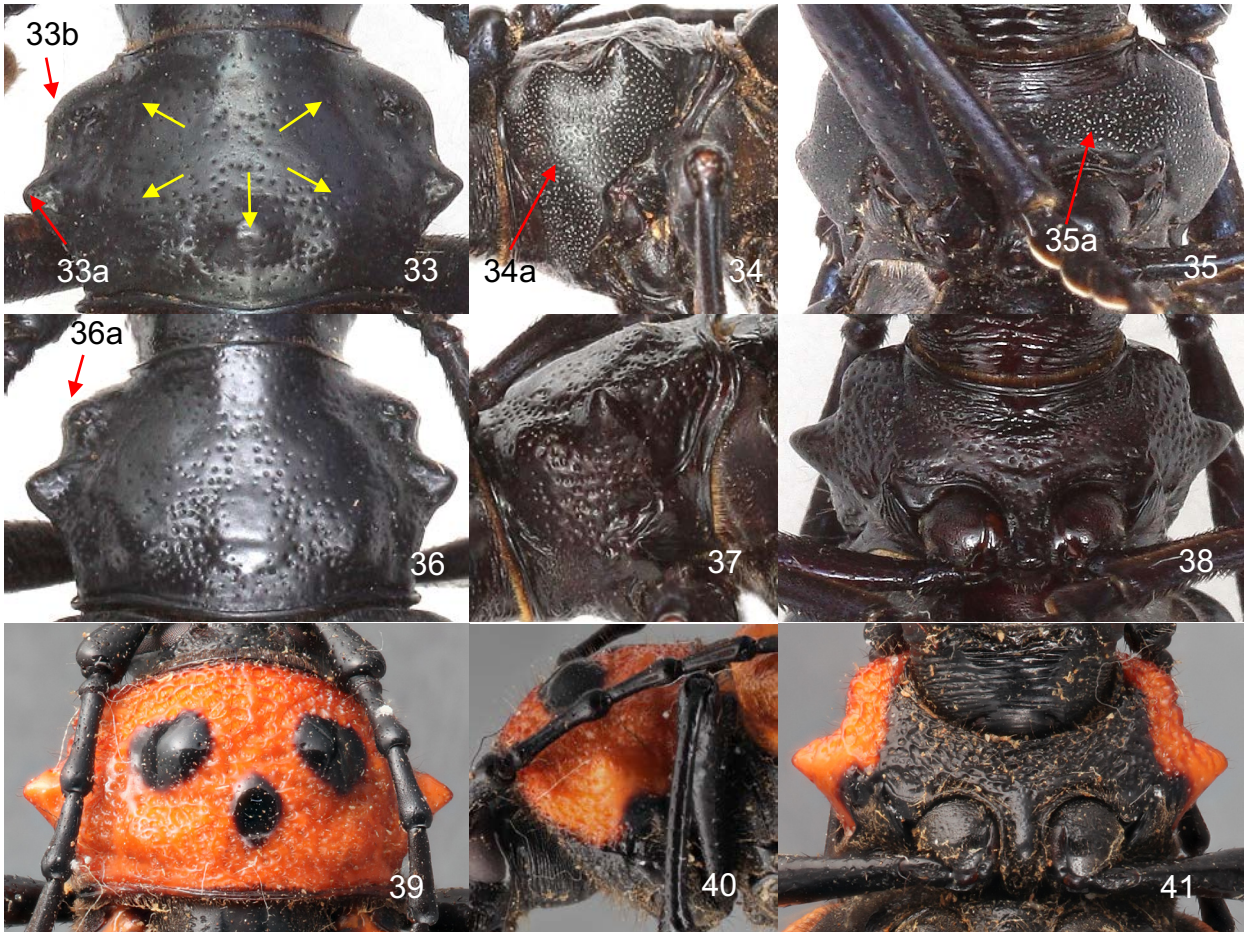


Figures 15–23. Pronotal and prosternal characteristic of *Stenaspis verticalis*: **15–17)** *S. verticalis*, male, Jalisco, MEX with sides of pronotum rounded. **15)** Disc coarsely punctate with 5 vague calli (red arrows). **16: 16a)** Proepisternum inflated and finely punctate (dark reddish area). **16: 16b)** Demarcation of proepisternal finely punctate area from coarsely punctate dorsum of disc. **17: 17a)** Subrectangular impressed area. **17: 17b)** Vague demarcation dividing proepisternum from the subrectangular impressed area. **18, 20)** *S. verticalis*, male, Nuevo Leon, MEX with side of pronotum with distinct lateral tubercles. **19)** *S. verticalis*, male, Puebla, MEX with proepisternum inflated and finely punctate clearly demarcated from dorsum. **21–22)** *S. verticalis*, female, Guerrero, MEX with side of pronotum distinctly tuberculate. **21: 21a)** Anterior angles obtusely tuberculate. **22)** Pronotal disc and proepisternum coarsely punctate. **23)** *S. verticalis*, female, Jalisco, MEX with prosternum coarsely punctate.

less developed anterior angles have more prominent lateral tubercles (Fig. 18, 27). Based on the specimens examined, the male *S. solitaria* all have well developed lateral tubercles (Fig. 33a) with rounded anterior angles (Fig. 33b), which do not extend and merge over the lateral tubercles. In the females, the coarse punctures on the side of the pronotum merge with punctures on the dorsum and are not clearly demarcated as in the males (Fig. 22, 31). The anterior angles of the pronotum in females are obtusely callused and obliquely tapered toward the apex (Fig. 21a, 30a). Females of all four species (i.e., *S. castaneipennis*, *S. solitaria*, *S. superba* and *S. verticalis*) have prominent lateral tubercles behind the middle and anterior angles broadly callused, and proepisternum

Figures 24–32. Pronotal and prosternal characteristic of *Stenaspis castaneipennis*. **24–26)** *S. castaneipennis*, male, Oaxaca, MEX with sides of pronotum rounded, disc coarsely punctate with 5 vague calli. **25)** Proepisternum inflated and finely punctate (dark reddish area) clearly demarcated from coarsely punctate dorsum (black area). **27–29)** *S. castaneipennis*, male, Oaxaca, MEX with sides of pronotum with distinct lateral tubercles. **28)** Proepisternum inflated and finely punctate (reddish area) clearly demarcated from dorsum (black area). **29: 29a)** Subrectangular finely punctate area of prosternum. **29: 29b)** Demarcation line dividing proepisternum from finely punctate subrectangular area of prosternum. **30–32)** *S. castaneipennis*, female, Oaxaca, MEX with side of pronotum distinctly tuberculate. **30: 30a)** Anterior angles obtusely tuberculate. **31–32)** Pronotal disc, proepisternum and prosternum coarsely punctate; proepisternun not demarcated from dorsum and prosternum.

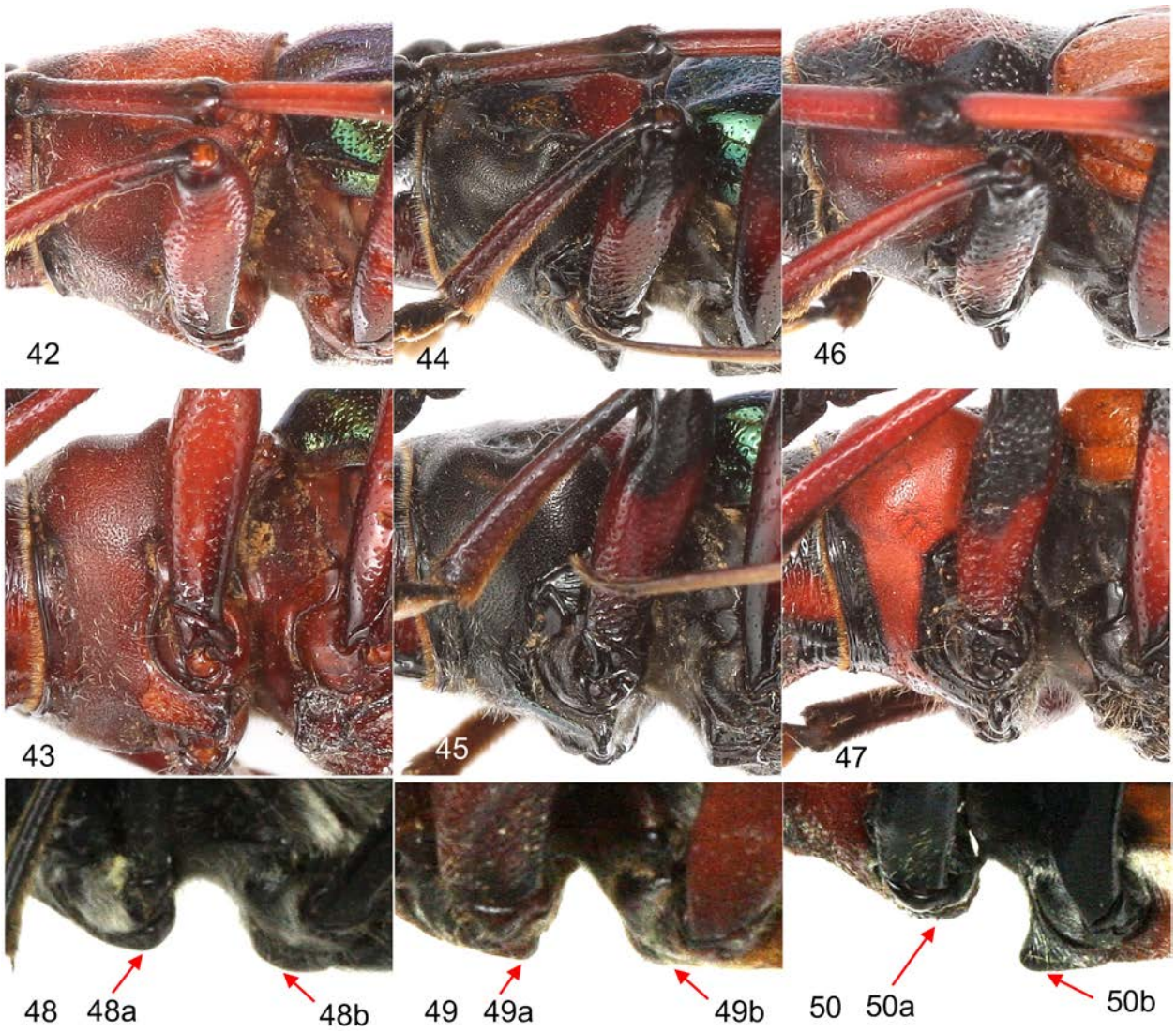
and prosternum coarsely punctate. As in other trachyderine genera there are five discal calli on the pronotum, two antemedial, one on each side of the middle, and three postmedial near the base, one in the middle and one each on either side (Fig. 15, 33). These five discal calli in *Stenaspis* are vaguely protuberant, and the spaces in the middle between these calli are usually flattened. In some specimens; however, the three calli near the base, especially the one in the middle, are more visible than the two in the anterior half. *Stenaspis superba* is the only species with the two anterior dorsal calli more prominent (Fig. 39) and the pronotal disc convex instead of flattened (Fig. 40).



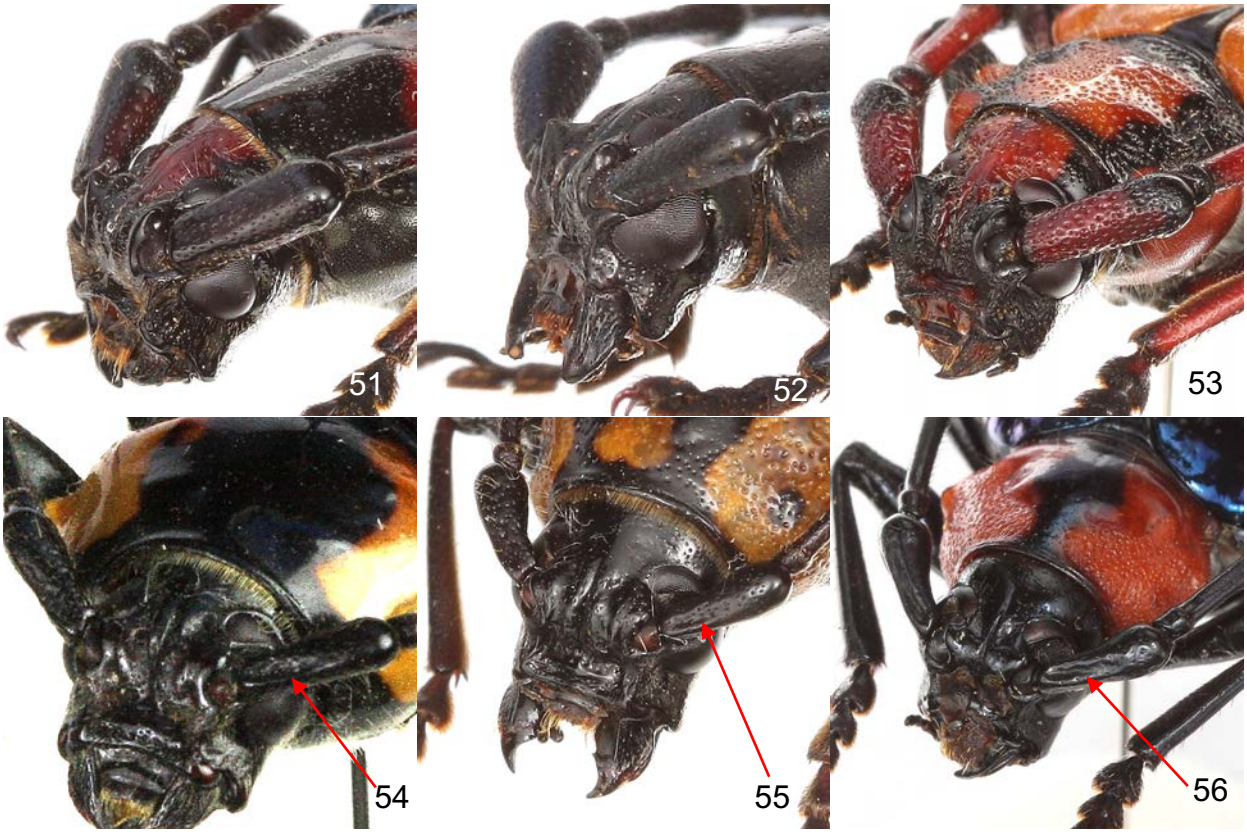
Figures 33–41. Pronotal and prosternal characteristic of *Stenaspis solitaria* and *Stenaspis superba*. **33–35)** *S. solitaria*, male, Cochise Co., AZ, USA with disc coarsely punctate with 5 vague calli (yellow arrows). **33: 33a)** Pronotum with prominent lateral tubercle. **33: 33b)** Rounded anterior angles, which does not extend and merge over lateral tubercles. **34: 34a)** Proepisternum finely punctate. **35: 35a)** Prosternum with finely densely punctate transverse subrectangular area on each side of middle. **36–38)** *S. solitaria*, female, Cochise Co., AZ, USA **36: 36a)** Anterior angle of pronotum obtusely callused and obliquely tapering to the apex of pronotum. **37)** Coarsely punctate proepisternum of female. **38)** Coarsely punctate prosternum of female. **39–41)** *S. superba*, holotype, female, Mojos, BOL (photos provided from J. Bergsten, NHRS). **39)** Coarsely punctate pronotal disc with two prominent discal calli in anterior half. **40)** Convex pronotal disc with coarsely punctate proepisternum. **41)** Coarsely punctate prosternum and broadly callused anterior angle of *S. superba*.

The prosternal intercoxal process of *S. castaneipennis*, *S. solitaria* and *S. verticalis* is also variable in shape ranging from uniformly sloping to the apex and abruptly declivous or concave behind (Fig. 42–43) to concave and abruptly acuminate at the apex (Fig. 44–47). Variation in the shape of prosternal process is more evident in *S. verticalis*, as compared to *S. castaneipennis* where the prosternal process is more commonly concave and abruptly acuminate at the apex. In *S. solitaria* the prosternal process is usually more uniformly sloped to the apex.

The scape in *S. castaneipennis*, *S. solitaria*, *S. superba* and *S. verticalis* is conical (without excavated area in basal half), usually glabrate and sparsely punctate or coarsely, separately punctate (Fig. 51–53; 57–61). The antennae of *S. verticalis* and *S. castaneipennis* are bicolored and antennomeres III–V are glabrous and sparsely punctate except apically darker and more densely punctate and pubescent (Fig. 57–58). In *S. solitaria*, which is concolorous (usually all black or reddish-brown) the antennomeres III–V are more densely, uniformly punctate throughout except for the basal half of the third antennomere, which is less densely punctate (Fig. 60). In the holotype female



Figures 42–50. Prosternal and mesosternal intercoxal process of *Stenaspis* compared to *Crioprosopus* and *Callistochroma*. **42–43)** *S. verticalis*, male, Jalisco, MEX with uniformly sloping prosternal intercoxal process to apex that is abruptly declivous behind. **42)** Lateral profile. **43)** lateral-tilted profile showing gradual sloping of intercoxal process to apex. **44–45)** *S. verticalis*, male, Puebla, MEX with prosternal intercoxal process concaved and abruptly acuminate apex. **44)** Lateral profile. **45)** Lateral-tilted profile showing inverted "U-shaped" sloping of intercoxal process to apex. **46–47** *S. castaneipennis*, male, Oaxaca, MEX with prosternal intercoxal process gradually sloping and then abruptly acuminate at apex. **46)** Lateral profile. **47)** Lateral-tilted profile showing gradual sloping and abrupt acumination at apex. **42–47** Mesosternal intercoxal process not protuberant, about level with coxae, and abruptly declivous in front. **48)** *Crioprosopus servillei* Audinet-Serville, female, Tegucigalpa, HND. **48: 48a)** Prosternal intercoxal process arcuate at apex. **48: 48b)** Mesosternal intercoxal process without obvious projection below coxal cavity. **49)** *Crioprosopus wappesi* Eya, male, Baja Verapaz, GTM. **49: 49a)** Prosternal intercoxal process arcuate at apex. **49: 49b)** Mesosternal intercoxal process level with coxae. **50)** *Callistochroma lampros* (Bates), male, Panama Prov., PAN. **50: 50a)** Prosternal intercoxal process arcuate at apex. **50: 50b)** Mesosternal intercoxal process protuberant, obtusely tuberculate and extending well below plane of prosternal intercoxal process.

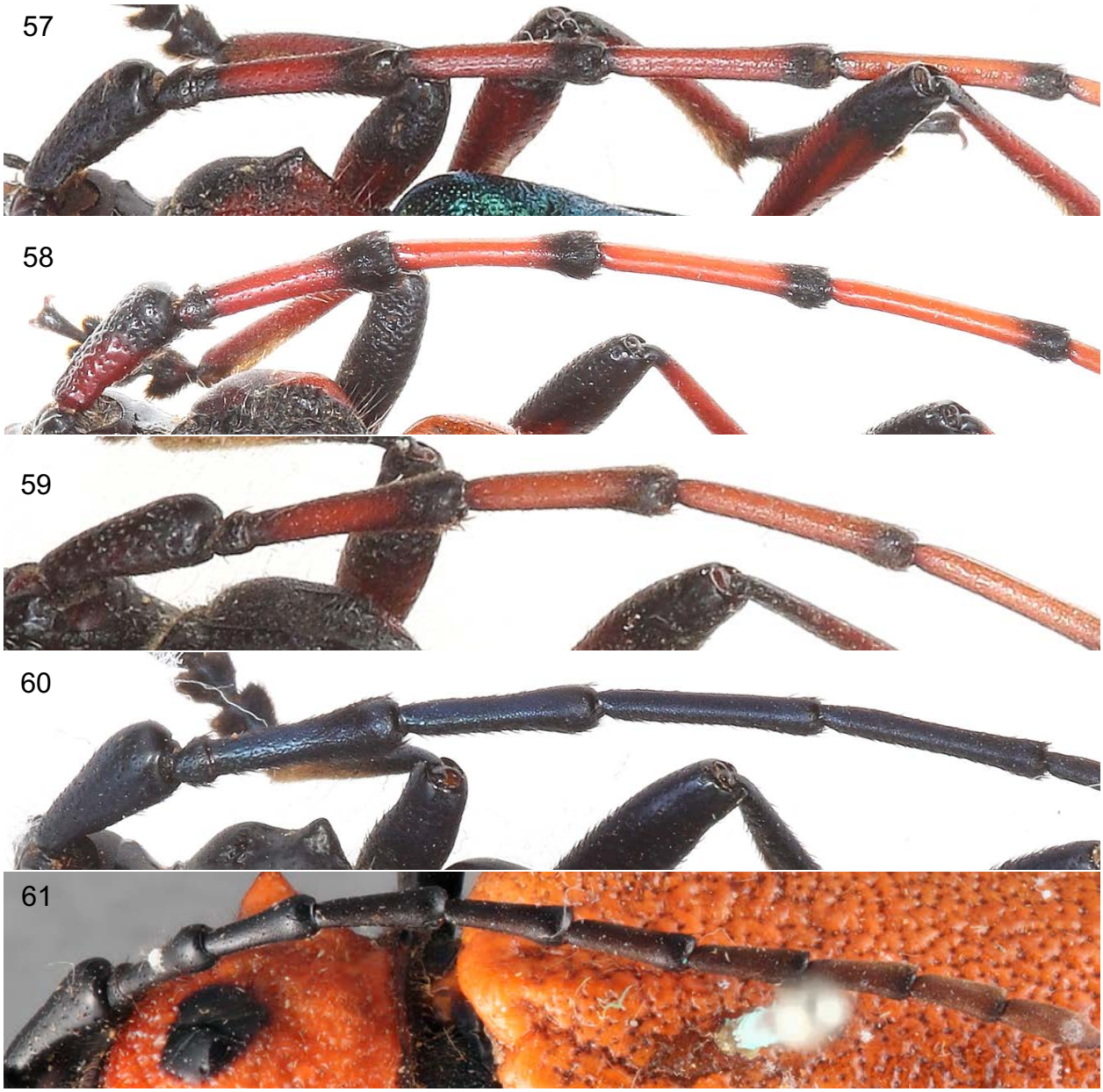


Figures 51–56. Scape of *Stenaspis* compared to *Crioprosopus* and *Callistochroma*. **51)** *Stenaspis verticalis*, male, Puebla, MEX. **52)** *S. solitaria*, male, Cochise Co., AZ, USA. **53)** *S. castaneipennis*, male, Oaxaca, MEX. **54)** *Crioprosopus servillei*, female, Tegucigalpa, HND. **55)** *Crioprosopus baldwini*, female, Chiriquí Prov., PAN. **56)** *Callistochroma lampros*, male, Panama Prov., PAN. **51–53)** Scape of *Stenaspis* without excavated area in basal half. **51–52)** Scape glabrate, sparsely punctate. **53)** Scape coarsely, separately punctate. **54–56)** Scapes of *Crioprosopus* and *Callistochroma* with excavated area in basal half.

of *S. superba* the antennomeres are black to dark brown with scape to the fourth antennomere sparsely punctate, and densely, finely punctate from antennomere V to XI (Fig. 61).

Other commonalities between these four species of *Stenaspis* include the elongate triangular scutellum which is narrowly acute at the apex (i.e., length ≥ width) and the elytra which are distinctly margined laterally and the apices unarmed as in *Crioprosopus*. The lateral margination of each elytron usually ends just prior to reaching the apex, and the elytra are obliquely truncate or rounded apically.

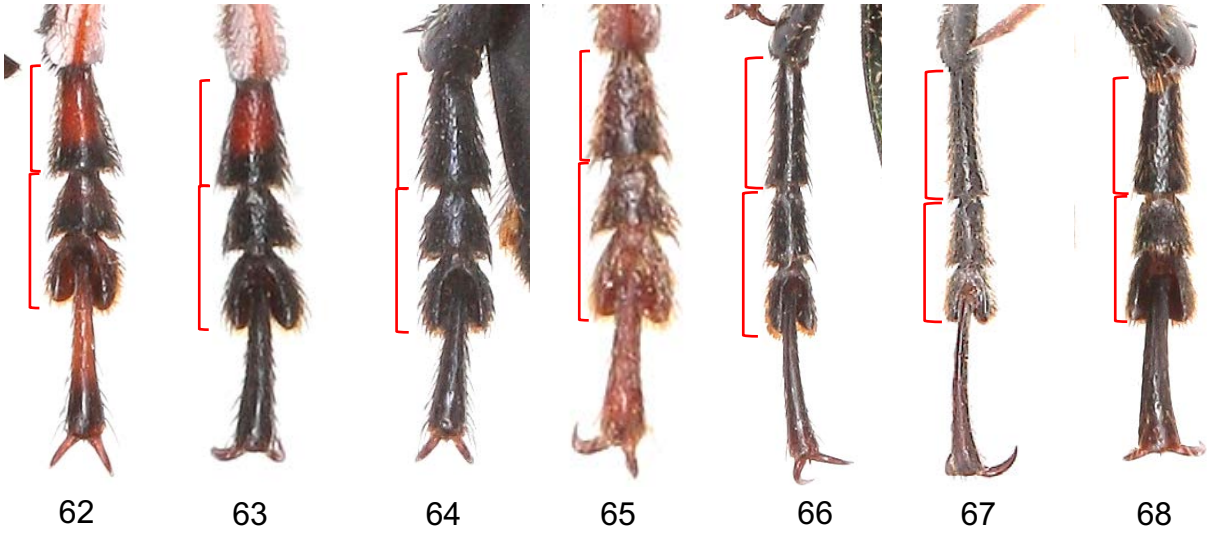
Herein, the genus *Stenaspis* is characterized as follows: (1) head with frons large, square, perpendicular, abruptly separated from anteocular space (Fig. 1–6); (2) dorsum of scape without excavated or impressed area in basal half (Fig. 51–53); (3) prosternal intercoxal process protuberant and ridged between coxae and subvertical to vertical or concave behind (Fig. 7–9); (4) mesosternal intercoxal process not protuberant, about level with top of coxae and abruptly declivous in front (Fig. 7–9); (5) pronotum narrower than base of elytra at humeri with sides rounded, angulate or frequently tuberculate slightly behind middle, and anterior angles rounded or broadly callused (Fig. 15–21, 24–30, 33, 36, 41); (6) the area between the five discal calli on the pronotum almost flat, usually glabrate, and dorsal calli usually absent or vague (e.g., Fig. 15–16 , 21–22, 24, 30–31, 33–34, 36–37); (7) hind tarsi with tarsomeres triangular, explanate, first tarsomere slightly shorter than following two together (Fig. 62–65); (8) males with proepisternum and prosternum finely, densely punctate, and proepisternum inflated and clearly demarcated from the coarsely punctate pronotal disc (Fig. 16, 19, 25, 28, 34), and prosternum with densely punctate transverse subrectangular area on each side of middle (Fig. 17a, 20, 26, 29a, 35a); (9) females with sides of



Figures 57–61. Antennae of *Stenaspis*. **57)** *S. verticalis*, male, Nuevo Leon, MEX. **58)** *S. castaneipennis*, male, Oaxaca, MEX. **59)** *S. lingafelteri* **sp. nov.**, holotype, male, Chiapas, MEX. **60)** *S. solitaria*, male, Cochise Co., AZ, USA. **61)** *S. superba*, holotype, female, Mojos, BOL. **57–59)** Antennae bicolored, antennomeres III–V, glabrate, sparsely punctate except apically darker, densely punctate and pubescent. **60)** Antennomeres concolorous, densely punctate except basal half of III sparsely punctate. **61)** Antennomeres black to brown, scape glabrate, sparsely punctate, scape to antennomere IV sparsely punctate.

pronotum laterally tuberculate behind middle (Fig. 21, 30, 36, 39) and coarsely punctate with punctures merging with coarse dorsal punctures (Fig. 22, 31, 37, 40), proepisternum not clearly demarcated from the pronotal disc as found in males, and anterior angles frequently broadly or obtusely callused (Fig. 21a, 30a, 36a, 41); and (10) elytra distinctly margined laterally, and apices of elytra unarmed and truncate or rounded at sutural angle (Fig. 10–12).

Crioprosopus and *Callistochroma* can be differentiated from *Stenaspis* by the prosternal intercoxal process that is arcuate at the apex (Fig. 48–50), dorsum of scape with basal half excavate (Fig. 54–56), tarsomeres of hind



Figures 62–68. Hind tarsomeres of *Stenaspis* compared to *Callistochroma* and *Crioprosopus* with red brackets showing lengths of tarsomere 1 (T_1) and tarsomeres 2+3 (T_{2+3}). **62–65)** Hind tarsi of *Stenaspis* with tarsomeres triangular, explanate, T_1 slightly shorter than following two together (T_{2+3}). Approximate ratio of length of tarsomere 1 over tarsomeres 2+3 (T_1/T_{2+3}) are as follows: **62)** *Stenaspis castaneipennis*, female, Oaxaca, MEX (T_1/T_{2+3}: 1/1.3); **63)** *S. verticalis*, female, Nuevo Leon, MEX (T_1/T_{2+3}: 1/1.4); **64)** *S. solitaria*, female, Cochise Co., AZ, USA (T_1/T_{2+3}: 1/1.3); and **65)** *S. lingafelteri* **sp. nov.**, holotype, male, Chiapas, MEX (T_1/T_{2+3}: 1/1.4). **66–68)** Hind tarsi of *Callistochroma* and *Crioprosopus* with 1st tarsomere narrow, elongate, and subequal in length to following two tarsomeres together. Approximate ratios of T_1/T_{2+3} are as follows: **66)** *Callistochroma viridipennis*, male, Esmeraldas Prov., ECU (T_1/T_{2+3}: 1/1.1); **67)** *Crioprosopus chiriquiensis*, female, Chiriquí Prov., PAN (T_1/T_{2+3}: 1/0.9); and **68)** *Crioprosopus rimosus*, female, Hidalgo, TX, USA (T_1/T_{2+3}: 1/1.1).

tarsi narrow and elongate, and first tarsomere subequal to the following two tarsomeres together (Fig. 66–68). Frequently, the last tarsomere with the claw (e.g., *Crioprosopus amoenus* Jordan, *Crioprosopus chiriquiensis* Eya and *Crioprosopus servillei* Audinet-Serville) is much more elongated than in *Stenaspis*. The prosternal intercoxal process of *Stenaspis* is protuberant or ridged behind the coxae and vertical or concave behind (Fig. 42–47), the scape is without a dorsal excavation (Fig. 51–53), and the hind tarsomeres are triangular and explanate with the first tarsomere slightly shorter than tarsomeres two and three together (Fig. 62–65). In general, the integument of *Crioprosopus* and *Callistochroma* is more glabrous and the punctures are finer than in *Stenaspis*. Also, the dorsum of antennomeres III–V is frequently canaliculate or impressed in many species of *Crioprosopus* (i.e., *C. amoenus*, *C. chiriquiensis* and *C. servillei*, and in males of *Crioprosopus thoracicus* (White) (i.e., *Crioprosopus basileus* Bates), *Crioprosopus championi* Bates, *Crioprosopus gaumeri* Bates, *Crioprosopus hondurensis* Eya, *Crioprosopus iridescens* White, *Crioprosopus nieti* Chevrolat, *Crioprosopus rimosus* (Buquet) and *Crioprosopus wappesi* Eya) (Fig. 158–160), while such sculpturing of antennomeres III–V is not found in *Stenaspis*.

Etymology of the name *Stenaspis* is Greek: στενὸς, narrow and ἀσπίς, shield referring to the elongated scutellum as described by Audinet-Serville (1834: 51) and Tavakilian (2020).

Key to Group III-Stenapses with Abruptly Separated Anteocular Space (partially adapted from Linsley 1962: 91 and modified from Eya 2015: 360)

1. Elytra distinctly margined at sides (Fig. 69–74) **2**
– Elytra obtusely margined at sides (Fig. 75–77) **6**

2(1). Dorsal surface of head, pronotum and elytra densely, coarsely, contiguously punctate (e.g., Fig. 13–14) . . . **3**

– Dorsum glabrate, if pronotum or head densely punctate then elytra glabrous or rugulose, punctures fine and well separated **4**

3(2). Elytral disc, femora, tibiae and ventral surface covered with long, erect, pale hairs, dorsal surface shining; ventral surface of femora and tibia densely, deeply punctate; lateral spine on pronotum obtuse; lateral margin of pronotum and elytra narrowly reddish; 12–24 mm (Fig. 13–14) ..... ***Pilostenaspis* Eya**

– Elytra without long erect hairs (or with very short hairs obscurely covering surface); femora and tibiae finely punctate, not covered with long, erect hairs, elytra black with broad yellowish or reddish bands or maculae, lateral spine on pronotum prominent, acute, recurved; 26–36 mm ..... ***Megapurpuricenus* Eya**

4(2). Basal half of scape excavate or scarred; prosternum with intercoxal process arcuate at apex; tarsomeres of hind tarsi elongate, narrow, 1st tarsomere subequal in length to following two together (Fig. 54–56, 48–50; 66–68) **5**

– Basal half of scape not excavate; prosternum with intercoxal process protuberant or ridged between coxae, vertical or concave behind; mesosternum not protuberant, about level with top of coxae; tarsomeres of hind tarsi short, explanate, 1st tarsomere shorter than following two together (Fig. 51–53, 42–47, 62–65) ..... ***Stenaspis* Audinet-Serville**

5(4). Mesosternal intercoxal process obtusely tuberculate and extending well below the plane of prosternal intercoxal process (Fig. 50b); prothoracic sculpture of male usually confined to limited area towards anterior angle of disc (Fig. 56); apices of elytra obliquely angulate, with outer armature, sutural angle rounded or acute; antennae with dorsal surfaces of antennomeres III–IV flattened but not canaliculate; abdominal segments usually glabrous ..... ***Callistochroma* Eya**

– Mesosternal intercoxal process without obvious projections or subtuberculiform (Fig. 48b, 49b); prothoracic sculpture of male with disc finely, densely punctate throughout (Fig. 158–160); apices of elytra rounded or subtruncate, with or without outer armature; antennae with dorsal surfaces of antennomeres III–V frequently canaliculate from apical ⅔ of III; abdominal segments usually densely clothed with silken pubescence ..... ***Crioprosopus* Audinet-Serville**

6(1). Pronotum armed with a lateral spine **7**

– Pronotum subcylindrical or rounded, without lateral spine; elytra with a pair of transverse yellowish bands; antennal tubercles prominent, vertex distinctly concave; body finely pubescent ..... ***Aethecerinus* Fall and Cockerell**

7(6). Body glabrate, dorsum opaque, elytra coarsely punctate at base ..... ***Purpuricenus* Dejean**

– Body pubescent, elytra sulcate or with distinct threadlike costae ..... ***Tragidion* Audinet-Serville**

Key to species of *Stenaspis* Audinet-Serville, 1834

1. Pronotum at least partly reddish or reddish-brown; elytra yellowish to pale testaceous, reddish or entirely metallic blue, green or purple or at least partly with metallic greenish sheen **2**

– Body concolorous black, bluish-black or reddish-brown; 22–36 mm. Southwestern USA and Mexico (Fig. 91–94) ..... ***S. solitaria* (Say)**

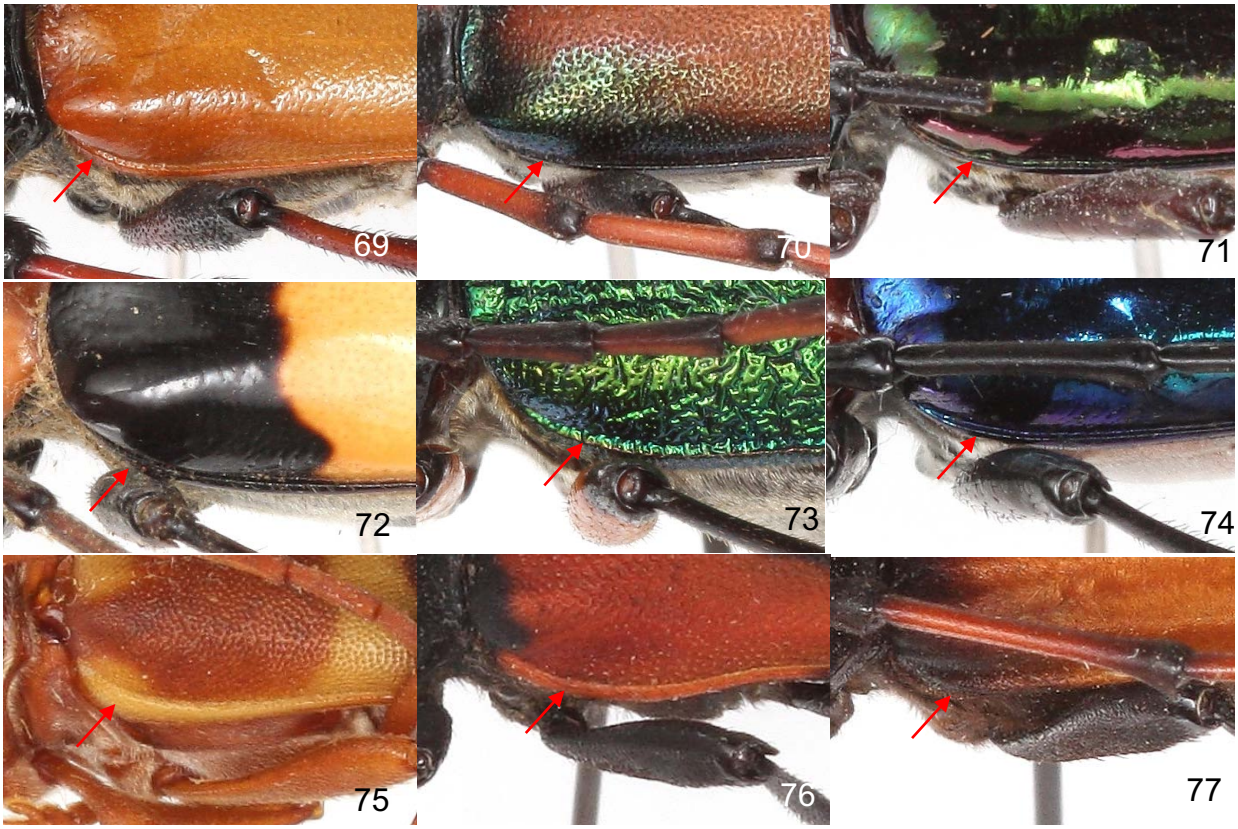
2(1). Antennomeres variegated, yellowish to reddish and apically black with basal ⅔ of antennomeres III–VI glabrate, finely, separately, irregularly punctate; apices more densely punctate and more densely clothed with short, depressed hairs (Fig. 57–59) **3**

– Antennomeres I–IV concolorous black, V–XI dark reddish-brown, antennomeres III–IV sparsely punctate, apices sparsely pubescent (Fig. 61); integument black; pronotum and elytra orange with surface rugose; pronotal disc with three black nitid calli; elytra rugulose with fine, separated punctures; 38 mm; Mojos, Bolivia (Fig. 95–101) ..... ***S. superba* Aurivillius**

3(2). Elytra metallic blue or green or epipleural and sutural margin of elytra with metallic bluish to greenish-yellow sheen **4**

– Elytra concolorous yellowish to pale testaceous, nitid, glabrous, separately, finely, shallowly punctate; 21–31 mm; Oaxaca, Mexico (Fig. 78–83) ..... ***S. castaneipennis* Dupont**

4(3). Elytra concolorous metallic greenish, bluish or purple, finely to coarsely punctate, antennal tubercles



Figures 69–77. Epipleural margin of elytra of Group III-Stenaspes. **69–74)** Elytra distinctly margined at side with acute lateral epipleural margin below humerus (red arrow) in *Stenaspis*, *Callistochroma* and *Crioprosopus*. **69)** *Stenaspis castaneipennis*, male, Oaxaca, MEX. **70)** *S. lingafelteri* **sp. nov.**, holotype, male, Chiapas, MEX. **71)** *Callistochroma viridipennis*, male, Esmeraldas, ECU. **72)** *Crioprosopus chiriquiensis*, female, Chiriquí Prov., PAN. **73)** *Crioprosopus rimosus*, female, Hidalgo, TX, USA. **74)** *Callistochroma lampros*, male, Panama Prov., PAN. **75–77)** Elytra obtusely margined at side without acute lateral margin (red arrows) as in *Aethecerinus*, *Purpuricenus* and *Tragidion*. **75)** Epipleural margin of elytra broadly rounded below humerus in *Aethecerinus wilsoni*, female, Bexar Co., TX, USA. **76)** Epipleural margin narrowly rounded in *Purpuricenus linsleyi*, male, Comal Co., TX, USA. **77)** Epipleural margin obtusely angulated in *Tragidion coquus*, male, Terrell Co., TX, USA.

prominent; 17–33 mm; Arizona and Texas, USA to Mexico (Fig. 103–136) . . . . . .
. . . . . .***S. verticalis* Audinet-Serville**

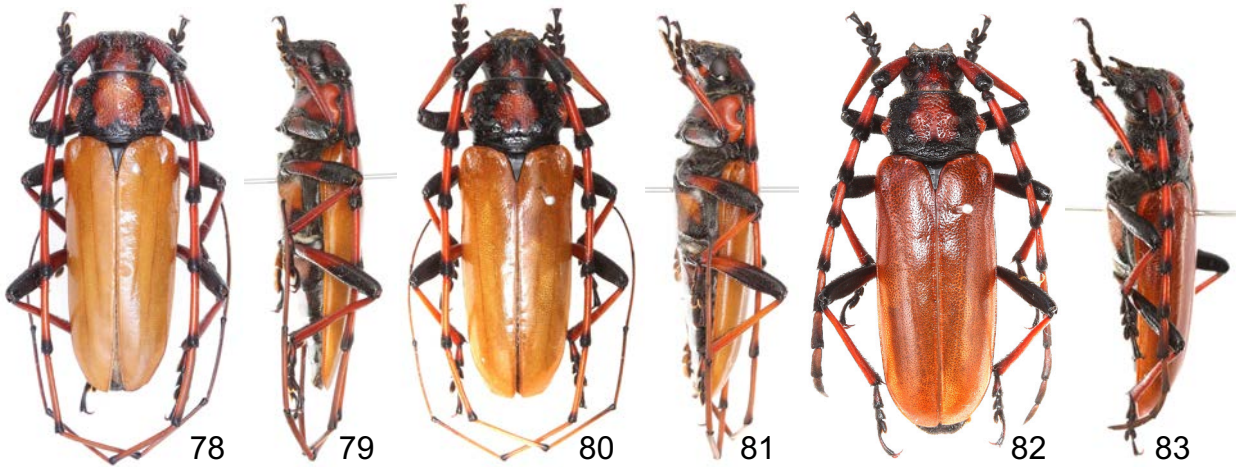
– Elytra testaceous with margins narrowly black, near base, humerus and basal four-fifths of the epipleural margin darker with metallic bluish to greenish-yellow sheen, and apical third of disc adjacent to sutural margin with faint metallic greenish-yellow sheen; antennal tubercles horizontal, vaguely elevated, apices angulate; 24 mm; Chiapas, Mexico (Fig. 84–90) . . . . . ***S. lingafelteri* Eya, sp. nov.**

Stenaspis castaneipennis Dupont, 1838

(Fig. 78–83)

Stenaspis castaneipennis Dupont 1838: 52; White 1853: 78; Lacordaire 1869: 171; Gemminger and Harold 1872 (cat.): 2967; Bates 1880: 76 (dist.); Aurivillius 1912: 458 (cat.); Blackwelder 1946: 589 (cat.) (cat.); Chemsak et al. 1992: 86 (cat.); Monné 1994 (cat.): 34; Monné and Giesbert 1994: 152 (cat.); Noguera and Chemsak 1996: 403 (dist.); MacRae et al. 2012: 181 (dist.).

Redescription. Male: Length 21–32 mm. Form large, glabrate; integument yellowish-brown to reddish-black; head, pronotum and appendages variegated reddish-brown to black; sternum variegated yellowish-black to black,



Figures 78–83. Dorsal and lateral images of *Stenaspis castaneipennis* Oaxaca, MEX. **78–79)** Male, 32 mm. **80–81)** Male, 27 mm. **82–83)** Female, 28 mm.

scutellum dark reddish-black to black; elytra yellowish to pale testaceous. Head with vertex and frons rugulose, irregularly punctate; genae irregularly punctate, sparsely covered with appressed pubescence; antennal tubercles prominent, apices acute; antennae exceeding elytral apices by about four segments, scape conical, coarsely separately to irregularly punctate with very short, depressed hair arising from each puncture; apices of antennomeres III–VII darker, slightly enlarged and expanded; antennomeres from apex of III laterally carinate with poriferous area on either side of carina; dorsum of antennomeres III–VI glabrate, nitid, finely, sparsely, irregularly punctate, apices densely punctate and densely clothed with short, black depressed hairs; antennomeres from VII densely clothed with short appressed pubescence; antennomere III longer than I, IV shorter than III, V longer than III, VI subequal to or longer than V, VII subequal to VI, VIII subequal to VII, IX subequal to VIII, X shorter than IX, XI longest, appendiculate at apical two-fifths. Pronotum 1.4–1.5 times as broad as long, rounded to broadly angulate at sides; anterior angles inflated, broadly rounded; disc with dorsal calli vague, two in anterior half on either side of middle, and three in basal half, one in middle and one each on either side; area between calli flattened, surface irregularly punctate, sparsely covered with long, erect, golden hairs; proepisternum inflated, finely, densely punctate, sparsely pubescent, and demarcated from prosternum and coarsely punctate elytral disc; prosternum transversely rugose with finely, densely punctate transverse subrectangular area on each side of middle; prosternal intercoxal process sparsely, irregularly punctate; mesosternum nitid, anterior half and on sides finely, densely, minutely punctate and densely pubescent with appressed, transparent hairs, posterior half irregularly punctate in middle; mesosternal intercoxal process sparsely pubescent on sides; metasternum nitid, sparsely punctate, and sparsely pubescent with long, depressed, golden hairs, metepisternum finely, densely pubescent with whitish, depressed hairs. Elytra about 2.3 times longer than broad, distinctly margined laterally; disc nitid, glabrous, separately, finely, shallowly punctate. Legs with femora slightly clavate, apical half rugulose, coarsely punctate, basal half sparsely, irregularly punctate, surface clothed with short, depressed, black hairs, outer margin with short, black, depressed bristles; tibiae slender, surface glabrate, sparsely punctate and sparsely covered with short, black, depressed hairs, inner margin with a row of short, depressed bristles in apical half. Abdomen glabrate, finely, shallowly and rather sparsely punctate in middle with suberect, golden pubescence, sides more finely, densely punctate, densely pubescent with appressed short hairs; fifth sternite truncate, slightly emarginate.

Female: 18–33 mm. Form similar to male, head, pronotum and appendages similar in coloration to male; antennae one segment shorter than elytral apex or attaining apices, scape conical, coarsely, separately punctate to finely punctate; apices of antennomeres III–V slightly enlarged, VI–XI gradually flattened, apices expanded and angulate; antennomere III longer than I, IV shorter than III, V shorter than III, VI subequal to V, antennomeres from VII–X progressively shorter, XI longer than X and subequal to IX, appendiculate at apical third. Pronotum laterally tuberculate in middle; anterior angles with obtuse callus on each side; proepisternum coarsely,

densely, contiguously punctate and not clearly demarcated from prosternum and coarsely punctate pronotal disc as in male; prosternum finely to coarsely striate-punctate (without finely punctate transverse subrectangular area found in males). Legs similar to males with inner margin of femora frequently sparsely covered with long, golden, suberect hairs. Abdomen similar to male, fifth sternite rounded, vaguely indented at apex.

Materials examined. MEXICO: *Oaxaca*: 6 km S.E. Santiago Matatlán, HWY 190, R.M.O. Ocotepec, 16 Oct. 2005, B.K. Eya (10 males, 5 females , BKEC), 21 Oct. 2005, B.K. Eya (2 males, 7 females, BKEC); 1.7 km W Hwy. 190 on Microondas Rd. N. of Ocotepec, 6800 ft., 16°49′32″N, 96°21′42″W, on flower *Viguiera dentata* (Cabanilles) Sprengel (Asteraceae) T.C. MacRae (1 male, DJHC); road to Microondas Ocotepec, 6 km S. Matatlán, 16°49′32″N, 96°21′42″W, 10 Oct. 2003, 2000–2100 m. N.M. Schiff (1 male, 1 female, LGBC), 14 Oct. 2006, 6800′ flowers/foliage, C.L. Bellamy (3 males, LGBC); Sola de Vega, 1500 m 25/30 Sept. 2005, D.J. Curoe (1 male, 1 female, BKEC).

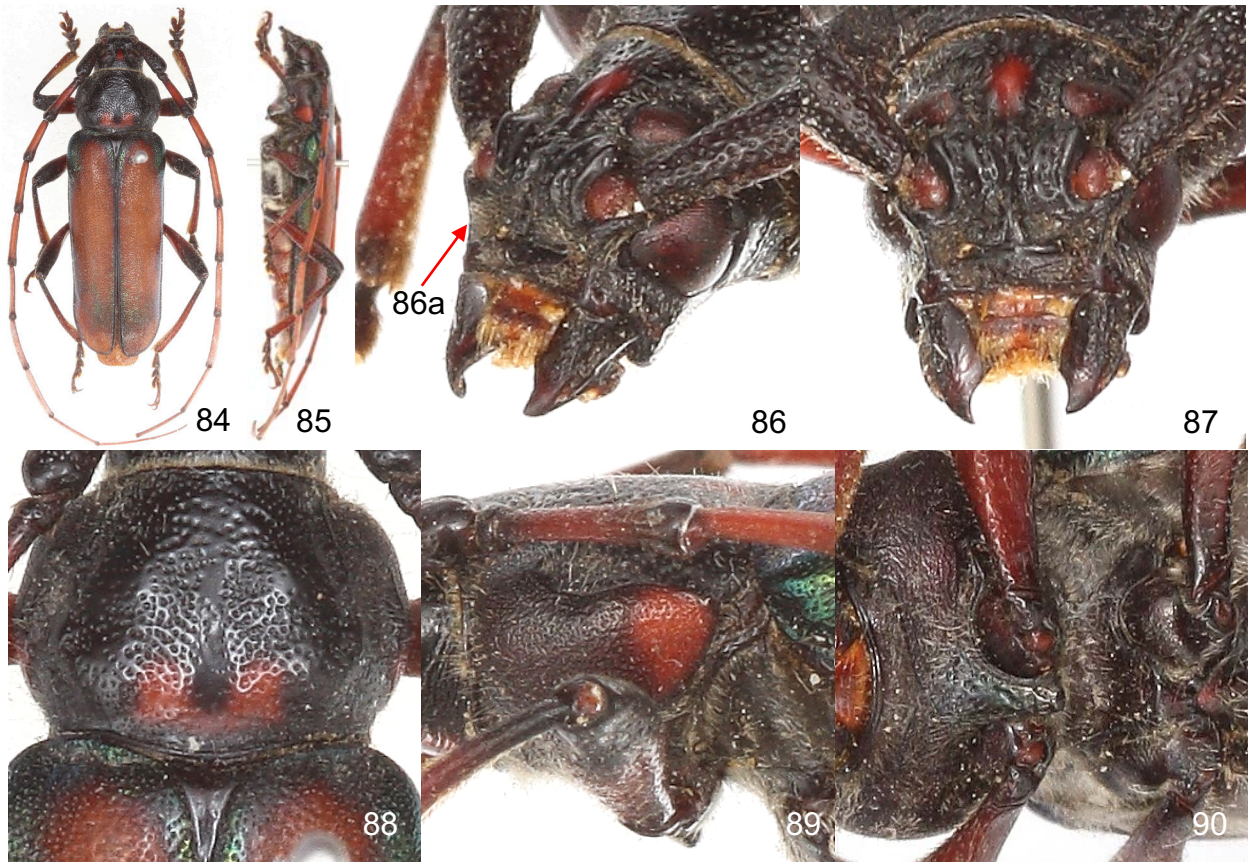
Discussion. According to Dupont (1838: 52), the head and thorax are variegated black and reddish; elytra smooth pale castaneous; antennae reddish with black articulation; legs reddish with apices of tarsi and femora black. The thorax is roughly similar in shape to that of *S. verticalis*, reddish with two lateral black bands, and anterior and posterior margin dark black; the elytra are very light reddish, longer and more parallel than in *S. verticalis*, less strongly punctate and more shiny. Other than the overall coloration of *S. castaneipennis*, this species can be differentiated by the black vittae on either side of the head and pronotal disc, much coarser, deeper punctures on the vertex, scape and pronotum (Fig. 46, 53), and the elytral discs nitid, glabrous, and separately, finely, shallowly punctate. The dark area on the pronotum of *S. verticalis*, if present, is mostly in the anterior half of the disc, and the punctures on the vertex, scape and pronotum are comparatively shallower and finer (Fig. 51). The elytra are more coarsely, closely and deeply punctate in *S. verticalis* compared to *S. castaneipennis*. The prosternal intercoxal process of *S. castaneipennis* is gradually sloping and then abruptly acuminate at apex in all of specimens examined (Fig. 46–47) whereas in *S. verticalis* the lateral profiles of the prosternal intercoxal process are variable, ranging from uniformly sloping to the apex (Fig. 42–43) to concave and abruptly acuminate at the apex (Fig. 44–45). The overall consistency in characteristics of *S. castaneipennis* can be attributed to the distribution limited to Oaxaca whereas *S. verticalis* is more polymorphic and widely distributed with regional variation in characters.

The females of *S. castaneipennis* can be differentiated from the males by the length of the antennae, shape of the antennomeres, and shape of the pronotum with more distinct lateral tubercles and broadly callused anterior angles (Fig. 30). The proepisternums of females are coarsely, densely, contiguously punctate and not clearly demarcated from the prosternum and coarse punctures on the dorsum (Fig. 31). The prosternum is without the finely punctate transverse subrectangular area found in males (Fig. 32). Some females have more finely punctate scape, and inner margins of the femora are frequently sparsely covered with long golden hairs. Also, the apex of the fifth abdominal sternite in males is truncate and slightly emarginate, whereas females have a rounded fifth sternite which is vaguely indented at apex.

Stenaspis lingafelteri Eya, new species

(Fig. 84–90)

Description. Male: Length 24 mm. Form moderately sized, glabrate; integument reddish-brown to piceous black; head, pronotum and appendages partly reddish-brown to testaceous; abdomen testaceous; scutellum black; elytra testaceous with margins narrowly black, around scutellum, near base, humerus, and basal four-fifths of epipleural margin darker with metallic bluish to greenish-yellow sheen, and apical third of disc adjacent to sutural margin with faint metallic greenish-yellow sheen. Head with vertex and frons irregularly punctate; mandibles with apices acute; genae irregularly punctate; sparsely covered with appressed pubescence; antennal tubercles horizontal, vaguely elevated, apices angulated; antennae exceeding elytral apices by about three antennomeres, scape conical, coarsely separately to irregularly punctate with very short, depressed hair arising from each puncture; apices of antennomeres III–VII darker, slightly enlarged and expanded; antennomeres from III laterally carinate with poriferous area on either side of carina with very short appressed pubescence; dorsum of antennomeres III–VI glabrate, finely, sparsely, irregularly punctate, punctures denser near apices, antennomeres from VII densely clothed with short appressed pubescence; antennomere III longer than I, IV shorter than III, V longer than IV and subequal to III, VI longer than V, VII subequal to VI, VIII shorter than VII, IX and X subequal



Figures 84–90. Dorsal and lateral images *S. lingafelteri* **sp. nov.**, holotype, male, Chiapas, MEX., 24 mm, and characteristics of head, pronotum and sternum. **84–85)** Dorsal and lateral images. **86)** Genae large, quadrate, margin of lower eye lobes well separated from mandibles. **86: 86a)** Dorsal anterior margin of genae ridged. **87)** Frons perpendicular, recessed between "anteocular space" (i.e., between dorsal anterior margins). **88)** Pronotum with sides rounded; disc glabrate, coarsely punctate. **89)** Proepisternum, inflated, finely, densely punctate, clearly demarcated from coarsely punctate pronotal disc. **90)** Gradually sloping and protuberant prosternal intercoxal process, ridged between coxae, and vertical behind; mesoternum with intercoxal process level with top of coxae.

to VII, XI longest, appendiculate at apical two-fifths. Pronotum 1.4 times as broad as long, rounded at sides; anterior angles inflated, broadly rounded; disc with dorsal calli absent, basal three-quarters with flattened area in middle, surface coarsely, irregularly punctate, very sparsely pubescent; proepisternum inflated, finely, densely punctate, sparsely pubescent, and demarcated from prosternum and coarsely punctate pronotal disc; prosternum transversely rugose with finely, densely punctate transverse subrectangular impressed area on each side of middle, surface moderately clothed with suberect pubescence; prosternal intercoxal process sparsely, irregularly punctate; mesosternum densely, minutely punctate in middle, densely pubescent with appressed hairs; mesosternum intercoxal process finely punctate, sparsely pubescent with appressed hairs; metasternum glabrate, sparsely punctate, and sparsely pubescent with long, whitish, suberect hairs, sides densely clothed with appressed whitish hairs; metepisternum finely, densely punctate, densely pubescent with whitish, depressed hairs. Elytra about 2.3 times longer than broad, distinctly margined laterally and along sutural margin; disc finely, rather densely punctate around scutellum, near base and humerus, along epipleural margin and apical half, remainder of the disc in middle finely, densely, shallowly punctate, very short, suberect, whitish hair arising from each puncture. Legs with femora slightly clavate, sparsely clothed with short, depressed pubescence, basal half glabrate, sparsely covered with large, very shallow punctures, apical half more densely punctate; tibiae slender, surface rugulose, densely covered with large, very shallow punctures, internally with a row of short, depressed bristles. Abdomen

glabrate, finely, shallowly and rather sparsely punctate in middle with suberect, whitish pubescence, sides more finely, densely punctate, densely pubescent with appressed short, whitish hairs; fifth sternite truncate, broadly, shallowly emarginate at apex.

Female: Unknown.

Etymology. This species is dedicated to Dr. Steven W. Lingafelter of the Animal and Plant Health Inspection Services, Plant Protection and Quarantine, United State Department of Agriculture (APHIS-PPQ-USDA) for his long service as a research entomologist specializing in the taxonomy of woodboring beetles at the Systematic Entomology Laboratory, USDA, National Museum of Natural History, Washington, DC, and as an entomologist and identification specialist at Douglas, Arizona. This author appreciates his invaluable review and comments provided for several articles published prior to this manuscript.

Type material. Holotype, male, MEXICO: *Chiapas*, Tuxtla Gutiérrez, 20 Sept. 1949, C. Bolivar (EMEC) deposited in EMEC.

Discussion. *Stenaspis lingafelteri* **new species** has characteristics that are found in other *Stenaspis* species, which include *S. castaneipennis*, *S. solitaria* and *S. verticalis*: (1) head with frons square, perpendicular, abruptly separated from anteocular spaces (Fig. 86–87); (2) proepisternum inflated, finely densely punctate, and clearly demarcated from the coarsely punctate pronotal disc (Fig. 89); (3) pronotum with anterior angles inflated and rounded, disc rather flat in middle, glabrate, dorsal calli vague or absent, coarsely punctate (Fig. 88); (4) prosternal intercoxal process protuberant and ridged between coxae, and vertical behind (Fig. 89–90); (5) mesosternal intercoxal process not protuberant, about level with top of coxae and abruptly declivous in front (Fig. 85, 90); and (6) apices of elytra rounded, unarmed (Fig. 84). The antennae of *S. lingafelteri* are sparsely, separately punctate and sparsely pubescent with short hairs on the dorsum of the scape and basal two-thirds of antennomeres III–VI, as in males of *S. castaneipennis* and *S. verticalis* (Fig. 59). *Stenaspis lingafelteri* is differentiated from the other males of the above three species by the overall coloration of the pronotal and elytral disc, slightly more elongate pronotum which is evenly rounded at the sides, antennal tubercles that are horizontal or less prominent, and by the shallow, coarsely, rugulosely punctate tibiae and femora. The lateral carina of antennomere III starts from the base in *S. lingafelteri* compared to *S. castaneipennis* and *S. verticalis*, where it starts from the apex of antennomere III or the apical half of antennomere III in *S. solitaria*. The elytra are more distinctly margined laterally and along the sutural margin in this species.

Stenaspis solitaria (Say, 1824)

(Fig. 91–94)

Type species: *Cerambxy solitarius* Say, 1824.

Callichroma solitaria Haldeman 1847: 32
Cerambyx solitaria Say 1824: 410
Cerambyx solitarius LeConte 1859a: 191
Smileceras solitarium LeConte 1850: 9; Meisheimer 1853: 101 (cat.)
Smileceras solitarius White 1853: 143; Thomson 1864: 208
Stenaspis lugubris Casey 1912: 318
Stenaspis unicolor White 1853: 78; Lacordaire 1869: 171
Steraspis unicolor Dupont 1840: 11 (misspelling)
Stenaspis solitarius LeConte 1854: 441 (dist.); LeConte 1873b: 336 (syn.)
Stenaspis solitaria LeConte 1858: 25, 40 (dist.), 1859b: 20, 1859c: 127 (dist.); Lacordaire 1869: 171; Gemminger and Harold 1872: 2967 (cat.); LeConte 1876: 519 (dist.); Bates 1880: 76 (dist.); Snow 1883: 42 (dist.); Bates 1885: 321 (dist.); Leng 1886: 62; Horn 1894: 338 (dist.); Townsend 1895: 47 (dist.); Wickham 1898: 22 (dist.); Snow 1906a: 170 (dist.), 1906b: 147 (dist.), 1906c: 179 (dist.); Fall and Cockerell 1907: 192 (dist.); Schaeffer 1908: 330 (dist.); Aurivillius 1912: 458 (cat.); Casey 1912; 318; Grossbeck 1912: 325 (dist.) Garnett 1918: 207 (dist.); Linsley 1934: 60 (dist.), 1942: 59; Blackwelder 1946: 589 (cat.); Vogt 1949: 177 (dist.); Spieth 1950: fig. 36; Gibson and Carrillo 1959: 120 (dist.); Linsley et al. 1961: 21 (dist.); Linsley 1962: 99 (biol.); Linsley and Cazier 1962: 745 (biol.); MacKay et al. 1987: 364 (dist.); Hovore et al. 1987: 297 (dist.); Hovore 1988: 28 (cat.); Chemsak et al. 1992: 86 (cat.); Terrón 1992: 288 (dist.); Monné and Giesbert 1994: 152 (cat.); Monné 1994: 35 (cat.); Noguera and Chemsak 1996: 403 (dist.); Linsley and Chemsak 1997: 434 (host); Heffern 1998: 24 (dist.); Monné 2001: 79 (host); Swift 2008: 4 (dist.).

Figures 91–102. Dorsal and lateral images of *Stenaspis solitaria*, and images from all sides of *S. superba*, holotype, female. **91–94)** *S. solitaria*, Cochise, AZ, USA. **91–92)** Male, 29 mm. **93–94)** Female, 31 mm. **95–101)** *S. superba*, holotype, female, Mojos, BOL. **98)** Image of head showing apices of mandible acute, genae large, quadrate margins of lower eye lobes well separated from mandibles. **98: 98a)** Dorsal anterior margins of genae ridged. **99)** Caudal image showing brush of hairs. **100)** Lateral image showing coarsely punctured proepisternum and epipleural margin of elytron below humerus. **101)** Ventral image showing pronotum narrower than elytra at humeri, lateral tubercles of pronotum slightly behind middle, rounded anterior angle of pronotum, and protuberant prosternal intercoxal process. **102)** Label information provided by NHRS along with photos of *S. superba*.

Redescription. Male: Length 22–35 mm. Form large, glabrate; integument concolorous black or bluish-black, rarely reddish-brown. Head with vertex and frons rugulose, irregularly punctate; mandibles with apices simple, rounded to narrowly truncate; genae nitid, irregularly punctate; antennal tubercles prominent, apices acute; antennae exceeding elytral apices by about three segments, scape conical, separately punctate with very short, depressed hair arising from each puncture; antennomeres II–VI clothed with short appressed, black hairs, antennomeres from VII densely clothed with minute, appressed pubescence; antennomeres III–VII with apices slightly enlarged and expanded, and laterally carinate from apex of III with poriferous area on either side of carina; dorsum of antennomere III with basal half finely, separately punctate, apical half densely punctate, antennomere

IV–VI finely, densely punctate, antennomere III subequal to or shorter than I, IV subequal to III, V longer than III, VI subequal to or longer than V, VII subequal to VI, VIII subequal to VII, IX subequal to VIII, X subequal to or shorter than IX, XI longest, appendiculate at apical third. Pronotum 1.5 times as broad as long, sides distinctly tuberculate slightly behind middle; anterior angles inflated, broadly rounded; disc with dorsal calli vague, two in anterior half on either side of middle, and three in basal half, one in middle and one each on either side; area between calli flattened, surface denudate, coarsely, shallowly, irregularly, punctate; proepisternum inflated, finely, densely punctate, sparsely pubescent, and clearly demarcated from coarsely punctate pronotal disc; prosternum transversely rugose, with transverse subrectangular finely, densely punctate impressed area on each side of middle; prosternal intercoxal process nitid, rugose or sparsely, irregularly punctate; mesosternum with surface nitid, anterior half and on sides finely, densely, minutely punctate, posterior half irregularly, sparsely punctate in middle; mesosternal intercoxal process sparsely pubescent; metasternum nitid, sparsely punctate, and sparsely pubescent with depressed, transparent hairs, metepisternum finely, densely pubescent with whitish, depressed hairs. Elytra about 2.4 times longer than broad, distinctly margined laterally; disc opaque, finely reticulate and separately, minutely punctate. Legs nitid, femora slightly clavate, vaguely, transversely striate, shallowly, sparsely punctate, sparsely clothed with appressed, short, black hairs, outer and inner margin with short, black, depressed bristles; tibiae slender, sparsely to densely punctate and clothed with short, black, depressed bristles denser on inner margin and in apical half. Abdomen glabrate, nitid, finely, shallowly and sparsely punctate, sparsely clothed with transparent pubescence; fifth sternite truncate, shallowly emarginate at apex.

Female: 20–36 mm. Form similar to male, head, pronotum, and appendages similar in coloration to male; antennae short, attaining middle of elytra, antennomeres II–VIII clothed with short appressed, black hairs, antennomeres from IX densely clothed with minute, appressed pubescence; apices of antennomeres III–V slightly enlarged, VI–XI gradually flattened, apices expanded and angulate; antennomere III shorter than I, IV shorter than III, V subequal to III, VI subequal to or shorter than V, antennomeres from VII–X progressively shorter, XI subequal to or longer than X and shorter than IX. Pronotum laterally tuberculate slightly behind middle; anterior angles with obtuse callus on each side; proepisternum coarsely, irregularly, sparsely punctate and not clearly demarcated from coarse punctures on pronotal disc as in male; prosternum coarsely, sparsely striate-punctate (without finely punctate transverse subrectangular area found in males). Elytra about 2.3 times longer than broad, disc and margin similar to male. Abdomen similar to male, fifth sternite truncate, occasionally indented at apex.

Materials examined. USA: California: *San Bernardino Co.* Mitchell Caverns St. Park, Park Headquarters, 4300′, Spring area, 26 Aug 1978, R.L. Aalbu (1 female, LGBC). Arizona: *Cochise Co.*: 2 mi. E. of Douglas, 2 Aug. 1994, B.K. Eya (2 males, 4 females, BKEC); 1 mi. N Rodeo, 23 Aug. 1972, D. Veirs (1 male, 1 female, BKEC); Fairbank, 27 Aug 1976, R.L. Aalbu (1 female, LGBC). *Pima Co.*: 8 mi S.E. Continental, 27 Aug. 1976, R.L. Aalbu (1 male, LGBC); Madera Canyon, 6 Aug. 1991, N.J. Smith (1 male, LGBC), 27 Aug. 1975, L. Bezark, G. Nishida, C. Kitayama, and B. Tilden (8 males, 4 females, LGBC), 31 Aug. 1975, L. Bezark, G. Nishida, C. Kitayama, and B. Tilden (4 males, 2 females, LGBC). *Santa Cruz Co.*: Madera Canyon, 7 Aug. 1991, N.E.C. Smith (1male, LGBC), 27 Aug. 1975, L. Bezark, G. Nishida, C. Kitayama, and B. Tilden (3 males, 5 females, BKEC, LGBC); Nogales, 28 Aug. 1976, R.L. Aalbu (1 male, 1 female, LGBC). *Sonora Desert*: 30 Aug. 1964, R.G.C. (1 male, BKEC). Texas: *Guadalupe Mts. Nat. Park*: July 1972, K. Solomon (1 male, LGBC). MEXICO: *Baja Cal. Sur*: 14.1 mi W. on Ramal a Los Naranjos, 15 Sept. 1988, A.J. Gilbert (1 female, LGBC). *Sinaloa*: Guamachil, 6 mi. S., 28 July 1966, J.A. Chemsak, E.G. and J.M. Linsley (1 female, BKEC). *Sonora*: Navajoa, 18 Aug. 1962, A.E. Michelbacher (1 male, BKEC).

Discussion. The apices of the mandibles are simple but rounded or narrowly truncate in *S. solitaria* (Fig. 52) compared to other species with the apices of the mandibles simple and acute (Fig. 51, 53). The antennomeres are finely, densely punctate from the apical half of the third and more densely clothed with appressed, short, black hairs (Fig. 60). Other *Stenaspis* species have antennomeres III–IV more sparsely punctate (Fig. 57–59, 61). Antennomere III is subequal to or shorter than the scape in *S. solitaria* male compared to other males with antennomere III longer than the scape. The sides of the pronotum are more distinctly tuberculate slightly behind the middle in both sexes (Fig. 33, 36). The elytral discs are opaque, finely reticulated and separately, minutely punctate. The femora appear more distinctly compressed or flattened in this species than others. Casey (1912: 318) described *Stenaspis lugubris* Casey as a species separate from *S. solitaria* based on the smaller size and antennae shorter in males, not more than a third longer than the body; however, such allometric variations in the length of the antennae (and antennomeres) are commonly seen in trachyderine species of variable size.

Stenaspis superba Aurivillius, 1908

(Fig. 95–101)

Stenaspis superba Aurivillius 1908: 5, 1912: 458 (cat.); Melzer 1932: 422; Blackwelder 1946: 589 (cat.); Linsley 1961: 632; Monné and Giesbert 1994: 152 (cat.); Monné 1994: 35 (cat.); Wappes et al. 2006: 23 (dist.).

Photographic Material Examined. Holotype, female, BOLIVIA: Mojos, N. Holmgren, June on the banks of stream, NHRS-JLKB 000071808. Six photographs provided by J. Bergsten of the Swedish Museum of Natural History (NHRS, Naturhistoriska Riksmuseet) as follows: NHRS-JLKB 000071808_caud.tif; NHRS-JLKB 000071808_dors.tif; NHRS-JLKB 000071808_fron.tif; NHRS-JLKB 000071808_late.tif; NHRS-JLKB 000071808_vent.tif.

Discussion. Aurivillius (1908: 5) described *S. superba* (length 38 mm) as a species with integument that is black, the pronotum and elytra orange with three nitid black calli on pronotal disc, two in anterior half and one medially in the posterior half. The head is punctate, vertex rugulose and uneven. The antennae barely reach middle of elytra, scape is conical, sub-nitid, sparsely punctate, and third antennomere shorter than the scape. The prothorax is described as being deeply rugose, punctate, convex with prominent tubercles on each side, surface clothed with short, erect golden-brown hairs, and the apical and basal margins narrowly black with dense black pubescence. The scutellum is narrow, elongate, black, canaliculate in the middle and irregularly, sparsely punctate. The elytra are strongly rugose and clothed with a few short hairs at the base, less rugose apically and denudate from the middle, and apices broadly rounded and unarmed. The sternum is all black, the prosternum is very rugulose, meso- and metasternum densely punctate and abdomen sparsely punctate. According to Aurivillius, *S. superba* is differentiated from all other known species of *Stenaspis* by the short antennae, and by the coloration and sculpture of the pronotum and elytra, which are reminiscent of an orange skin.

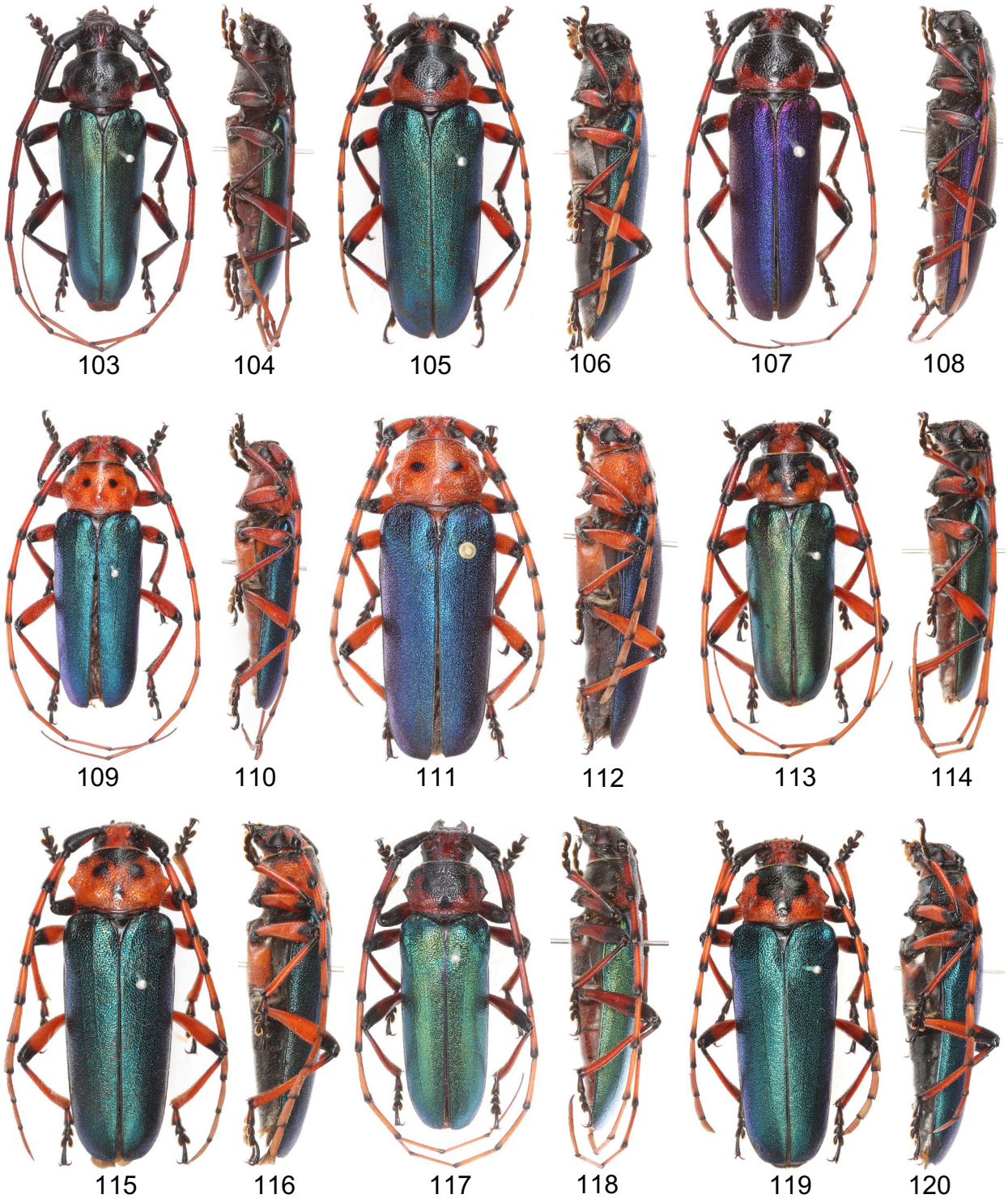
Examination of holotype photographs shows that *S. superba* appears to have the characters representative of *Stenaspis* as follows: (1) head with frons large, square and recessed between the dorsal anterior margin of gena (Fig. 98, 100); (2) prosternal intercoxal process protuberant and ridged between coxae and vertical behind (Fig. 101); (3) mesosternal intercoxal process not protuberant, level with coxae, and abruptly declivous in front (Fig. 100); (4) pronotum narrower than base of elytra at humeri, lateral tubercles placed slightly behind middle, and anterior angle broadly callused (Fig. 101); (5) proepisternum of thorax coarsely punctate (Fig. 40); and (6) elytra distinctly margined laterally (Fig. 100), and apices rounded and unarmed (Fig. 95, 97). Compared to other *Stenaspis* species, *S. superba* has a pronotal disc that is more convex (Fig. 40) with two prominent anterior dorsal calli, and a disc surface that is more coarsely punctate. Also, the elytra (E) are more elongate relative to pronotum (P), where the E/P ratio is 4.8 compared to other species where E/P ranges from 3–3.8. The other four species have the pronotal disc flattened (Fig. 16, 22, 31, 34, 37) and glabrate with vaguely visible dorsal calli. Although *S. superba* is geographically isolated in Bolivia compared to all other known species found in USA and Mexico, it has many characteristics that are commonly found in *Stenaspis*; therefore, at this time this species is retained in this genus until a male is captured and the pattern of sexual punctation on the thorax is examined. Males of this group of trachyderines (i.e., *Callistochroma*, *Crioprosopus* and *Stenaspis*) have additional characteristics that substantiate placement of species into their appropriate genera.

Stenaspis verticalis Audinet-Serville, 1834

(Fig. 103–136)

Stenaspis verticalis Audinet-Serville 1834: 52; Dupont 1838: 51; Castelnau 1840: 419; Guérin-Méneville 1844: 218 (syn.); White 1853: 78 (syn.); Strauch 1861: 127 (cat.); Thomson 1864: 208; Lacordaire 1869: 171; Chenu 1870, 311; Gemminger and Harold 1872: 2967 (cat.); Bates 1880: 76 (dist.), 1885: 321 (dist.); Leng 1886: 62; Townsend 1895: 47 (dist.); Fall and Cockerell 1907: 192 (dist.); Casey 1912: 319; Aurivillius 1912: 458 (cat.); Perkins and Swezey 1924: 51 (host.); Smyth 1934: 117 (biol.); Blackwelder 1946: 589 (cat.); Gibson and Carrillo 1959: 120 (dist.); Linsley 1962: 98; Chemsak et al. 1980: 33 (dist.); Terrón 1992: 288 (dist.); Chemsak et al. 1992: 86 (cat.); Chemsak and Noguera 1993: 64 (dist.); Napp 1994: 279; Monné 1994: 35 (cat.); Monné and Giesbert 1994: 152 (cat.); Noguera and Chemsak 1996: 403 (dist.); Noguera et al. 2002: 624 (dist.); Turnbow et al. 2003: 18 (dist.); Hovore 2006: 374 (dist.); Noguera et al. 2007: 312 (dist.); Maes et al. 2010: 618 (dist.); Garcia Morales et al. 2014: 106 (dist.); Noguera and Gutiérrez 2016: 659 (dist.).
Trachyderes superbus Newman 1838: 493.

Redescription. Male: Length 17–33 mm. Form large, robust; integument reddish-brown to black; head, pronotum, and appendages at least partly red or bright reddish-orange, elytra metallic blue, green or purple, scutellum



Figures 103–120. Dorsal and lateral images of *Stenaspis verticalis*. **103–104)** *S. v. arizonicus* (Casey 1912), male, 29 mm, Pima Co. AZ, USA. **105–106)** *S. v. arizonicus*, female, 27 mm, Pima Co. AZ, USA. **107–108)** Male, 23 mm, Val Verde Co. TX, USA. **109–110)** *S. v. insignis* (Casey 1924), male, 30 mm, Medina Co. TX, USA. **111–112)** *S. v. insignis*, female, 28 mm, Comal Co. TX, USA. **113–114)** *S. v. insignis*, male, 29 mm, Cameron Co. TX, USA. **115–116)** *S. v. insignis*, female, 27 mm, Cameron Co. TX, USA. **117–118)** Male, 23 mm, Nuevo Leon, MEX. **119–120)** Female, 31 mm, Nuevo Leon, MEX.

all black or basal half brownish and apically black. Head with vertex and frons rugulose, irregularly punctate, glabrate; mandibles with apices acute; genae irregularly punctate; sparsely covered with appressed pubescence; antennal tubercles prominent, apices acute; eyes moderately large, finely faceted, upper lobes small, well separated; antennae elongate, 11-segmented, exceeding elytral apices by about four segments, scape conical, coarsely separately to irregularly punctate with very short, depressed hair arising from each puncture; apices of antennomere III–VII slightly enlarged and expanded; antennomeres from apex of III laterally carinate with poriferous area on either side of carina, dorsum of antennomeres III–VI glabrate, nitid, finely, sparsely, irregularly punctate, apices densely punctate and densely clothed with short, black depressed hairs, antennomeres from VII densely clothed with short appressed pubescence; antennomere III longer than I, IV shorter than III, V longer than IV, VI subequal to V, VII subequal to VI, VIII subequal to or shorter than VII, IX shorter than VIII, X shorter than IX, XI longest, appendiculate at apical two-fifth. Pronotum 1.5–1.6 times as broad as long, rounded to broadly angulate at sides; anterior angles inflated, broadly rounded; disc with dorsal calli vague, two in anterior half on either side of middle, and three in basal half, one in middle and one each on either side; area between calli flattened, surface coarsely, irregularly punctate, sparsely covered with whitish, transparent hairs; proepisternum inflated, finely, very densely punctate, sparsely pubescent, and demarcated from prosternum and coarsely punctate pronotal disc; prosternum transversely rugose with finely densely punctate transverse subrectangular impressed area on each side of middle; prosternal intercoxal process nitid, irregularly punctate; mesosternum with surface nitid, anterior half and on sides finely, densely, minutely punctate and densely pubescent with appressed, transparent hairs, posterior half sparsely, irregularly punctate in middle; mesosternal intercoxal process sparsely pubescent on sides; metasternum nitid, sparsely punctate, and sparsely pubescent with long, depressed, whitish hairs, sides occasionally densely pubescent; metepisternum densely, minutely punctate, densely pubescent with whitish, depressed hairs. Elytra about 2.2–2.4 times longer than broad, distinctly margined laterally; disc finely to coarsely punctate. Legs with femora slightly clavate, finely, sparsely to coarsely punctate, surface sparsely clothed with short, depressed hairs, outer margin with short, depressed bristles; tibiae slender, surface glabrate, sparsely to coarsely, densely punctate and sparsely covered with short, depressed hairs, inner margin with a row of short, depressed bristles in apical half. Abdomen glabrate, finely, shallowly and rather sparsely punctate in middle, sparsely pubescent with suberect hairs, sides more finely, densely punctate, densely pubescent with appressed, short hairs; fifth sternite truncate to broadly, shallowly emarginate at apex.

Female: 19–37 mm. Form similar to male, head, pronotum and appendages similar in coloration to male; antennae reaching apical fifth of elytra to attaining apices, scape conical, coarsely, separately punctate to finely, separately punctate; apices of antennomeres III–VI slightly enlarged, VII–XI gradually flattened, apices expanded and angulate; antennomere III longer than I, IV shorter than III, V shorter than III, VI subequal to V, antennomeres from VII–X progressively shorter, XI longer than X and subequal to IX, appendiculate at apical quarter. Pronotum laterally tuberculate in middle; anterior angles with obtuse callus on each side; disc finely, sparsely, irregularly punctate to coarsely, contiguously punctate, sparsely covered with transparent, erect hairs; proepisternum coarsely, irregularly punctate and not clearly demarcated from prosternum and pronotal disc as in male; prosternum transversely rugose and coarsely striate-punctate (without finely punctate transverse subrectangular area found in males). Abdomen similar to male, fifth sternite rounded to truncate, shallowly emarginate or vaguely indented at apex.

Materials examined. USA: Texas: *Val Verde Co*.: near Langtry, 13 Oct. 1994, on *Baccharis* Linnaeus (Asteraceae), D.W. Sundberg (1 male, DJHC). MEXICO: *Nuevo Leon*: 28 km W. Linares Viejo y La Palma, HWY58, 22 Oct. 2004, B.K. EYA (4 females, BKEC). *Nayarit*: Volcan Ceboruco, 5–15 km W. Jala, 15 Oct. 2001, R.L. Penrose (1 female, LGBC). *Jalisco*: Est. Biol. Chamela, 1/8 July 1988, J.A. Chemsak (1 male, 1 female, BKEC), 23 Oct. 1995, B.K. EYA (1 female, BKEC); Planta La Meza, 13.8 km N.E. San Gabriel, Hwy 432, 18 Oct., B.K. Eya (1 female, BKEC); Ajijic, 1585 m. 11 Sept. 2012, G. Nogueira (1 male, DJHC), 10/15 Oct. 1989, D. Curoe (1 male, DJHC); Volcan de Tequila, 1380 m., 25/30 Sept. 2012, R. Cunningham, L. Bezark (1 male, 1 female, LGBC). *Michoacan*: 8.3 km El Puerto (Jct. to Cotija), 19°49′N, 102°37′W, 1800 m., 18 Oct. 1988, A.D. Mudge (1 female, DJHC). *Puebla*: 22 km N.W. Jct. 190/125, 9 km N.W. Oaxaca border, 14 Oct. 2005, B.K. Eya (1 male, BKEC). *Guerrero*: 23 km W. Iguala, 11/16 Sept. 1982, elev. 1040 m., J.A. Chemsak, J.A. Powell (1 female, BKEC). *Oaxaca*: 1 mi S.E. Tutla, 6500′, 7 Oct. 1977, J. Powell, J. Chemsak, T. Eichlin, and T. Friedlander (1 male, BKEC); 10 km NNE Huajuapan de Leon, 28 Oct. 1990, A.D. Mudge (3 males, 4 females, DJHC, LGBC), 1 Nov. 1990, A. Mudge (3 males,

LGBC), 1 Nov. 1990, A.D. Mudge (1 male, DJHC); 12 km NNE Huajuapan de Leon, 1 Nov. 1990, A.D. Mudge (2 males, LGBC); 7 km S. Huajuapan de Leon, 1700 m., 28 Oct. 1990, R.L. Westcott (1 female, LGBC).

Discussion. According to Linsley (1962: 98), this species exhibits considerable geographical variation in color and sculpturing as described by Bates (1885: 321). *Stenaspis verticalis* males also show considerable allometric variation in the length of antennomeres depending on the size of specimen, where larger individuals (31–33 mm) have antennomere IV longer than III and antennomeres V–X progressively longer, whereas in smaller specimens (17–21 mm) the length of antennomere IV is shorter than III, V longer than IV, VI subequal to or longer than V, and VII–X progressively shorter or subequal to the previous antennomeres. Antennomere XI in males of *S. verticalis* is the longest and is distinctly appendiculate as though there is a twelfth antennomere but the integument around the appendicular area is definitely fused. In large males (≥30 mm) the finely, densely, punctate transverse subrectangular impressed areas on each side of the prosternum are fused in the middle to form one continuous transverse subrectangular impressed area (Fig. 17), whereas in males smaller than 30 mm the transverse subrectangular areas are well separated (Fig. 20, 29). According to Casey (1912), the holotype of *Stenaspis verticalis verticalis* Audinet-Serville, 1834 is from Iguala in Guerrero, Mexico although the specific location is not noted by Audinet-Serville (1834) and Dupont (1834) other than just Mexico as the type locality. There are two subspecies named from the USA: *Stenaspis verticalis insignis* Casey, 1924, and *Stenaspis verticalis arizonicus* Casey, 1912.

***Stenaspis verticalis arizonicus* Casey, 1912** (Type locality: Arizona, USA). *Stenaspis verticalis*: LeConte 1858: 40 (cat.). *Stenaspis arizonicus* Casey 1912: 318. *Stenaspis verticalis arizonicus* Linsley 1962: 99; Chemsak et al. 1992: 86 (cat.); Monné and Giesbert 1994: 152 (cat.); Monné 1994: 35 (cat.); Lingafelter et al. 2014: 20 (holotype); Heffern et al. 2018: 746 (biol.).

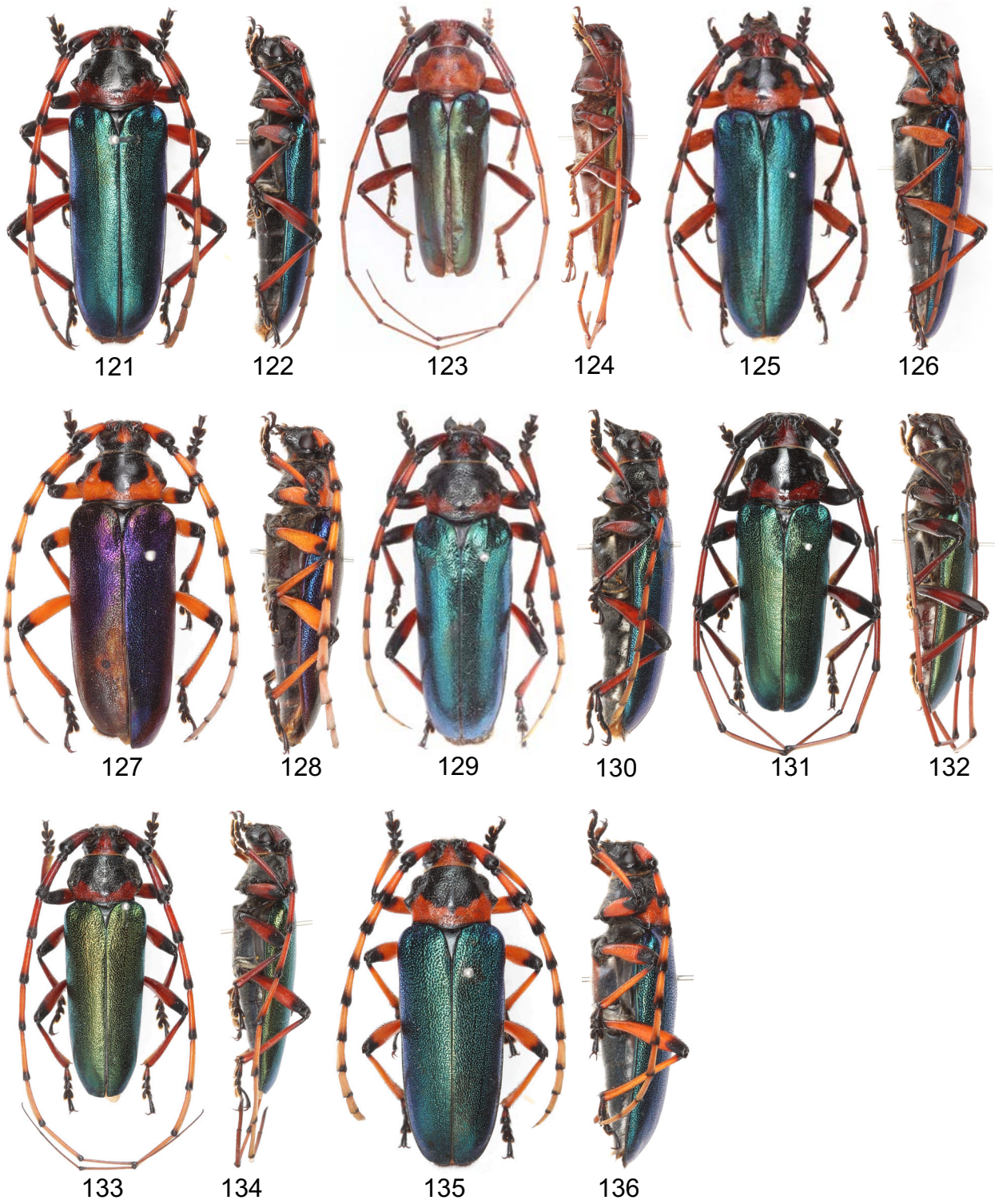
Materials examined. USA: Arizona: *Pima Co.*: Baboquivari Mountains, Brown Canyon, 10/11 July 2001, 31°46′ 23″N, 111°33′31″W, W. K. Will (1 male, 1 female, LGBC); Kitt Peak, 6 Aug. 1994, B.K. Eya (1 female, BKEC), Kitt Peak Obs. Rd. on roadside flower, 18 Sept. 1979, C.Y. Kitayama (1 male, LGBC); Lower Madera Canyon near old Missile Base, 10 Aug. 1990, R. Duff (1 female, LGBC); Kitt Peak Rd., 1 Sept 1979, L. Bezark, G. Nishida, C. Kitayama, B. Tilden (1 male, LGBC); Madera Canyon, 13 Aug. 1988, D. Ahart (1 male, LGBC). *Santa Cruz Co.*: Pena Blanca Lake, 26 Aug. 1975, L. Bezark, G. Nishida, C. Kitayama, B. Tilden (1 female, LGBC).

Discussion. According to Linsley (1962: 99), *S. v. arizonicus* has the elytra finely and densely punctate, usually green or greenish-blue. The pronotum is black and margined posteriorly with red. The ventral surface is reddish-brown or piceous, rarely with any red on metasternum. According to Casey (1912: 319), the very dense sculpture of the elytra is a striking character that differentiates *S. v. arizonicus* from *S. v. verticalis* Audinet-Serville. Examination of specimens from Arizona, which is the northwesternmost range of this species, *S. v. arizonicus* differs from the other subspecies by the darker, duller integument (Fig. 103–106, 146) and finely, confluently, vermiculate-punctate elytra (Fig. 137). Moving eastward into Texas the punctures on the elytra and scape become coarser, and the integument of the pronotum is more polished, as in the example from Val Verde County, Texas (Fig. 107–108, 138, 147).

***Stenaspis verticalis insignis* Casey, 1924** (Type locality: Texas, Comal Co., USA). *Stenaspis insignis*: Casey 1924: 262; Vogt 1949: 177 (dist.). *Stenaspis verticalis insignis*: Linsley 1962: 99; Hovore et al. 1987: 297 (dist.); Chemsak et al. 1992: 86 (cat.); Monné and Giesbert 1994: 152 (cat.); Monné 1994: 35 (cat.); Lingafelter et al. 2014: 80 (holotype).

Materials examined. USA: Texas: *Bexar Co.*: Petrenko Rd. 5 Oct. 1994, D.W. Sundberg (1 male, DJHC); Camp Bullis, NW. San Antonio, 25 Sept. 1960, E.L. Smith (1 female, LGBC). *Medina Co.*: 8 mi. W. Median, 15 Sept. 2013, bait, D.W. Sundberg (1 female, DJHC), 4 Oct. 2013, bait, D.W. Sundberg (1 male, DJHC). *Comal Co.* New Braunfels, 2 Oct. 1984, D. Sundberg (1 female, DJHC).

Also tentatively assigned to this subspecies are nine additional specimens from Texas as follows: *Jim Wells Co.*: Premont, 13 Oct. 1984, D.J. Heffern (1 female, DJHC). *San Patricio Co.*: 4–5 mi. N. Sinton, 12 Oct. 1985, D.J. Heffern (1 female, DJHC); Sinton Area, 9 Nov. 1985, D.J. Heffern (1 male, DJHC). *Cameron Co.*: Sabal Palm Grove, 25/27 Oct. 1986, Heffern and Brattain (1 male, 1 female, DJHC), Hwy 4, Palmito Hill, 21 Oct. 1989, D.J. Heffern (1 female, DJHC); 16 km W. Boca Chica, 24 Oct. 1990, collected from *Baccharis* Linnaeus (Asteraceae), L.G. Bezark (1 male, 2 females, LGBC).



Figures 121–136. Dorsal and lateral images of *Stenaspis verticalis* (cont.) **121–122)** Female, 26 mm, Nayarit, MEX. **123–124)** Male, 31 mm, Jalisco, MEX. **125–126)** Female, 37 mm, Jalisco, MEX. **127–128)** Female, 23 mm, Michoacán, MEX. **129–130)** Female, 26 mm, Guerrero, MEX. **131–132)** Male, 32 mm, Puebla, MEX. **133–134)** Male, 27 mm, Oaxaca, MEX. **135–136)** Female, 27 mm, Oaxaca, MEX.

Discussion. Examination of specimens of *S. v. insignis* from the vicinity of San Antonio, Texas (Bexar, Comal, and Medina Counties), which is the northeasternmost range of this species, shows that this subspecies differs from *S. v. verticalis*, and *S. v. arizonicus* by the following characteristics: (1) striking bright reddish coloration of the integument (Fig. 109–112); (2) pronotum that is polished wholly or predominately bright reddish, coarsely, deeply, irregularly punctate, and frequently with two black spots in the anterior half (Fig. 148); (3) prosternum, meso- and metasternum that are mostly or partly reddish; (4) scape and elytra that are coarsely, contiguously punctate (Fig. 139, 148); and elytra that are usually metallic bluish. The antennae of both sexes of *S. v. insignis* are shorter than in the other subspecies, and usually about four-fifths the length of the body in females. According to Casey (1924: 263), other than from the overall color of integument, *S. v. verticalis* differs from *S. v. insignis* by the sculpture of the elytra where the punctures are well separated. Moving southward from Comal to San Patricio and Cameron Counties in Texas, and further into Nuevo Leon, Mexico, the antennae of both sexes are longer, and in females almost attaining the apex of the elytra or slightly exceeding elytra (Fig. 115–116). Also, there is a darkening of the integument of sternum, proepisternum and pronotal disc (i.e., area which is encompassing the two calli in the anterior half, the middle callus in posterior half, and the anterior margin), and the base of the scape especially in males (Fig. 113–120). A gradual geographical change in metallic coloration of the elytra from blue to greenish is also noticeable.

In general, further south into Mexico (i.e., Nayarit, Jalisco, Michoacán, Guerrero and Puebla) the punctures on the pronotal disc and scape become shallower, finer and sparser (Fig. 149–153), and the basal half of the elytral discs are more separately punctate (Fig. 140–144). There is an exceptional male specimen from Chamela, Jalisco (Fig. 123–124, 150) with dull reddish integument which resembles *S. v. insignis*, however, the pronotal disc is coarsely, shallowly and contiguously punctate (Fig. 150) and the elytral disc is finely, separately punctate (Fig. 141). *Stenaspis v. insignis* has a polished pronotal disc that is coarsely, deeply and irregularly punctate, and the elytra more coarsely, contiguously punctate (Fig. 139). Moving further southeastward from Jalisco into Michoacán, Guerrero and Puebla the elytra of *S. v. verticalis* become coarser but separately punctate (Fig. 142–144), and further into Oaxaca the elytra become coarsely, deeply and contiguously punctate (Fig. 145), more consistently aeneous green in coloration, and the basal half of the scape is more consistently reddish in all specimens examined (Fig. 154).

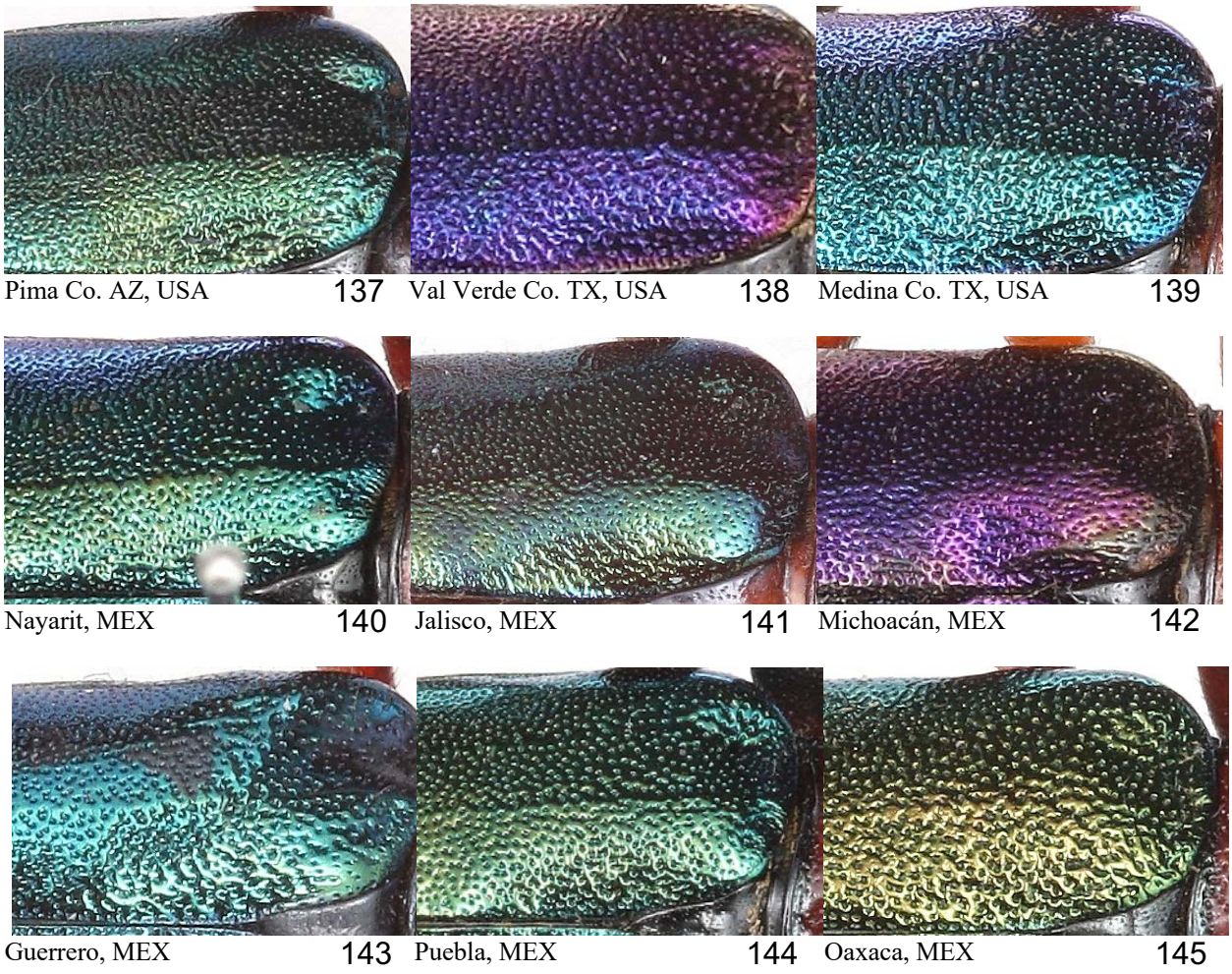
Stenaspis validicornis Casey, 1912 (Type locality: Guerrero, Mexico). *Stenaspis validicornis* Casey 1912: 319; Blackwelder 1946: 589 (cat.); Chemsak et al. 1992: 86 (cat.); Monné and Giesbert 1994: 152 (cat.); Monné 1994: 35 (cat.); Noguera and Chemsak 1996: 403 (dist.); Lingafelter et al. 2014: 339, 369 (lect.).

According to Casey (1912: 319), *S. validicornis* is one of the various forms of the *verticalis* group, where the males are defined by differences in color of the integument and punctures on the elytral disc and prosternum. The various forms of the *verticalis* group examined by Casey are based on male characteristics only. Casey (1924: 263), wrote: "*validicornis* may be regarded as a subspecies or variety of *verticalis* Serv." According to Mayr (1969: 41), "subspecies are normally allopatric," and when several subspecies are reported from the same locality, it strongly indicates an incorrect usage of the term subspecies. Since the type localities of *S. v. verticalis* and *S. v. validicornis* are both from Guerrero, according to Casey (1912: 319) in close proximity to each other, *S. v. validicornis* is considered to be consubspecific with *S. v. verticalis*. This conclusion is based on the polymorphic nature of *S. verticalis* as a species, which exhibits a notable geographic variation in color and sculpturing and the extensive range in distribution from the southwestern United States to southeastern Mexico. *Stenaspis v. validicornis* is in the middle of the geographic range of this species and based on the description provided by Casey (1912) *S. v. validicornis* does not exhibit enough variation in its form and sculpturing to be considered a separate subspecies. A photograph of *S. validicornis* holotype (Bezark 2020, id: 26567) does not show any notable difference in the overall appearance compared to *S. verticalis* (e.g., *S. verticalis*, syntype, Bezark 2020, id: 18558).

Crioprosopus plagiatus (Waterhouse, 1877), new combination

(Fig. 155, 158)

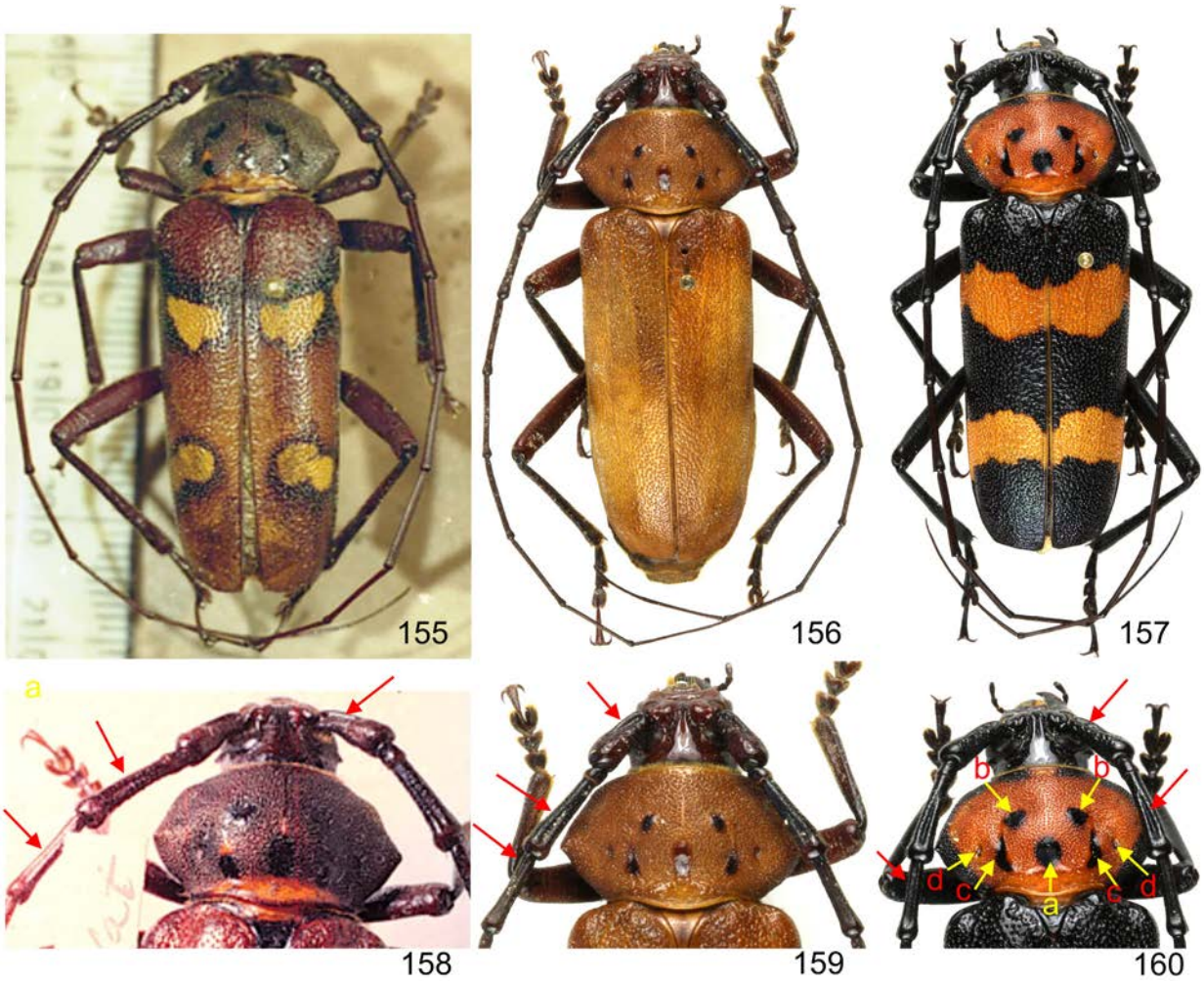
Stenaspis plagiata Waterhouse 1877: 12; Bates 1880: 76; Lameere 1883: 40 (cat.); Waterhouse 1890: 11; Aurivillius 1912: 458 (cat.); Blackwelder 1946: 589 (cat.); Chemsak et al. 1992: 86 (cat.); Monné and Giesbert 1994: 152 (cat.); Monné 1994: 34 (cat.); Hovore 2006: 374 (dist.).



Figures 137–145. Variations in elytral sculpturing of *Stenaspis verticalis* from northwestern USA to southeastern MEX. **137)** *S. v. arizonicus*, male, Pima Co. AZ, USA with finely, confluently, vermiculate-punctate elytra. **138)** Male, Val Verde, TX, USA with coarser punctures. **139)** *S. v. insignis*, male, Medina Co. TX, USA with coarsely, contiguously punctate metallic bluish elytra. **140)** Female, Nayarit, MEX with separately punctate elytra. **141)** Male, Jalisco, MEX with finer, separately punctate elytra. **142)** Female, Michoacán, MEX with coarser, separately punctate elytra. **143)** Female, Guerrero, MEX with even coarser punctures than female from Michoacán. **144)** Male, Puebla, MEX with punctures well separated and sparser. **145)** Male, Oaxaca, MEX with much coarser, separately punctate aeneous green elytra.

Discussion. Waterhouse (1877: 12) described *S. plagiata* as a species of *Stenaspis*. According to his description, *S. plagiata* is elongate, parallel-sided with a thorax that is almost twice as broad as long, convex, closely rugulose with five nitid black impressions on the disc, and side angulate in middle. The elytra are scarcely narrower than the thorax. Based on the photographs of *S. plagiata* (Bezark 2020, id: 18552 and 18553), the pronotum is as wide or slightly wider than the elytra at the humeri, and the disc is densely, contiguously punctate with a black glabrate macula post-medially in middle and with six black, glabrate maculae on either side, a pair ante-medially, and another pair post-medially on each side of the middle macula, and another pair of maculae on each side in a depressed area adjacent to the lateral tubercles (e.g., Fig. 160 a–d). The elytra are coarsely, confluently punctate. These characteristics of *S. plagiata* (Fig. 155, 158) are shared with *Crioprosopus wappesi* Eya (Fig. 156, 159) and *Crioprosopus nieti* Chevrolat (Fig. 157, 160), and the overall resemblance of *S. plagiata* is strikingly similar to these two species of *Crioprosopus*. The four *Stenaspis* species examined (i.e., *S. castaneipennis*, *S. solitaria*, *S.*

Figures 146–154. Changes in sculpturing of scape and pronotum of *Stenaspis verticalis* from northwestern USA to southeastern MEX. **146)** *S. v. arizonicus*, male, Pima Co. AZ, USA with darker, duller integument, and more finely punctate scape. **147)** Male, Val Verde Co., TX, USA with coarser punctures on scape and pronotum. **148)** *S. v. insignis*, male, Medina Co. TX, USA with coarsely, contiguously punctate scapes, and pronotal disc that is polished, predominately bright reddish, and with two black spots in anterior half. **149)** Female, Nayarit, MEX with polished, sparsely, finely punctate scape and pronotum. **150)** Male, Jalisco, MEX resembling *S. v. insignis* but with dull reddish integument and pronotal disc that is coarsely, shallowly and contiguously punctate, and scape separately punctate. **151)** Female, Michoacán, MEX with sparsely, finely punctate scape and pronotum. **152)** Female, Guerrero, MEX with sparsely, finely punctate scape and coarsely punctate pronotum. **153)** Male, Puebla, MEX with sparsely, shallowly punctate scape and pronotal disc. **154)** Male, Oaxaca, MEX with more densely punctate pronotal disc and basal half of scape that is more consistently reddish.



Figures 155–160. Images of dorsum and antennomeres I–IV of *Crioprosopus*. **155)** *Crioprosopus plagiatus* (Waterhouse), male, holotype, Guatemala City, GTM (BMNH) (Bezark 2020, id:18552). **156)** *C. wappesi*, male, Baja Verapaz, GTM. **157)** *C. nieti*, male, Veracruz, MEX. **158)** *C. plagiatus* with impressed or canaliculate basal half of scape and canaliculate dorsum of antennomeres III–IV (red arrows) (Bezark 2020, id: 18553). **159–160)** *C. wappesi* and *C. nieti* with canaliculated scape and dorsum of antennomeres III–IV (red arrows) as found in *C. plagiatus*. **160)** *C. nieti* used as an example to show arrangement of glabrate maculae on pronotal disc (yellow arrows) as found in *C. plagiatus* and *C. wappesi*. **160: a)** Black glabrate macula at middle post-medially. **160: b–d)** Six black, glabrate maculae on either side. **160: b)** Antemedial pair. **160: c)** Postmedial pair on each side of middle macula (160a). **160: d)** Pair of maculae on each side in a depressed area adjacent to lateral tubercles.

superba and *S. verticalis*) all have the pronotum narrower than the base of the elytra at the humeri, and discs that are more sparsely and irregularly punctate. Furthermore, *S. plagiata* has the signature impression in the basal half of the scape found in *Crioprosopus*, and canaliculations on the dorsum of antennomeres III and IV, which are evident from the photos (Bezark 2020, id: 18552, 18553). Therefore, *Stenaspis plagiata* is transferred to *Crioprosopus* as a new combination, *Crioprosopus plagiatus* (Waterhouse), **new combination**, although the actual specimen from the British Museum of Natural History was not examined.

I would like to provide an interesting side note concerning the name or word *plagiatus* or *plagiata* that appears in the Latin description of *S. solitaria* (e.g., Thomson 1864: 208) or as a species name of a damselfly (e.g., *Lestes plagiatus* (Burmeister)). As described by Fliedner (2006), *plagiatus* does not translate as "kidnapped" as defined in a Latin dictionary but the etymology of the name "*plagiatus* or *plagiata*" is from Late Latin "*plagio-*", from Ancient Greek πλάγιος (plágios or "oblique, sideways or transverse") and the Latin suffix -atus (marked

with or equipped with) or provided with oblique markings. In the case of the damselfly *L. plagiatus* it refers to the conspicuous white band on either side of the thorax from the base of the rear wings to the middle pair of legs. For *C. plagiatus* (Waterhouse) it refers to the presence of transverse yellow markings on the elytra. Another example is the yellow tomentose spots in a species of Staphylinidae (*Sphaerobulbus biplagiatus*) (Smetana 2006). Thomson (1864: 208) writes "Prothorax dorso vel plagiatus, vel tuberculatus, vel inaequalis" describing *Smilecerus* LeConte (i.e., *S. solitaria*), which appears to be describing the anterior angle and lateral tubercles of pronotum as "prothorax ridged and oblique, and tuberculate, and unequal."

The following is the revised couplets to key for the species of the genus *Crioprosopus*:

Amendment to the key to species of the genus *Crioprosopus* Audinet-Serville (Eya 2015: 376)

1. Elytra metallic green (or blue) or rusty reddish-brown with metallic green-golden yellow luster **2**

— Elytra not metallic, black with yellow markings, yellowish with dark markings, brownish with yellowish maculae or entirely yellowish-brown with no markings **9**

2(1). Pronotal disc densely punctate from apex to base with a glabrous band extending down the middle; antennae usually attaining or exceeding apex of elytra . . . . . **male, (continue to couplet 3, Eya 2015: 376)**

— Pronotal disc glabrate; antennae usually much shorter, not attaining apex of elytra. . . . . **female, 18**

9(1). Elytra or pronotum with dark or black maculae or fascia; scutellum triangular, as long as wide **10**

— Elytra and pronotum immaculate, concolorous, castaneous to darker reddish brown; scutellum triangular, flat, emarginated medially at base; Venezuela . . . . . ***C. tricolor* (Waterhouse), male**

10(9). Pronotum large, as wide or wider than elytra at base, disc densely punctate from apex to base, sides with lateral tubercles obtuse or broadly angulate. **11**

— Pronotum small, narrower than elytra at base, disc entirely glabrous or sparsely, separately punctate, lateral tubercles smaller, acute **14**

11(10). Pronotum with obtuse lateral tubercles or side angulate, recurved upward, disc with small dark glabrate spot in middle of posterior half, macula (or contiguous pair of maculae) on each side, a pair antemedially and another on the outside of the postmedial pair of maculae; elytra coarsely, confluently punctate at base **12**

— Pronotum inflated, sides obtusely angulate, confluently punctate, disc with two to five linearly impressed maculae in posterior half; elytra flavotestaceous, finely punctate, dark spots on elytra at anterior margin adjacent to scutellum, transverse maculae behind middle adjacent to suture, and irregular band or maculae apically; eastern Mexico, Honduras . . . . . ***C. servillei* Audinet-Serville, male (i.e., *C. divisus* Bates)** (Eya 2020: 8, fig. 21, 24)

12(11). Elytra with a transverse orange band or yellow maculae at basal third, another at apical third **13**

— Elytra without transverse bands; head, antennae and legs reddish brown; apices of antennomeres not angulate; Guatemala (Fig. 156) . . . . . ***C. wappesi* Eya**

13(12). Elytra with a transverse orange band at basal third, another at apical third; head, antennae, and legs black; antennae from antennomere V expanded externally, apices angulate; southwestern Mexico to Costa Rica (Fig. 157) . . . . . ***C. nieti* Chevrolat**

— Elytra with yellow maculae with dark margin at basal third, another at apical third; head, antennae, and legs dark reddish-brown; apices of antennomeres not angulate; Guatemala (Fig. 155) . . . . . ***C. plagiatus* (Waterhouse) comb. nov.**

14(10). Elytra with 2 or 3 longitudinal costae, surface either finely separately punctate or densely punctate . . . . . **15** (Eya 2020: 7, fig. 16—18)

— Elytra with disc glabrous, surface impunctate. **17**

15(14). Pronotum glabrous or glabrate and finely, sparsely punctate; elytra disc smooth, finely, shallowly punctate **16**

— Pronotum glabrate, rather coarsely, sparsely, irregularly punctate; elytra with black corrugated transverse band in the middle, which narrows at sutural margin, disc finely, densely and rather deeply punctate in middle, Costa Rica, Panama . . . . . ***C. baldwini* Eya** (Eya 2020: 7, fig. 15, 18)

16(15). Elytra straw-yellow, humeral angle and integument adjacent to scutellum black, marking in the middle of disc oblique from sutural margin and widening at epipleural margin, apices with black, irregular, triangular macula; eastern Mexico, Honduras . . . . . ***C. servillei* Audinet-Serville, female** (Eya 2020: 7, fig. 13, 14, 16, 17)

— Elytra black with broad transverse pale yellow band just behind base, contracting and interrupted at suture, and behind middle with large pale-yellow spot not touching margin and separated from suture; Mexico . . . . . ***C. saundersii* White** (Bezark 2020 id: 15905–15906)

17(14). Femora reddish with apices and base black, abdominal segments reddish; Costa Rica . . . . . ***C. amoenus* Jordan** (Eya 2015: 378, fig. 92–93)

— Legs and undersurface black; Panama . . . . . ***C. chiriquiensis* Eya** (Eya 2015: 116–117)

18(2). Elytra with surface glabrate **19**

— Elytra with surface rugose (or crinkled) from base to apex; southern Texas and northern Mexico . . . . . ***C. rimosus* (Buquet)** (Eya 2015: 387, fig. 130–133)

19(18). Pronotal disc black, dark brownish or reddish with black maculae **20**

— Pronotal disc entirely reddish, except front margin narrowly black; vertex with ferruginous vitta; underside of head yellowish. Honduras . . . . . ***C. thoracicus* (White)** (Bezark 2020 id: 18555–18556)

20(19). Elytra brilliant metallic green or blue **21**

— Elytra not as brilliant, green-golden yellow, partly yellowish-translucent; thorax reddish, anterior margin of disc with two black maculae; southeastern Mexico . . . ***C. gaumeri* Bates** (Bezark 2020 id: 15892)

21(20). Mesosternal intercoxal process subtuberculiform, scutellum triangular, as wide as long, pronotal disc and prosternum coarsely punctate, smaller species (25–29 mm); Venezuela . . . . . ***C. tricolor* (Waterhouse)** (Eya 2015: 394, fig. 144–145)

— Mesosternal intercoxal process non-protuberant, arcuate at apex, scutellum usually longer than wide, pronotal disc and prosternum finely punctate, larger species (33–40 mm) **22**

22(21). Pronotum nearly glabrous, finely punctate, black or dark brownish with orange maculae on sides; sternites orange-reddish; mesosternum and all coxae darker; southern Mexico . . . . . ***C. thoracicus* (White) (i.e., *C. basileus* Bates)** (Eya 2015: 378, fig. 98–103)

— Pronotum and sternites entirely black; southern Mexico . . . . . ***C. thoracicus* (White) (i.e., *C. nigricollis* Bates)** (Bezark 2020 id: 46576)

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