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Review of species of *Anelaphus* Linsley and its new synonym *Gymnopsyra* Linsley from the United States and Canada with description of a new species, synonymies, distributional notes and an illustrated identification key (Coleoptera: Cerambycidae: Elaphidiini)

Steven W. Lingafelter

8920 S. Bryerly Ct., Hereford, Arizona, 85615

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0798: 1–30 **INSECTA MUNDI** 2020

Review of species of *Anelaphus* Linsley and its new synonym *Gymnopsyra* Linsley from the United States and Canada with description of a new species, synonymies, distributional notes and an illustrated identification key (Coleoptera: Cerambycidae: Elaphidiini)

Steven W. Lingafelter

8920 S. Bryerly Ct., Hereford, Arizona, 85615
elaphidion@gmail.com

Abstract. A review and illustrated key to *Anelaphus* Linsley, 1936 (Coleoptera: Cerambycidae: Elaphidiini) of the United States and Canada is provided, along with taxonomic and distributional notes. *Gymnopsyra* Linsley, 1937, is a **new synonym** of *Anelaphus*. *Gymnopsyra chemsaki* Linsley, 1963 is a **new synonym** of *Gymnopsyra magnipunctatus* (Knull, 1934). *Anelaphus hoferi* (Knull, 1934) and *Anelaphus tuckeri* (Casey, 1924) are **new synonyms** of *Anelaphus simile* (Schaeffer, 1908). *Anelaphus parallelus* (Newman, 1840), *Anelaphus rusticus* (LeConte, 1850), and *Anelaphus davisi* Skiles, 1985 are **new synonyms** of *Anelaphus villosus* (Fabricius, 1792). *Anelaphus aspera* (Knull, 1962), *Anelaphus bupalpa* (Chemsak, 1991), and *Anelaphus magnipunctatus* (Knull, 1934) are all **new combinations**. *Anelaphus brummermannae* Lingafelter, **new species**, is described from Arizona.

Key words. Longhorned beetle, wood-borer, taxonomy, classification, faunistics, Nearctic.

ZooBank registration. urn:lsid:zoobank.org:pub:A03A123F-CB4E-409D-AF00-C1C6D17091E5

Introduction

Elaphidiini Thomson, 1864 currently contain 93 genera and approximately 630 species occurring only in the Western Hemisphere from southern Canada to Chile and Argentina (Monné 2019). *Anelaphus* Linsley, 1936 currently has 66 species ranging from North to South America. Many species are dull colored and lack distinct patterns or morphological features. Good lighting and magnification are essential to make accurate identifications. Compounding the confusion in this group is the fact that taxa have been described throughout the last 100 years without adequate comparison to similar taxa and without consultation with contemporary taxonomists who were working with the same fauna in the same regions of the United States. Sometimes, as additional species of Elaphidiini were described, original generic concepts were either unmodified or ignored.

This study attempts to remedy the confusion as it relates to the genera *Anelaphus* and *Gymnopsyra* Linsley, 1937. Generic and species synonymies are made and justification through historical literature review and character analysis is provided. One new generic and six new specific synonymies are proposed and a new species of *Anelaphus* from Arizona is described. With these taxonomic changes, there are now 22 species of *Anelaphus* known from the United States and Canada. An illustrated key to all of these species is provided. Additional biological, distributional, and taxonomic notes are provided for many species. The goal of this work is to bring more order and stability to the tribe Elaphidiini and better enable accurate identifications for future works involving systematics, taxonomy, and ecology.

Materials and Methods

The collections listed below were examined in the course of this research. The acronyms are used in the Material Examined sections following each species account.

ASUC Arizona State University Collection, Phoenix, Arizona, U.S.A. (N. Franz, S. Lee)
DJHC Daniel J. Heffern Collection, Houston, Texas, U.S.A.
FWSC Fred W. Skillman, Jr. Collection, Phoenix, Arizona, U.S.A.
JEWC James E. Wappes Collection, San Antonio, Texas, U.S.A.
JHC Jeffrey Huether Collection, Geneva, New York, U.S.A.
RFMC Roy F. Morris Collection, Lakeland, Florida, U.S.A.
SWLC Steven W. Lingafelter Collection, Hereford, Arizona, U.S.A.
SWRS Southwestern Research Station Collection, Portal, Arizona, U.S.A. (M. Lanan)
UAIC University of Arizona Insect Collection, Tucson, Arizona, U.S.A. (W. Moore, G. Hall)
USNM National Museum of Natural History, Smithsonian Institution, Washington, DC, U.S.A. (C. Micheli)
ZMKC Zoologische Museum, Kiel University, Kiel, Germany (M. Kuhlmann, D. Brandis)

The online and printed primary type photographic database of the Smithsonian Institution (Lingafelter et al. 2014, 2020), the online catalogues of New World Cerambycidae (Bezark 2019), and the online primary type databases of the American Museum of Natural History (AMNH 2020) and Museum of Comparative Zoology (2020) were also accessed to make comparative studies of other material.

Imaging, measurements, and microscopy were undertaken with a Nikon Digital Sight DS-F12 camera mounted on a Nikon SMZ18 Stereomicroscope equipped with SHR Plan Apo 0.5× and 1× lenses. Image montages were made by Helicon Focus 6.8.0 and enhanced via cropping, color correction, sharpening, and lighting tools in Adobe Photoshop Elements 12.

Results

Anelaphus Linsley 1936

(Fig. 1–29)

Anelaphus Linsley 1936: 464. Type species: *Elaphidion spurcum* LeConte 1864. Original designation.
Gymnopsyra Linsley, 1937, **new synonym**. Type species: *Gymnopsyra phoracanthoides* Linsley, 1937 (=*Elaphidion* (*Anoplium*) *magnipunctata* Knull, 1934). Original designation.

Discussion. *Anelaphus* Linsley (1936) was originally characterized by "feebly" spinose antenna, at most only slightly longer than the body and "unarmed" femora and elytral apices. It included species originally placed in *Elaphidion* Audinet-Serville (1835) and *Anoplium* Haldeman (1847), with *Anelaphus spurcus* (LeConte, 1854) designated as the type species (Fig. 2g).

Gymnopsyra Linsley (1937) was originally characterized by the non-carinate antennae, "rotundate" rather than emarginate or spinose elytral apices, and rounded, coarsely sculptured pronotum. It was monotypic and included *Gymnopsyra phoracanthoides* Linsley (a synonym of *Gymnopsyra magnipunctata* (Knull, 1934), synonymized by Linsley 1963) (Fig. 5c–d) which was originally described in *Elaphidion*, subgenus *Anoplium*.

Linsley (1937), in his original description of *Gymnopsyra* (Fig. 5a–b), briefly compared it only to *Psyrassa* Pascoe (1866) and *Stenosphenus* Haldeman (1847), two genera that are clearly distinctive. Although he had just described *Anelaphus* the year before (Linsley 1936), he made no comparison of *Gymnopsyra* to that genus or to species in *Anoplium* (whether used as a genus or subgenus of *Elaphidion*), most of which would be placed subsequently in *Peranoplium* Linsley, 1957. In that paper, Linsley compared those species transferred into *Peranoplium* only with *Anopliomorpha*, and again made no mention of, or comparison to, *Gymnopsyra* or *Anelaphus*.

Linsley (1963), in his monograph of the Cerambycidae of North America, acknowledged the similarity and relatedness of *Anelaphus* and *Gymnopsyra* as they appeared in the same couplet in his key to genera of Elaphidiini. There, they were distinguished by the pronotum moderately coarsely to finely punctate and pubescence partially obscuring the surface in *Anelaphus*, while the pronotum is very deeply, coarsely, confluently punctate,

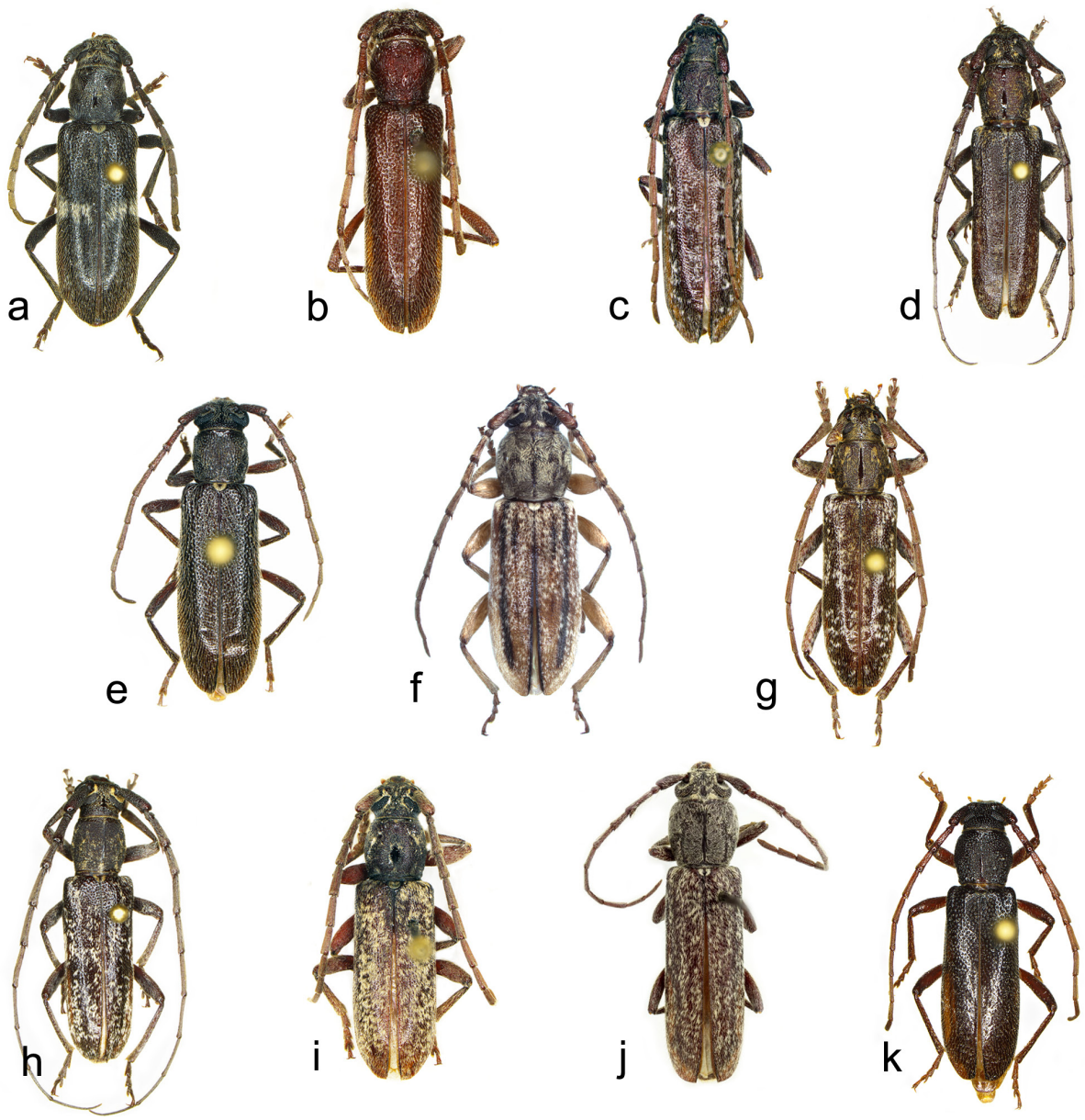

Figure 1. Species of *Anelaphus* occurring in America north of Mexico (photographs are not to scale). **a)** *A. albofasciatus* (Linell). **b)** *A. aspera* (Knull). **c)** *A. belkini* Skiles. **d)** *A. brevidens* (Schaeffer). **e)** *A. brummermannae* Lingafelter. **f)** *A. cinereus* (Olivier). **g)** *A. debilis* (LeConte). **h)** *A. dentatus* Chemsak. **i)** *A. inermis* (Newman). **j)** *A. inflaticollis* Chemsak. **k)** *A. magnipunctatus* (Knull).

with punctures much larger than those at base of elytra and integument shining and very sparsely pubescent in *Gymnopsyra*.

Skiles (1985) broadened the definition of *Anelaphus* by synonymizing *Elaphidionoides* Linsley, 1957, which included species having bispinose elytral apices, in particular, *E. parallelus* (Newman) and *E. villosus* (Fabricius) (treated later herein). He provided a redescription of *Anelaphus* and a modified key couplet 19 of Linsley (1963). He highlighted the pubescent patch on the antennal tubercles, apices of the mesofemur not or scarcely attaining the posterior margin of the metacoxae, and the apex of the metafemur falling far short of elytral apices as diagnostic characters of *Anelaphus*.

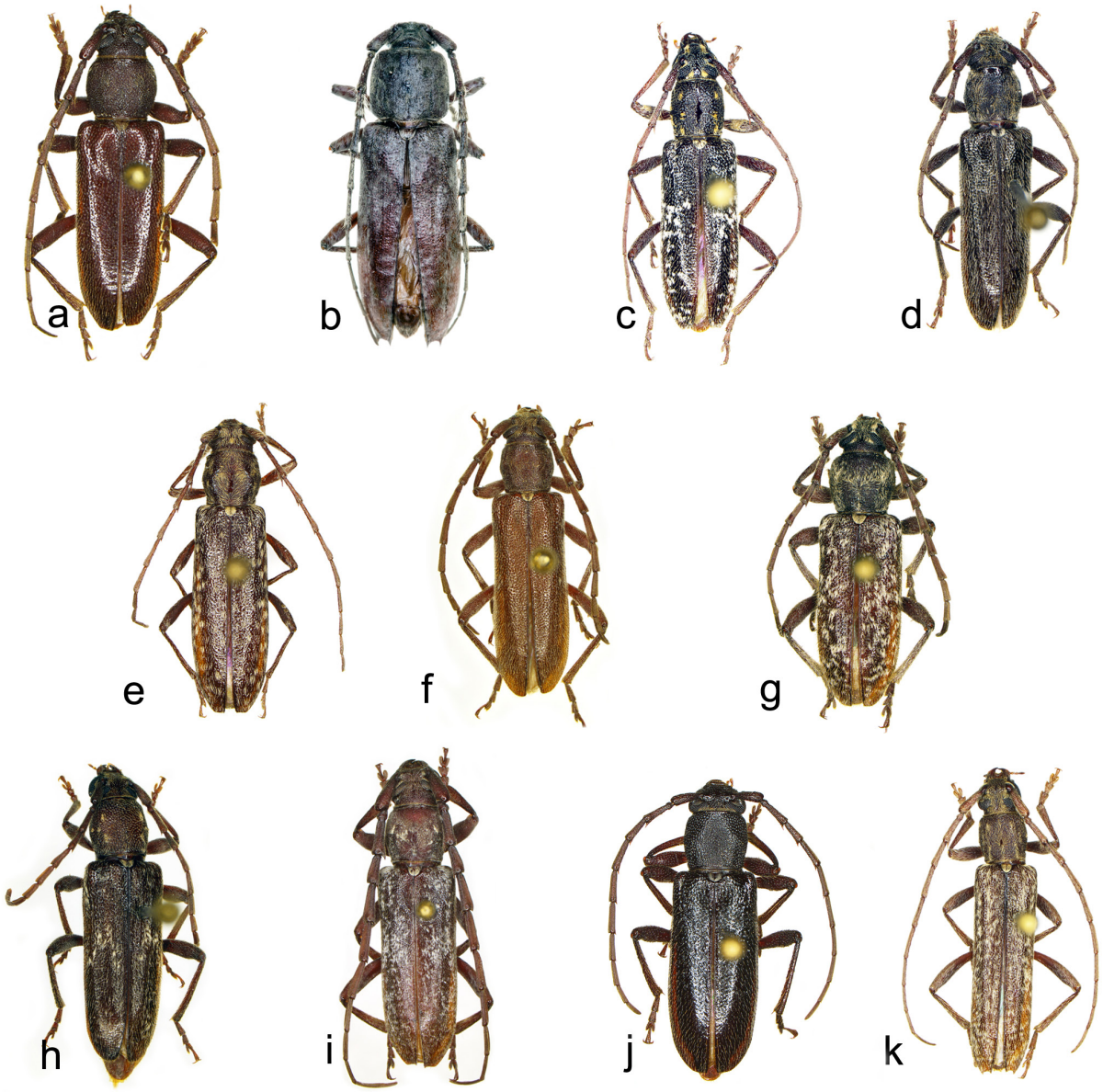

Figure 2. Species of *Anelaphus* occurring in America north of Mexico (photographs are not to scale). **a)** *A. moestus* (LeConte). **b)** *A. mutatum* (Gahan). **c)** *A. niveivestitus* (Schaeffer). **d)** *A. piceus* (Chemsak). **e)** *A. pumilus* (Newman). **f)** *A. simile* (Schaeffer). **g)** *A. spurcus* (LeConte). **h)** *A. subdepressum* (Schaeffer). **i)** *A. subinermis* Linsley. **j)** *A. submoestus* Linsley. **k)** *A. villosus* (Fabricius).

Lingafelter (1998) discussed the similarity of *Anelaphus*, *Gymnopsyra*, and *Peranoplium*, synonymizing the latter with *Anelaphus* since the characters used to distinguish it (alveolate pronotal punctures, antennae with reduced spines on antennomeres 3 and 4) were deemed as insufficient basis to maintain *Peranoplium* as a distinct genus. A matrix of 70 morphological characters was included in that work. It was shown that many diagnostic features such as tibial carinae, the shape and distribution of pronotal punctures and calli, and the shape of the prosternal intercoxal process were quite variable among species and genera, evolving numerous times in the Elaphidiini. The only synapomorphic character state for *Anelaphus* on the strict consensus tree of Lingafelter (1998) was the wide and deep posterior notch of the metepisternum. However, this character was shown to have independently evolved in other elaphidiine genera. Two other characters, the blunt shape of the apex of

the metasternal notch that receives the anteromedial extension of the first abdominal ventrite and the presence or absence of a middle pronotal callus were likewise shown to be unsatisfactory for characterizing *Anelaphus* exclusive of other genera. Through further careful study of all the species of *Anelaphus* and *Gymnopsyra*, I have concluded that there is no basis to maintain *Gymnopsyra* as a distinct genus and it is synonymized with *Anelaphus*.

Following the International Code of Zoological Nomenclature, Article 31.2, species group names that are latinized adjectives in the nominative singular must agree in gender with the generic name with which it is combined (ICZN 1999: 38). Specific epithets that are nouns in apposition are exempted and original spelling is retained. Another exception is when the gender of the species group name was not indicated and cannot be conclusively determined from the evidence of usage, then that name is to be considered as a noun in apposition with the original spelling retained for new combinations.

Gymnopsyra was proposed by Linsley (1937), without an etymology. It is formed from *Gymnos* latinized from Greek, Γυμνός, meaning naked, and *psyra*, which is probably latinized from Greek, ψείρα, meaning louse. The "*a*" ending suggests it is a nominative singular noun and therefore feminine in gender (Winston 1999: 149). The "*es*" ending of the type species epithet, *phoracanthoides*, indicates it is a fifth declension noun which is feminine in gender according to Latin grammar (Winston 1999: 152). Therefore, it must be concluded that *Gymnopsyra* is feminine.

Anelaphus was proposed by Linsley (1936), also without an etymology. The name was apparently latinized *elaphos* from Proto-Greek, ἔλᾰφος, meaning deer, in the nominative singular form. The ending "*us*" suggests that *Anelaphus* is a second declension masculine noun (Winston 1999: 152). Therefore, all new combinations of species from the feminine *Gymnopsyra* must have their specific epithets modified to conform to the masculine *Anelaphus*, unless exempted according to subarticles of Article 31.2 (ICZN 1999).

Diagnosis. Species of *Anelaphus* are nocturnally active with coarsely faceted eyes, dense pubescent patches at the apex of each antennal tubercle (rarely absent), antennae lacking carinae, antennomeres three and four, at least, mesally spinose or dentiform (antennae very rarely lacking spines), prosternal process arcuately declivous and expanded apically (rarely unexpanded at apex), scutellum mostly densely pubescent, pronotum distinctly punctate, rounded or nearly straight at sides and lacking lateral tubercles, as wide as or wider than long (rarely longer than wide), antennomere three short, one-half to two-thirds the length of the pronotum (rarely over two-thirds), antennae of males extending beyond elytral apices by no more than two antennomeres and antennae of females not or barely attaining elytral apices, elytral apices rounded apicolaterally (rarely spinose or dentiform apicolaterally), pronotum with a medial impunctate callus (rarely absent), femora gradually expanded medially, femoral apices rounded, dorsal integument light to dark brown, and length of nearly all specimens 10–20 mm.

Anelaphus is most similar to *Aneflomorpha* Casey, *Aneflus* LeConte, *Anopliomorpha* Linsley, *Astromula* Chemsak and Linsley, *Elaphidion* Audinet-Serville, *Enaphalodes* Haldeman, *Eustromula* Cockerell, *Micranoplium* Linsley, *Micraneflus* Linsley, *Neaneflus* Linsley, *Orwellion* Skiles, *Parelaphidion* Skiles, *Pseudoperiboeum* Linsley, *Psyrassa* Pascoe, and *Stenelaphus* Linsley. Characters distinguishing each of these genera are discussed below.

Most species of *Aneflomorpha* are more elongate and narrow bodied than most species of *Anelaphus* and have the pronotum distinctly longer than wide (as wide or wider than long in almost all *Anelaphus*), have the third antennomere nearly two-thirds the length of pronotum (about half the length of the pronotum in most *Anelaphus*), have antennal tubercles lacking a patch of pubescence at apex (present in most *Anelaphus*), and usually have bidentate, bispinose, or truncate elytral apices (rounded apicolaterally in most *Anelaphus*).

Aneflus have a more elongate form and are at least 20 mm in length with few exceptions (*Anelaphus* specimens are very rarely over 20 mm long), have apicolaterally expanded antennomeres (unexpanded or weakly so in *Anelaphus*), have pronounced mesal antennal spines present on at least antennomeres 3–5 and usually 3–7 and sometimes also apicolaterally, (mesal antennal spines, if present beyond antennomere five in *Anelaphus*, are usually very weak), have elytral apices that are almost always bispinose (typically apicolaterally rounded in *Anelaphus*, but if bispinose, then either smaller than 20 mm long or without the elongate form).

The small genus *Anopliomorpha* is characterized by having a distinct carina on basal antennal segments (absent in *Anelaphus*), absence of dense pubescence on the antennal tubercles (present in most *Anelaphus*), presence of very long "flying" setae scattered over the body and appendages (present in only a few species of *Anelaphus*, but not as extreme), absence of a pronotal callus (present in most *Anelaphus*), and by its small, delicate

size and proportions, with almost all specimens less than 10 mm (nearly all specimens of *Anelaphus* are longer than 10 mm).

The monotypic genus *Astromula* lacks antennal spines (present in almost all specimens of *Anelaphus*) and has very short antennae barely attaining the middle of the elytra, with antennomeres 3–5 together about the length of the pronotum (antennae reaching nearly two-thirds of elytral apices and antennomeres 3–4 often about as long or longer than pronotum in most *Anelaphus*).

The large and primarily Caribbean genus *Elaphidion* is distinguished by the abruptly declivous prosternal process between the procoxae (arcuately declivous in *Anelaphus*), the more pronounced mesal (and often apicolateral) spines on most antennomeres—usually very strong mesally on antennomere 3 (restricted to antennomeres 3–6 or fewer in most species of *Anelaphus*), the bispinose elytral apices in most specimens (rounded apicolaterally in most *Anelaphus*) and the spinose or dentiform metafemoral apices (rounded in *Anelaphus*).

Enaphalodes has similar proportions to *Anelaphus*, but almost all specimens are longer than 20 mm (*Anelaphus* are very rarely over 20 mm long), the third antennomere is about two-thirds the length of the pronotum (shorter in most *Anelaphus*), the antennal tubercles lack a distinct pubescent patch (present in most *Anelaphus*), the meso- and metafemora are very slightly expanded (gradually enlarged to weakly clavate in most *Anelaphus*), and the elytral apices are often bispinose (rounded apicolaterally in most *Anelaphus*).

Eustromula, like *Astromula*, has very short antennae that barely attain the middle of the elytra and has antennomeres 3–5 together about as long as the pronotum (the antennae typically attain the apical third or more of the elytra and antennomeres 3–4 are about as long or longer than the pronotum in *Anelaphus*), the antennal tubercles lack a pubescent patch (present in most *Anelaphus*), and the meso- and metafemora are linear (gradually enlarged to weakly clavate in most *Anelaphus*).

The monotypic genus *Micranoplium* is smaller than 10 mm in length (almost all specimens of *Anelaphus* are larger), lacks pubescent patches on the antennal tubercles (present in *Anelaphus*), and lacks antennal spines (present on at least third antennomere in almost all specimens of *Anelaphus*).

Micraneflus lacks pubescent patches on the antennal tubercles (present in *Anelaphus*), lacks antennal spines (present on at least third antennomere in almost all specimens of *Anelaphus*), and has the pronotum slightly longer than broad (usually as wide or wider than long in *Anelaphus*).

Neaneflus has antennomeres expanded apicolaterally (generally unexpanded in most *Anelaphus*), has weak antennal carinae present (absent in *Anelaphus*), and lacks pubescent patches on the antennal tubercles (present in *Anelaphus*).

Orwellion has antennomere three at least two-thirds the length of the pronotum (shorter in most *Anelaphus*), has the antennae extending beyond the elytral apices by at least three antennomeres in males and by one antennomere in females (antennae are relatively shorter in *Anelaphus*), lacks a distinct pubescent patch on the antennal tubercles (present in most *Anelaphus*), has distinct post-ocular pubescent patches (absent in most *Anelaphus*), and has the elytral apex apicolaterally spinose or dentiform (rounded in most *Anelaphus*).

Parelaphidion lacks pubescent patches on the antennal tubercles (present in *Anelaphus*), has the antennae usually extending beyond the elytral apices by at least two antennomeres in males and one antennomere in females (antennae are relatively shorter in most *Anelaphus*), has moderately to strongly bispinose elytral apices in nearly all specimens (rounded apicolaterally in most *Anelaphus*), and has the third antennomere at least two-thirds the length of the pronotum (usually shorter in *Anelaphus*).

The small genus *Pseudoperiboeum* has a lateral pronotal tubercle on each side (absent in *Anelaphus*), has long "flying" setae scattered over integument (absent from most *Anelaphus*), lacks pubescent patches on the antennal tubercles (present in most *Anelaphus*), has the antennae extending beyond the elytral apices by at least three antennomeres in males and by nearly one antennomere in females (antennae are relatively shorter in *Anelaphus*), and has the apicolateral elytral apex either spinose, dentate or truncate (rounded in most *Anelaphus*).

Psyrassa has the pronotum mostly smooth and nearly impunctate (heavily punctate in *Anelaphus*) and much longer than wide (as wide or wider than long in *Anelaphus*), lacks pubescent patches on the antennal tubercles (present in most *Anelaphus*), and has the elytra apex apicolaterally spinose in many species (rounded in most *Anelaphus*).

Stenelaphus is recognized by the scattered, long, "flying" setae over the dorsum (absent from most *Anelaphus*), lacks pubescent patches on the antennal tubercles (present in most *Anelaphus*), and has the antennae

extending beyond the elytral apices by at least three antennomeres in males and by nearly one antennomere in females (antennae are relatively shorter in *Anelaphus*).

Anelaphus brummermannae Lingafelter, new species

(Fig. 1e, 3a–d, 4a–b)

Diagnosis. *Anelaphus brummermannae* is most easily confused with *A. piceus* (Chemsak) and *A. simile* (Schaeffer) due to the similarly small size, uniform coloration, weakly spined antennomeres, coarsely alveolate-punctured pronotum, and posteriorly closed procoxal cavities. It is most easily distinguished by the denser pubescence on the elytra that is mostly semi-translucent golden, suberect and not recurved back toward the elytra. In *A. piceus*, which it superficially resembles the most due to the usual very dark brown coloration of most specimens of both species, the elytra have pubescence that is mostly short, non-translucent white, recurved, and sparser. The elytra of *A. brummermannae* lack the longitudinal, glabrous strips that are characteristic of *A. piceus*. The pronotum of *A. piceus* has a glabrous, impunctate collar anteriorly, thickest at middle, which is narrow in *A. brummermannae*. The head of *A. piceus* lacks long, erect setae unlike in *A. brummermannae* which has conspicuous long, erect setae on the frons, antennal tubercles, and usually vertex. *Anelaphus simile* is most similar to *A. brummermannae* structurally, but most specimens are lighter reddish-brown in color compared to the very dark brown color of all known specimens of *A. brummermannae*. The elytral pubescence of *A. simile* ranges from off-white to pale yellow ochre and is mostly short and recurved. The metasternum of *A. simile*, especially at the sides and anterior margin, is densely, shallowly punctate and usually has pubescence dense enough to hide much of the integument. In *A. brummermannae*, the metasternum is sparsely, separately punctate, with punctures relatively deep and well-defined and the metasternal pubescence is sparse and does not conceal the integument. The pronotum of *A. brummermannae* is more quadrate, not rounded at sides and not widest at middle or anterior of middle as in most specimens of *A. simile* and *A. piceus*. Additionally, there are aedeagal features of *A. brummermannae* that differ subtly from *A. piceus* and *A. simile* as described below.

Description. Small to moderate sized, 9.5–11.5 mm long; 2.5–3.1 mm broad; integument uniformly dark brown (rarely light brown). Head with combination of mostly appressed, short, semitranslucent golden setae mixed with longer erect setae on the frons, antennal tubercles, and vertex. Interantennal impression weak; antennal tubercles rounded and not strongly elevated. Antennae of male extending beyond elytral apices by one antennomere; shorter than elytra in female (Fig. 3a–b). Last antennomere 1.4 times length of penultimate in male with pronounced constriction at apical third; less than 1.3 times length of penultimate in female and with weak constriction apically. Antennomere four of both sexes slightly shorter than three and five. Antennae with short mesal spine on antennomere 3, very weakly spined to dentiform mesally on antennomere 4. Antennomeres 3–10 moderately produced apicolaterally. Antennae with combination of suberect and appressed semitranslucent, golden setae becoming more dense, shorter, and appressed on antennomeres 6–11. Pronotum nearly quadrate (Fig. 3c), width subequal to length, not rounded at sides, distinctly narrower than base of elytra and slightly narrower than head at widest point; base and apex in most specimens approximately equal width. Pronotum with conspicuous semitranslucent golden pubescence that is sparse, short, recurved, and not concealing punctures. Pronotum covered with contiguous, mostly uniformly sized circular alveolate punctures except on narrow anterior collar and lacking smooth calli. Prosternum with sparse, separate punctures of uniform size and distribution in females; with a patch of denser, smaller punctures anterior to procoxae in males. Prosternal intercoxal process arcuately recessed between procoxae, strongly expanded at apex closing procoxal cavities posteriorly. Elytron with moderately dense, uniformly distributed, semitranslucent golden, suberect pubescence combined with a few scattered erect and subappressed setae (Fig. 3d). Elytral apices rounded to suture, lacking spines or acute angle at suture (Fig. 3a). Elytron with large punctures, dense but mostly non-contiguous at basal half, becoming shallower and ultimately indistinct at apex. Scutellum rounded posteriorly, with very dense, bright white pubescence throughout except for small glabrous basal region. Legs short with pro-, meso-, and metafemora progressively longer; metafemora extending to about apex of third ventrite. Femoral pubescence mostly short, sparse, semitranslucent golden, subappressed but not recurved. Femoral apices rounded mesad and laterad, without spines. Tibiae cylindrical; only slightly enlarged apically. Venter with pubescence consisting of semitranslucent golden, short, sparse setae that do not conceal the mostly separate, small, sparse punctures that are most conspicuous on

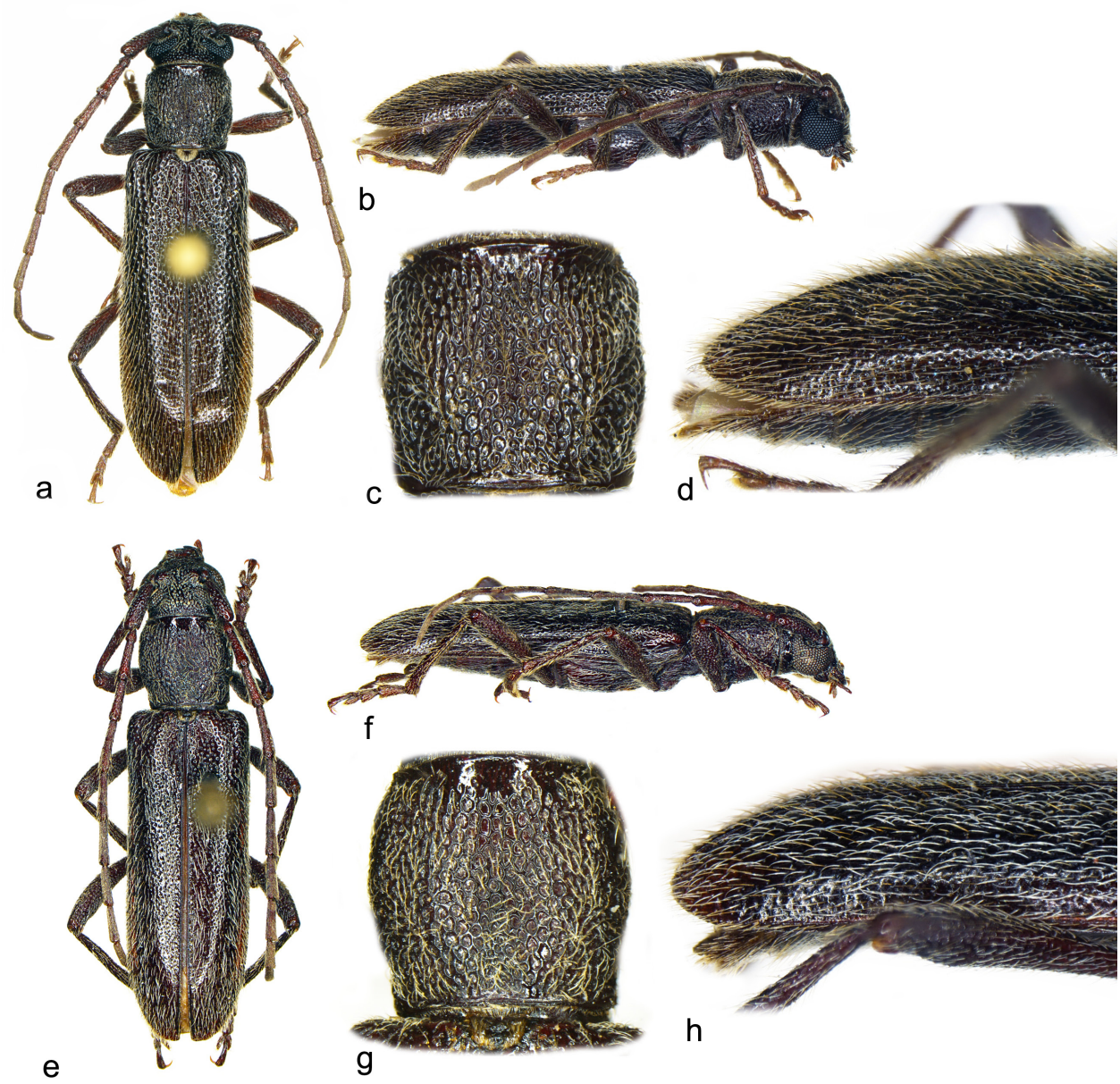

Figure 3. *Anelaphus brummermannae* Lingafelter, new species and *A. piceus* (Chemsak). **a)** *A. brummermannae*, dorsal. **b)** *A. brummermannae*, lateral. **c)** *A. brummermannae*, pronotum. **d)** *A. brummermannae*, closeup of elytral pubescence. **e)** *A. piceus*, dorsal. **f)** *A. piceus*, lateral. **g)** *A. piceus*, pronotum. **h)** *A. piceus*, closeup of elytral pubescence.

the metasternum and metepisternum. Last ventrite of both sexes broadly rounded apically, without modification. Apex of eighth tergite (Fig. 4a) moderately impressed at middle; subapical setose ridge and pigmented patch relatively broad and quadrate shaped with long, widely spaced setae; apex of median lobe evenly narrowed; setae on apices of paramere long; parameres with rounded internal openings (Fig. 4b).

Etymology. This species of *Anelaphus* is named for naturalist and artist, Margarethe Brummermann, who collected most of the known specimens on her property in Picture Rocks, Arizona.

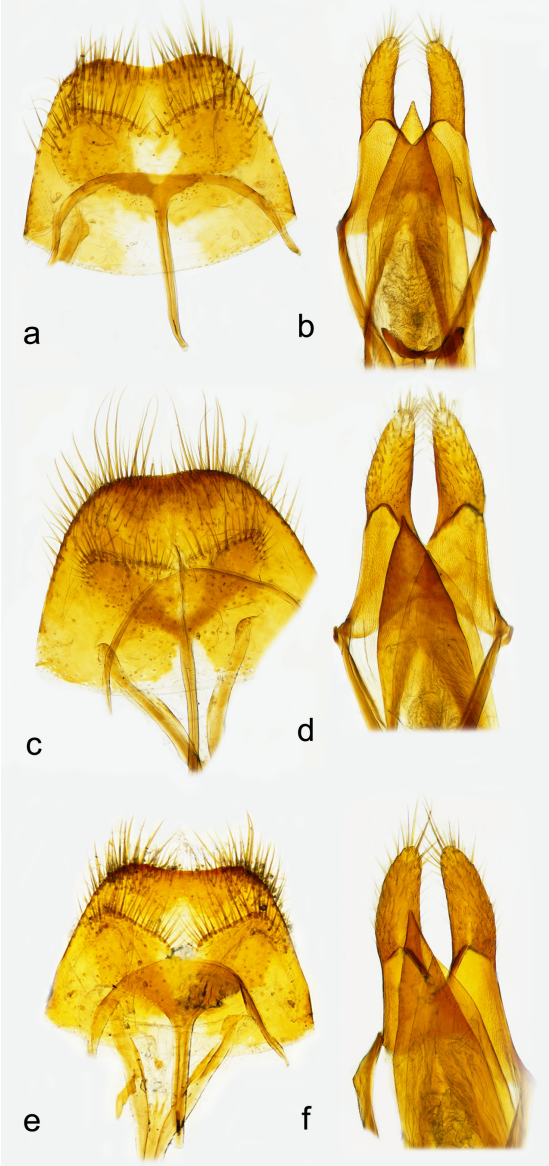

Figure 4. Male genitalia of *Anelaphus brummermannae* Lingafelter, new species, *A. piceus* (Chemsak), and *A. simile* (Schaeffer). **a)** *A. brummermannae*, eighth tergite. **b)** *A. brummermannae*, parameres and median lobe. **c)** *A. piceus*, eighth tergite. **d)** *A. piceus*, parameres and median lobe. **e)** *A. simile*, eighth tergite. **f)** *A. simile*, parameres and median lobe.

Discussion. Like *Anelaphus piceus* (Chemsak), this is an early species with adults flying mostly from early April to late June, before the monsoon rains arrive. All specimens have been collected at lights in Sonoran Desert habitat below 5000′. Host plants are unknown.

Type material. Holotype, male: **USA: Arizona:** Pima Co., Picture Rocks, 665 m, 32°21.402′N, 111°12.289′W, 6 June 2019, at light, Margarethe Brummermann (USNM). Paratypes (all **USA: Arizona):** Maricopa Co., Lake Pleasant Park, 18 May 1992, Blacklight, F. W. Skillman, Jr. (1 male, FWSC); Pima Co., same data as holotype except, 1–10 June 2017 (1 female, SWLC), 1 May 2019 (1 female, UAIC), 4 May 2019 (1 female, SWLC); Pima Co., Tucson Mountains, 32°16.4′N, 111°08.8′W, at light, 2 May 2019, M. Brummermann (1 female, ASUC); Santa Cruz Co., Puerto Canyon, 1000 m, 31°37.8′N, 111°03.8′W, 8 July 2018, at light, M. Brummermann (1 male, SWLC); Pinal Co., 14 km E. Florence, 650 m, 32.9832°N, 111.2384°W, 31 May 2018, M. A. Johnston (ASUC).

Anelaphus albofasciatus (Linell)

(Fig. 1a)

Elaphidion albofasciatum Linell 1897: 393.
Anoplium linelli Casey 1924: 246. Synonymy by Linsley (1936: 465).

Discussion. This distinctive species was described from Los Angeles, California and its synonym, *Anoplium linelli* Casey, was described from Tucson, Arizona (Linsley 1963; Lingafelter et al. 2014, 2020). The biology and description of larvae, pupae, and genitalia was made by Raske (1972). Specimens are rarely collected, perhaps because they are most active in the spring and early summer before the monsoon rains that bring out the majority of species in the region. Specimens have been attracted to lights and found on cacti of the genera *Echinocactus* Link and Otto, *Opuntia* Miller, and *Cylindropuntia* Engelmann (Cactaceae) at night (Linsley 1963; Swift 2008). Additional localities for Arizona and Texas (**new state record**) are recorded. Note that Tanner (1934) recorded this species from Utah and Bezark (2018) recorded it from Nevada (also noted in Tavakilian and Chevillotte 2020) but these states are not reflected in Monné and Nearns (2020).

Material examined. USA: Arizona: La Paz Co., Bouse Dunes, 17 May 1992 & 10 May 2013, blacklight, F. W. Skillman, Jr. (3, FWSC); Maricopa Co., Lake Pleasant Park, 18 May 1992, blacklight, F. W. Skillman, Jr. (1, FWSC); Pima Co., Tucson, 1230 E. Placita del Cervato, 27 April 1990, UV light, R. Wielgus (1, ASUC); Pima Co., Molino Canyon Vista, 32°19.604′N, 110°41.995′W, 1260m, 2 May 2020, S.W. Lingafelter (3, SWLC); Pima Co., Redington Road just NE of Tanque, Verde Falls trailhead 980m, 32°15.363′N, 110°39.746′W, 29 April 2020, S. W. Lingafelter, MV/UV lights (1, SWLC); Pinal Co., Tom Mix Memorial, Highway 79, 27.5 km SE of Florence 720m, 32°49.294′N, 111°12.274′W, 25 April 2020, MV/UV lights, S. W. Lingafelter (23, SWLC); Pinal Co., Tom Mix Memorial, Highway 79, 27.5 km SE of Florence 720m, 32°49.294′N, 111°12.274′W, 25 April 2020, *Cylindropuntia versicolor* at night, S. W. Lingafelter (1, SWLC); Pinal Co., Tom Mix Memorial, Highway 79, 27.5 km SE of Florence 720m, 32°49.294′N, 111°12.274′W, 25 April 2020, MV/UV lights, J. Botz & S. Vitanza (2, SWLC); Pinal Co., Roadside off Route 60 [actually Highway 79] near Florence, UV/MV light, 32.9019°N, 111.2805°W, 25 April 2015, S. S. Anzaldo (1, ASUC); **Texas:** Presidio Co., ZH Canyon, 11.7 miles W. Valentine, 19–23 May 2005, 30.5438°N, 104.6856°W (2, FWSC).

Anelaphus asperus (Knull), new combination

(Fig. 5e–f)

Gymnopsyra aspera Knull 1962: 105.

Discussion. Linsley (1963) and Monné and Nearns (2020) included Arizona and Bezark (2019) added New Mexico in the range of this species that was described from Big Bend in southwestern Texas (Knull 1962). However, no specimens outside of western Texas (Big Bend region) have been examined, and its occurrence west of Texas is doubtful. Because *Anelaphus* is masculine and the original genus, *Gymnopsyra* is feminine, the epithet is changed from *aspera* to *asperus*.

Anelaphus bupalpus (Chemsak), new combination

Gymnopsyra bupalpa Chemsak 1991: 477.

Discussion. This species is known only from Jalisco, Mexico, and is not included in the illustrated key. Because *Anelaphus* is masculine and the original genus, *Gymnopsyra* is feminine, the epithet is changed from *bupalpa* to *bupalpus*.

Material examined. Mexico: Jalisco: 7 km north Autlán de Navarro, road to Microondas de San Francisco, 19.83506°N, 104.34757°W, 3 July 2018, F. Skillman and J. F. Limon (1, FWSC).

Anelaphus dentatus Chemsak

(Fig. 1h)

Anelaphus dentatus Chemsak 1962: 110.

Discussion. This species was known from only two specimens from the Dragoon Mountains, Arizona when it was originally described (Chemsak 1962). Additional Arizona material has been examined and documented from the Patagonia, Santa Rita, San Cayetano, and Huachuca Mountains.

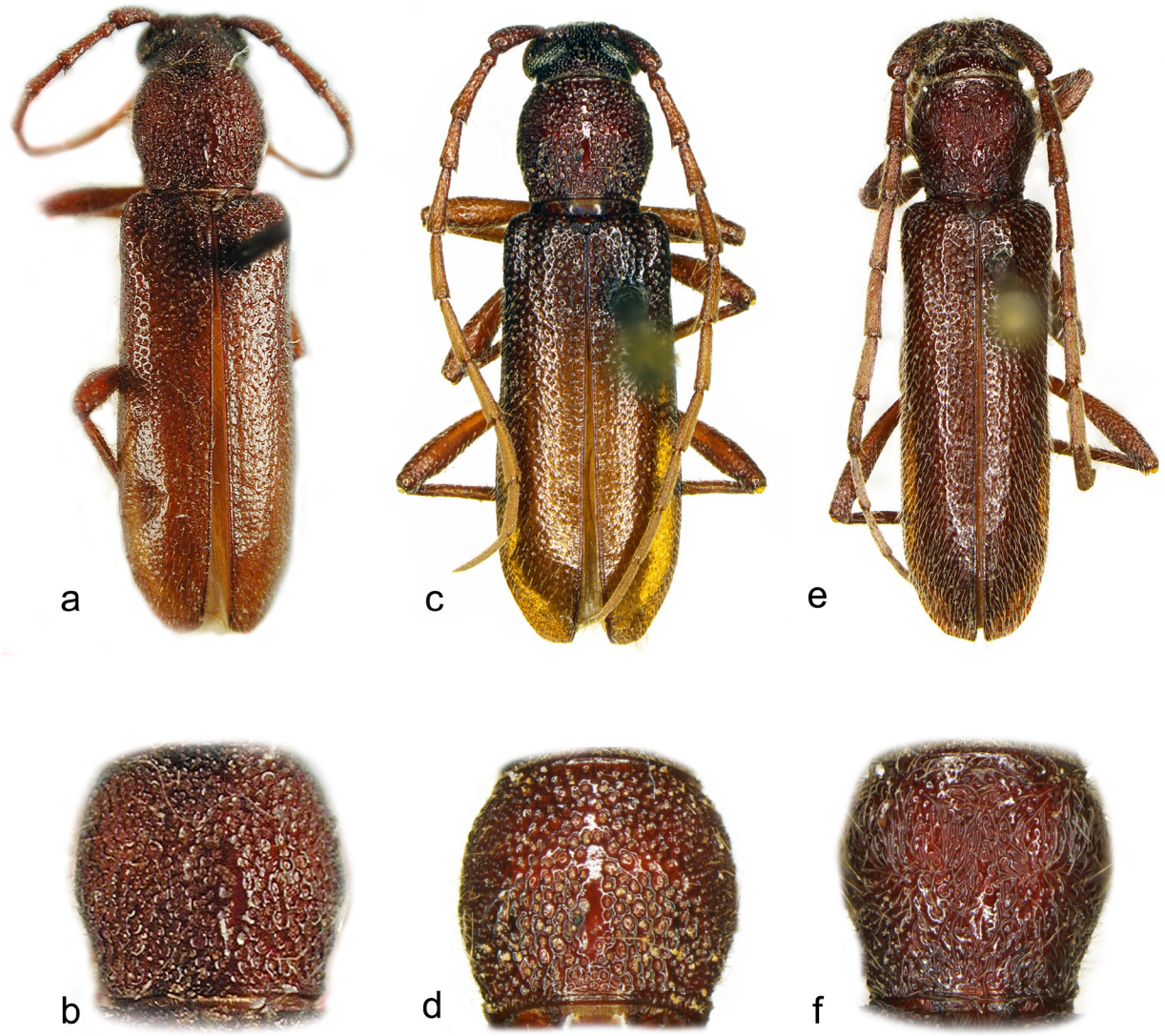

Figure 5. Former *Gymnopsyra* species. **a)** *G. chemsaki* Linsley, holotype, dorsal habitus. **b)** *G. chemsaki*, holotype, pronotum. **c)** *G. magnipunctata* (Knull), SWRS specimen determined by Knull, dorsal habitus. **d)** *G. magnipunctata*, pronotum. **e)** *G. aspera* (Knull), holotype. **f)** *G. aspera*, holotype, pronotum.

Material examined. USA: Arizona: Cochise Co., Lower Ida Canyon, 31°22.77′N, W110°19.82′W, 1815 m, 12 June 2018, MV/UV lights, S.W. Lingafelter (2, SWLC); Santa Cruz Co., Patagonia Mtns., near Duquesne, 5700′, 12 August 2003, UV light, S. McCleve & D. Cabarga (1, FWSC); Santa Cruz Co., Santa Rita Mountains, 4880′, 17 June 1963, J. D. Marshall (1, SWLC); Santa Cruz Co., SR19 & Peck Canyon Road, 23 June 2001, F. W. Skillman, Jr. (1, FWSC).

Anelaphus magnipunctatus (Knull), new combination

(Fig. 1k, 5a–d)

Elaphidion (*Anoplium*) *magnipunctata* Knull 1934: 12.
Gymnopsyra chemsaki Linsley 1963: 98, **new synonym**.

Discussion. In his monograph on North American Cerambycidae, Linsley (1963) described *Gymnopsyra chemsaki* and distinguished it from *G. magnipunctata* (Knull 1934) by "the dense, subcontiguous punctures of the elytral

base, much denser punctures of the head, and more abundant pubescence of the elytra". He further wrote, "The more widely separated eyes and impunctate band at the apex of the pronotum appear to separate *aspera* [Fig. 5e, f] from *chemsaki*." Examination of the holotype of *G. chemsaki* (Fig. 5a–b), specimens identified as *G. magnipunctata* by Knull in the Southwestern Research Station collection (Fig. 5c–d), along with material collected from the Baboquivari and Dragoon Mountains in Arizona and the Big Bend region in Texas show that these are the same species. *Gymnopsyra chemsaki* is therefore a new synonym of *G. magnipunctata*. Because *Anelaphus* is masculine and the original genus, *Gymnopsyra* is feminine, the epithet is changed from *magnipunctata* to *magnipunctatus* for this new combination.

Material examined. USA: Arizona: Cochise Co., Cochise Stronghold, 31°56.746′N, 109°57.555′W, 1456m, 9 July 2016 (2, SWLC); Cochise Co., Cochise Stronghold, 2–11 July 2012, sweet bait, F. W. Skillman, Jr. (3, FWSC); Cochise Co., Cochise Stronghold, 2 August 2010, MV & Blacklight, F. W. Skillman, Jr. (1, FWSC); Cochise Co., west slope of Dragoon Mountains, Middlemarch Road 20.5 km NE of highway 80, 1695m, 31°51.483′N, 109°57.750′W, 3 July 2018, MV/UV lights, S. W. Lingafelter (3, SWLC); Cochise Co., 5 mi. W. Portal, S.W.R.S., 5400′, 25 June 1957, M. Statham (2, SWRS); Cochise Co., 28 mi. E. Douglas, Guadalupe Canyon, 24 June 1970 (1, SWRS); Mohave Co., Hualapai Mtns., 6 August 2010, MV & blacklight, F. W. Skillman, Jr. (2, FWSC); Pima Co., Molino Basin, July 1, 1973 (1, SWLC); Pima Co., Baboquivari Mountains, Brown Canyon, Buenos Aires National Wildlife Refuge, W Brown Bear Canyon Road,1257 m, 31°46′20.1″N, 111°33′17.3″W, 21–22 June 2018, MV/UV lights, S. W. Lingafelter (2, SWLC); Pima Co., Madera Canyon, 2 August 1975, 24 July 1988, 26 July 1990, D. Ahart (3, FWSC); **Texas:** Presidio Co., Big Bend Ranch State Park, 7 June 1994, D. W. Sundberg (2, FWSC); **New Mexico:** Grant Co., FR153, 5 mi. W. Tyrone, 4 July 2003, light, F. W. Skillman (5, FWSC); Grant Co., Harden Cienega Road, 5 mi. N. SR78, 2.5 mi. E. AZ/NM line, 22 July 2015, F. W. Skillman, Jr. (1, FWSC).

Anelaphus moestus (LeConte)

(Fig. 2a)

Elaphidion moestum LeConte 1854: 442.
Anoplium laterale Casey 1914: 365. Synonymy by Linsley (1963: 111).
Anoplium pinorum Casey 1914: 365, **new synonym**.

Discussion. This species was reported from Arizona in Linsley (1963), but no specific locality records were published until this study was undertaken. The following records of material examined further document its distribution in the southwestern United States. *Anoplium pinorum* Casey, 1914, treated as a subspecies of *Anelaphus moestus* by Linsley (1963), is here considered a synonym of *Anelaphus moestus* since the size, color, and punctation characters identified by Casey are concluded to be individual variation. Also, the wide distribution of the nominotypical form which encompasses the type locality of *Anoplium pinorum* (Southern Pines, North Carolina) contradicts the expectation of allopatry for subspecies.

Material examined. USA: Arizona: Cochise Co., 7 mi. W. Sunsites, 10 July 2007, F. W. Skillman, Jr. (1, FWSC); Gila Co., Mt. Ord Road, FS620, 2 mi. E. Jct. Rt. 87, 20 July 2017, J. Huether (1, JHC); Graham Co., Aravaipa Canyon, Turkey Creek, 11 August 1998, UV & MV light, F. W. Skillman, Jr. (1, FWSC); Graham Co., Aravaipa Canyon, Turkey Creek, 11 August 2001, on dead hackberry, F. W. Skillman, Jr. (1, FWSC); Maricopa Co., Sunflower, brown sugar trap, 29 July – 5 August 1995, F. W. Skillman, Jr. (3, FWSC); **Oklahoma:** Comanche Co., Wichita Mountains Wildlife Refuge, Lake Rush, 1671′, 34°44′21″N, 98°36′20″W, 7 July 2000, red wine trap, S. W. Lingafelter & N. E. Woodley (1, SWLC); **Texas:** Comal Co., Bulverde, 15–16 June 1996, UVBL, B. Warner, J. Wappes (1, FWSC); Jeff Davis Co., Davis Mountains Resort, 5800′, 17 June 1991, D. G. Marqua (1, SWLC); Jeff Davis Co., Davis Mountains, Boy Scout Road (FM 1832), 1270 m, 30°48.433′N, 103°54.650′W, 13 August 2015, MV/UV lights, S. W. Lingafelter (1, SWLC); Jeff Davis Co., FM 1832, 1 mi. W. SR17, 24 June 2014, F. W. Skillman, Jr. (11, FWSC); Presidio Co., Plata, 14 July 2009, MV & Blacklight, Skillman & Ribardo (2, FWSC).

Anelaphus piceus (Chemsak)

(Fig. 2d, 3e–h, 4c–d)

Peranoplium piceus Chemsak 1962: 111.

Discussion. This species was originally recorded from southeastern Arizona by Chemsak (1962). Rice, et al.

(1985) documented it from Texas and New Mexico and confirmed the larval host of *Acacia*. Bezark (2019) records this species from California and Jalisco, Mexico. Monné and Nearns (2020) record it from Morelos and Sonora, Mexico. Additional localities from Arizona, Texas, Utah (**new state record**) and Sonora, Mexico are recorded.

Material examined. Mexico: Sonora: Granados, 29.857222°N, 109.311667°W, 570m, March 30, 2012, T. R. Van Devender (7, ASUC); Sonora, vicinity of Cajon Bonito, 22–25 May 2017, F. W. Skillman, Jr. (2, FWSC); Sonora, vicinity of Moctezuma, 21 April 2017, MV/UV lights, S. Lee (1, ASUC, 10, FWSC); **USA: Arizona:** Cochise Co., San Bernardino Wildlife Refuge, Minckley Ponds, 1141m, 31°20.602′N, 109°15.852′W; 13 June 2018, MV/UV lights, S. W. Lingafelter (3, SWLC); Cochise Co., Bisbee, 1429 Franklin St., 31°24′23.8″N, 109°55′57.6″W, 5200′, 4–17 April 2013, Malaise trap, Arnold S. Menke (1, SWLC); Cochise Co., East Charleston Road on east side of San Pedro River bridge, 31°37.557′N, 110°10.422′W, 1215m, 23 May 2020, S. W. Lingafelter (1, SWLC); Cochise Co., Cochise Stronghold, 20 May 2015, F. W. Skillman, Jr. (1 FWSC); Cochise Co., 7 mi. W. Sunsites, 12–20 June 1997, 25 June 2015, 15–18 May 1998, at light, F. W. Skillmann, Jr. (7, FWSC); Cochise Co., Hereford, 8920 S. Bryerly Court, N31°24′14″, W110°13′52″, 1500m, 11 June 2019, MV/UV lights, 6 May 2020, S. W. Lingafelter (1, SWLC); Maricopa Co., Phoenix, South Mountain Park, 20 August 1971, J. E. Wappes (1, JEWC); Pima Co., Picture Rocks, 665 m, 32°21.402′N, 111°12.289′W, 21 March 2013 & 15 April 2010, at lights, Margarethe Brummermann (2, SWLC); Pima Co., Madera Canyon, 7–11 July 1973, J. E. Wappes (1, JEWC); Pima Co., 17 mi. E. Sells, 13 May 1964, at light, G. H. Nelson (1, JEWC); Pima Co., Box Canyon, 4395′, 31°47.881′N, 110°47.996′W, 4 April 2007 (3, ASUC); Pima Co., Tucson Mountain Park, at light, 11 April 1989, F. W. Skillman, Jr. (2, FWSC); Pima Co., Tucson Mountains, Gates Pass, extracted from pupal cells of *Encella farinosa*, 24 February 1980, Cicero (1 FWSC); Pima Co., Madera Canyon, 26 July 1990, D. Ahart (1, FWSC); Pima Co., Redington Road just NE of Tanque, Verde Falls trailhead 980m, 32°15.363′N, 110°39.746′W, 29 April 2020, S. W. Lingafelter, beating *Prosopis* at night (2, SWLC); Pima Co., Redington Road just NE of Tanque, Verde Falls trailhead 980m, 32°15.363′N, 110°39.746′W, 29 April 2020, S. W. Lingafelter, MV/UV lights (2, SWLC); Pima Co., Redington Road just NE of Tanque Verde Falls trailhead, 980m, 32°15.363′N, 110°39.746′W, 28 April 2018, on *Prosopis* sp., N.E. Woodley (1, SWLC); Pinal Co., Tom Mix Memorial, Highway 79, 27.5 km SE of Florence 720m, 32°49.294′N, 111°12.274′W, 25 April 2020, MV/UV lights, S. W. Lingafelter (3, SWLC); Santa Cruz Co., Nogales, Lindgren Trap, April–May 2012 (4, Nogales Mariposa Port Insect Collection); Santa Cruz Co., Mt. Hopkins Road Km 1 past, Whipple Observatory, 1320m, 31°40.327′N, 110°56.466′W, 26 May 2020, S. W. Lingafelter (2, SWLC); Santa Cruz Co., Rio Rico, 1053 m, 31.468040, -110.974227, MV/UV lights, 8 March 2017 & 14 April 2017, S. Vitanza (2, SWLC); Santa Cruz Co., Rio Rico, 1216 Juan Legarra, 1085m, 31°28′51″N, 110°57′58″W, UV lights, 6–14 April 2016 & 10 May 2016, S. W. Lingafelter (3, SWLC); Santa Cruz Co., Peña Blanca Canyon, 31°23.22′N, 111°05.58′W, 1195 m, 13 June 2019, MV/UV lights, S.W. Lingafelter (1, SWLC); Santa Cruz Co., Puerto Canyon, 1000m, 31°37.8′N, 111°03.8′W, at light, 8 July 2018, Margarethe Brummermann (1, SWLC); **Texas:** Brewster Co., Big Bend National Park, Oak Spring, 4000′, 8 May 1959, light, Howden and Becker (1, SWLC); Brewster Co., Black Gap Wildlife Management Area, Road 2827 18 miles SE US 385, 2330′, 29°34′N, 103°57′W, 9 May 2015, Wappes & Skillman (3, JEWC); Brewster Co., Black Gap Wildlife Management Area, Rd. 2827 18 miles SE US 385, 2330′, 29°34′N, 103°57′W, 9 May 2015, Skillman & Wappes (25, FWSC); Brewster Co., Terlingua Ranch, Ament Lake, 3480′, 29°27′N, 103°29′W, 17–18 April 2015, MV/UV light, Wappes & Skillman (6, JEWC); Brewster Co., Terlingua Ranch, Ament Lake, 3480′, 29°27′N, 103°29′W, 16–18 April 2015, 8 May 2015, MV/UV light, Skillman & Wappes (33, FWSC); **Utah:** Kane Co., Coral Pink Sands State Park, 11 July 2016, F. W. & S. A. Skillman (1, FWSC).

Anelaphus simile (Schaeffer)

(Fig. 2f, 4e–f, 6a–f, 7a–f)

Elaphidion simile Schaeffer 1908: 334.
Anoplium tuckeri Casey 1924: 247, **new synonym** (Fig. 6e–f).
Anoplium nanulum Casey 1924: 247. Synonymized with *Anoplium tuckeri* by Linsley (1963: 118).
Elaphidion (*Anoplium*) *hoferi* Knull 1934: 69, **new synonym** (Fig. 6c–d).

Discussion. The species formerly placed in *Peranoplium* Linsley, 1957 (which was synonymized with *Anelaphus* by Lingafelter (1998)) have resulted in an abundance of confusion due to their non-descript appearance and the

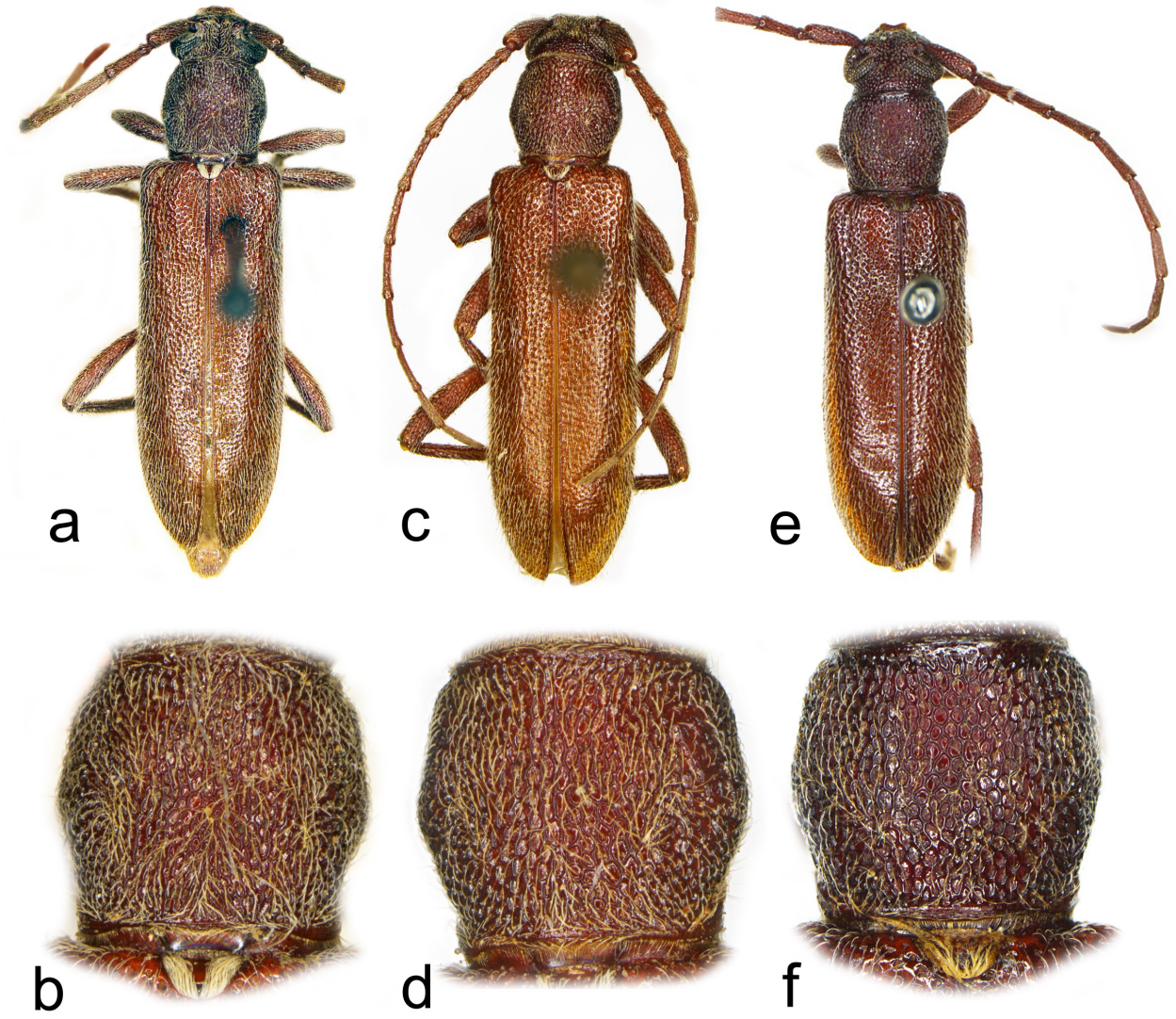

Figure 6. Former *Peranoplium* species. **a)** *P. simile* (Schaeffer), holotype, dorsal habitus. **b)** *P. simile*, holotype, pronotum. **c)** *P. hoferi* Knull, SWRS specimen determined by Knull, dorsal habitus. **d)** *P. hoferi*, pronotum. **e)** *P. tuckeri* (Casey), lectotype, dorsal habitus. **f)** *P. tuckeri* (Casey), lectotype, pronotum.

vague descriptions of alleged differences in setation and punctation. Further, the species in this complex were described without reference or comparison to one another. For example, Casey (1924) in his description of *Anoplium tuckeri*, did not contrast it with *Anelaphus simile* (Schaeffer) (at the time, *Elaphidion simile*), or any other species. Knull (1934) compared his newly described *Elaphidion* (*Anoplium*) *hoferi* to *E. cinerescens* LeConte (this was misspelled and referred to "*Elaphidion cinerascens*", a synonym of *Micranoplium unicolor* (Haldeman)). That species lacks antennal spines, has truncate elytral apices, has fine (not alveolate) pronotal punctation, and occurs only in the eastern United States. Knull made no comparison of *A. hoferi* to *A. simile*, *A. tuckeri* or any other species.

I examined a specimen in the Southwestern Research Station in Portal, Arizona, that was identified as *Anelaphus hoferi* by Knull in 1959 (Fig. 6c–d, Fig. 7b, e). This specimen has no characters that would distinguish it from the holotype of *A. simile* (Fig. 6a–b, 7a, d) and the lectotype of *A. tuckeri* (Fig. 6e–f, Fig. 7c, f), both of which I have also examined. The pronotal punctation is identical and other characters of pubescence, color, proportions, etc., are very minor and within what is expected by intraspecific variation. Therefore, I consider *A. hoferi* and *A. tuckeri* as new synonyms of *A. simile*.

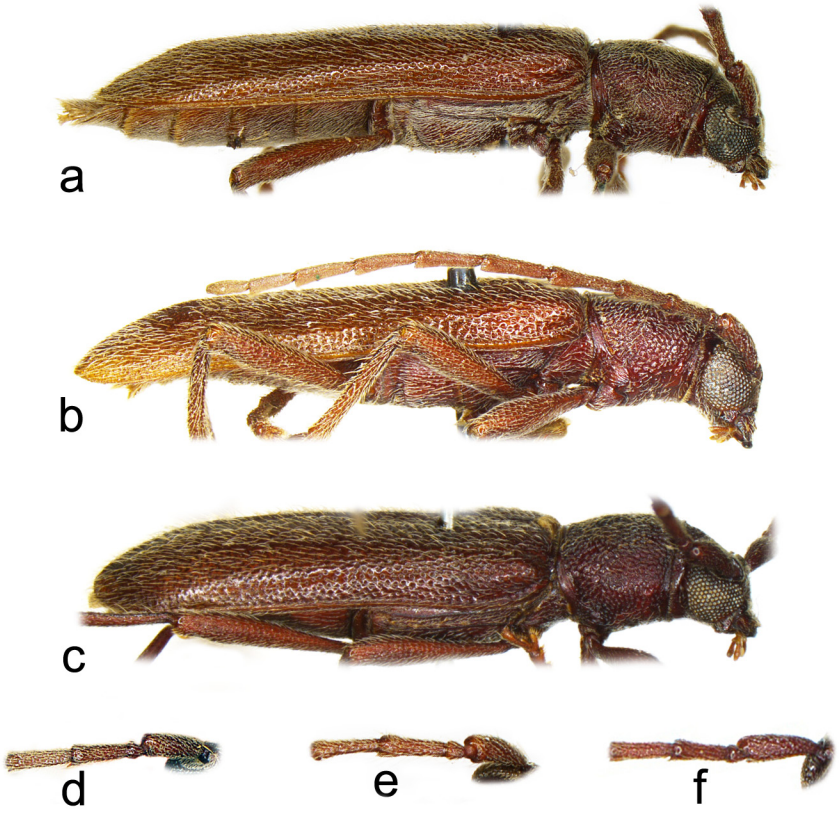

Figure 7. Former *Peranoplium* species. **a)** *P. simile* (Schaeffer), holotype, lateral habitus. **b)** *P. hoferi* Knull, SWRS specimen determined by Knull, lateral habitus. **c)** *P. tuckeri* (Casey), lectotype, dorsal habitus. **d)** *P. simile* (Schaeffer), holotype, basal antennomeres. **e)** *P. hoferi* Knull, SWRS specimen determined by Knull, basal antennomeres. **f)** *P. tuckeri* (Casey), lectotype, basal antennomeres.

Material examined. Mexico: Sonora: La Aduana, 22 May 1962, F. D. Parker, L. A. Stange (1, SWLC); Sonora, Guayamas, May 1973, Dr. Lenczy (1, ASUC); **USA: Arizona:** Cochise Co., 5 mi. W. Portal, S.W.R.S., 5400′, 13 June 1957, 16 June 1957 & 2 July 1957, M. Statham (3, SWRS); Cochise Co., 1 mile S. Portal, 4800′, July 3, 1965, at light, J. H. Davidson, J. M. Davidson, M. A. Cazier (4, ASUC); Cochise Co., Ash Canyon, UV light, 29 April 2011, C.W. O′Brien (2, FWSC); Cochise Co., Huachuca Mountains, Ramsey Canyon, 3 June 2012 & 19–23 May 2013, lights, P. H. Sullivan (SWLC, 2); Cochise Co., Hereford, 8920 S. Bryerly Court, N31°24′14″, W110°13′52″, 1500m, 12 June 2016, 11 June 2019, 6 June 2019, 16-17 May 2020, S. W. Lingafelter (8, SWLC); Cochise Co., Hereford, 8920 S. Bryerly Court, N31°24′14″, W110°13′52″, 1500m, 27 May 2020, N. E. Woodley (1, SWLC); Cochise Co., Huachuca Mountains, Carr Canyon Road, 6.6 km from Highway 92, 31°25.922′N, 110°16.674′W, 11 June 2019, MV/UV light, S.W. Lingafelter (2, SWLC); Cochise Co., Cochise Stronghold, 4 July 1973, Jim Cope (1 FWSC); Cochise Co., Huachuca Mountains, Miller Canyon (Palmerlee Ruin), 13 July 1991, UV light, W. B. Warner (1, SWLC); Cochise Co., lower Lutz Canyon, 3.1 km SW of Highway 92, 1750m, 31°22.703′N, 110°15.657′W, 27 May 2020, S. W. Lingafelter (5, SWLC); Pima Co., Santa Rita Ranch, June 1977, Dr. Lenczy (2, SWLC); Pima Co., Sabino Canyon, 14 May 1919, at light, G. Hofer (1, SWLC); Pinal Co., Tom Mix Memorial, Highway 79, 27.5 km SE of Florence 720m, 32°49.294′N, 111°12.274′W, 25 April 2020, MV/UV lights, S. W. Lingafelter (3, SWLC); Santa Cruz Co., Mt. Hopkins Road Km 1 past, Whipple Observatory, 1320m, 31°40.327′N, 110°56.466′W, 26 May 2020, S. W. Lingafelter (5, SWLC); Santa Cruz Co., Nogales, 31.335339°, –110.938107°, May 13, 2019, 3,932 ft, MV/UV lights, S. Vitanza (1, SWLC); Santa Cruz Co., Madera Canyon, 31.712894°, –110.875016°, UV/MV lights, 25 May 2018, S. Vitanza (1, SWLC).

Anelaphus submoestus Linsley

(Fig. 2j)

Anelaphus submoestus Linsley 1942: 42.

Discussion. One record of this rarely collected species was reared from *Sapindus marginatus* [= *S. saponaria* var. *drummondi*] from the Santa Rita Mountains in Arizona (Linsley 1963). New records are listed below for Arizona and Sonora, Mexico (**new state record**). Note that this species is missing from Monné and Nearns (2020).

Material examined. Mexico: Sonora: MX16 at km 155, 5 July 2008, at light, Skillman, O'Brien, Ribardo (9, FWSC); **USA: Arizona:** Maricopa Co., Ft. McDowell, Verde River, 2 July 1986, D. Ahart (1, FWSC); Maricopa Co., vicinity of Mesa, 6 June 1964, light trap, Jim Haddock (1, SWLC); Maricopa Co., Gila Road at Airport Road, N33°21′, W112°30′, 26 July 1997, W. B. Warner (2, FWSC); Pima Co., Picture Rocks, 665 m, 32°21.402′N, 111°12.289′W, 15 July 2017 & 7 July 2016, at light, Margarethe Brummermann (2, SWLC).

Anelaphus villosus (Fabricius)

(Fig. 2k, 8a-c, 9a-c)

Stenocorus villosus Fabricius 1792: 302.
Callidium pulverulentum Olivier 1795: (70) 69. Synonymy with *E. parallelum* by Gahan (1895: 105).
Stenocorus putator Peck 1819: 307.
Elaphidion parallelum Newman 1840: 29, **new synonym** (Fig. 8b).
Elaphidion arctum Newman 1840: 29. Synonymy with *E. parallelum* by Horn (1885: 5).
Elaphidion pruinosum Guérin-Méneville 1844: 225. Synonymy with *E. parallelum* by LeConte (1873: 183).
Elaphidion rusticum LeConte 1850: 14, **new synonym**
Elaphidion oblitum LeConte 1850: 14. Synonymy with *E. parallelum* by LeConte (1873: 183).
Hypermallus abruptus Casey 1912: 301. Synonymy with *S. villosus* by Linsley (1963: 91).
Hypermallus scuticularis Casey 1912: 302. Synonymy with *S. villosus* by Linsley (1963: 91).
Hypermallus lacustris Casey 1912: 302. Synonymy with *S. villosus* by Linsley (1963: 91).
Hypermallus medialis Casey 1912: 302. Synonymy with *E. parallelum* by Linsley (1963: 92).
Hypermallus medialis canadensis Casey 1912: 303. Synonymy with *E. parallelum* by Linsley (1963: 92).
Hypermallus medialis densicollis Casey 1912: 303. Synonymy with *E. parallelum* by Linsley (1963: 92).
Hypermallus defectus Casey 1912: 303. Synonymy with *E. parallelum* by Linsley (1963: 92).
Hypermallus molliculus Casey 1912: 304. Synonymy with *E. parallelum* by Linsley (1963: 92).
Hypermallus breviusculus Casey 1914: 364. Synonymy with *S. villosus* by Linsley (1963: 91).
Hypermallus militaris Casey 1914: 364. Synonymy with *S. villosus* by Linsley (1963: 91).
Anelaphus davisi Skiles 1985: 308, **new synonym** (Fig. 8c).

Discussion. The complex of elongate, parallel-sided hardwood twig borers including, originally, *Anelaphus villosus* (Fabricius) and *A. parallelus* (Newman), and later, *A. davisi* Skiles, has been a constant source of confusion because there are no morphological features that consistently allow for discrimation among these taxa. Fabricius's (1792) original description of *villosus* (based on a single specimen from "Carolina") (Fig. 8a) defined the species as follows: "*thorace mutico, obscurus cinereo villosus elytris bidentatis*." Of note is that he described the elytral apices as bidentate. Newman (1840: 28) redescribed *villosus* in *Elaphidion*, based on a specimen from St. John's Bluff, Florida (note that this is also the type locality of another synonym of *A. parallelus*, *A. arctum* Newman, which was synonymized by Horn (1885)), and described the elytral apices as "*truncata, utroque angulo spina*", meaning truncate with both angles spinose. Immediately following the *E. villosus* account, Newman described *Elaphidion parallelum* (Fig. 8b), noting the elongate form, parallel elytra, and truncate elytral apices. He had specimens from east Florida, Georgia, and Delaware.

Skiles (1985) was the most recent worker who attempted to discriminate among the adults of this complex. He stated that *A. parallelus* "is often confused with *A. villosus*, but is readily separated by its more slender form (elytra over three times as long as broad in *parallelus*, no more than three times as long as broad in *villosus*) and the third antennal segment, which is subequal to the fourth in *parallelus* but distinctly longer than the fourth in *villosus*." This was a slight expansion of the characters used by Linsley (1963) and Gosling (1978).

Skiles (1985) added to the complex two additional species, *A. davisi* (Fig. 8c) and *A. belkini* (Fig. 1c), both from the Davis Mountains in Texas. Skiles described *A. davisi* as having the third and fourth antennomeres

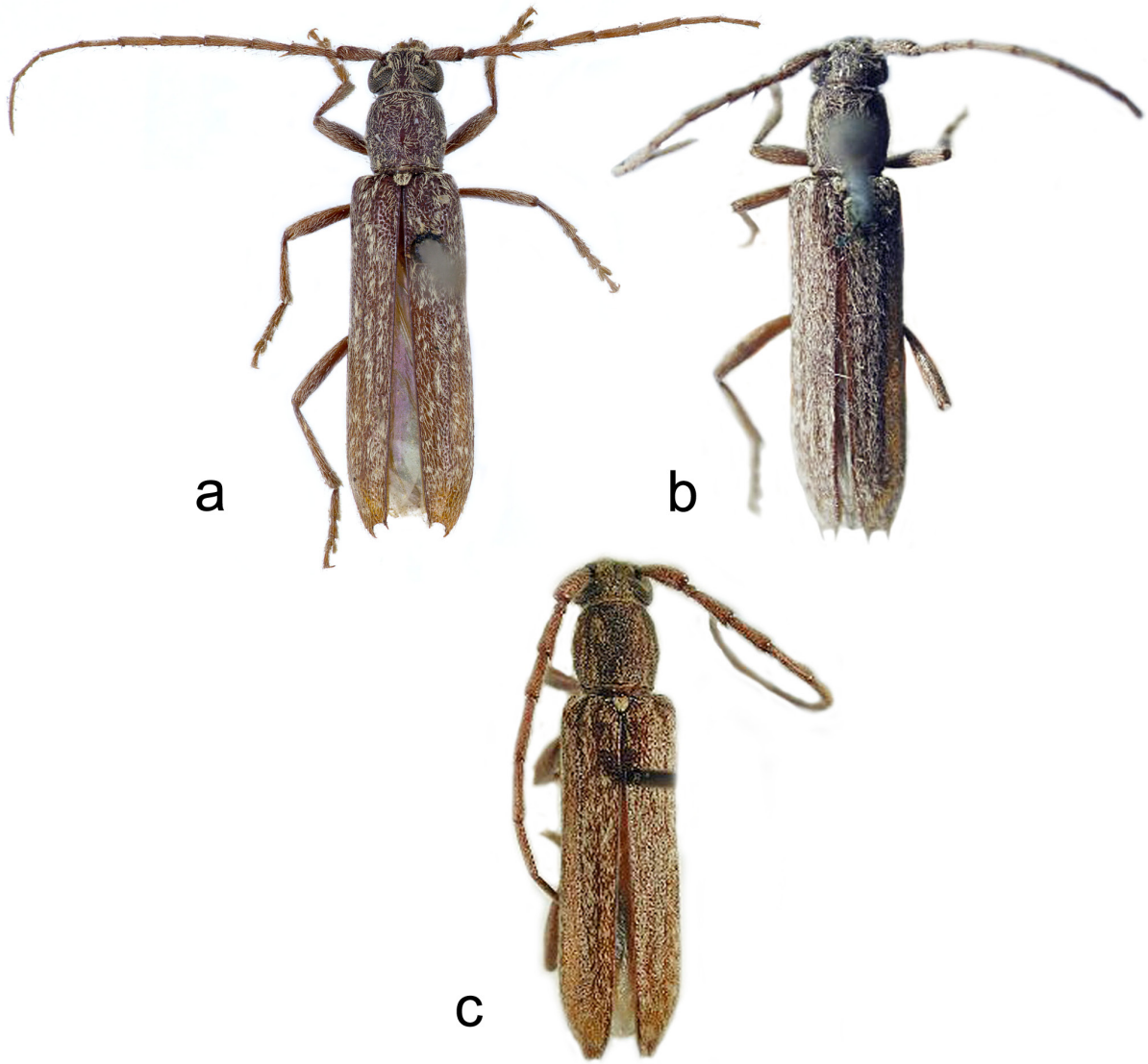

Figure 8. Types of *Anelaphus villosus* (Fabricius) and its synonyms. **a)** *Stenocorus villosus* Fabricius, holotype. **b)** *Stenocorus parallelus* Newman, syntype. **c)** *Anelaphus davisi* Skiles, holotype.

subequal and said, "from *A. parallelus*, which it most closely resembles, *A. davisi* can be distinguished by the more robust form and antennae, the more coarsely punctate metasternum, abdomen, and legs, the reduced antennal spines, and by the emarginate, rather than bispinose elytral apices." He later conceded that "some of the central Texas specimens [of *A. parallelus*] exhibit reduced elytral spines and a rather coarsely punctate abdomen. It is thus possible that *A. davisi* represents an isolated population which is only subspecifically distinct from *A. parallelus*."

Lingafelter and Horner (1993) found intergradation in north Texas for specimens identified as *parallelus* and *villosus* and treated these under the same species account in their faunal study. In particular, measurements were made of the elytral width to length ratio and it was found that distinctions made by Skiles were not clear. They stated, "There is either intergradation in NCT [north central Texas] between the two species or the given distinction is not valid, perhaps only representing individual variation."

Gosling's (1978, 1981) works (also summarized in Solomon 1995) showed biological differences among what he called *A. villosus* (larvae of which bore into recently dead oaks and other hardwoods, and do not girdle them) and *A. parallelus* (larvae of which girdle living twigs of oaks, preferentially, but will also use other

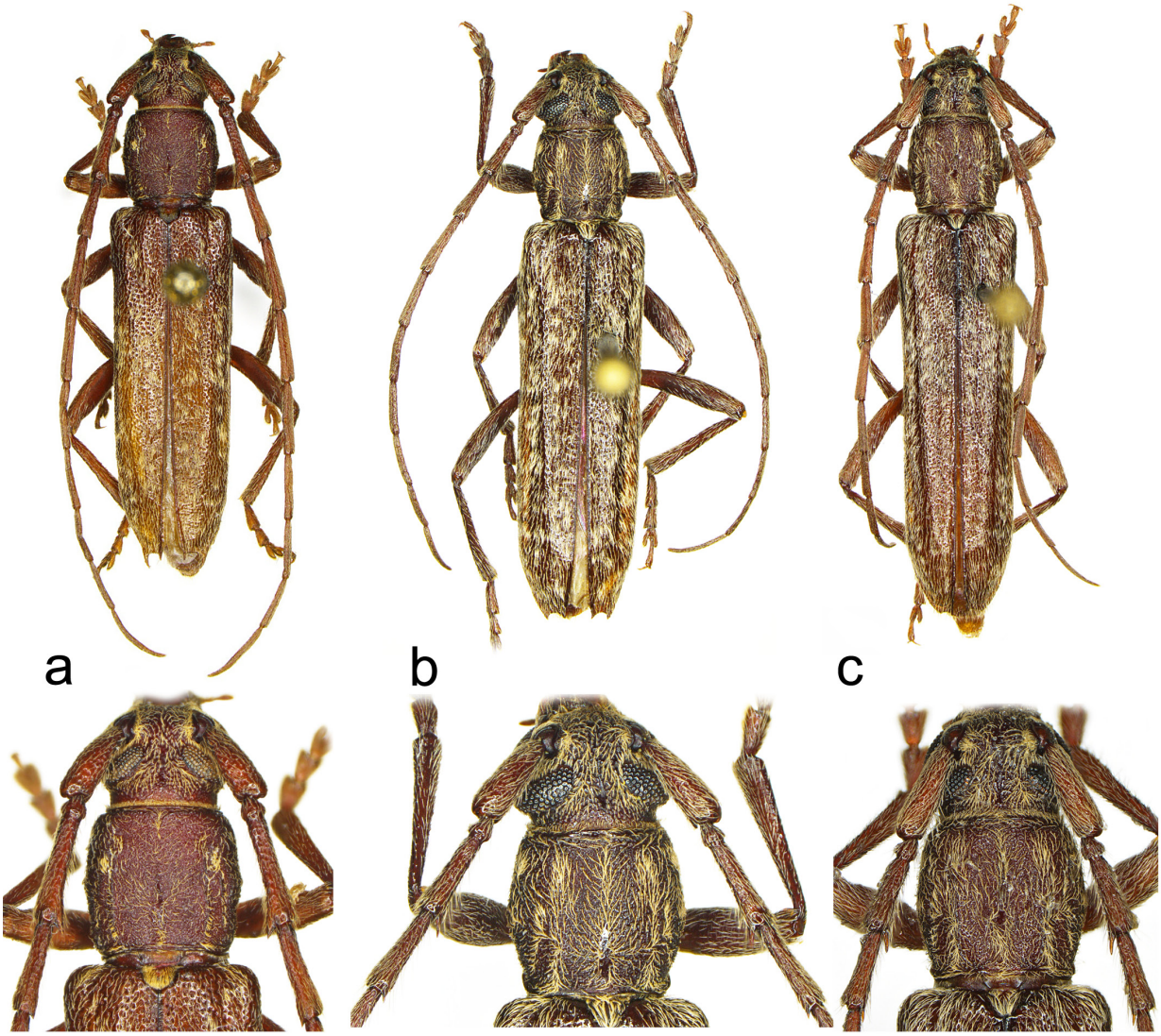

Figure 9. Variation of *Anelaphus villosus* (Fabricius). **a)** Montgomery Co., Maryland specimen (*villosus* form). **b)** Edwards Co., Texas specimen (*parallelus* form). **c)** Pecos Co., Texas specimen (*davisi* form).

hardwoods). While Gosling did show two distinct biologies in Michigan, he did not assess whether these biological distinctions are maintained throughout the range of these taxa that occur throughout the eastern half of the United States into west Texas. On this point, some of the type specimens of *A. davisi* were reared from dead *Quercus emoryi* Torrey, and this apparent difference in larval biology from *A. parallelus* was used to justify his description of that species.

Gosling's contention that biological differences imply species differences is strongly challenged in the ecological and population genetics literature. Generalist species populations often display intraspecific niche diversity through variations in behavior, morphology, and habitat use (Costa-Pereira and Pruitt 2019), and this intraspecific niche variation has been further discussed in Bolnick et al. (2011) and Roughgarden (1972). Significant intraspecific variation in feeding, host-use, and larval behavior has been documented in *Drosophila* Fallén flies (Sokolowski 1985) and *Manduca* caterpillars (Smith 2019), among many other animals.

I have examined photographs of the dorsal views of the holotype of *Stenocorus villosus* Fabricius, a syntype of *Elaphidion parallelum* Newman, and the holotype of *Anelaphus davisi* Skiles and determined that any morphological features used by Gosling, Skiles, Chemsak, and others to differentiate these taxa (e.g., proportions of

elytra, pronotum, and relative lengths of third and fourth antennomeres) do not show discrete differences. The holotype of *Stenocorus villosus* Fabricius has elytra 3.24 times longer than wide, antennomere 3 is 98.3% as long as antennomere 4, and the pronotum is equal in length and width. A syntype of *Elaphidion parallelum* has the elytra 3.26 times longer than wide and the pronotum 1.1 times longer than wide (the ratio of the antennomeres cannot be determined due to their orientation in the photograph, but do not appear significantly distinctive). These proportions demonstrate that they are meaningless to distinguish among the forms. I have examined specimen collected at the same location and time that vary in having truncate or dentiform elytral apices (Pecos Co., Texas) and elytral proportions at both extremes (Gilmer Co., Georgia). While there are populations that apparently exhibit different larval biologies regarding larval girdling and adult oviposition on recently dead versus living hardwoods, I contend that there is widespread support for an alternative conclusion that this is another example of intraspecific variation as has been documented widely and cited above. It is therefore my opinion that the above-mentioned forms represent a single widespread species. The other oak *Anelaphus* species described by Skiles (1985), *A. belkini*, is not included in this complex since the structure of the elytral apex (rounded to a spinose suture), antenna (scape and third antennomere weakly sulcate), and pronotum (punctation as coarse as elytral base in both sexes) allow for its morphological distinction.

Another taxon in the complex, *Elaphidion rusticum* LeConte, has been considered *incertae sedis* in recent catalogues (Bezark 2019; Monné 2019). Fitch (1859) says, "...our latest authorities place it as a synonym of the *Stenocorus villosus* of this author [Fabricius 1792]" in his long discussion of *putator* which was described by Peck (1819), and is itself is now a synonym of *Anelaphus villosus* in the aforementioned catalogues. Linsley (1963: 96) stated, "Judging from the above description, this species [*rusticum*] is an *Elaphidionoides*, probably synonymous with *E. villosus* (Fabricius) or *E. parallelus* (Newman)." I therefore remove *Elaphidion rusticum* LeConte from *incertae sedis* and place it as a new synonym of *Anelaphus villosus* (Fabricius).

This species is widespread throughout the eastern United States and Texas. Bezark (2018) recorded one specimen identified as *A. davisi* from New Mexico. Although Linsley et al. (1961) records one specimen from the Southwestern Research Station, Portal, Arizona, 6 June 1958, extensive collecting has yielded no additional material from Arizona. Many hundreds of specimens have been examined over the past 20 years, but the following records below represent more recent material from throughout the range.

Material examined. Illinois: Cook Co., Palos Park, 10 June 1968 (1, DJHC); **Maryland:** Montgomery Co., North Potomac, 20 April 1999, S. W. Lingafelter (1, SWLC); **New York:** Westchester Co., Briarcliff Manor, 20–21 April 1988, J. D. Ryan (1, DJHC); **Georgia:** Gilmer Co., 269 Creekside Road, Ellijay, 24 May – 1 June 2019, UV/MV lights, R. Morris (4, RFMC); **Ohio:** Ashland Co., Mohican State Park, 14 July 1979, R. A. Androw (1, DJHC); **South Carolina:** Pickens Co., Clemson, 27 May 1989, J. K. Moulton (1, DJHC); **Texas:** Bexar Co., San Antonio, 8734 Paisano Pass, 397 m, 29°41.361′N, 98°39.669′W, 6 April 2018, MV/UV lights, J.E. Wappes & S. W. Lingafelter (2, SWLC); Edwards Co., Choya Ranch W. of Camp Wood, 29°40.665′N, 100°01.330′W, 440 m, 13 April 2018, MV/UV lights, S.W. Lingafelter (1, SWLC); Jeff Davis Co., Davis Mtns. Resort, 5800′, 14 June 1991, D. G. Marqua (1, SWLC); Pecos Co., 28 miles S. Ft. Stockton on 385, 1–2 January 1998, reared *Quercus mohriana*, Morris and Wappes (2, RFMC).

Key to *Anelaphus* of America north of Mexico

Linsley (1963) provided the most recent key to *Anelaphus* north of Mexico. In that work, 14 species were included, but those formerly in the genus *Peranoplium* (synonymized by Lingafelter 1998), *Elaphidionoides* (some of which were synonymized by Skiles 1985), and *Gymnopsyra* (synonymized herein) were not. Lingafelter (2007) provided a key to the 7 species of *Anelaphus* east of the Rocky Mountains but excluding western Texas. Martins (2005) and Nascimento (2018) provided the only other keys to *Anelaphus*, but those works were restricted to South American species. As a result of this study, there are now 22 species of *Anelaphus* known for America north of Mexico: *A. albofasciatus* (Linell), *A. aspera* (Knull), *A. belkini* Skiles, *A. brevidens* (Schaeffer), *A. brummermannae* Lingafelter, *A. cinereus* (Olivier), *A. debilis* (LeConte), *A. dentatus* Chemsak, *A. inermis* (Newman), *A. inflaticollis* Chemsak, *A. magnipunctatus* (Knull), *A. moestus* (LeConte), *A. mutatum* (Gahan), *A. niveivestitus* (Schaeffer), *A. piceus* (Chemsak), *A. pumilus* (Newman), *A. simile* (Schaeffer), *A. spurcus* (LeConte), *A. subdepressum* (Schaeffer), *A. subinermis* Linsley, *A. submoestus* Linsley, and *A. villosus* (Fabricius). Size ranges and distributions are

included to aid in identification, but this information should be used with caution since aberrant individuals exist in any population and known distributions change with time. For more detail on distribution and host plants, it is recommended to consult Monné and Nearns (2020), Tavakilian and Chevillotte (2020), or other primary references cited herein.

1. Elytral integument with contrasting pattern of dark costal lines or basal and apical maculae combined with light brown elsewhere (Fig. 10a). Known only from Florida in the U.S. 8–11 mm ..... ***Anelaphus cinereus* (Olivier)**

— Elytral integument of uniform light, dark, or reddish-brown coloration (although distinct and contrasting pubescent patches may be present) (Fig. 10b-c) **2**

Figure 10. Elytra of *Anelaphus*. **a)** *A. cinereus* (Olivier). **b)** *A. simile* (Schaeffer). **c)** *A. subdepressum* (Schaeffer).

2(1). Elytra without any obvious patches of light pubescence or contrasting integumental colors (Fig. 10b) **16**

— Elytra with white, ochre, or gray pubescence forming spots or fasciae (Fig. 10c) **3**

3(2). Elytra with a straight transverse pubescent fascia at middle, sometimes extending posteriorly to occupy most of posterior half of elytra (Fig. 11). Distributed in southwestern U.S. to Texas. 9–15 mm ..... ***Anelaphus albofasciatus* (Linell)**

— Elytra with pubescence not forming a straight transverse fascia at middle **4**

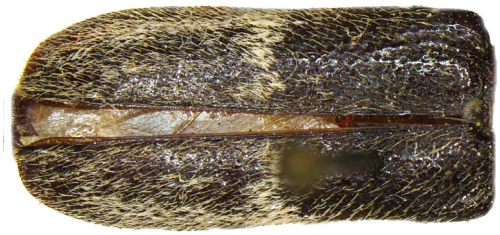

Figure 11. Elytra of *A. albofasciatus* (Linell).

4(3). Elytra with numerous mostly uniformly sized and mostly evenly spaced patches of appressed pubescence. Pronotum with three elongate calli, one at middle bordered on each side by a crescent-shaped callus. Antennomeres 2+3 nearly the length of pronotum; third antennomere relatively narrow, only slightly wider than half width of scutellum (Fig. 12). Eastern U.S. to Texas. 8–11 mm ..... ***Anelaphus pumilus* (Newman)**

— Elytral pubescence more irregular, not forming uniformly sized, evenly spaced patches. Pronotal calli, if present, most often forming just at center and without elongate peripheral calli. Antennomeres 2+3 almost always shorter than pronotum; third antennomere more robust, greater than half width of scutellum **5**

Figure 12. Elytron, pronotum, and basal antennomeres of *A. pumilus* (Newman).

5(4). Elytra with very dense, erect setae present throughout, in addition to denser appressed setal patches (Fig. 13). Known only from Texas in the U.S. 9–15 mm . . . . . ***Anelaphus spurcus* (LeConte)**

— Erect setae, if present on elytra, sparsely distributed **6**

Figure 13. Elytron (lateral view) of *A. spurcus* (LeConte).

6(5). Elytral markings with middle wavy pubescent fascia, sometimes broken and incomplete (rarely almost absent), extending nearly from lateral to sutural margin with denser pubescence sometimes present at apex. Elytra lacking other separate pubescent maculae or spots (Fig. 14a). Known only from Arizona in the U.S. 8–14 mm. . . . . ***Anelaphus subdepressum* (Schaeffer)**

— Elytra with scattered pubescent patches throughout (sometimes coalescing into a vaguely defined transverse fascia) (Fig. 14b). **7**

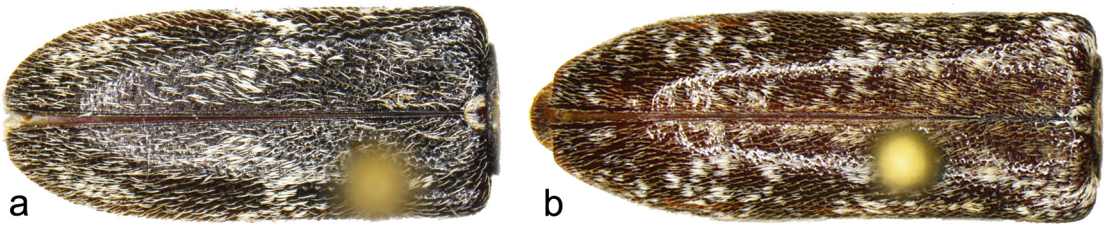

Figure 14. Elytra. **a)** *A. subdepressum* (Schaeffer). **b)** *A. debilis* (LeConte).

7(6). Pronotum with middle callus and 4 smaller peripheral calli on disk. Elytral apices strongly bispinose (spines about length of scutellum) (Fig. 15). Known only from Florida in the U.S. 15–21 mm ..... ***Anelaphus mutatum* (Gahan)**

— Pronotum without middle and peripheral calli in combination (if peripheral calli present, then elytral apices without spines). Elytral apices at most weakly bispinose (spines, if present, much shorter than scutellum) **8**

Figure 15. Dorsal habitus of *A. mutatum* (Gahan).

8(7). Elytral apex weakly bispinose or bidentate (rarely truncate). Form narrow and elongate (both elytra together almost always ranging from 2.8–3.4 times longer than breadth at base) (Fig. 16a–c, showing from left to right, respectively, variation of Maryland, central Texas, and west Texas forms). Widespread in the eastern half of U.S. to Texas. 10–18 mm ..... ***Anelaphus villosus* (Fabricius)**

— Elytral apex rounded externally to a dentiform or spinose suture or obliquely truncate (Fig. 17). Form usually more robust (elytra usually less than 2.8 times longer than breadth at base) **9**

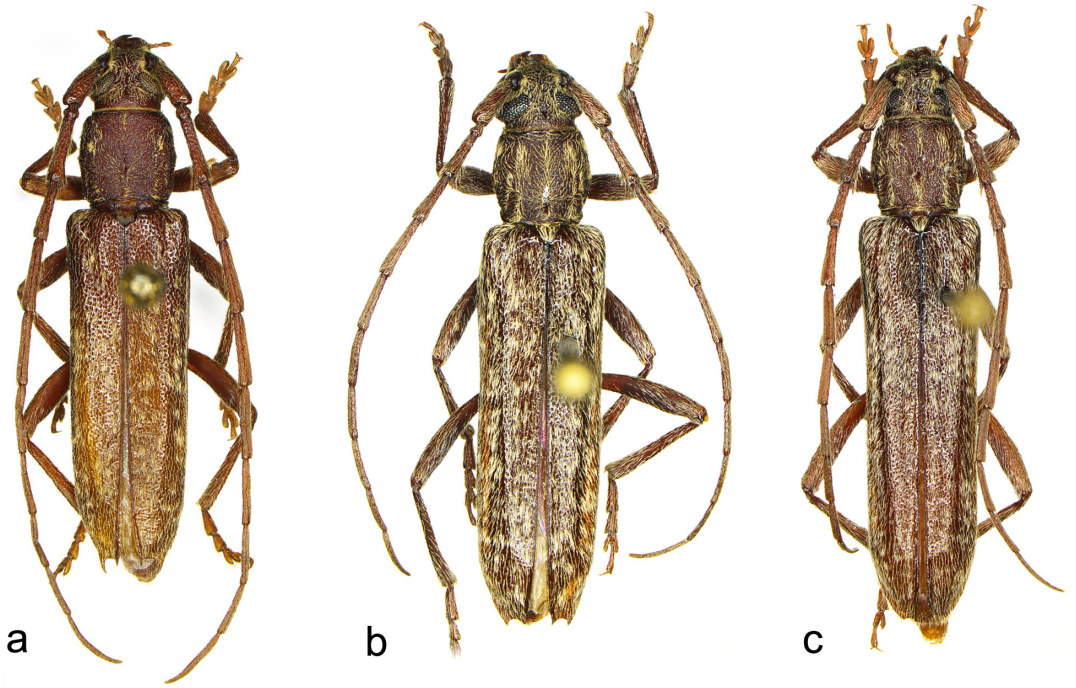

Figure 16. Variation of *Anelaphus villosus* (Fabricius). **a)** Robust form (Maryland). **b)** Narrow *parallelus* form (central Texas). **c)** *davisi* form (west Texas).

9(8). Dorsum with combination of ochre (primarily on pronotum), white, and or off-white pubescence (primarily on elytra) (Fig. 17a–b) **10**

— Dorsum with one distinct color of pubescence. **11**

10(9). Elytral apex truncate or very weakly bidentate. Elytra with bright white appressed pubescent patches most concentrated at middle and apical region. (Fig. 17a). Basal sutural region of elytra without ochre pubescence. Known only from Texas. 9–13 mm . . . . . ***Anelaphus niveivestitus* (Schaeffer)**

— Elytral apices rounded to spinose suture. Elytra with off-white pubescent patches scattered throughout (Fig. 17b). Basal sutural region of elytra with ochre pubescence. Known only from Texas in the U.S. 10–17 mm . . . . . ***Anelaphus debilis* (LeConte)**

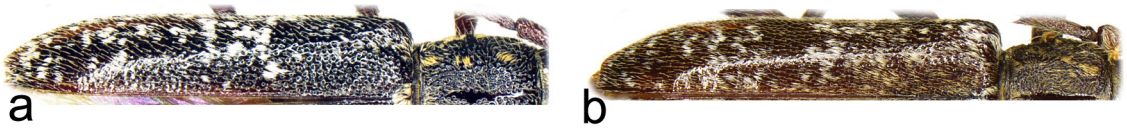

Figure 17. Elytron and pronotum. **a)** *A. niveivestitus* (Schaeffer). **b)** *A. debilis* (LeConte).

11(9). Pronotum distinctly broader anteriorly than posteriorly, as broad as elytral base at widest point (Fig. 18a). Known only from California. 11–14 mm . . . . . ***Anelaphus inflaticollis* Chemsak**

— Pronotum not distinctly broader anteriorly than posteriorly and much narrower than elytral base (Fig. 18b) **12**

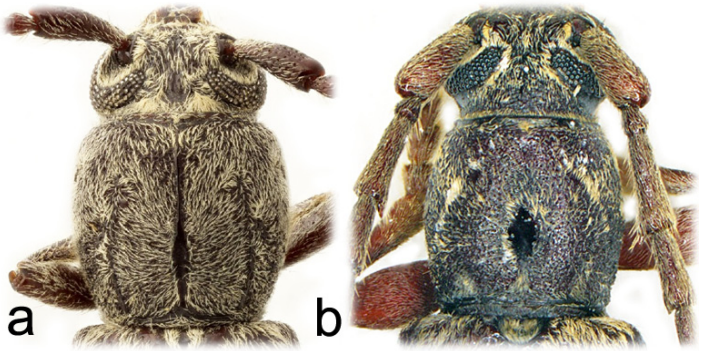

Figure 18. Pronotum and head. **a)** *A. inflaticollis* Chemsak. **b)** *A. inermis* (Newman).

12(11). Antennal tubercles strongly elevated and acute at apex, distinctly angled in between (Fig. 19a). Middle pronotal callus usually absent or indistinct (shorter than scutellum if present). Basal antennomeres usually with pronounced dorsal sulci on 3–5, at least. Last antennomere of males over 1.5 times length of penultimate and constricted strongly at apical third giving appearance of a twelfth segment. Pronotal punctation finer than that of elytral base. Known only from Texas in the U.S. 14–19 mm . . . . . ***Anelaphus subinermis* Linsley**

— Antennal tubercles not or weakly elevated and rounded at apices, nearly flat in between from anterior view (Fig. 19b). Middle pronotal callus distinct (longer than scutellum and sometimes elongate and extending nearly the entire length of the pronotum) (Fig. 21a–b). Basal antennomeres without pronounced sulci. Last antennomere not modified and less than 1.5 times length of penultimate. Pronotal punctation fine or coarse (Fig. 21) **13**

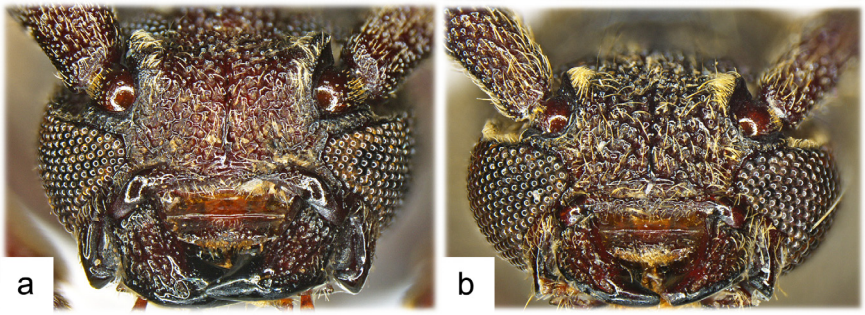

Figure 19. Anterior view of head showing antennal tubercles. **a)** *A. subinermis* Linsley **b)** *A. inermis* (Newman).

13(12). Elytral apex rounded to suture which is, at most, dentiform and lacks spine (Fig. 20a) **14**
— Elytral apex rounded or slightly truncate to suture which has distinct spine (Fig. 20b) **15**

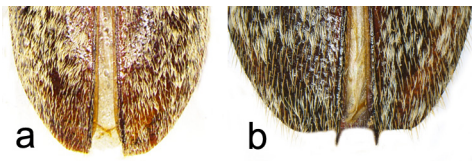

Figure 20. Apex of elytron. **a)** *A. inermis* (Newman). **b)** *A. dentatus* Chemsak.

14(13). Pronotum with small, dense maculae of white or ochre pubescence on disk. Pronotal callus oval and less than one-third length of pronotum (Fig. 21a) (indistinct in some specimens). Distributed in southeastern U.S. to Texas. 10–19 mm . . . . . ***Anelaphus inermis* (Newman)**
— Pronotum without distinct maculae. Pronotal callus linear and more than one-half length of pronotum (Fig. 21b). Distributed in southwestern U.S. to Texas . . . . . ***Anelaphus brevidens* Schaeffer**

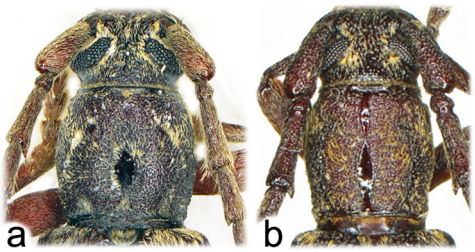

Figure 21. Prontum and head. **a)** *A. inermis* (Newman). **b)** *A. brevidens* Schaeffer.

15(13). Third antennomere attaining posterior fourth of pronotum, at most. Elytra with numerous longer, suberect setae in addition to appressed setae. Elytra with generally more robust form (Fig. 22a). Known only from Arizona. 14–19 mm . . . . . ***Anelaphus dentatus* Chemsak**

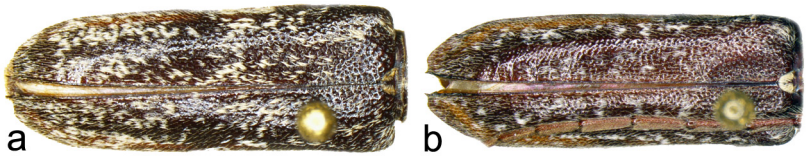

Figure 22. Elytra. **a)** *A. dentatus* Chemsak. **b)** *A. belkini* Skiles.

— Third antennomere apex attaining posterior margin of pronotum. Elytra with very few and sparse suberect setae in addition to appressed setae. Elytra with generally more elongate form (Fig. 22b). Known only from western Texas (Davis Mountains). 12–17 mm ..... ***Anelaphus belkini* Skiles**

16(2). Each elytron with a few setae that coalesce into one or two inconspicuous patches at middle near lateral margin (note that this taxon will key out in two places due to its variability) (Fig. 23a) (note that a few nearly immaculate specimens of *A. subdepressum* have been seen and those will key here, too, but can be distinguished by slightly open procoxal cavities [closed in *A. simile*] and darker brown integument [lighter reddish-brown in *A. simile*]). Known only from Arizona in the U.S. 9–14 mm ..... ***Anelaphus simile* (Schaeffer)**

— Each elytron without any such spots of pubescence (Fig. 23b) **17**

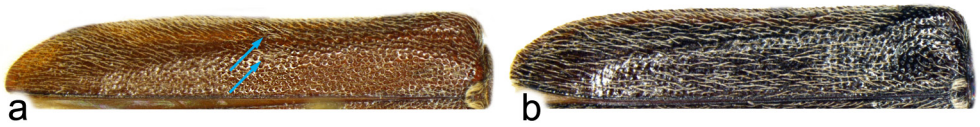

Figure 23. Elytron. **a)** *A. simile* (Schaeffer). **b)** *A. piceus* (Chemsak).

17(16). Proxocal cavities closed posteriorly by a strongly expanded intercoxal process (Fig. 24a) **18**

— Procoxal cavities open behind (see green arrow, Fig. 24b); intercoxal process weakly to moderately expanded at apex **20**

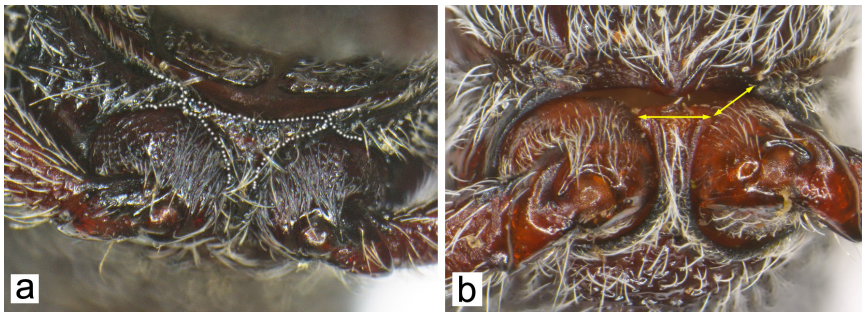

Figure 24. Prosternal process and procoxal cavities. **a)** Strongly expanded prosternal process and closed procoxal cavities of *A. piceus* (Chemsak). **b)** Weakly expanded prosternal process and open procoxal cavities of *A. submoestus* Linsley.

18(17). Elytra with short, white or off-white, recurved pubescence that is separated by 2–3 longitudinal integumental strips lined by longer erect golden setae (best visible from anterior view, but difficult to see in worn or greasy specimens) (Fig. 25c, e). Pronotum usually with a broad, impunctate, shining band at anterior margin, widest at middle, nearly two-thirds as thick as length of scutellum (Fig. 25a). Southwest U.S. to Texas and Utah. 9–13 mm ..... ***Anelaphus piceus* (Chemsak)**

— Elytra with pubescence mostly golden, ochre, off-white, or translucent, rather than white, and not separated by longitudinal strips (Fig. 25d, f). Pronotal impunctate band, if present, of uniform width and much narrower than half length of scutellum (Fig. 25b) **19**

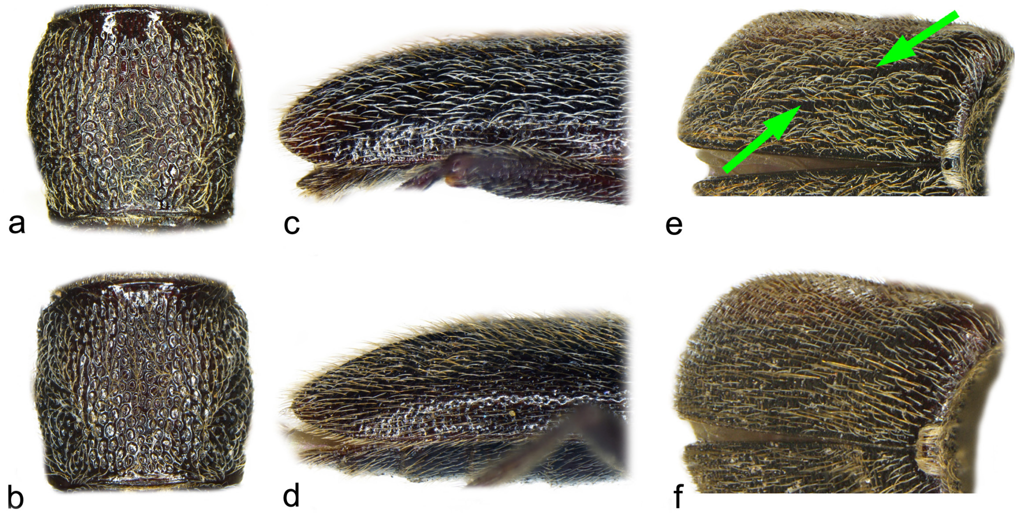

Figure 25. Pronotum and elytron. **a)** Pronotum of *A. piceus* (Chemsak). **b)** Pronotum of *A. brummermannae* Lingafelter. **c)** Elytron (lateral view) of *A. piceus*. **d)** Elytron (lateral view) of *A. brummermannae*. **e)** Elytron (anterodorsal view) of *A. piceus*. **f)** Elytron (anterodorsal view) of *A. brummermannae*.

19(18). Elytral pubescence mostly short, ochre or off-white, subappressed and recurved, but mixed with scattered, longer, suberect setae (Fig. 26a). Color usually light reddish-brown. Pronotum broadly rounded at sides or distinctly broader at anterior half than posterior, with punctation contiguous and unevenly alveolate (Fig. 26b). Metasternum on anterior and lateral margins with small, shallow, mostly contiguous punctures that are usually mostly concealed by moderately dense, appressed setae. Known only from Arizona in the U.S. 9–14 mm .... ***Anelaphus simile* (Schaeffer)**

— Elytral pubescence mostly golden, suberect and not recurved and mixed with numerous longer, erect setae (Fig. 26c). Color usually dark brown. Pronotum nearly quadrate, not evenly rounded at sides, with ovoid-alveolate punctures mostly larger than those of elytra (Fig. 26d). Metasternum on anterior and lateral margins with relatively deep, small, and separate punctures that are mostly visible and not hidden from sparse setae. Known only from Arizona. 9–12 mm .... ***Anelaphus brummermannae* Lingafelter, n. sp.**

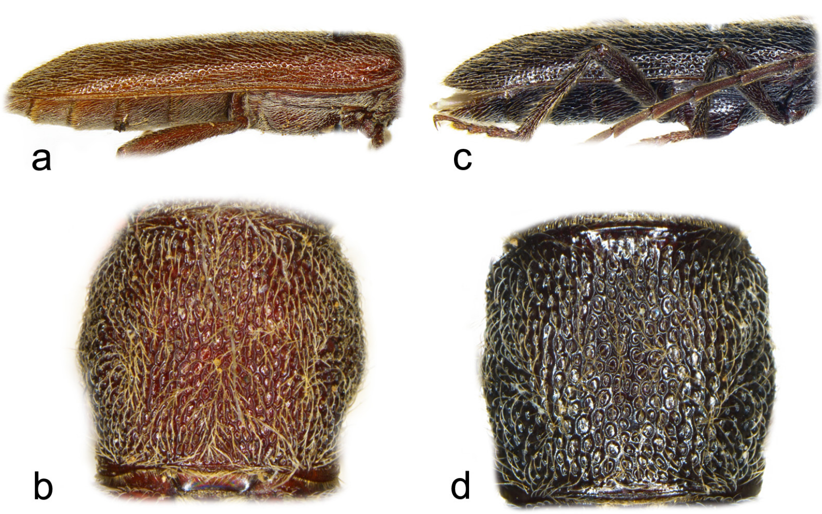

Figure 26. Pronotum and elytron. **a)** Elytron (lateral view) of *A. simile* (Schaeffer). **b)** Pronotum of *A. simile*. **c)** Elytron (lateral view) of *A. brummermannae* Lingafelter. **d)** Pronotum of *A. brummermannae*.

20(17). Intercoxal process barely expanded at apex (Fig. 27a), procoxal cavities widely open posteriorly. Mesal spine of third antennomere often shorter than width of base of fourth antennomere. Middle impunctate pronotal callus usually present (Fig. 27c–d) and at least one-fourth length of pronotum **21**

— Intercoxal process moderately expanded at apex (Fig. 27b), extending behind procoxal cavities, procoxal cavities moderately open posteriorly. Mesal spine of third antennomere longer than width of base of fourth antennomere. Pronotum usually lacking an impunctate callus at middle (Fig. 27e), but if present, shorter than length of 4 punctures **22**

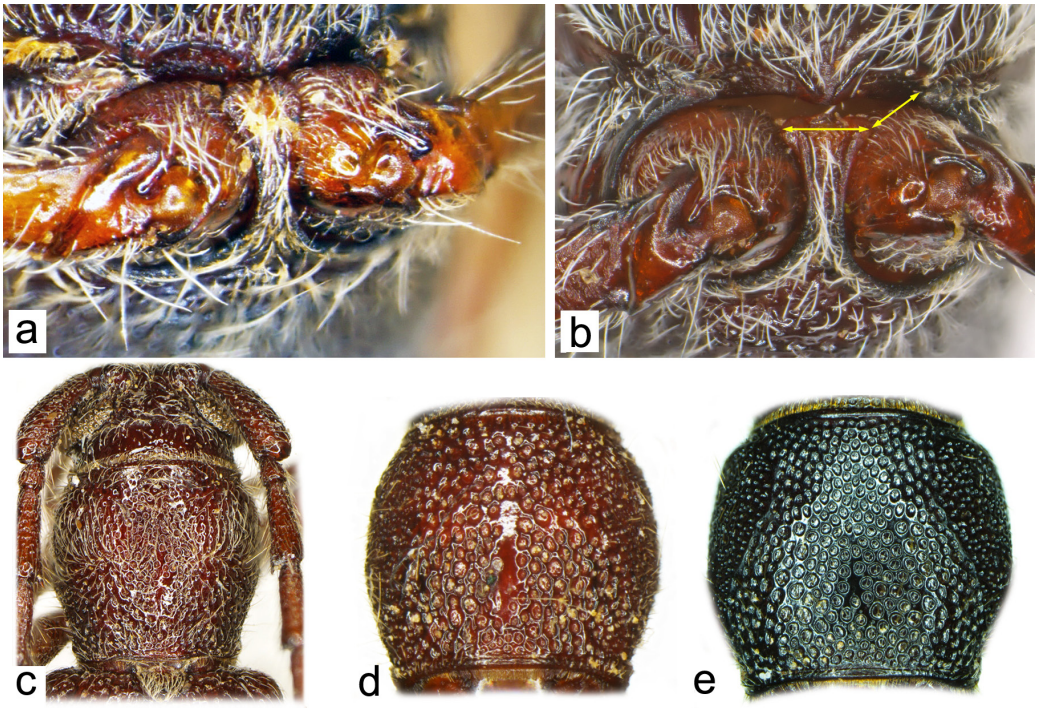

Figure 27. Pronotum, prosternal process and procoxal cavities. **a)** Barely expanded prosternal process and widely open procoxal cavities of *A. magnipunctatus* (Knull). **b)** Moderately expanded prosternal process and open procoxal cavities of *A. submoestus* Linsley. **c)** Pronotum of *A. asperus* (Knull). **d)** Pronotum of *A. magnipunctatus*. **e)** Pronotum of *A. submoestus* Linsley.

21(20). Tibiae, femora, and most antennomeres with only a few short, erect setae; those present are shorter than half the length of antennomere 4 (Fig. 28a). Pronotal pubescence moderately dense, partially obscuring many punctures (Fig. 27c). Pronotum strongly constricted posteriorly, much narrower at base than apex (Fig. 27c). Length of elytron approximately six times greater than width (Fig. 1b). Known only from southwestern Texas (Big Bend National Park). 9–11 mm ..... ***Anelaphus asperus* (Knull)**

— Tibiae, femora, and most antennomeres each with 2–4 very long setae (many about two-thirds the length of antennomere 4) extending in various directions from plane of antennomeres (Fig. 28b). Pronotal pubescence sparse and inconspicuous, not obscuring punctures (Fig. 27d). Pronotum only slightly narrower posteriorly than anteriorly, nearly evenly rounded at sides (Fig. 27d). Length of elytron much less than six times its width (Fig. 1k). Known from Arizona to southwestern Texas. 11–14 mm..... ***Anelaphus magnipunctatus* (Knull)**

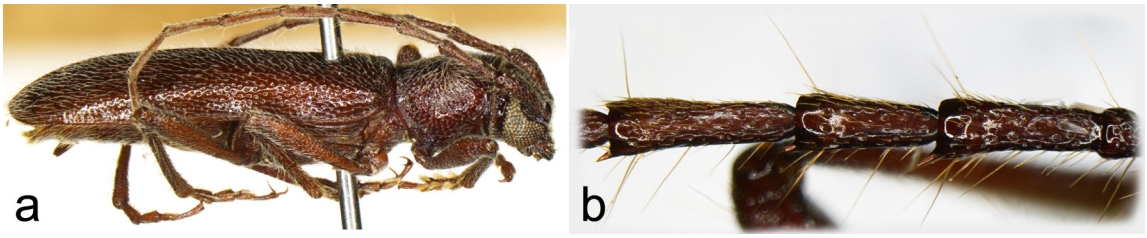

Figure 28. Habitus of *Anelaphus* spp. **a)** Lateral view of *A. asperus* (Knull). **b)** Antennal setae of *A. magnipunctatus* (Knull).

22(20). Pronotal pubescence moderate and conspicuous and punctures of differing size, much more closely spaced and mostly smaller than those of elytral base, more so in males (Fig. 29a). Widely distributed in eastern and southern U.S. to Arizona. 9–15 mm . . . . . ***Anelaphus moestus* (LeConte)**

— Pronotal pubescence very inconspicuous, nearly glabrous on disk and punctures mostly uniform in size and distribution, larger than those of elytral base (Fig. 29b). Known only from Arizona in the U.S. 9–15 mm . . . . . ***Anelaphus submoestus* Linsley**

Figure 29. Pronotum and head. **a)** *A. moestus* (LeConte). **b)** *A. submoestus* Linsley.

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