

A Checklist and New Species of *Eleodes* Eschscholtz (Coleoptera: Tenebrionidae) Pertaining to the Subgenus *Promus* Leconte, with a Key to United States Species

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A CHECKLIST AND NEW SPECIES OF *ELEODES* ESCHSCHOLTZ (COLEOPTERA: TENEBRIONIDAE) PERTAINING TO THE SUBGENUS *PROMUS* LECONTE, WITH A KEY TO UNITED STATES SPECIES

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ABSTRACT

The tenebrionid genus *Eleodes* Eschscholtz, 1829 was monographed by Blaisdell in 1909. Blaisdell's monograph did not cover most of the continental Mexican species, and most of the *Eleodes* subgenera have not been revised since the time of that publication. The subgenus *Promus* LeConte, 1862 is herein reviewed. *Eleodes compositus* Casey, 1891, **revised status**, is removed from synonymy with *Eleodes hispilabris* (Say, 1824) and placed in the subgenus *Promus*. Moreover, *Eleodes hepburni* Champion, 1892 is moved from *Promus* to the subgenus *Steneleodes* Blaisdell, 1909. *Eleodes subnitens sinuata* Blaisdell, 1909 is placed as a junior synonym of *Eleodes subnitens* LeConte, 1851, **new synonymy**. *Eleodes madrensis* Johnston, **new species**, is described from Arizona and northern Sonora, Mexico. A checklist is given for all species currently assigned to *Promus*, and a key is presented for the eight species known to occur in the United States.

Key Words: taxonomy, darkling beetles, sky islands, Arizona, synonymy

The genus *Eleodes* Eschscholtz, 1829 is among the most conspicuous and often observed groups of tenebrionids (Coleoptera: Tenebrionidae *sensu* Bouchard *et al.* 2011) in North America. Many researchers have worked to produce a large body of literature on the genus, yet there still remain many systematic challenges within *Eleodes*, especially with regards to the species-level taxonomy (Triplehorn and Thomas 2011) and nomenclature (Thomas 2005). The most current and comprehensive revision of *Eleodes* was undertaken in Blaisdell's (1909) monograph, which treated species from the United States and Baja California, and most of the currently recognized 15 subgenera have not been treated since then. One such subgenus is *Promus* LeConte, 1862. Initially erected by LeConte (1862) as a monotypic genus to accommodate the species described by Thomas Say as *Blaps opaca* Say, 1823, *Promus* was subsequently classified as a subgenus of *Eleodes* by Horn (1870) and remained relatively unchanged through Blaisdell's (1909) revision.

Promus can be readily separated from the other subgenera of *Eleodes* by several gender-specific characters. In particular, the males can be recognized by having the plantar groove of at least the first protarsomere interrupted by a patch of yellow, tomentose setae. The males of most species also have a single profemoral spine. *Eleodes opacus* (Say, 1823) and *Eleodes fusiformis* LeConte, 1858 lack profemoral spines but can be recognized

by their strongly fusiform and dorsally flattened body. Females of all species lack profemoral spines and lack tarsal pads, having an uninterrupted plantar groove on all tarsal segments. The female genitalia are distinct, being quadrate in form with the inner posterior angle of the coxite produced, acute, and pointing mesally; and the gonostyle is rounded and flattened, positioned on the posterior facing edge of the coxite, often clothed in long setae.

The *Eleodes* fauna of Mexico represents a largely unrevised group of species. In the most recent checklist of the Tenebrionidae, Papp (1961) largely followed Gebien's (1938) placement of the Mexican species into the standing subgenera of the time. Many of these placements remain to be critically re-examined, and it is likely that many changes will need to be made. Although a revision of the Mexican species of *Promus* is beyond the scope of this paper, the herein provided checklist includes all species presently assigned to the subgenus. The *Promus* species found in the United States have remained fairly stable, though several changes are presented here, including the description of a new species based on material acquired from museums and through recent collecting.

MATERIAL AND METHODS

Specimens were examined with a Leica M205 dissecting microscope and measured with an attached Leica DFC450 camera. Images were taken

with the Visionary Digital Passport camera system equipped with a Cannon 6D and 65 mm lens; stacked images were obtained with Zerene Stacker and processed in Adobe Photoshop 6.

Specimens were examined from the following institutions:

ADSC	Aaron D. Smith Collection, Flagstaff, AZ
ASUHIC	Hasbrouck Insect Collection, Arizona State University, Tempe, AZ
CASC	California Academy of Sciences, San Francisco, CA
MAJC	M. Andrew Johnston Collection, Tempe, AZ
OSUC	C. A. Triplehorn Insect Collection, Ohio State University, Columbus, OH
RLAC	Rolf L. Aalbu Collection, Sacramento, CA
TAMU	Texas A&M University Insect Collection, College Station, TX
USNM	United States National Museum, Smithsonian Institution, Washington, DC
WBWC	William B. Warner Collection, Phoenix, AZ

SYSTEMATICS

Eleodes (Steneleodes) hepburni Champion, 1892, new placement

Eleodes compressitarsis Blaisdell, 1935

Eleodes beameri Blaisdell, 1937

Eleodes bryanti Blaisdell, 1937

Eleodes palmerleensis Blaisdell, 1937

Eleodes hepburni is the valid name for a group of synonymized species names with a tangled nomenclatural legacy. Blaisdell (1937) described the subgenus *Holeleodes* Blaisdell as containing three then newly described species from Arizona, therein named *E. beameri* Blaisdell (the type species), *E. bryanti* Blaisdell, and *E. palmerleensis* Blaisdell. These three purported species were later found to be conspecific with each other and were thus synonymized, remaining assigned to the subgenus *Holeleodes* (Triplehorn and Doyen 1972). Triplehorn (2010) further synonymized these three species names with two priority-carrying names, i.e., *E. compressitarsis* Blaisdell and *E. hepburni*, which had both been placed by Papp (1961) in the subgenus *Ardeleodes* Blaisdell.

In his act of assigning synonymy, Triplehorn (2010) erroneously placed *E. hepburni* in the subgenus *Promus*. However, throughout his discussion, Triplehorn referenced the similarity of this assemblage to *Eleodes longicollis* LeConte, 1851, which has consistently been placed in the subgenus *Steneleodes*. It is thus apparent that Triplehorn

(2010) intended to place *E. hepburni* in *Steneleodes* and not *Promus*. This interpretation is further and unambiguously supported by the presence of heavily sclerotized female genitalia characteristic of the subgenus *Steneleodes* and phylogenetic placement based on molecular data (A. D. Smith and M. A. Johnston, unpublished data). *Eleodes hepburni* is hereby placed in the subgenus *Steneleodes*.

Although Triplehorn (2010) did not make any mention of the subgenus *Holeleodes*, it is in accordance with current species-level synonymies that this subgenus follows the placement of *E. hepburni* and thereby becomes a junior subjective synonym of *Steneleodes*.

Eleodes (Promus) compositus Casey 1891, revised status (Fig. 1)

The well-known coleopterist Thomas L. Casey described 15 species of *Eleodes*, of which four are currently considered valid. *Eleodes compositus* was described in 1891 and subsequently synonymized by Blaisdell (1909) with *Eleodes hispilabris* (Say), albeit without reexamining the type or any specimens that could be ascribed to this newly designated infrasubspecific *forma composita* (Blaisdell 1909). Blaisdell assessed that the aberrant form of the pronotum which Casey described “is no proof that it is specifically distinct. Analogous aberrations are observed in *dentipes* in particular, and *hispilabris* is fully as variable as that species” (Blaisdell 1909). Indeed, the pronotum of *E. compositus* (Fig. 1) is

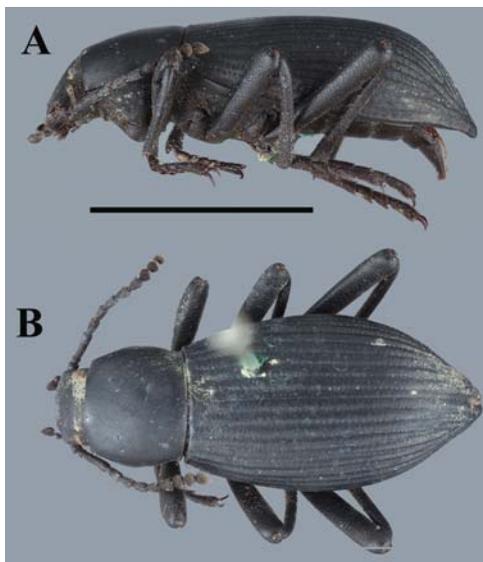


Fig. 1. *Eleodes compositus*. A) Holotype male, lateral habitus, scale bar = 1 cm, B) Dorsal habitus.

subquadrate, evenly arcuate laterally, and only slightly constricted posteriorly unlike the pronotum of *E. hispilabris*, which is distinctly constricted posteriorly, widest anterior of midline, and with very prominent anterior projections. The name *E. compositus* has since been listed as a synonym of *E. hispilabris* in several publications and its status has not been reconsidered in the literature (Papp 1961; Tanner 1961).

As part of an ongoing effort to reassess every type specimen within the genus *Eleodes*, the type of *Eleodes compositus*, residing at the USNM, was examined. In doing so, it became apparent that this specimen did not represent *E. hispilabris*, nor was it even a member of the subgenus *Eleodes* where *E. hispilabris* is placed. In fact, this specimen belongs to the subgenus *Promus* as clearly evidenced by the holotype male having the combined characters of spined profemora and the first two segments of the protarsi with pads of tomentose setae, a combination found in no other subgenus. The heavily sulcate elytral striae clearly distinguish this species from all other described *Promus* species. The holotype, with the locality given as “Texas”, remains as the only known specimen of this enigmatic species. *Eleodes compositus* Casey is hereby returned to valid, species-level standing and placed in the subgenus *Promus*.

***Eleodes subnitens sinuata* Blaisdell, 1909**

(Fig. 2)

Thomas (2005) reviewed and illuminated the many nomenclatural problems created by Papp’s (1961) checklist, which validated many of Blaisdell’s infrasubspecific ‘*formae*’ as avail-

able species-level names. Blaisdell himself never intended to formalize these designations, rather they were meant to aid entomologists in discussing natural variation within a single species. One such case is *E. subnitens sinuata*.

Blaisdell’s (1909) original description references two male specimens from Prescott, Arizona as having “the pronotum widest at the middle, and the sides are feebly sinuate before the basal angles, the base appearing narrower than normal”. He also noted that some females tend to show similar variation, as opposed to the *forma typica*, which has the pronotum appearing to be widest at the base. Unfortunately, the specimens referred to by Blaisdell are not identifiable as present in the California Academy of Sciences insect collection, where his vouchers have been deposited. However, the California Academy does have a single specimen with Blaisdell’s determination label of “*Eleodes (Promus) sinuata* Blaisdell”, with a collection date of 17 July 1921, 12 years after the publication of his monograph. This specimen is from Texas and belongs to what is now known as *Eeleodes knullorum* Triplehorn, 1971. Therefore it is most plausible that Blaisdell recognized the California Academy specimen as a member of a then-undescribed species and presumably applied a manuscript name to it, which was never published.

It is possible that the specimens and habitus that Blaisdell referred to as ‘*forma sinuata*’ are conspecific with a herein newly named and described species (see below), in that this newly recognized and validated entity has been long confused with *Eleodes subnitens* LeConte and shares with it the presence of a posteriorly sinuate pronotum. The two species are often found in sympatry, generally in mid-elevation oak-juniper forests; indeed, the two species are found together both in the vicinity of Prescott, Arizona and throughout southeastern Arizona. However, the male tarsal setation of the new entity is distinctive and is not a feature that Blaisdell was likely to miss. Blaisdell (1909) concludes his *E. subnitens* diagnosis with: “the males have only the basal joint of the anterior tarsi pubescent beneath, which distinguishes it from all other members of the subgenus, except *insularis*”. This sentence immediately precedes his *forma* descriptions. It should also be noted that, while the sinuate shape of the pronotum is the most superficially striking feature to diagnose *E. subnitens* as separate from the new species, it is not always reliable. Some specimens of *E. subnitens* are known to have remarkably sinuate pronota.

In light of the above, I conclude that *E. subnitens sinuata* Blaisdell as specified in Blaisdell (1909) does *not* refer to the herein newly described species, but rather to a form within *E. subnitens*,

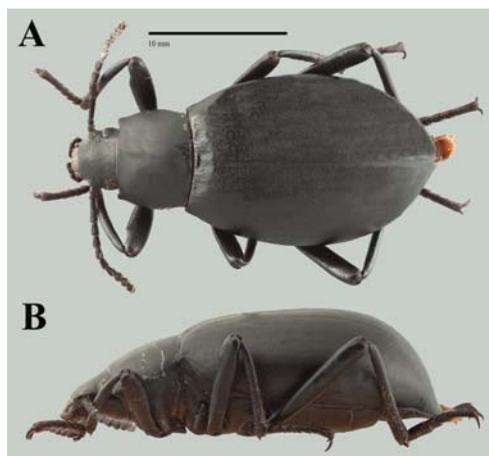


Fig. 2. *Eleodes subnitens sinuata*. A) Neotype female, lateral habitus, scale bar = 1 cm, B) Dorsal habitus.

which is often easily recognizable by its parallel-sided pronotum, though there is variation in its lateral curvature. Based on an examination of large series of specimens, I conclude that the sinuate form discussed by Blaisdell falls well within the natural variation of the species and does not represent a diagnosable subspecies. *Eleodes subnitens sinuata* Blaisdell, 1909 is hereby placed as a junior subjective synonym of *Eleodes subnitens* LeConte, 1851.

Type Material. A neotype female (Fig. 2), deposited in CASC, is hereby designated for *E. subnitens sinuata*. Two labels, first "USA:AZ, Yavapai Co 12km/SW Prescott, headlamping/34.4576° -112.5199° 5700ft/23-VIII-2014 M.A. Johnston", second red paper "Neotype/*Eleodes subnitens sinuata*/ Blaisdell, 1909".

Eleodes (Promus) madrensis Johnston,
new species
(Fig. 3)

Diagnosis. This species can be readily distinguished from other members of *Eleodes*, subgenus *Promus*, by the presence of tomentose pads interrupting the plantar surface on the first and second protarsal segments in males, the shape of the pronotum being widest anterior to midline, attenuate posteriorly, and by having a strongly declivous prosternum with a small recurved process at the

tip. It most closely resembles *E. knullorum* and *Eleodes subnitens*, as discussed above.

Description. **Male.** Length 18–23 mm; width 7–9 mm ($n = 21$). Body elongate oval, widest near middle of abdomen, glabrous. **Head:** Antennae clavate, moderately long, extending beyond pronotum by approximately 3 segments, segments 3–7 longer than wide, segments 8–11 at least as wide as long. Mentum transversely hexagonal; anterior margin blunt, half as wide as posterior margin; lateral angles lined with long, dark setae. Maxillae heavily punctate, clothed with scattered golden setae; stipes bearing long, dark setae; palpifer rounded, produced ventrally, with long, dark setae; terminal palp segment triangular, distal margin as wide as segment is long; galea and lacinia covered with dense, yellow setae anteriorly. Ligula with 2 dense brushes of yellow setae dorsally. Mandibles heavily punctate laterally; punctures obsolete anteriorly. Head subparallel, narrowing anteriorly before antennal insertion and posteriorly behind temples, moderately punctured evenly throughout; labrum transverse, deeply sinuate anteromesally, densely covered with large punctures, clothed with yellow setae densest along anterior margin; clypeus completely fused, frontoclypeal suture entirely visible; postgenae clothed with sparse, yellow setae and punctate, punctures becoming confused mesally and forming transverse stria that do not extend to submentum; eyes elongate, slightly constricted by

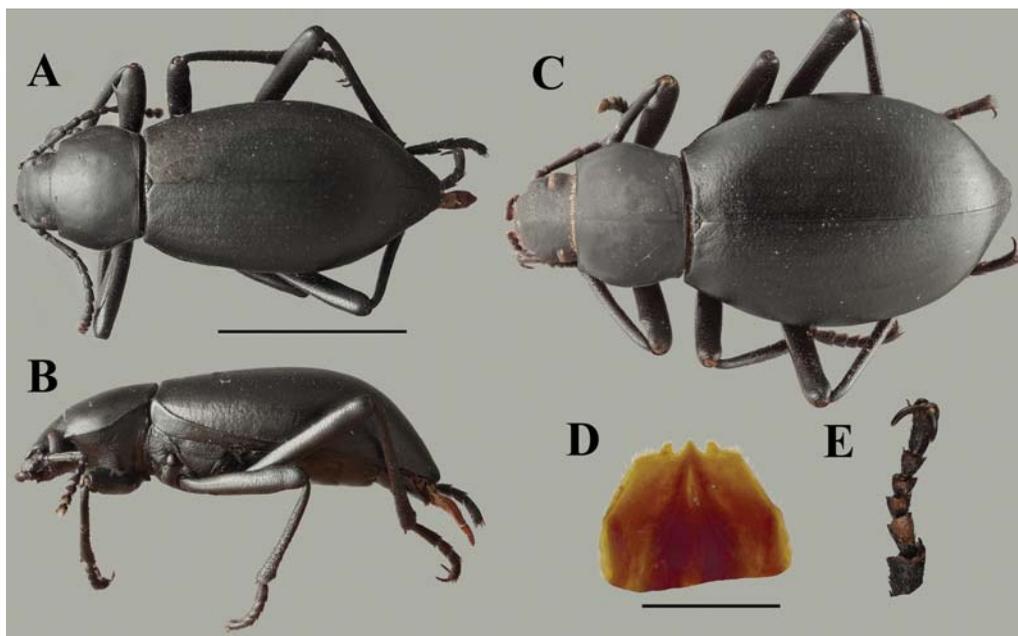


Fig. 3. *Eleodes madrensis*. A) Holotype male, dorsal habitus, scale bar = 1 cm, B) Lateral habitus, C) Paratype female, dorsal habitus, D) Paratype female, terminalia, dorsal view, scale bar = 1 mm, E) Paratype male, fore tarsus, ventral view.

epistomal canthus, ventral lobe positioned slightly anterior to dorsal. **Thorax:** Pronotum quadrate, rounded laterally, slightly wider than long; widest slightly anterior to midline; anterior angles acute, distinct, projecting antero-laterally; lateral margin inflexed immediately after anterior angles, then laterally inflated, becoming wider than elytral base, posterior half sinuate; posterior margin slightly narrower than elytral base; posterior margin slightly and evenly rounded; disc evenly convex, with small, scattered, moderately dense punctures. Prosternum narrow between coxae, about half the width of coxal opening, with a shallow median furrow; strongly declivous immediately anterior of coxae, with a short, rounded, recurved process strongly appressed to anterior margin of mesosternum; clothed with scattered, short, golden setae. Scutellum moderately large, about twice as wide as long; adorned with several large, shallow punctures. Elytra glabrous, fused medially; moderately densely punctate; punctures arranged in linear striae; striae very inconspicuously and slightly depressed; elytral intervals bare and impunctate. Epipleura moderately wide, same width as pseudepipleura, traceable to posterior margin of thorax, epipleura and pseudepipleura contiguous and indiscernible thereafter; pseudepipleura ending near midline of 5th visible sternite. Hind wings absent. **Legs:** Relatively long. Profemora clavate, moderately punctate throughout; each puncture bearing a single golden brown seta; armed with a single, acute tooth on anterior face; tooth positioned about 1/4 the femoral length from apex, angled antero-laterally. Protibia with similar punctation and setation as femora; ending with 2 apical spurs of similar length, each about 2/3 as long as first protarsal segment. Protarsi 5-segmented; segments 1–4 of similar length, segment 5 as long as the 3 preceding segments; segments 1 and 2 with yellow tomentose setal pads interrupting plantar surface; segments 3–4 with golden setae lining the apico-lateral margins of plantar groove; segment 5 with plantar groove fully lined with yellow-brown spicules. Mesothoracic legs similar to prothoracic legs, but lacking the femoral tooth and tomentose pads on tarsal segments 1–2; segments 1–4 with golden setae lining the apico-lateral margins of plantar groove. Metothoracic legs elongate; femora reaching the posterior margin of 4th visible sternite, not toothed; tarsi 4-segmented, each segment with yellow-brown spicules lining lateral margins of plantar surface.

Abdomen: With 5 visible sternites; sternites 1–3 connate, bearing scattered, small punctures; sternites 4–5 hinged laterally with intersegmental membrane conspicuous, moderately densely punctured. Intercoxal process transverse, rectangular; 1.5 times as wide as mesocoxal diameter.

Terminalia: Adeagus simple; basal piece cylindrical, parallel-sided, rounded anteriorly; fused parameres approximately 3/4 as long as basal piece, triangular; dorsal base of parameres deeply bisinuate, with sharply acute anteriorly oriented lateral points; lateral margins of parameres evenly convergent; distal end of parameres rounded, laterally compressed. Clavae 1/2 the length of parameres; longitudinally curved, concave in distal half; distal margin rounded, flattened, vertically oriented.

Female. Length 23–26 mm; width 8–10 mm ($n = 37$). Similar to male, body generally larger, abdomen slightly expanded. Profemora unarmed but bluntly sinuate distally. Protarsal segments 1–2 without tomentose pad; all tarsal segments with golden brown setae along antero-lateral margins of plantar groove. **Terminalia:** Coxites trapezoidal, elongate, twice as long as wide, dorsally concave; mesally appressed, produced apical angle acutely produced, triangular; lateral and distal margins clothed with long, yellow setae. Gonostyles as wide as long, rounded, crowned with long, yellow setae.

Variation. The morphology of this species is fairly consistent, though the tarsi are sometimes abraded, likely due to specimen age, which can obscure the male setal pads.

Distribution. Northern Sonora, Mexico; southwestern New Mexico, southeastern to central Arizona, United States.

Etymology. The specific epithet *madrensis* is derived from the Madrean archipelago, where this species is found.

Remarks. Specimens of *Eleodes madrensis* are frequently found in natural history collections, but tend to be interspersed with material identified as *E. subnitens* and *E. knullorum*. See Diagnosis and Key for means to separate these taxa. K. W. Brown was the first tenebrionid worker to diagnose the difference between *E. madrensis* and *E. subnitens*, indicated in his collection by the determination label of ‘Promus possibly new species.’ The type specimen has therefore been selected from his original series of specimens from Ramsey Canyon.

Type Material. Holotype (male) first label “ARIZ., Cochise Co./Huachuca Mts., Miller/Canyon. 5-VIII-1971/ex. R.L. Dunn” second label “Purchased 1971 from/Russell D. Dunn” third label green disc indicating specimens formerly of K. W. Brown Collection, deposited in CASC.

Paratypes. 57 marked with blue paratype labels, 9 with same information as holotype, 5 males, 4 females, 1 with additional label “Eleodes (Promus)/Poss. N. SP./det KWB, ‘82” ADSC; “Ramsey Canon/Huachuca Mts/Ariz. WH Mann” “WM Mann 1954/Collection” 1 male, 2 females, USNM; “Madera Cn/Pima Co./Arizona” “Dr Lenczy/X.1982” 2 males, USNM; “Palmerlee/9.18.07

Ariz.” “Coll. By/ HAKaerber” “WM Mann 1954/ Collection” 1 male 1 female, USNM; “Huachu. Mtns/7.11.02 Ariz.” “Miller Can./HAKaerber” 1 female, USNM; “Palmerly/Cochise Co./Ariz.” “Brooklyn/ Museum/Colln. 1929” 1 male, USNM; “Portal, AZ/ 7.20.44/W.W. Jones” “branchus” 1 female, USNM; “Arivaca/Pima Co./Arizona” 1 female, USNM; “ARIZONA: Santa Cruz Co./Madera Canyon/ 24-VIII-1980 night/T.P. & T.A. Friedlander,/and P.W. Kovarik” 1 female, TAMU; “USA:AZ, Pima Co./Sta Rita Mtns N31°45.794'/W110°50.798' 4336ft/26-VII-2013 W.B.Warner” 1 female WBWC; “USA:AZ, Yavapai Co. 12km/SW Prescott, headlamping/34.4576° -112.5199° 5700ft/23-VIII-2014 M.A. Johnston” 1 male, 2 females, MAJC; “MEXICO, Sonora/16.5 air km ENE of/Bacadehuachi/29.844444, -108.976944/2-VIII-2012 1680m/leg. T.R.Van Devender” “sycamore-Cupressus/arizonica/riparian forest/on slope” 2 females, ASUHIC; “USA:AZ Cochise County/ Ramsey Canyon Nature Preserve/ex: side of cabin at night/N31.446° W110.314°/Jul 1 2012 EK Moody” 1 male, ASUHIC; “Mexico, Sonora/ Mt. Huachinera/Rancho Madrono/vi-25-81 2200m/ McCleve & Jump” 3 males 4 females, OSUC; “NM: Hidalgo Co./Animas Mts./Indian Cr/vi-6-80 1828m/Scott McCleve” 1 female, OSUC; “AZ: Graham Co./Gila Mts./Bonita Creek/vi-13-79 1164m/Scott McCleve” 1 female, OSUC; “nr. Portal, Cochise/Co., AZ/8-25-70/S. McCleve” 1 female, OSUC; “Chiricahua M.,/29.VIII.60 Ar.” “SW res/sta.” “Collr. C.A./Triplehorn” 1 female,

OSUC; “AZ, Cochise Co./Huachuca Mtns./Copper Cn 1882m/vi-10-78/Scott McCleve” 1 male, OSUC; “Huachu. Mts./Ariz” “Miller Can./HA. Wenzel” “H.W. Wenzel/Collection” 1 male, 1 female, OSUC; “Huachuca mts./Ariz. 18-VIII-71/Ramsey Canyon” “D.J. & J.N./Knull Collrs.” 1 female, OSUC; “Madera Can./Santa Rita Mts./Ariz. 17-VI-70” “W.E. & C.A./Triplehorn/Collectors” 1 female, OSUC; “AZ:STA CRUZ Co./Santa Rita Mts./ Madera Cn/v-31-79 1499m/Scott McCleve” 1 female, OSUC; “AZ- Cochise Co./Cochise Stronghold/ DBrzoska 12-VIII-1982” 1 male 1 female, OSUC; “Sta. Catalina Mts./ARIZ./Molino Basin 4400'/ 16-VI 1970” “W.E.&C.A./Triplehorn/Collectors” 1 male, OSUC; AZ: Cochise Co./Huachuca MtsCop-/per Cn vi-6-77/Scott McCleve” 1 female, OSUC; “Arizona, Madera/Cn. Santa Rita Mts./ Santa Cruz Co./6200 ft.1-2.VIII.52” “H.B. Leech/ J.W. Green/Collectors” 1 female, CASC; “6000 ft Mt./Washington” “Nogales Ariz./J.A. Kusche/ July 1919-17” “Van Dyke/Collection” 1 male 1 female, CASC; “Santa Rita Mts./Ariz. 5 to 8000ft./June, F.H. Snow” “Blaisdell/Collection” 1 female, CASC; “31°25'30"N 111°11'30"W/ USA, Arizona, Sta Cruz Co./Sycamore Cyn, 26:III:2000/Cols. K.Will, W.Moore./K.Ober” 1 female, RLAC; “Ariz., Maricopa/Co. Red Mountain/VI-22-2000/K.Will col.” 1 female, RLAC; “Arizona, Gila Co./Tonto Natural Bridge/ VI-12:14-88 at night/R.L. Aalbu col.” 1 female, RLAC; “USA:AZ. Gila Co./Pinal Mtn. Rec./Area (Pine-Oak)/VII-28-1991” 1 female, RLAC.

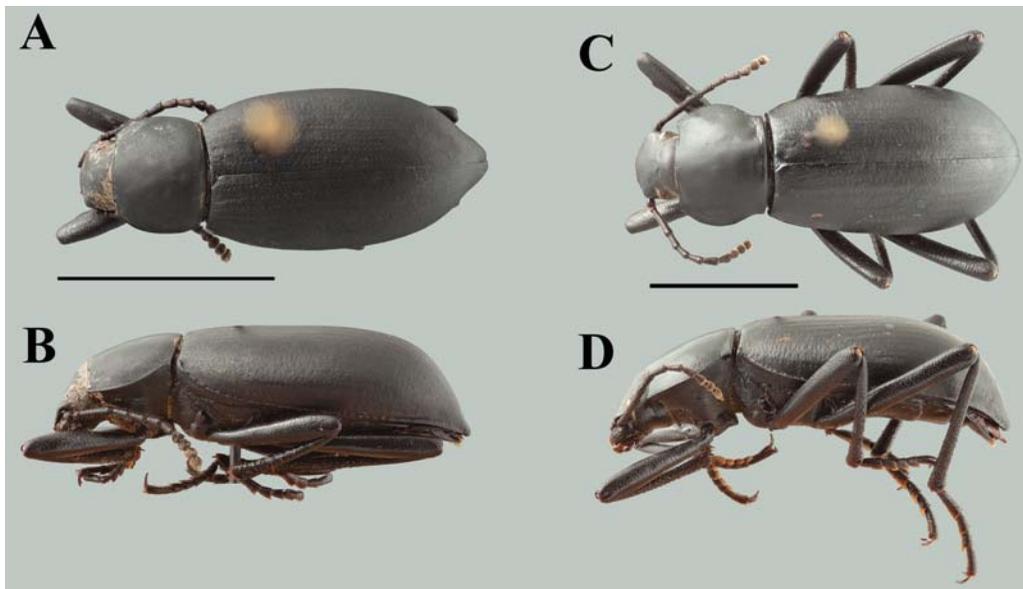


Fig. 4. *Eleodes knullorum*, paratype males, dorsal and lateral habitus, scale bars = 1 cm. A–B) Form 1, C–D) Form 2.

CHECKLIST OF THE SPECIES OF *PROMUS*
LECONTE, 1862

The following is the complete list of species currently placed in the *Eleodes* subgenus *Promus*.

Genus *Eleodes* Eschscholtz 1829: 8
Subgenus *Promus* LeConte 1862: 226
anachronus Triplehorn 2010: 373

brucei Triplehorn 2007: 638
calcaratus Champion 1884: 86
compositus Casey 1891: 58, new placement
erraticus Champion 1884: 87
fusiformis LeConte 1858: 184
goryi Solier 1848: 251
seriatus LeConte 1858: 185 (synonym)
*hoge*i Champion 1885: 91
insularis Linell 1899: 181

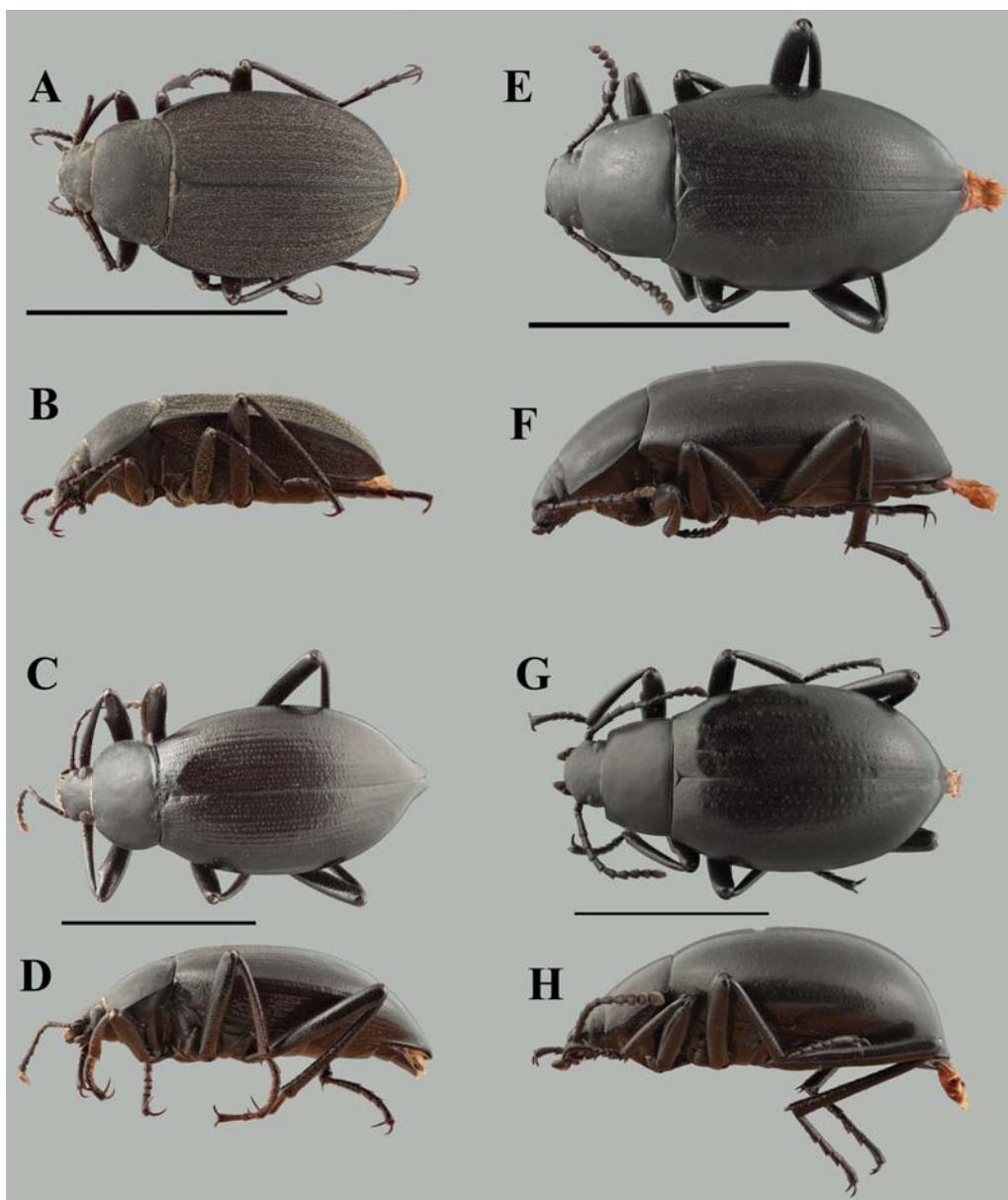


Fig. 5. *Eleodes* (*Promus*) species, dorsal and lateral habitus, scale bars = 1 cm. A–B) *E. opacus*, C–D) *E. striolatus*, E–F) *E. fusiformis* G–H) *E. goryi*.

insularis terricola Blaisdell 1923: 265 (synonym)
impolitus (Say 1835: 183)
aubei Solier 1848: 245 (synonym)
knullorum Triplehorn 1971: 56
longicornis Champion 1884: 87
madrensis Johnston, new species
montanus Champion 1884: 86
opacus (Say 1823: 263)
spiculiferus Triplehorn 2007: 632
spinolae Solier 1848: 253
striolatus LeConte 1858: 185
subnitens LeConte 1851: 134
subnitens sinuata Blaisdell 1909: 163 (synonym)
watrousi Triplehorn 2007: 640

KEY TO THE SPECIES OF *ELEODES* SUBGENUS *PROMUS* OF THE UNITED STATES

The subgenus *Promus* is represented in the United States by eight species. *Eleodes knullorum* is highly variable (Triplehorn 1971) and thus keys to two distinct forms, which occur sympatrically in southwestern Texas (Fig. 4). The definitional boundaries of *E. knullorum* may need revision when examined in the context of the group's entire geographic range, which includes northern Mexico.

1. Elytral disc strongly flattened, lateral margin distinctly carinate (Fig. 5A–B) *E. opacus* (Say)
- 1'. Elytral disc laterally rounded 2
2. Body strongly fusiform, males without profemoral spines, anterior angles of pronotum rounded (Fig. 5E–F) *E. fusiformis* LeConte
- 2'. Body not strongly fusiform, males with single profemoral spine, anterior pronotal angles often acute 3
3. Elytra clothed with minute yellow setae originating from small, evenly spaced punctures *E. spiculiferus* Triplehorn
- 3'. Elytra glabrous, without setae, punctuation variable 4
4. Elytra with deeply impressed, sulcate striae, intervals convex (Fig. 1) *E. compositus* Casey
- 4'. Elytra without sulcate striae 5
5. Elytra with >25 conspicuous, neatly arranged, longitudinal striae comprised of small punctures, anterior pronotal angles rounded (Fig. 5C–D) *E. striolatus* LeConte
- 5'. Elytra without neatly arranged striae, or with few, large punctures, anterior pronotal angles acute 6
6. Elytra with conspicuous strial punctures, often quite large (Fig. 5G–H) *E. goryi* Solier
- 6'. Elytra with small, inconspicuous punctures (Figs. 2–4) 7
7. Pronotum constricted behind anterior angles, evenly arcuate in posterior half, prosternal process large, forming triangular wedge (Fig. 2) *E. subnitens* LeConte
- 7'. Pronotum with lateral margins evenly arcuate anteriorly, sinuate posteriorly, prosternum variable, not forming a large triangular wedge (Figs. 3–4) 8
8. Prosternum flat, horizontal, extending beyond procoxae. Male profemoral tooth blunt, dentate (Fig. 4A–B) *E. knullorum* Triplehorn (form 1)
- 8'. Prosternum declivous behind procoxae. Males with strong profemoral spines 9
9. Southwestern Texas. Abdomen not attenuate posteriorly, female gonostyle reniform, inserted on anterior dorsal surface of coxite (Fig. 4C–D) *E. knullorum* Triplehorn (form 2)
- 9'. Arizona, southwestern New Mexico. Abdomen attenuate posteriorly, female gonostyle truncate mesally, inserted on posterior face of coxite (Fig. 3) *E. madrensis* Johnston, new species

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