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from west-central North America,  
and a lectotype designation for *Elater soleatus* Say

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Five new species of *Dipropus* Germar (Coleoptera: Elateridae) from west-central North America, and a lectotype designation for *Elater soleatus* Say

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**Abstract.** The species of *Dipropus* Germar (Coleoptera: Elateridae) of the west-central region of North America are taxonomically reviewed. Historical records of *D. approximatus* (Candèze), *D. ferreus* (LeConte), *D. simplex* (LeConte) and *D. soleatus* (Say) in the region are based on misidentifications. *Dipropus pericu* **new species** is described from Baja California Sur. *Dipropus reinae* **new species**, *D. sonora* **new species** and *D. yaqui* **new species** are described from southern Arizona, New Mexico and Sonora. *Dipropus warneri* **new species** is described from Arizona, New Mexico and Texas. *Dipropus sus* (Candèze) is reported from Morelos, Sonora and Sinaloa as **new state records**. Keys to the species of the region are provided. The historical value of a specimen of *Elater soleatus* Say in the Dejean collection is discussed and its lectotype designated. *Ischiodontus oblitus* Candèze is treated as an objective synonym of *Dipropus soleatus*.

**Key Words.** Taxonomy, new records, new synonym, Sonora, Baja California, Arizona, New Mexico, Texas.

**Resumen.** Las especies de *Dipropus* Germar (Coleoptera: Elateridae) de la región centro-oeste de América del Norte están taxonómicamente evaluados. Los registros históricos de *D. approximatus* (Candèze), *D. ferreus* (LeConte), *D. simplex* (LeConte), y *D. soleatus* (Say) en la región están basado en identificaciones erróneas. *Dipropus pericu* **nueva especie** se describe desde Baja California Sur. *Dipropus reinae* **nueva especie**, *D. sonora* **nueva especie**, y *D. yaqui* **nueva especie** se describen desde el sur de Arizona, Nuevo México y Sonora. *Dipropus warneri* **nueva especie** se describe de Arizona, Nuevo México y Texas. *Dipropus sus* (Candèze) se informa de Morelos, Sonora y Sinaloa como **nuevos registros estatales**. Se proporcionan claves para las especies de la región. Se le da la importancia histórica de un espécimen de *Elater soleatus* Say en la colección de Dejean. Un lectotipo es señalado para *E. soleatus* Say y *Ischiodontus oblitus* Candèze se considera como un sinónimo objetivo de *Dipropus soleatus*.

**Palabras Clave.** Taxonomía, nuevos registros, nuevo sinónimo, Sonora, Baja California, Arizona, Nuevo México, Texas.

## Introduction

*Dipropus* Germar (1839) is one of the more taxonomically diverse and understudied genera of elaterid beetles, with about 120 valid and many undescribed species distributed throughout tropical, subtropical and warm-temperate regions of the Americas. Historically, the species of *Dipropus* received little taxonomic attention, possibly due to Candèze's (1859) potentially fateful admonition that "Leur uniformité rend leur distinction spécifique difficile." For example, the taxa treated here (Fig. 1–19) illustrate why species of *Dipropus* are frequently treated by collectors as 'unidentifiable brown click beetles that come to lights' and are often misidentified or remain undetermined in collections. Still, species of *Dipropus* are often some of the more abundantly collected click beetles at lights and may be important ecological components in certain habitats.

A majority of the valid species of *Dipropus* were described in *Ischiodontus* Candèze (1859) and by Champion (1895). Champion produced the only taxonomic revision to date of the North American species, but excluded those species from the United States and the Baja California peninsula. Horn (1894) noted that the *Biologia Centrali-Americana* project regarded the Baja California peninsula as faunally outside its area of inclusion, but effectively most of northwestern Mexico was excluded from active exploration (Godman 1915). The *Dipropus* species of the United States were studied sporadically through nearly 200 years of the primary taxonomic and faunal studies, and reviewed only in an unpublished thesis by Clark (1963).

The type species of *Dipropus* is *Dicrepidius laticollis* Eschscholtz, 1829, as designated by Duponchel (1845). The designation of *Elater pexus* Germar by Hyslop (1921) is not valid. The type of *Ischiodontus* Candèze is *I. pinguis* Candèze, 1859, as designated by Hyslop (1921). All three of these species are presently congeneric and each will key to *Dipropus* (Casari 2013), though Casari's (2008) phylogenetic analysis of the tribe indicates that the genus is probably polyphyletic. It may not be surprising if these species are segregated by genus reassignments in the future. The generic synonymy was apparently overlooked before Arnett (1962), who listed *Dipropus* as the senior name. The use of *Ischiodontus* by Downie and Arnett (1996) is an error.

The study region of west-central North America here includes northwestern Mexico and much of the southwestern USA. Politically, this area includes the states of Sonora, Baja California, Baja California Sur and the northern portions of Chihuahua in Mexico; and Arizona south of the Salt River valley, southwestern New Mexico and extreme southeastern California in the United States. This region is the southern portion of the Madrean Floristic Region and includes the Sonoran and Chihuahuan Floristic Provinces (Thorne 1993). It is a western and northern extension of the Neotropical Realm, which is reflected by the presence of *Dipropus* species. The mountain ranges of the region are often collectively called the Madrean Archipelago or Sky Islands (e.g. Gottfried et al. 2013, Brusca and Moore 2013).

Within the core of the study area, at least 135 valid species of Elateridae are documented from the United States portion, 36 species from the Baja California peninsula, and 62 species from Sonora (unpubl. data), including those herein reported. The elaterid fauna of the region lacks published modern summaries by either political or environmental unit, though faunistic work is underway. An overview of insect biodiversity studies in the region was provided by Bailowitz and Palting (2010).

Horn (1894) provided the only published summary of the Baja California elaterid fauna and listed 19 species including "*Ischiodontus ferreus* LeConte" and "*Ischiodontus soleatus* Say". Within the region *D. approximatus* (Candèze), *D. ferreus* (LeConte), *D. simplex* (LeConte) and *D. soleatus* (Say) have historical records, but all specimens seen determined as these species are misidentifications.

Very little published information is available on the ecology of *Dipropus* species. Adults are nocturnal, typically collected at lights, occasionally by beating or sweeping shrub or tree branches, or captured by traps. Elsewhere, larvae and occasional adults of *Dipropus* species are found in decaying wood, under loose bark, and among epiphyte roots and rhizoids on tree branches (Costa 1977; unpubl. data). They are also reported from leaf sheaths of epiphytic bromeliad phytotelmata (Zaragoza Caballero 1974). Gut dissections reveal broken pollen and liquid contents suggesting that like most click beetles they probably feed at or on flowers, extra-floral nectaries, plant weeps and wounds, or on small phytophilous and floricolous arthropods. Larvae are predators on other invertebrates, but possibly also on fungi and myxomycetes (Casari and Biffi 2012; unpubl. data). Elsewhere, *Dipropus* species occur from humid lowland rainforests to mid-montane forests, and tropical and subtropical woodlands. Within the study area, *Dipropus* species inhabit warm-temperate and subtropical shrublands, gallery forests, woodlands and *Quercus-Pinus* forests in the Madrean Evergreen Forest and Woodland, Sonoran Desertscrub and San Lucan Thornscrub biotic provinces (Brown et al. 2007).

Casari (2008, 2013) presented the only published phylogenetic hypothesis for the genera of Dicrepidina, but her results indicated a complex composition of *Dipropus* without resolved monophylies. She (Casari 2013) concluded that the genus should probably be divided into additional genus-level taxa, but that such action required a larger selection of species than those than was used to represent the various species groups in the genus. The genus as presently constituted is a wealth of biodiversity opportunities for basic discovery and documentation, ecological associations and evolutionary patterns.

Here, the species of *Dipropus* from west-central North America are taxonomically treated. Five species new to science and new records of previously described species are given. A lectotype designation is given for *Elater soleatus* Say, a species from the eastern United States and in the past incorrectly determined from the study region. *Ischiodontus oblitus* Candèze is treated as an objective synonym of *E. soleatus*. Three additional species are excluded from the regional fauna. Certain extra-limital species and records are included as needed to clarify their taxonomy, distribution and similarities to focal taxa.

## Materials and Methods

Primary types were examined for most pertinent taxa described from Mexico and the United States. The one exception is the type of *Tricrepidius triangulicollis* Motschulsky that was examined by proxy with a specimen compared by M.C. Lane in 1968 and his notes (unpubl. notebook at USNM) that confirmed Horn's (1883) assessment of its taxonomic status. Type and other specimens reported here came from the following collections: Arizona State University, Tempe (ASUT); Florida State Collection of Arthropods (FSCA); Los Angeles County Museum, (LACM); Museum of Comparative Zoology, Harvard University, Cambridge (MCZ, except MCZ/Fall is the H. C. Fall collection, MCZ/Horn is the G. H. Horn collection and MCZ/LeC is the J. L. LeConte collection); Natural History Museum, London (BMNH); San Diego Natural History Museum, San Diego (SDMC); Texas A&M University, College Station (TAMU); National Museum of Natural History, Washington, D.C. (USNM); University of Arizona, Tucson (UAIC); Bohart Museum of Entomology, University of California, Davis (BMEC); University of New Mexico, Albuquerque (UNMC); University of Texas Insect Collection, Austin (UTIC); and individuals mentioned in the acknowledgments. The Gareth Powell collection is denoted as GSPC, the Kyle Schnepf collection as KESC, and the author's collection as PJJC. Recently collected specimens from Sonora were acquired by T. R. Van Devender under Instituto de Biología-UNAM permit FAUT-0062 to Harry Bailovsky. These specimens will be divided between UNAM, ASUT, and PJJC. Collection abbreviations are from Evenhuis (2013).

Descriptions include observations and measurements on both male and female specimens. Morphological terms and concepts generally follow Calder (1996) and Lawrence et al. (2010). Integument color terms are based on Smith (1906) and Nichols and Schuh (1989). Measurements were made with an ocular micrometer at 0.1 and 0.01 mm increments between 10–50 magnifications. Body length was measured from the anterior margin of the frons to the elytral apices, and width was measured across the elytral humeri. The ocular index of Campbell and Marshall (1964) and Fender (1972), a ratio of frons width and head width inclusive of the eyes, was calculated to two decimal places. Antennomere length ratios occur as sexual dimorphism, but are also important for discriminating species of *Dipropus*. The ratios were calculated for antennomeres 2–11 as measured along the lateral midline from antennomere base to apex, and values were rounded to one decimal place. When the string of values is presented as antennomeres 2–3, 7, 11, then antennomeres 3–6 are subequal and 7–10 are subequal. When the string is abbreviated to antennomeres 2–3, 11 or 2–4, 11, then antennomeres 4–10 are subequal to antennomere 3. Pronotal length is along the midline from anterior margin to the antescutellar emargination, and width is at the widest point at midlength or base of the hind angles. Tarsomere lengths were measured from base to apex, values rounded to two decimal places, and given as a ratio string. Aedeagus total lengths were measured from the median lobe (penis) apex to the anterior margin of the basal piece (phallobase); paramere length from apex to the anteriormost point of the basal lobe; paramere tip along midline from apex to lateral spine; and basal piece length from basal lateral angle to apex of shoulder junction with paramere. Aedeagal ratios of taxonomic value measured at higher magnifications and calculated to two decimal places are basal piece length/total length, paramere length/total length, paramere apex/paramere length.

Label data are generally presented verbatim, except dates are standardized to the dd.mm.yyyy format, with the month in lower case Roman type. Information from separate labels is separated by a slash (/) bracketed by single spaces. Interpolated information is given within brackets as needed for clarity or supplementation.

## Taxonomy

### *Dipropus* Germar

*Dipropus* Germar, 1839: 215

Type species: *Dicrepidius laticollis* Eschscholtz 1829: 31, designation of Duponchel 1845: 61 (not *Elater pexus* Germar 1824: 55, of Hyslop 1921: 641)

*Ischiodontus* Candèze 1859: 90 (synonymy by Arnett 1962: 505)

Type species: *Ischiodontus pinguis* Candèze 1859: 100, designation of Hyslop 1921: 651

*Tricrepidius* Motschulsky 1859: 366 (synonymy by Horn 1883: v)

Type species: *Tricrepidius triangulicollis* Motschulsky 1859: 367, by monotypy

**Diagnosis.** Characters of Elaterinae, Ampedini, Dicrepidini, *Dipropus* (modified from Casari 2013). Coloration brunneotestaceous, brunneous, castaneous, rufopiceous, to nigrous, sometimes with weak to strong submetallic blue to green reflections or iridescence dorsally. Body form usually moderately elongate, subcylindrical. Integument moderately to strongly punctured, punctures often umbilicate, fine to coarse, sparse to coalescent. Frontal margin broadly arcuate, carina complete, extending anteriorly, often a distance greater than the length of the labrum. Subfrontal clypeal remnant evenly contoured, ecarinate. Antenna serrate in both sexes, with 11 antennomeres; antennomere 2 short, subcylindrical; antennomere 3 serratiform, subequal in length or shorter than antennomere 4; pubescence similar between sexes, antennomere 2 with primary setae only; males often with antennomeres 3–5 and 6–10 of unequal lengths. Pronotosternal suture excavate anteriorly, with hypomeral margin explanate and bordering carina elevated to form a channel receiving the antenna in repose. Mesoventrite with fossal margin gradually sloped. Metacoxal lamina sinuate posteriorly, extended and strongly angular over the trochanter. Tarsomeres 1–4 progressively shortening, tarsomere 4 very small; ventral membranous lobes on tarsomeres 1–3, often large on tarsomeres 2 and 3.

Casari and Biffi (2012) summarized much of the available knowledge of larval morphology and biology, and provided a key to genera. Casari (2013) provided a key to the genera of Dicrepidini based on adults.

### ***Dipropus pericu* new species**

(Fig. 1–2, 13)

*Ischodontus ferreus* of Horn 1894: 327, not LeConte 1853: 462

*Ischiodontus soleatus* of Horn 1894: 327, not Say 1834: 79

**Description.** Length 9.2–10.2 mm, width 2.5–2.8 mm. Integument brunneotestaceous; venter, antennae and legs paler.

Head with vertex and frons umbilicately punctate; frons depressed, shallowly concave discally; frontal margin subcarinate, evenly arcuate, moderately projecting. Ocular index 53–69. Antenna of male long, reaching beyond body midlength, antennomeres 3–10 broadly serrate, apex of antennomere 6 slightly exceeding apex of hind angle, antennomere 2 short, length 0.5x width, antennomeres 2–3, 7, 11 length ratio 1.0:4.3, 4.8, 6.8.

Pronotum width 1.1x length; trapezoidal; moderately, evenly convex, with shallow median impression posteriorly; deplanate toward hind angles; lateral margin carina obsolescent, weak to absent anteriorly; discal punctures shallowly umbilicate anterolaterally, becoming sparse, separated by 0.8–1.0x own diameters, small, shallow medially and posteriorly. Hind angles slightly divergent at base, incurved apically; with short dorsal carina near lateral margin; posterior margin with short incisions.

Elytra finely microreticulate; basal margins subcarinate; striae with serial punctures rounded to slightly elongate-oval; intervals shallowly convex basally, flattening apically, each with small biseriate, setate punctures; apices conjointly rounded.

Mesoventral fossa broadly V-shaped; sides shallowly inclined. Metacoxal lamina with obtuse to narrowly rounded, briefly extended angle at basal third. Ventrites with moderately sparse, shallow, setose punctures. Abdominal ventrite punctures shallow to evanescent, sparse and subumbilicate in male; small, dense on female ventrite 5.

Metaleg with tibia 1.4x length of femur, tarsus 0.9x length of tibia; tarsomeres 2 and 3 with broad ventroapical membranous lobes, tarsomeres 1 and 2 with dense ventral brush of golden setae; tarsomere length ratio 1.00:0.46:0.23:0.15:0.58.

Aedeagus (Fig. 16) with basal piece 0.46 of total length, paramere 0.48 of total length, paramere apex 0.22 of paramere length.

Female: Body subparallel; pronotum length 0.75x width; antenna short, antennomere 11 slightly exceeding apex of hind angle, antennomere 2–3, 11 length ratio 1.0:3.3, 6.0; metatarsomere length ratio 1.0:0.52:0.19:0.14:0.57; ventrite 5 with punctures fine, simple, dense along posterior margin.

**Type Specimens.** Holotype male labeled: MEX: Baja Calif. Sur, 4.5 mi. E. Santa Catarina, 20.ix.1976, P.J. Johnson coll. (PJJC to USNM).

Paratypes (46): same as holotype (3, PJJC); **MEXICO: BAJA CALIFORNIA SUR:** Ramal a El Rosario, 6 mi. from hwy 1, 8.ix.1988: E.G. Riley (3, TAMU); 9 mil N. Cabo San Lucas, 9.ix.1988, Coll. E.G. Riley, blacklight (20, TAMU); 9.8 mi W. hwy 1 on Ramal San Antonio de la Sierra, 19.ix.1988: E.G. Riley (1, TAMU); 13 mi. E. hwy 19, E. of Todos Santos, 17.ix.1988; E. Riley, blacklight (2, TAMU); 4.3 mi. W. on Ramal a El Rosario from hwy 1, 6-7.ix.1988, Coll. E.G. Riley (9, TAMU); 4 km NE El Sauzal, 23°5'N 19°56'W, 500m, 14.viii.1980, Westcott & Bellamy (3, PJJC); 5½ mi (air) NNE Cabo San Lucas, 330m, 3.x.1987, Westcott & Mudge (1, PJJC); Sta Rosa, Low. Cal. / 8998 / Shoemaker, tion[sic!] 1956 (2, USNM); Baja California, 1.x.1967 / Cabo San Lucas, 22°52' N, 1QM-N [?] (1, SDMC); Boca de la Sierra, 29.ix.1967 (1, SDMC).

**Additional Material Examined.** “Lower California”, a silver colored paper disc with edge cut (3, MCZ/LeC) [det. as *I. approximatus*].

**Etymology.** The species epithet “*pericu*” is treated as a noun in apposition and is in honor of the Pericú indigenous people of the Cape Region of the Baja California peninsula.

**Distribution.** MEXICO, Baja California Sur.

**Notes.** *Dipropus pericu* is the only species of the genus known from the Cape Region of the Baja California peninsula and appears to be endemic to the area of the Sierra de la Laguna.

### ***Dipropus reinae* new species**

(Fig. 3–4, 14)

**Description.** Length 9.3–10.4 mm, width 3.3–3.4 mm. Body castaneous to piceocastaneous; legs concolorous to body; antennae infusate, venter, antennae, and legs rufobrunneous with rufopiceous highlights.

Head with ocular index 61–65. Antenna short, reaching to metafemoral angle of elytra, antennomere 8 reaching apex of hind angle, antennomeres 2–3, 11 length ratio 1.0:3.0, 3.4, 5.8.

Pronotum 1.2–1.3x wider than long; broadly trapezoidal; lateral margin strongly carinate at hind angle, anteriorly arcuate ventrad to anterior margin. Hind angles divergent at base, slightly incurved apically; with strong dorsal carina at midwidth, extending onto pronotum, apex slightly arcuate laterally.

Elytra with striae with serial punctures rounded, shallow; intervals shallowly convex basally, flattening apically, biseriate punctures moderately large and merging with striae punctures; apices conjointly rounded to subtruncate.

Metaleg with tibia 0.9x length of femur, tarsus 0.8x length of tibia; tarsomere length ratio 1.00:0.42:0.21:0.16:0.53.

Aedeagus as in Fig. 10; basal piece 0.47 of total length, paramere 0.52 of total length, paramere apex 0.21 of paramere length.

Female: As for male except body form subparallel; pronotum length 0.86x width; antenna moderately long, antennomere 8 reaching apex of hind angle, antennomere 2–3, 11 length ratio 1.0:3.5, 5.8; metatarsomere length ratio 1.00:0.52:0.23:0.17:0.82; ventrite 5 with punctures moderately large, simple, evenly distributed.

**Type Material.** Holotype male labeled: MEXICO, SONORA, Agua Zarca, S of Nogales, 31.16222, -110.95333, leg. T.R. Van Devender, A.L. Reina-G., 13.vi.2012 / collected at lights on building at night (ASUT).

Paratypes (157): **MEXICO, SONORA:** 15.5 air km SW of Nogales, el. 1200m, 31.19728, -111.10139, leg. T.R. Van Devender, A.L. Reina-G., 12.vii.2012 / rocky canyon riparian forest/oak woodland (1, ASUT); **UNITED STATES, ARIZONA: Cochise Co.,** nr Southwest Research Station, nr. Portal, 5,500 ft., 31°52'55"N, 109°13'04"W, 4.viii.2003, E. Riley, UV (1, TAMU); nr SW Research Station, Cave Creek Cyn, 5,650 ft., 31°53'38"N, 109°12'53"W, 6.viii.2003, E. Riley, UV (2, TAMU); Portal, vii-20-44, W.W. Jones 35, 44-20665 (1, USNM); Palmerlee, viii-7 / Chas. Schaeffer collection (1, USNM); vii.31 (1, USNM); Paradise, viii / Wickham coll. 1933 (1, USNM); Carr Canyon, 12.vii.[19]36, M. Cazier (1, USNM); Huachuca Mts., Carr cyn, Clark Spr., el. 6150', 17.vii.1976, P.M. Jump (2, SDMC); Dragoon Mts, Sorin Cn, 1926 m, 23-24.vii.1979, at light, S. McCleve (2, UAIC); Cochise Stnghld, 4000', 28.vii.1964, J. Burger, UV lt. (1, UAIC); Hereford, vi.1985 / T. Miller colr (1, BMEC); 5 mi. W. Portal, Chiricahua Mts, 5.viii.1958 / D.D. Linsdale collector (1, BMEC); S[outh] W[estern] R[esearch] S[tation], 5400', 5 mi.W. Portal, 2.viii.1969 / L.D Anderson collector (1, BMEC); 1 mi. So. Portal, 29.vii.1965, 4800 ft, at light / collectors: J.H. Davidson, J.M. Davidson, M.A. Cazier (1, BMEC). **Graham Co.,** Galiuro Mts, High Cr., 1660 m, 20.vii.1978, at lite, S. McCleve (1, UAIC); Ft. Grant, 16.7 / Coll. Hubbard & Schwarz (1, USNM); Ft. Huachuca, Ariz. / 4197 (1, LACM). **Pima Co.,** Sta Catalina Mts / July 24, 13 / M. Chrisman coll. (1, USNM); same July 22, 13 (1, USNM); St. Catalina Mts., 11.vii.1975, K. Stephan Coll. (1, FSCA); St. Rita Exp. Range, 3-5.vii.1973, W. Nuttig leg. (1, FSCA). **Pinal Co.,** Oracle, 7.7 / Coll. Hubbard & Schwarz (1, USNM). **Santa Cruz Co.,** Pena Blanca Lake, 20.vii.1985, Paul K. Lago (2, PJJC); 18.vii.1976, coll. S. Mc. (1, SDMC); 3.2 km S Pena Blanca Lake, 1250 m., 28.vii.1989; R.S. Anderson & S. McCleve: UV light (4, TAMU); nr. Peña Blanca Lake, 31°22'58"N, 111°05'30"W, 7.viii.2003, E. Riley, UV (2, TAMU); Sycamore Cyn, near Ruby Road, 24.vii.04, light, J. Huether (2, PJJC); Patagonia, vii-10-1936 (1, USNM); 3 m. E. of Montezuma Pass, 17.vii.1942, B.E. White (1, USNM); Huachu[ca] Mts, 29.vii.1907 / Mill Can, H.A. Koeber (1, USNM); Santa Rita Mts, Gardner Cn, 1508 m, 16.vii.1980, at light, S. McCleve (1, UAIC); Patagonia Mts, Harshaw Cr, 1577 m, 1.viii.1979, at light, S. McCleve (3, UAIC); Pajarito Mts, Pena Blanco Can, 27.vii.1978, 1191 m, at lite, S. McCleve (2, UAIC); Santa Rita Mts, Madera Can, 14.vii.1959, Bltr, Radford, Werner, Patterson, Samuelson (1, UAIC); Patagonia, 29.vii.1941, F.H. Parker (1, UAIC); Madera Cyn, 4880 ft., 3.vii.1963, V.L. Yesterley collector (2, BMEC); 15.vii.1963 (6, BMEC); 18.vii.1963 (1, BMEC); 21.vii.1963 (5, BMEC); 23.vii.1963 (2, BMEC); 31.vii.1963 (7, BMEC); 3.viii.1963 (1, BMEC); 14.vi.1965, collector D.N. Harrington (2, BMEC); 18.vi.1965 (1, BMEC); 19.vi.1965 (6, BMEC); 5.vii.1965 (1, BMEC); 14.vii.1965 (1, BMEC); 4.viii.1965 (1, BMEC); Pena Blanca / at light 415, 16.vii.1959, R.H. Arnett, Jr. (8, FSCA); Lot No. 415, 16.vii.1959, R.H. Arnett Jr, ER Van Tassell (3, FSCA); Lot No. 420, 20.vii.1959 (5, FSCA); Lot No. 421, 21.vii.1959 (1, FSCA); Lot No. 417, 18.vii.1959 (2, FSCA); see note 422, 22.vii.1959 (1, FSCA); at light 417, 19.vii.1959 (1, FSCA); Pena Blanca, Pajarito Mts. / Lot No. 536, 31.vii.1961, R.H. Arnett, Jr., E. Van Tassell (2, FSCA); Lot No. 543, 2.viii.1961 (2, FSCA); Lot No. 524, 28.vii.1961 (2, FSCA); Lot No. 536, 31.vii.1961 (2, FSCA); Lot No. 557, 5.viii.1961 (5, FSCA); Lot No. 553, 4.viii.1961 (5, FSCA); Lot No. 511, 26.vii.1961 (6, FSCA); Lot No. 540, 1.viii.1961 (5, FSCA); Lot No. 560, 6.viii.1961 (1, FSCA); lot no. 534, 30.vii.1961 (1, FSCA); lot no. 600, 10.vii.1962 (1, FSCA); lot no. 600, 12.vii.1962 (1, FSCA); lot no. 600, 7.vii.1962 (1, FSCA); lot no. 763, 4.viii.1963 (1, FSCA); Lot No. 763, 24.vii.1961 (5, FSCA); Lot No. 840, 26.vii.1961 (1, FSCA); Lot No. 549, 3.viii.1961 (2, FSCA); lot no. 600, 9.vii.1962 (1, FSCA); lot no. 600, 11.vii.1962 (3, FSCA). **NEW MEXICO: Hidalgo Co.,** Animas Mts, 1755 m, Double Adobe Cr., 11.vii.1981, at light, S. McCleve (2, UAIC); 1706 m, Godfrey Place, 8.vii.1981, at lite, S. Dobrott (2, UAIC); 4 mi. North of Rodeo, along rt. 80, at light / Lot no. 753, 23.vii.1963, R.H. Arnett, Jr, ER. Van Tassell (1, FSCA).

**Additional Material Examined.** Arizona?, LA Museum, 25.vii.1916 / P379 (1, LACM). One specimen labelled "Lower California" (1, USNM) is not in a distributional area supported by verified additional specimens. To date, there is no other indication that *D. reinae* occurs on the Baja California peninsula despite the faunal commonality with Sonora and southern Arizona.

**Etymology.** This species is named in honor of Ana L. Reina-G., co-collector of the first specimens seen of this species and dedicated naturalist of the Sonoran Sky Island Region.

**Distribution.** MEXICO: Sonora; UNITED STATES: Arizona, New Mexico.



**Notes.** Specimens of this species were sometimes originally determined as *I. soleatus* (Say).

***Dipropus sonora* new species**

(Fig. 5–6, 15)

**Description.** As for *D. pericu*, except: Length 10.4–12.4 mm, width 2.9–3.4 mm. Body piceocastaneous throughout, antennae piceous.

Head with ocular index 53–64. Antenna moderately long, reaching to metafemoral angle of elytra, antennomere 8 reaching apex of hind angle, antennomeres 2–3, 7, 11 length ratio 1.0:6.7, 8.0, 10.3.

Pronotum 1.2x longer than wide, with lateral margin strongly carinate at hind angle, weakening anteriorly; strongly arcuate toward anterior angle in anterior 0.25 of length.

Metaleg with tibia 1.1 length of femur, tarsus same length as tibia; tarsomere length ratio 1.00:0.79:0.25:0.21:0.67.

Aedeagus as in Fig. 11; basal piece 0.56 of total length, paramere 0.39 of total length, paramere apex 0.15 of paramere length.

Female: As for male, except body form subparallel; pronotum 0.83x wider than long; antenna short, antennomere 10 reaching apex of hind angle, antennomere 2–4, 11 length ratio 1.0:2.8:2.4, 4.2; metatarsomere length ratio 1.00:0.40:0.25:0.20:0.70; ventrite 5 with punctures small, fine, evenly distributed.

**Type Material.** Holotype male MEXICO: SONORA, 15.5 air km SW of Nogales, el. 1200m, 31.19728, -111.10139, leg. T.R. Van Devender, A.L. Reina-G., 12.vii.2012 / rocky canyon riparian forest/oak woodland (USNM).

Paratypes (45): **MEXICO: SONORA**, same as holotype (1, ASUT); Rancho el Jarazos, 22.4 km N of Nacozari de Garcia, Sierra la Púrica, 30.57556°N 109.73250°W, 1595m, 16 July 2013, T.R. Van Devender, A.L. Reina-G.; rocky cyn, oak woodland (1, PJJC); 10 mi. E. Navajoa, 13.viii.1959, blacklight trap, W.L. Nutting & F.G. Werner (1, UAIC). **UNITED STATES: ARIZONA, Pima Co.**, Badoquavari [sic!] Mts., e.s.l. 31 mi N. Sasabe / see note 356, 24.vii.1958, R.H. Arnett, Jr. (1, FSCA). **Santa Cruz Co.**, Pena Blanca, 12.viii.1983, G.W. Ulrich, U.V. (2, PJJC); at light, 13.vii.2013, Col. Gareth S. Powell / WGS84 31.3883, -111.0929, elv 1190 m (1, GSPC); 3.2 km S Pena Blanca Lake, 1250 m., 28.vii.1989; R.S. Anderson & S. McCleve: UV light (1, TAMU); at light 415, 16.vii.1959, R.H. Arnett, Jr. (3, FSCA); Lot No. 419, 19.vii.1959, R.H. Arnett Jr, ER VanTassell (2, FSCA); Lot No. 420, 20.vii.1959 (2, FSCA); Lot No. 421, 21.vii.1959 (1, FSCA); Lot No. 417, 18.vii.1959 (1, FSCA); Lot No. 424, 23.vii.1959 (1, FSCA); 1250 m., 28.vii.1989; R.S. Anderson & S. McCleve: UV light (1, TAMU); Pena Blanca, Pajarito Mts. / Lot No. 536, 31.vii.1961, R.H. Arnett, Jr., E. VanTassell (1, FSCA); Lot No. 568, 9.viii.1961 (1, FSCA); Lot No. 524, 28.vii.1961 (1, FSCA); Lot No. 506, 25.vii.1961 (1, FSCA); Lot No. 557, 5.viii.1961 (1, FSCA); Lot No. 511, 26.vii.1961 (2, FSCA); Lot No. 560, 6.viii.1961 (3, FSCA); lot no. 534, 30.vii.1961 (4, FSCA); lot no. 600, 6.vii.1962 (1, FSCA); Lot No. 498, 20.vii. 1961 (2, FSCA); lot no. 600, 1.viii.1962 (1, FSCA); lot no. 600, 10.vii.1962 (3, FSCA); Pajarito Mts., Pena Blanca / Lot no. 840, 28.vii.1964, R.H. Arnett, Jr, ER. Van Tassell (1, FSCA); Lot no. 763, 24.vii.1963 (2, FSCA); 1 mi. N. Nogales, Mariposa Canyon, 11.viii.1971, R.L. Jacques (1, FSCA).

**Etymology.** The species epithet “*sonora*” is treated as a noun in apposition and is after the Free and Sovereign State of Sonora (Estado Libre y Soberano de Sonora), Mexico.

**Distribution.** MEXICO: Sonora; UNITED STATES: Arizona.

**Notes.** This species is one of the more commonly collected *Dipropus* species in the region, especially in southwestern Arizona.

***Dipropus sus* (Candèze)**

(Fig. 7–8, 16)

*Ischiodontus sus* Candèze 1859: 114, 1891: 62; Gemminger and Harold 1869: 1516; Champion 1895: 325; Schwarz 1906: 78; Schenkling 1925: 92; Blackwelder 1944: 300

*Dipropus sus* (Candèze) of Arnett 1962: 505 (by indication)

**Diagnosis.** Length 11.5–15.6 mm, width 3.3–4.6 mm. Body ferruginotestaceous to piceocastaneous; legs concolorous to body; pubescence auroflavous to chalceous. Ocular index 66. Antenna reaching to before metafemoral notch; antennomere 8 reaching apex of hind angle, antennomeres 2–3, 11 length ratio 1.0:3.0, 4.6.

Pronotum subrectangular, 1.1–1.2x wider than long. Metatarsomere length ratio 1.00:0.53:0.24:0.24:0.0.94.

Aedeagus with basal piece 0.60 of total length, paramere 0.40 of total length, paramere apex 0.34 of paramere length.

Female as for male, except body form slightly more robust; elytra widest at midlength.

**Specimens Examined.** Holotype, male: “Mex. [green paper]” (BMNH). **MEXICO, JALISCO**, Sierra de Manantlan, vi.1986, L.T. Iniguez col. (reverse: Ayotitlan nocturne) / Ayotitlán, Mpio. de luautitlán bosque de pino, alt. 940 m (TAMU); **MORELOS**: Xochicalco Pyramid, 29.xi.1962 / F.D. Parker, L.A. Stange collectors (1, BMEC); **SINALOA**, (1, USNM); 16 mi. S. Gaumuchil, 30.vi.1963 / F.D. Parker, L.A. Stange collectors (2, BMEC); 3 mi. NW Choix, 7.vi.1968 / T.A. Sears, R.C. Gardener, C.S. Glaser (1, BMEC); 4 mi. N. San Blas, 17.viii.[19]65, H.R. Burke & J. Meyer / taken at light (1, TAMU); **SONORA**, Municipio de Aconchi, Rancho los Alisos, 9.4 km (by air) WSW of Aconchi, Sierra Aconchi, 29.79833N, 110.31972W, 1301m elev., leg. T.R. Van Devender and A.L. Reina-G., 2.ix.2012 (1, PJJC); W. side of Mazatán, 550m, 29.0472, -110.14806, 17.vi.2012 (1, ASUT); 25.vi.2012 (1, ASUT); 57 mi N [of] Culiacan, 28.viii.1959 / A R Menke, L A Stange colls (1, BMEC); **VERACRUZ**, Cordoba, 14.viii.1966 / Alfredo B. Lau colr (1, BMEC).

**Notes.** The Morelos, Sinaloa and Sonora specimens represent **new state records** and provide the northernmost records of this species. *Dipropus sus* (Candèze) was described from “Mexique.” Champion (1895) reported the species from the states of Chihuahua, Puebla, Veracruz (as “Cordova”), Guanajuato, Guerrero, Jalapa, and Nayarit (as “Tres Marias Is.”). The holotype is in the Natural History Museum, London, and was examined.

Specimens from Morelos and Veracruz have a more closely and coarsely umbilicate punctation on the pronotum, the punctures being adjacent anterolaterally. Specimens from more northern regions have the pronotal punctation slightly sparser and smaller on the disc.

***Dipropus warneri* new species**

(Fig. 9–10, 17)

**Description.** As for *D. pericu*, except length 8.1–11.4 mm, width 2.3–3.4 mm. Integument testaceous-castaneous.

Head with ocular index 67. Antenna moderately long, reaching to metafemoral angle of elytra, antennomere 8 reaching apex of hind angle, antennomeres 2–3, 7, 11 length ratio 1.0:3.5, 3.6, 5.8.

Pronotum slightly wider (1.1x) than long; trapezoidal; lateral margin strongly carinate at hind angle, sinuate at midlength; integumental punctures coarse, umbilicate, approximate, becoming slightly sparser, separate by 0.2x own diameter on posterior declivity. Hind angles strongly divergent at base, slightly incurved apically; with strong dorsal carina near lateral margin.

Elytra with intervals shallowly convex throughout, becoming obscurely corrugated apically; apices conjointly rounded to subtruncate.

Metaleg with tibia 1.2x length of femur, tarsus 0.8x length of tibia; tarsomere length ratio 1.00:0.47:0.21:0.21:0.74.

Aedeagus as in Fig. 12; basal piece 0.63 of total length, paramere 0.42 of total length, paramere apex 0.29 of paramere length.

Female: As for male, except body form subparallel; pronotum length 0.82–0.85x width; antenna short, antennomere 10 reaching apex of hind angle, antennomere 2–4, 11 length ratio 1.0:2.2:2.0, 3.0; metatarsomere length ratio 1.0:0.44:0.22:0.11:0.77; ventrite 5 with punctures small, simple, evenly distributed.

**Type Material.** Holotype, male, ARIZONA: Pima Co., Continental, 27.vii.1990, W.B. Warner (PJJC to USNM).

Paratypes (26): **MEXICO: CHIHUAHUA**, Nuevo Casas Grandes, 1371 m, 13.vii.1981, at light, P. Jump (1, UAIC). **COAHUILA**, Cuatro Ciénegas Nat'l Preserve, 21-23.vi.2011, 26.91851°N, 102.10211°W, D.C. Lightfoot et al., colrs. / Site C7, Rio Mesquites, basin floor, ponds, stream, general collecting (9, UNMC); 23-24.vi.2011, 26.87756°N, 102.13855°W, D.C. Lightfoot et al., colrs. / Site B4, ~14.14 km SW of Cuatro, saline/alkaline/gypsum, limestone gravels, general collecting (1, UNMC); 24.vi.2011, 26.80562°N, 102.01695°W, D.C. Lightfoot et al., colrs. / Site F5, ~20.61 km S of Cuatro Poza, wetlands, light trap (11, UNMC). **UNITED STATES: ARIZONA**, "Ariz." (1, MCZ/Horn). **Cochise Co.**, Willcox, 24.vii / Coll. Hubbard & Schwarz (1, USNM); 25.vii (2, USNM); Douglas, 25.vii.[19]44, W.W. Jones 43, 44-20665 (1, USNM); Texas Pass, Drago[o]n Mts., 19-17.vii, Wheeler leg. (1, USNM). [**Pima Co.**] Baboquiv[ari] Mt., 15-30.vi.[19]23 (1, MCZ/Fall); viii/1-15/24 (1, MCZ/Fall). **Santa Cruz Co.**, Santa Rita Mts., 8000 ft., July, F.H. Snow (1, MCZ/Fall); Santa Rita M., 13.vii.1937 / D.J. & J.N. Knull collrs (1, USNM); Nogales, Wickham, 10.viii.1913 (1, USNM). **NEW MEXICO**, [**Bernalillo Co.**], Wickham Albuquerque / Wickham collection 1933 (1, USNM). **Chaves Co.**, Roswell, 27.vii.1966 / Rosenberg collection (2, USNM). **Grant Co.**, Central City, 8 mi. E. Silver City, 15.vii.1971, J.R. McClellan, blacklight (1, TAMU). **Hidalgo Co.**, Animas Mts., 1566 m, Double Adobe Cr., 10.vii.1981, at light, S. McCleve (1, UAIC); **Otero Co.**, 10 mi. So. of Orogrande, 13.vi.1940, T.O. Thatcher collector (1, USNM). **Sandoval Co.**, Thornton, vii.[18]97 (1, MCZ/Fall). **TEXAS, El Paso Co.**, Fabens, 24.vi.2004, 31°31'17"N, 106°07'38"W, coll. E. Riley (1, TAMU); El Paso, 28.vi.1958, M.H. Hatch (1, USNM); viii.[190]4, J. Woodgate (1, MCZ/Fall). [**Brewster Co.**], Alpine, 15-30.vii.[19]26 (3, MCZ/Fall).

**Etymology.** This species is named in honor of William "Bill" Warner for his generosity in donating specimens and his numerous contributions to coleopterology.

**Distribution.** MEXICO, Chihuahua, Coahuila; UNITED STATES, Arizona, New Mexico, Texas.

**Notes.** *Dipropus warneri* has the most southern and eastern distribution to central Coahuila and southwestern Texas of the species occurring within the study area.

### *Dipropus yaqui* new species

(Fig. 11–12, 18)

**Description.** As for *D. pericu*, except length 13.4–15.4 mm, width 3.6–4.2 mm. Integument rufopiceous to piceous; venter, antennae, and legs rufobrunneous with rufopiceous highlights.

Head with vertex and frons coarsely, umbilicately punctate; frons depressed to shallowly concave discally. Compound eyes large, ocular index 36–41. Antenna moderately long, reaching to metafemoral angle of elytra, antennomere 8 reaching apex of hind angle, antennomeres 3–10 moderately serrate, 2–3, 7, 11 length ratio 1.0:4.5, 5.0, 6.8.

Pronotum as wide as long; trapezoidal; lateral margin strongly carinate at hind angle, evident to anterior margin; integumental punctures coarse, umbilicate, approximate, becoming slightly sparser on posterior declivity. Hind angles divergent at base, slightly incurved apically; with strong dorsal carina near lateral margin. Hypomeron with coarse, umbilicate punctures.

Elytra with intervals shallowly convex throughout, becoming obscurely corrugated apically; apices conjointly rounded to subtruncate.

Mesocoxal lamina with subtriangular extension rounded at apex. Ventrites with coarse umbilicate punctures; metaventrite punctures finer discally, posteriorly. Abdominal ventrite punctures shallow; sparser and subumbilicate; becoming small, dense on ventrite 5.

Metaleg with tibia 1.1x length of femur, tarsus 0.9x length of tibia; tarsomere length ratio 1.00:0.58:0.25:0.25:0.75.

Aedeagus as in Fig. 13; basal piece 0.60 of total length, paramere 0.35 of total length, paramere apex 0.39 of paramere length.

Female body subparallel; pronotum length 0.8x width; antenna short, antennomere 10 reaching apex of hind angle, antennomere 2–4, 11 length ratio 1.0:3.7:3.0, 5.33; metatarsomere length ratio 1.00:0.37:0.18:0.18:0.75; ventrite 5 with punctures fine, dense, evenly distributed.

**Type Specimens.** Holotype, male, labelled: Santa Cruz Co., AZ, Pena Blanca Lake, 20 July 1985, Paul K. Lago (PJJJ to USNM).

Paratypes (207): **MEXICO, SONORA**, Rancho el Jarazos, 22.4 km N of Nacozari de Garcia, Sierra la Púrica, 30.57556°N 109.73250°W, 1595m, 16.vii.2013, T.R. Van Devender A.L. Reina-G., rocky cyn, oak woodland (2, PJJJ); 55 km SW Moctezuma, 23.vii.1980, at light, 1066 m, S. McCleve, P. Jump (1, UAIC); 17 km SW Moctezuma, 21-22.vii.1980, at light, 944 m, S. McCleve, P. Jump (1, UAIC). **UNITED STATES, ARIZONA, Cochise Co.**, Portal, 4.viii.1973 / collector P.M. Jump (2, SDMC); Steward Cmpgrd, Cave Creek, 4.viii.1974, A.V. Evans (1, TAMU); nr SW Research Station, Cave Creek Cyn, 5,650 ft., 31°53'38"N, 109°12'53"W, 6.viii.20003, E. Riley, UV (1, TAMU); Chiricahua M., vii-12-65 / D.J. & J.N. Knull Colls (1, USNM); same vii-22-65 (1, USNM); same viii-1-65 (1, USNM); same viii-4-65 (1, USNM); same viii-9-65 (1, USNM); Sunny Flat Cpgd, Chiricahua Mtns, 31.vii.1986 (1, BMEC); Huachuca M., vii-1921, D.J. & J.N. Knull collrs / J.N. Knull collection (1, USNM); 1 mile So. Portal, 22.vii.1965, 4800 ft. at light / collectors: J.H. Davidson, J.M. Davidson, M.A. Cazier (1, BMEC); 23.vii.1965 (4, BMEC); 24.vii.1965 (1, BMEC); 25.vii.1965 (3, BMEC); 27.vii.1965 (1, BMEC); 29.vii.1965 (3, BMEC); 2.viii.1965 (1, BMEC); 3.viii.1965 (1, BMEC); 8.viii.1965 (1, BMEC); Chiricahua Mt., S.Fork Cn. / Lot No. 824, 13.vii.1964, R.H. Arnett, Jr, ER. VanTassell (1, FSCA); Lot No. 814, 10.vii.1964, R.H. Arnett Jr, ER VanTassell (1, FSCA); 24.vii.1965, blacklight trap (3, FSCA); lot no. 837, 18.vii. 1964, R.H. Arnett, Jr., ER VanTassell (1, FSCA); S.W. Research Station, 5 mi. W. Portal, 5400', 25.vii.1956, MJWestfall / J.N. Knull det. 1960 (3, FSCA); 4.viii.1956 (1, FSCA); Stewart Campground, 7.vii.2013, at light, Col. Gareth S. Powell (1, GSPC); Chiricahua Mountains, 7.vii.2013, on ground at night, Kyle E. Schnepf / Stewart Campground, 31°53.457'N, 109°10.063'W (1, KESC). **Pima Co.**, Continental, 14.vii.1974, D.G. Marqua coll. (1, TAMU); Baboquivari Mts, Sabino Cn, 1143 m [31.8176N, 111.5473W], 31.vii.1979, at light, S. McCleve (2, UAIC); Molino Cn. / Lot No. 409, 12.vii.1959, R.H. Arnett, Jr. (1, FSCA). **Santa Cruz Co.**, Madera Cyn., 4880', 15.vii.1963 / V.L. Vesterby collector (19, BMEC); 18.vii.1963 (14, BMEC); 21.vii.1963 (12, BMEC); 23.vii.1963 (10, BMEC); 31.vii.1963 (1, BMEC); 3.viii.1963 (4, BMEC); 11.viii.1963 (1, BMEC); same, 14.viii.1963 (1, BMEC); 14.vi.1965 / collector D.N. Harrington (1, BMEC); 18.vi.1965 (4, BMEC); 19.vi.1965 (7, BMEC); 15.vii.1965 (5, BMEC); 25.vii.1965 (1, BMEC); 27.vii.1965 (3, BMEC); 31.vii.1965 (1, BMEC); 8.viii.1965 (3, BMEC); 10.viii.1965 (1, BMEC); 12.viii.1965 (3, BMEC); 5.viii.1976 / R.T. Ross Acc. No (1, BMEC); 12.vii.1981 (1, BMEC); 1.viii.67 / M.W. Stone colr (1, BMEC); 8.vii.1963, J.S. Beckett collector (1, BMEC); Santa Rita Mts, 24-25.ii.1966, D.G. Marqua & M.E. Thompson (1, BMEC); Madera Canyon, 24.viii.1975, coll-L. Bezark, G. Nishida, C. Kitayama, B. Tilden (2, PJJJ); 13.viii.1983, G.W. Ulrich, U.V. (1, PJJJ); 15.viii.1983 (1, PJJJ); 26.viii.1984 (1, PJJJ); 15.viii.1973, C. Bellamy collector (1, TAMU); 13-14.viii.1983: E.G. & M.A. Riley (2, TAMU); 9-20.viii.1978, coll: Brown, Faulkner (1, SDMC); 2.ix.1969, coll. Peter M. Jump (1, SDMC); lot no 436, 5.viii.1959, R.H. Arnett, Jr. (1, FSCA); 27.vii.1969, R.H. Arnett Jr, ER VanTassell (4, FSCA); 3.viii.1968 (1, FSCA); Bog Springs Cmpgrd, 2.viii.1974, A.V. Evans (2, TAMU); 3.viii.1973, A. Evans (2, TAMU); vic. Roundup Cmpg, 27.vii.1986, K.A. Smith & D.E. Russell (1, PJJJ); 12.viii.1983, G.W. Ulrich, U.V. (1, PJJJ); nr. Peña Blanca Lake, 31°22'58"N, 111°05'30"W, 7.viii.2003, E. Riley, UV (12, TAMU); 3.2 km S. Pena Blanca Lake, 1250 m, 28.vii.1989, R.S. Anderson & S. McCleve: UV light (2, TAMU); Patagonia, 17.vii.1974, D.G. Marqua coll. (1, TAMU); Pajarito Mts., Pena Blanca Can., 27.vii.1978, 1191 m, at lite, S. McCleve (1, UAIC); 30.vii.1979, 1158 m, at lite, S. McCleve (1, UAIC); Pena Blanca, Pajarito Mts. / Lot No. 600, 21.vii.1962, R.H. Arnett Jr, ER VanTassell (1, FSCA); 28.vii.1962 (1, FSCA); 31.vii.1962 (1, FSCA); Lot no. 600, 1.viii.1962 (2, FSCA); Lot no. 600, 6.viii.1961 (1, FSCA); Lot No. 543, 2.viii.1961 (1, FSCA);

Lot No. 563, 6.viii.1962 (1, FSCA); Lot No. 840, 30.vii.1964 (1, FSCA); 20.vii.1964 (1, FSCA); Lot no. 600, 6.viii.1962, R.H. Arnett Jr, ER VanTassell (1, FSCA); Lot No. 763, 24.vii.1963, R.H. Arnett Jr, ER VanTassell (1, FSCA); Lot No. 763, 9.viii.1963 (1, FSCA); Pajarito Mts., Pena Blanca Cyn. 28.vii.1970, K. Stephan Coll. (1, FSCA); Patagonia Mts., Harshaw Cr., 1577 m, 1.viii.1979, at light, S. McCleve (2, UAIC); Santa Rita Mts., Gardner Cn, 1508 m, 6.viii.1980, at light, S. McCleve (1, UAIC); 16.vii.1980 (2, UAIC); Sycamore Cyn., 15.viii.1966 / H.K. Court collector (1, BMEC); near Peña Blanca Lake, 13.vii.2013, at light, Kyle E. Schnepf (1, KESC). **NEW MEXICO, Hidalgo Co.**, Animas Mts., Indian Creek, 5-6.viii.1979, 1737 m, at light, S. McCleve (2, UAIC); 1566 m, Double Adobe Cr., 10.vii.1981, at light, S. McCleve (4, UAIC).

**Additional Material Examined.** MEXICO / Chas. Schaeffer collection (1, USNM).

**Etymology.** The species epithet “*yaqui*” is treated as a noun in apposition and is named in honor of the Yaqui indigenous people of Arizona and Sonora.

**Distribution.** MEXICO, Sonora; UNITED STATES: Arizona, New Mexico.

**Notes.** This is the largest, darkest-colored, and probably the most commonly collected species in the region. The large series of specimens in the Bohart Museum (BMEC) was originally determined as *D. pinguis* (Candèze), a species from Mesoamerica. Two Arizona specimens from the FSCA were originally identified as *I. approximatus* (Candèze), another Mesoamerican species.

#### Keys to Species of *Dipropus* of West-Central North America\*

\*The sexes are distinguished by the more slender body of males and stouter body of females, antennae longer in males, and the genital structures.

#### Key to Males

- |       |   |                                      |
|-------|---|--------------------------------------|
| 1.    | Body longer, 13.4–15.4 mm length .....  | <b>2</b>                             |
| —     | Body shorter, <12.5 mm length .....   | <b>3</b>                             |
| 2(1). | Pronotum regularly trapezoidal. Integument dark chestnut to chestnut-black; pubescence pale yellow. Aedeagus (Fig. 21) with an obtusely angulate shoulder at midlength; median lobe narrow lengthwise; paramere strongly sinuate, narrow at midlength .....   | <b><i>Dipropus yaqui</i> n. sp.</b>  |
| —     | Pronotum subquadrate. Integument yellow-chestnut to chestnut; pubescence shiny golden. Aedeagus (Fig. 16) slightly sinuate at midlength, median lobe and parameres each broad basally, tapering apically .....  | <b><i>Dipropus sus</i> (Candèze)</b> |
| 3(1). | Antenna longer, apical antennomere reaching second abdominal ventrite .....   | <b>4</b>                             |
| —     | Antenna shorter, apical antennomere reaching metacoxa .....   | <b>5</b>                             |
| 4(3). | Body shorter, ≤10.2 mm, Pronotum broadly subtrapezoidal, discal punctures separated by 0.5–1.0x own diameter, simple to indistinctly umbilicate. Aedeagus (Fig. 16) with median lobe subparallel, basal piece 0.46 of total length, paramere 0.48 of total length, paramere apex narrowly sagittate. Distribution: Baja California Sur, Cape Region ..... | <b><i>Dipropus pericu</i> n. sp.</b> |
| —     | Body longer, >10.4 mm. Pronotum narrowly subtrapezoidal, discal punctures approximate, umbilicate. Aedeagus (Fig. 18) with median lobe slightly narrowed at midlength, basal piece 0.56 of total length, paramere 0.39 of total length, paramere apex broadly sagittate. Distribution: Arizona, Sonora .....  | <b><i>Dipropus sonora</i> n. sp.</b> |

- 5(3). Pronotum with discal punctures simple to subumbilicate; lateral margin carina obsolete before reaching anterior edge. Aedeagus (Fig. 20) narrowly shouldered, median lobe subparallel before apex, basal piece 0.63 of total length, paramere 0.42 of total length, paramere with prickle-like spine laterally, apex tapered ..... *Dipropus warneri* n. sp.  
 — Pronotum with margin complete to anterior margin; hind angles indistinctly flared, not recurved apically. Aedeagus (Fig. 17) with basal piece 0.47 of total length, paramere 0.52 of total length, paramere apex narrowly sagittate ..... *Dipropus reinae* n. sp.

### Key to Females

1. Antennomeres 3–10 longer than wide. Integument rufocastaneous to piceous, pubescence pale flavous ..... **2**  
 — Antennomeres 3–10 wider than long. Integument (Fig. 8) flavocastaneous to castaneous; pubescence auroflavous to chalceous ..... *Dipropus sus* (Candèze)
- 2(1). Pronotum with lateral margins subparallel basally. Antenna shorter, antennomere 10 reaching apex of pronotal hind angle ..... **3**  
 — Pronotum (Fig. 4) trapezoidal to anterior quarter length then narrowing to anterior margin. Antenna longer, antennomere 8 nearly reaching apex of pronotal hind angle .....  
 ..... *Dipropus reinae* n. sp.
- 3(2). Pronotal hind angles divergent at base, incurved apically ..... **4**  
 — Pronotal hind angles divergent throughout length (Fig. 10) ..... *Dipropus warneri* n. sp.
- 4(3). Pronotal disc punctures spaced  $\leq 0.5x$  own diameter, distinctly umbilicate. Integument rufocastaneous to piceocastaneous. Distribution: Arizona, Sonora ..... **5**  
 — Pronotal disc punctures spaced  $> 0.8x$  own diameter, simple to subumbilicate. Integument (Fig. 2) flavocastaneous to castaneous. Distribution: Baja California Sur, Cape Region .....  
 ..... *Dipropus pericu* n. sp.
- 5(4). Prosternal process gradually inclined apically. Integument (Fig. 12) castaneopiceous .....  
 ..... *Dipropus yaqui* n. sp.  
 — Prosternal process distinctly arcuate between and sharply inclined behind coxae; integument rufocastaneous ..... *Dipropus sonora* n. sp.

### Species Excluded from Regional Fauna

#### *Dipropus approximatus* (Candèze)

*Ischiodontus approximatus* Candèze 1859: 113, 1891: 61; LeConte 1863: 46, 1866: 46; Gemminger and Harold 1869: 1515; Crotch 1873: 70; Horn 1885: 50; Champion 1895: 326; Schwarz 1906: 77; Leng 1920: 174; Schenkling 1925: 88; Blackwelder 1944: 299

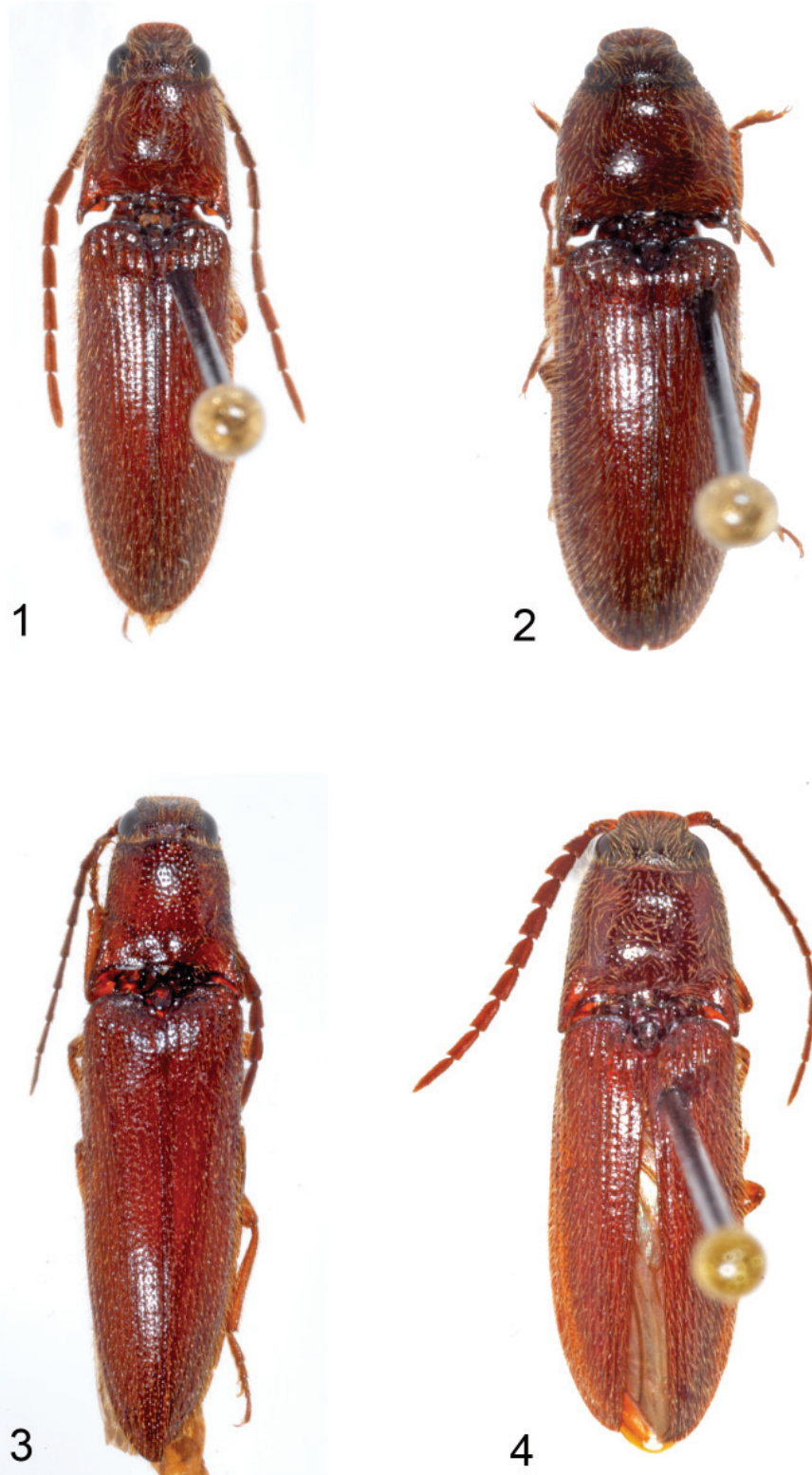
*Dipropus approximatus* of Arnett 1962: 505 (by indication)

**Diagnosis.** [Characters based on holotype only.] Body 10.0 mm long, 2.2 mm wide; castaneous. Ocular index 58. Antennae long, reaching body midlength; antennomere 2–10 [antennomere 11 missing] length ratio 1.0:3.4.

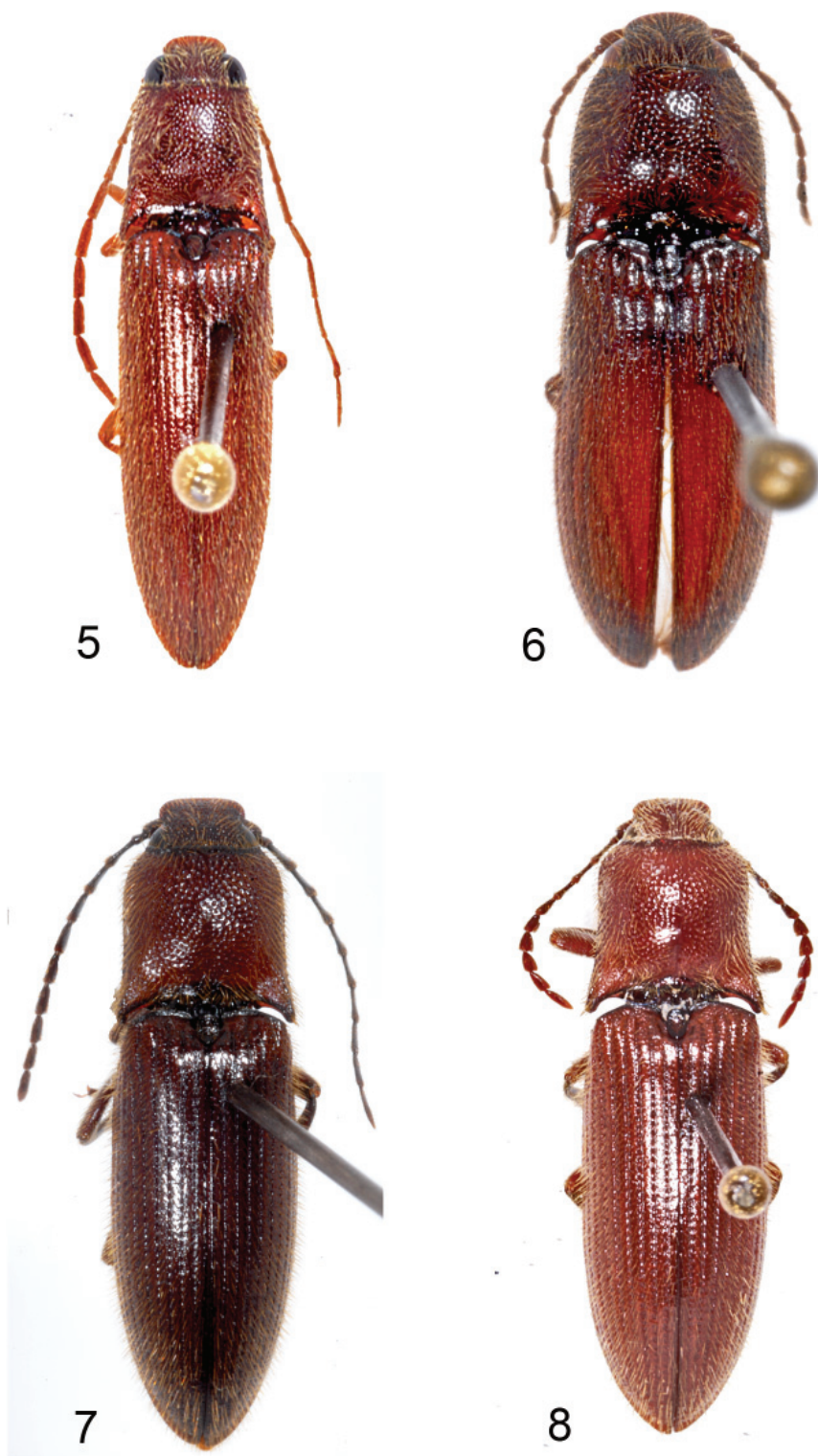
Pronotum broadly trapezoidal; width 1.2x length.

Aedeagus with basal piece 0.59 of total length, paramere 0.48 of total length, paramere apex 0.30 of paramere length.

Female not associated.



Figures 1-4. *Dipropus* species. 1) *D. pericu* n. sp., male. 2) *D. pericu* n. sp., female. 3) *D. reinae* n. sp., male. 4) *D. reinae* n. sp., female.

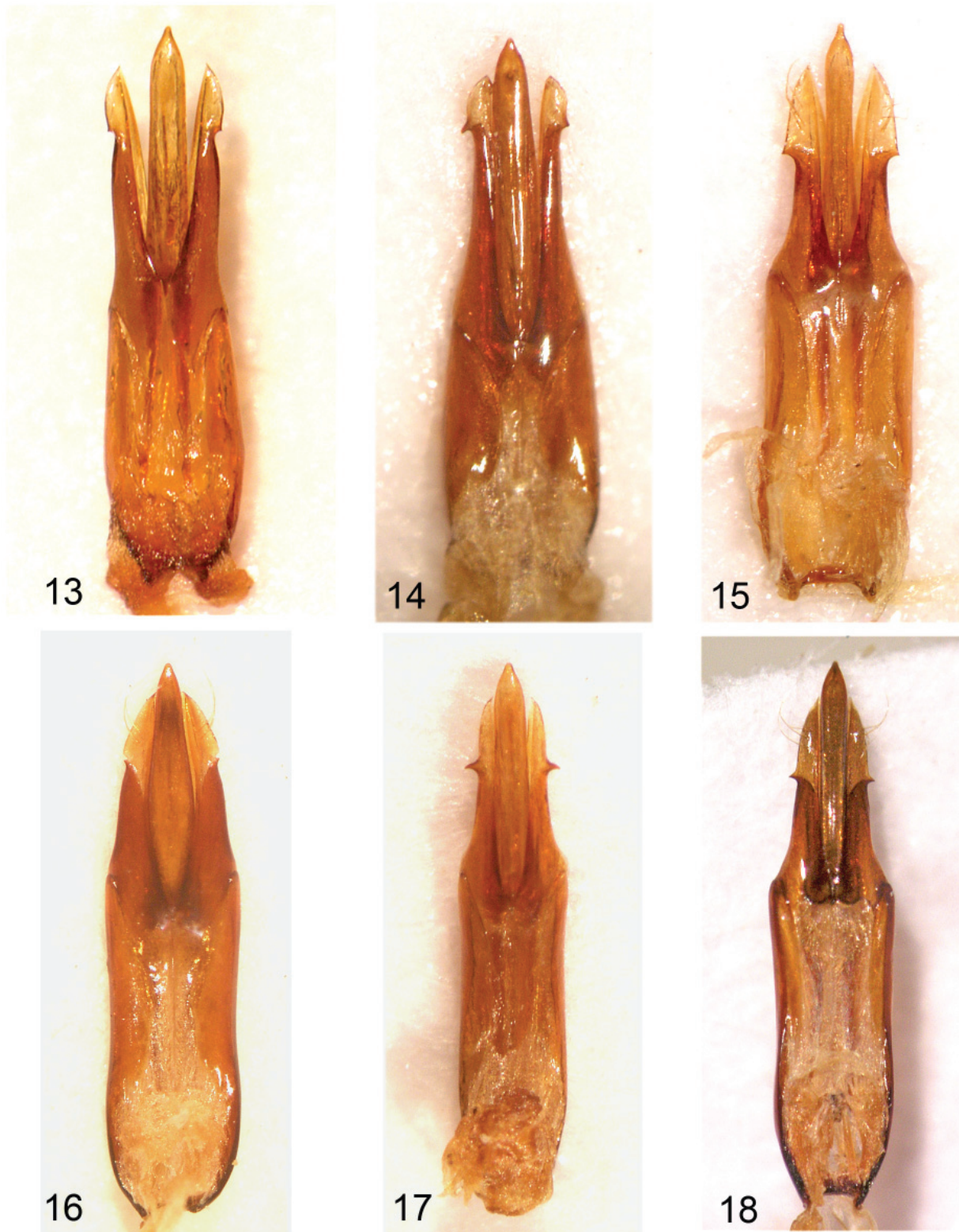


**Figures 5-8.** *Dipropus* species. 5) *D. sonora* n. sp., male. 6) *D. sonora* n. sp., female. 7) *D. sus* (Candèze), male. 8) *D. sus* (Candèze), female.





Figures 9-12. *Dipropus* species. 9) *D. warneri* n. sp., male. 10) *D. warneri* n. sp., female. 11) *D. yaqui* n. sp., male. 12) *D. yaqui* n. sp., female.



Figures 13-18. *Dipropus* species, aedeagi, dorsal aspects. 13) *D. pericu* n. sp. 14) *D. reinae* n. sp. 15) *D. sonora* n. sp. 16) *D. sus* (Candèze). 17) *D. warneri* n. sp. 18) *D. yaqui* n. sp.

**Specimen Examined.** Holotype male; “Type / Mex / 72 / coll. Janson, ex Laferte / *I. approximatus* / *approximatus* Mann., Reiche, Mexico (part)” (BMNH). Other labels pertain to the *Biologia Centrali-Americana* material as described by Johnson (2002).

**Notes.** *Dipropus approximatus* is poorly represented in collections, with all examined attributed specimens actually representing other species. The species was described from “Mexique” by Candèze (1859) and compared to *D. tuspanus* (Candèze). Superficial similarity is also shared with *D. elongatus* Champion and *D. rufulus* (Candèze), also from south-central Mexico. LeConte (1863, 1866) applied the name to specimens from Texas, which are here recognized as *D. soleatus* (Say) and *D. simplex* (LeConte). Horn (1885) stated that *D. approximatus* from the United States was misidentified and is not in our fauna, an assessment agreed with here. Champion (1895) gave the species only from Mexico.

Clark (1963) recorded this species from Arizona and California, but he apparently relied upon historical identifications and repetitions of catalog records. The holotype male of this species was examined at the Natural History Museum, London. Aedeagal morphology is very similar to that of *D. fuscus* (LeConte) and *D. soleatus* (Say) (Fig. 20), and this shared morphology segregates this three-species group from all other described species of *Dipropus* from south-central Mexico to the United States. No specimens from the study region are known to possess the aedeagal morphology of any of these three species. Misidentifications that demonstrate the historical taxonomic problem included four specimens in the National Museum of Natural History, which were found to represent both *D. pericu* and *D. reinae*. Forty specimens from Arizona in the Bohart Museum, University of California-Davis, are here referred to *D. reinae*. Three specimens of “*I. approximatus*” in the MCZ/LeC, each bearing a silver disc with a cut edge representing ‘Lower California’, are attributed to *D. pericu*.

### *Dipropus ferreus* (LeConte)

*Dicrepidius ferreus* LeConte 1853: 462, 1858: 35; Lacordaire 1857: 172; Candèze 1859: 151

*Tricrepidius triangulicollis* Motschulsky, 1859: 367; Crotch 1873: 69; Horn 1883: v (synonymy); Henshaw 1885: 67; Candèze 1891: 61; Schwarz 1906: 77; Woodworth 1913: 199; Leng 1920: 174; Schenkling 1925: 90; Blackwelder 1944: 299

*Ischiodontus ferreus* of LeConte 1861: 168, 1863: 46, 1866: 46; Gemminger and Harold 1869: 1515; Crotch 1873: 70; Candèze 1891: 61; Cockerell 1898: 151; Townsend 1903: 67; Fall and Cockerell 1907: 177; Adams 1909: 168; Woodworth 1913: 198; Leng 1920: 174; Schenkling 1925: 90; Blackwelder 1944: 299.

*Ischiodontus ferrus* of Schwarz 1906: 77 (misspelling)

*Dipropus ferreus* of Arnett 1962: 505 (by indication)

**Diagnosis.** Length 12.6–15.2 mm, width 3.3–4.3 mm. Body ferruginotestaceous to piceocastaneous; legs concolorous to body. Pubescence aureoflavous. Ocular index 64. Antenna reaching to before metafemoral notch; antennomere 8 reaching apex of hind angle, antennomeres 2–11 length ratio 1.0:2.7, 4.6.

Pronotum subrectangular, 1.1–1.2x wider than long. Metatarsomere length ratio 1.00:0.55:0.32:0.32:0.100.

Aedeagus with basal piece 0.60 of total length, paramere 0.40 of total length, paramere apex 0.34 of paramere length.

Female as for male, except body form slightly more robust; antenna shorter, antennomere 9 reaching apex of hind angle.

**Specimens Examined.** Holotype, female, “[red disc] / *Ischiodontus ferreus* Lec. / Type 2425” (MCZ). **TEXAS, Blanco Co.**, Pedernales Falls State Park, 21.vi.00, N30 20 11.9, W98 15 00.4, 204 m, J.C. Abbott #704 & field class (1, UTIC). [**Brazoria Co.**], W. Columbia, 4 mi. S., 11-15.vii.76 (1, UTIC); Brooks Co., 6 mi. S. Falfurrias, 10.x.1970 / G.C. Gaumer and R.R. Murray, leg. (1, TAMU). **Hardin Co.**, Village Ck. St. Pk. (site 1), 30.25534°N, -94.17091°W, 14.viii.2010, E. Riley, UV (1, TAMU). **Live Oak Co.**, 6 mi. south of George West, 20.ix.2014, at light, Kyle E. Schnepf (7, KESC). **Reeves Co.**, near Balmorhea, 20.vii.2013, at light, Kyle E. Schnepf (1, KESC). **Sn [San] Patricio Co.**, Welder Wdlf.

Refuge, 12.x.1988, coll. E.G. Riley, BL & MV light (1♀, TAMU). **Travis Co.**, Austin, Brackenridge Field Lab., 550 ft., 3.xi.1984, Joshua Hayes (1, UTIC); 22.ix.2000, J.E. Gillaspay collector (1, UTIC); 3.x.2000, BL trap, J.E. Gillaspay, coll. (3, UTIC); 30°17'03"N, 97°46'42"W, 21.ix.1999, BL trap, J.E. Gillaspay collector (1, UTIC); 11.x.1999 (1, UTIC).

**Notes.** Candèze (1859) was unfamiliar with LeConte's *Dicrepidius ferreus*, treating it as *incertae sedis*, until later (Candèze 1891). *Dipropus ferreus* was described from southern Texas and appears restricted to regions east of the Sierra Madre Occidental, including southeastern New Mexico and Tamaulipas (Townsend 1903, Fall and Cockerell 1907). The type was examined at the Museum of Comparative Zoology, Harvard University. Horn (1883) provided the synonymy of *Tricrepidius triangulicollis* with *Ischiodontus ferreus* when he determined that the specimen seen by Motschulsky was collected in Texas by Enea Silvio Vincenzo Piccolomini. Schwarz (1906), Schenkling (1925) and Blackwelder (1944) followed this synonymy. In a geographical study Adams (1909) included "*I.*" *ferreus* as a species from New Mexico that was considered a characteristic species for the fauna of the lower Rio Grande River valley.

*Dipropus ferreus* is immediately distinguished from sympatric congeners by a comparatively broader frontal margin, shining golden pubescence, and aedeagal morphology. This species is distinctly sexually dimorphic: females with a longer and broader body, and proportionately shorter antennae. Both sexes resemble their counterparts of *D. sus* (Candèze) from the Sierra Madre Occidental.

*Dipropus ferreus* was reported (Horn 1894) from from El Taste, Baja California, just north of Cabo San Lucas. Michelbacher and Ross (1942) reported that Horn's specimens from El Taste were collected by Gustave Eisen in September and October 1893. Eisen's trip was the fifth of the California Academy of Sciences biological expeditions to Baja California (Eisen 1895, Michelbacher and Ross 1942). The latter authors reported that the materials "were largely destroyed by the San Francisco earthquake and fire of 1906." These early identifications of *D. ferreus* were likely specimens now attributable to *D. pericu* n. sp., and a specimen in the Horn collection determined to this new species is considered a duplicate from Eisen's collection.

*Dipropus ferreus* continued to be cataloged (Woodworth 1913, Leng 1920, Schenkling 1925) from the State of California due to the *T. triangulicollis* attribution and a persistent overlooking of Horn's (1883) note on its Texas origin. Of the *Dipropus* examined for this study none from California or elsewhere in the region were attributable to this species, suggesting that the sole basis for the listing was the misattributed *T. triangulicollis* record. *Dipropus ferreus* should be removed from lists of insects inhabiting the study region.

### ***Dipropus simplex* (LeConte)**

*Dicrepidius simplex* LeConte 1853: 462, 1858: 35; Lacordaire 1857: 171; Candèze 1859: 151

*Ischiodontus simplex* of LeConte 1861: 168, 1863: 46, 1866: 46; Horn 1885: 50; Candèze 1891: 61; Gemminger and Harold 1869: 1516; Crotch 1873: 70; Austin 1880: 28 (catalog number only, synonym of *I. soleatus*); Schwarz 1906: 77; Leng 1920: 174; Schenkling 1925: 91; Blackwelder 1944: 300

*Dipropus simplex* of Arnett 1962: 505 (by indication)

**Diagnosis.** Length of male 9.1–10.9 mm, width 2.6–3.2 mm. Body castaneous to piceocastaneous; legs concolorous to body; antennae infusate. Ocular index 55–59. Antenna long, reaching to anterior margin of first abdominal ventrite; antennomere 8 reaching apex of hind angle, antennomeres 2–3, 7, 11 length ratio 1.0:3.4, 3.8, 7.2.

Pronotum trapezoidal, 1.1–1.2x wider than long. Metatarsomere length ratio 1.00:0.42:0.21:0.16:0.68.

Aedeagus with basal piece 0.54 of total length, paramere 0.43 of total length, paramere apex 0.37 of paramere length.

Female as for male, except body form slightly robust; antenna long, reaching metafemoral notch of elytra, antennomere 2–3, 7, 11 length ratio 1.0:2.4, 2.5, 4.5; metatarsomere length ratio 1.00:0.57:0.29:0.24:0.95.

**Specimens Examined.** Holotype, male: “Tex. / I. simplex Lec. / soleatus 9 / Type 2426” (MCZ). **TEXAS**, [Bastrop Co.] Bastrop St. Pk., nr. Bastrop, 9.vi.1976, E.R. Hoebeke (1, UTIC); Bexar Co., 22 mi. NW San Antonio, Scenic Oaks, at light, 19.ix.2014, Kyle E. Schnepf (5, KESC). **Brown Co.**, Camp Bowie Nat. Gd., Brownwood, 6.6 mi SE, 24.iii.2008-29.iv.2008, J.C. Abbott (1, UTIC); 24.vi.2008-04.ix.2008 (1, UTIC); [Brazoria Co.] W. Columbia, 4 mi. S., 11-15.vii.[19]76 (1, UTIC). **Brazos Co.**, College Station, 31.viii.1996, E.G. Riley, UV (2, TAMU); Riley Estate, 30°58849’N, 96°25366’W, 12.vi.2008, E. Riley, UV (1, TAMU); 30°35’18”N, 96°15’12”W, 10.viii.2005, E. Riley, UV (1, TAMU); 16.viii.2005 (1, TAMU); same, vii.2003 (2, TAMU). **Brooks Co.**, 8 mi. S. Falfurrias, 12.ix.1987, coll. E.G. Riley (2, TAMU). **Cameron Co.**, Lennox Southmost Preserve, at light, 24.ix.2014, Kyle E. Schnepf (2, KESC). [Dimmit Co.] Catarina, 12 mi. E, 22-25.vi.[19]76 / night (3, UTIC). **Hidalgo Co.**, Bentson-Rio Grande Valley St. Pk.17-18.v.1979, E.G. Riley (2, TAMU); El Rancho Cima Scout Ranch, Iron Wheel Mesa, UV light, 29.9535°N, 98.1684°W, 24-29.vi.2007, E.G. Riley (5, TAMU); Santa Ana NWR (site 3), Wildlife Drive, 13.ix.2009, 26.07526°N, 98.13880°W, M. Quinn & E. Riley – 1084 (1, TAMU); near Bentsen RGVSP, 22.ix.2014, at light, Kyle E. Schnepf (1, KESC). Live Oak Co., 6 mi. south of George West, 20.ix.2014, at light, Kyle E. Schnepf (8, KESC). **Runnels Co.**, Rowena, Brown Estate, Victor Street, 30.vii.2004, N. Brown, porch light (1, TAMU). **San Patricio Co.**, Welder Wildlife Foundation, Sinton, 12.5 km NE @ Hwy 77, N28.113, W97.418, 1-3.vii.2002, J.C. Abbott #1033 & Field class (1, UTIC). **Travis Co.**, Austin, Brackenridge Field Lab., 2.vi.1998, J.E. Gillaspay (1, UTIC); 170 m, 3-9.vii.1990, M. Kish, malaise trap (1, UTIC); 550 ft., 27.ix.1983, Scott E. Lacy (1, UTIC); 22.ix.2000, J.E. Gillaspay collector (1, UTIC); 3.x.2000, BL trap, J.E. Gillaspay, coll. (2, UTIC); 30°17’03”N, 97°46’42”W, 16.vii.1998, BL trap, J.E. Gillaspay collector (1, UTIC); 24.vi.1999 (6, UTIC); 23.vii.1999 (1, UTIC); 11.x.1999 (1, UTIC); Camp Mabry Nat. Guard, Austin, 16.vi-8.vii.2004, J.C. Abbott (1, UTIC). **Val Verde Co.**, Devils R. @ Dolan Falls, 13.3 mi W of Loma Alta, 18-22.vi.2001, J.C. Abbott #760 & Field Ent. class (1, UTIC); N29.88531, W100.99407, 12.vi-16.vi.2000, J.C. Abbott #703 & Field Ent. class (2, UTIC). **Walker Co.**, Huntsville State Park, Huntsville, 7.1 mi. S., 5-6.vii.2000, J.C. Abbott #711 & Field class (1, UTIC). **LOUISIANA**, St. Landry Par[ish], Sunset, black light trap, 18.vi.1981, coll. E.G. Riley (1, TAMU).

**Notes.** Described from Texas, *D. simplex* (LeConte) is a name that was commonly applied historically to specimens collected across the southwestern United States and northwestern Mexico. The type is in the Museum of Comparative Zoology, Harvard University, and was examined. *Dipropus simplex* is found from eastern Missouri to southern Michigan to Delaware, and south to Florida and Tamaulipas. Specimens previously attributed to *D. simplex* from the study region are here referred to *D. sonora* (see above). Horn (1885) reported his examination of the collection of J. L. LeConte and found a specimen arrangement in the latter’s cabinet that suggested that *D. simplex* may be a synonym of *D. soleatus*, but this was a misinterpretation.

### *Dipropus soleatus* (Say)

(Fig. 19–21)

*Elater soleatus* Say 1834: 79, 1839: 176; LeConte 1859: 612; Bousquet 1993: 9

*Monocrepidius soleatus* of Sturm 1843: 66

*Athous soleatus* of Haldeman and LeConte 1853: 69

*Dicrepidius soleatus* of LeConte 1853: 462; Lacordaire 1857: 172; Candèze 1859: 151

*Ischiodontus soleatus* of LeConte 1861: 168, 1863: 46, 1866: 46; Crotch 1873: 70; Austin 1880: 28 (as catalog number only); Horn 1885: 50; Henshaw 1885: 67; Gemminger and Harold 1869: 1516; Crotch 1873: 70; Candèze 1891: 61; Ulke 1903: 20; Schwarz 1906: 77; Blatchley 1910: 729; Leng 1920: 174; Schenkling 1925: 92; Blackwelder 1944: 300; Löding 1945: 63; Bousquet 1993: 9; Downie and Arnett 1996: 787

*Monocrepidius oblitus* Dejean 1833: 86, 1836: 98 (*nomen nudum*); Chevrolat 1867: 601

*Ischiodontus oblitus* Candèze 1859: 101; Chevrolat 1867: 601; Horn 1878: xvi (original synonymy), 1885: 50; Crotch 1873: 70; Henshaw 1885: 67; Candèze 1891: 61; Schwarz 1906: 77; Leng and Mutchler 1914: 204; Schenkling 1925: 91

*Dipropus soleatus*, of Arnett 1962: 505 (by indication); Clark 1963: 28; Kirk 1969: 49, 1970: 51; Peck and Thomas 1998: 73

**Diagnosis.** Length of male 9.0–10.4 mm, width 2.5–3.0 mm. Body (Fig. 19) castaneous to piceocastaneous; legs concolorous to body; antennae rufopiceous to infusate. Ocular index 58–68. Antenna moderate in length, reaching to midlength of metaventrite; antennomere 9 reaching apex of hind angle, antennomeres 2–3, 7, 11 length ratio 1.0:3.0, 3.2, 5.2.

Pronotum trapezoidal, 1.1–1.2x wider than long. Metatarsomere length ratio 1.00:0.42:0.21:0.16:0.68.

Aedeagus (Fig. 20) with basal piece 0.55 of total length, paramere 0.46 total length, paramere apex 0.35 paramere length.

Female as for male, except body form slightly robust; antenna short, apex just reaching apex of pronotal hind angle, antennomere 2–4, 11 length ratio 1.0:2.7:2.3, 3.9; metatarsomere length ratio 1.00:0.35:0.20:0.18:0.65.

**Specimens Examined.** Holotype of *Ischiodontus oblitus* Candèze label data see Fig. 21 (BMNH). **ALABAMA**, Baldwin Co., Gulf St. Pk. 27.vi.1986, coll. E.G. Riley (1, TAMU). **INDIANA**, Monroe Co., Bloomington, 15.viii.1990, F.N. Young (1, PJJC); 31.v.1990 (2, PJJC); 28.vii.1990 (1, PJJC); 23.vii.1987 (1, PJJC); 9.vii.1987 (1, PJJC); 5.vii.1990 (1, PJJC); vii.1987 (1, PJJC); 12.vii.1990 (2, PJJC). **MISSISSIPPI**, Lafayette Co., Oxford, 23.vii.1981, P.K. Lago (1, PJJC). **MISSOURI**, Randolph Co., 1 mi. E. Moberly, 18.vii.1976, coll. E.G. Riley (2, TAMU). **TEXAS**, **Bastrop Co.**, Camp Swift NG Base, 8.6 km N of Bastrop, 21.vii.2003, JC Abbott (1, UTIC). **Brazos Co.**, Riley Estate, 30°58849'N, 96°25366'W, 16.viii.2005, E. Riley, UV (2, TAMU); 29.viii.2005 (1, TAMU). **Hardin Co.**, Village Ck. St. Pk. (site 1), 30.25534°N, 94.17901°W, 14.viii.2010, E. Riley, UV (3, TAMU). **Nacogdoches Co.**, Camp Whispering Pines, nr. Garrison, 13.vii.1985, E.G. Riley (2, TAMU). **Sabine Co.**, Mill Creek Cove, "Beech Bottom", 8.8 mi. NE Hemphill, UV light, 31.3851°N, 93.7090°W (NAD27), 11-16.vi.2007, D.J. Hefern, et al. (6, TAMU).



**Figures 19-21.** *Elater soleatus* Say lectotype / *Ischiodontus oblitus* Candèze, holotype. **19)** Adult, dorsal habitus. **20)** Aedeagus, dorsal aspect. **21)** Specimen labels.

**Notes.** Say (1834) described *E. soleatus* from Indiana, not Michigan as stated by Clark (1963) and Downie and Arnett (1996). This description and locality were republished posthumously (Say 1839). LeConte (1853) recorded the species from Michigan, which was repeated by Candèze (1859) and seems to be the source of the erroneous interpretation. This species is widespread through much of the southeastern United States, with specimens seen from Kansas to eastern Texas, to Florida and north to New Jersey, southern Michigan, Indiana and Missouri. Specimens misdetermined as *I. soleatus* by Horn (1894) were recorded at San José del Cabo, Baja California, collected by Xantus de Vesey (Michelbacher and Ross 1942). Two of these specimens in the Horn Collection are each labeled from “Cal.” and have a yellow square, indicating ‘Lower California’. These specimens represent *D. pericu*.

There is no type or syntype of *D. soleatus* in the Museum of Comparative Zoology, where most known remnants of the Say collection are located and where most of his recognized remaining types are known to reside (Lindroth and Freitag 1969, Mawdsley 1993, Prena 2013). Although John Lawrence LeConte stated in a letter to Alexander Agassiz that his collection “contains specimens carefully compared with those described by Say” (Darlington 1961), none of the elaterids in the LeConte collection are known or recognizably Say’s specimens. In 2013 a specific search was made for Say’s elaterid specimens in the Say, T. W. Harris, F. E. Melsheimer – D. Ziegler, J. L. LeConte and G. H. Horn collections at the MCZ, and though candidate syntypes for other elaterid species were found, there were none for *E. soleatus*.

Say sent beetle specimens to some of his European correspondents, including elaterids to P. M. F. A. Dejean (Dejean 1826, Weiss and Ziegler 1931, Lindroth 1955, Lindroth and Freitag 1969, Prena 2013), with specimens of some of his non-elaterid species known to exist in the collections of other correspondents such as Germar, Winthem and Barabino. Prena (2013) found Say weevil syntypes sent to Germar now in the Museum für Naturkunde, Berlin. Most of Germar’s elaterid collection went to his nephew Schaum, others were held by Klug, with both sets acquired by Candèze (1857). Seven Say’s species were listed by Sturm (1843) as in his collection, with these specimens possibly obtained in exchanges from Germar or Dejean. One of these species, *Elater bellus* Say, was previously listed as a Melsheimer species (Sturm 1826). No specimens of *E. soleatus* were found in the ZMHB (B. Jäger, in litt.; pers. observ.), and the Sturm specimen was not found in the ZSM (M. Balke, in litt.).

Lindroth (1955) concluded that ground beetle (Carabidae) specimens in European collections bearing green labels with “Say” written (see Fig. 3) could be considered syntypes. Searches for potential Say’s elaterid specimens in the Dejean or other collections should focus on either Say’s or Dejean’s labels indicating the specimen came from John Eatton LeConte, and such specimens could also be considered for primary type designation.

*Ischiodontus oblitus* Candèze, 1859 was based on a single specimen “Du sud des États-Unis”, and beginning with Horn (1878) was regarded as a synonym of *D. simplex* (e.g. Henshaw 1885, Candèze 1891, Schwarz 1906, Schenkling 1925). The female holotype of *I. oblitus* in the Natural History Museum, London, was labeled by M. C. Lane in 1964 (Fig. 19–21). Candèze made available many names originally used by Dejean, which in this case is *Monocrepidius oblitus*, a *nomen nudum* in Dejean’s (1833, 1836) last two catalogs and Sturm (1843). The labels attached to the specimen (Fig. 21) document important points in its individual history. Of particular note is the small green rectangle with the handwritten “Say” that is consistent with those seen on carabid specimens (Lindroth 1955, Lindroth and Freitag 1969). However, such labels were commonly used by early 19<sup>th</sup> century European entomologists and often simply indicated the source of a given specimen (J. Prena, in litt.). The handwriting observed is also consistent with that of Say as seen on labels at the MCZ and illustrated by Horn and Kahle (1935–1937), although Say’s handwriting was very similar to that of both Harris and Melsheimer, all using a cursive style common in the early 1800s. The large green rectangle is a typical Dejean label (Horn and Kahle 1935, Lindroth 1955) and has the name that Dejean gave to the specimen. This label states that the specimens originated from North America and from J. E. LeConte.

Since J. E. LeConte never visited Indiana, an *Ischiodontus oblitus* specimen may have come from his family rice growing plantation “Woodmanston” in Liberty County, Georgia (Gray 1883, Barnhart 1917), now the LeConte-Woodmanston Plantation and Botanical Gardens (2016). The specimen may have been given to Dejean by LeConte, who sent and personally delivered “environs six cents espèces de Coléoptères” [ca. 600 species] (Dejean 1825), or “800 species from Georgia” (Dow 1914, Essig 1931). LeConte may have also given examples of Say’s species, if not Say examined specimens, to Dejean when visiting him and A. Boisduval early in 1828 (Dejean 1828, Sorensen 1995), six years before the

*E. soleatus* description (Say 1834) was first published. Interestingly, Tyson Stroud (1992) wrote of an animosity between LeConte and Say. This rivalry derived from Say's accusation that LeConte did not properly promote American science by ignoring naming priority by Say and others, and that he instead sent specimens to taxonomists in Europe for identification and description. The strained relationship between LeConte and Say occurred around the time of the Paris trip, which temptingly suggests that this specimen was part of a personal intrigue between two famous founders of natural history in the United States, and involving Count Dejean.

Dejean's elaterids, including Say and LeConte specimens, found their way to La Ferté, then to E. C. A. Candèze (Candèze 1857), and then to E. Janson and the Natural History Museum via F. D. Godman (Arrow and Hampson 1906; Godman 1915; Hayek 1973). However, some early specimens are known to occur in other museums (Essig 1931; M. Ivie, in litt.), especially the Museo Regionale di Scienze Naturali, Turin, where Dejean's cibrionines are located. The convoluted history of various parts of the Dejean elaterid collection and the known exchanges, purchases, and gifting of specimens among the early 19th-century naturalists requires taxonomic due caution with regard to presuming that any given single specimen of a species may be the only remaining original representative of that taxon.

Dejean did not routinely accept published nomenclatural priority so that, at least with elaterids, his determination labels included the original name as he received them from correspondents and a new name that he gave on the label and in his catalogues (Dejean 1825; Lindroth 1973). Dow (1913) wrote of J. E. LeConte being influenced by Dejean "who slighted many species named by Say and renamed them, alleging that he could not read the English descriptions." Concerning this particular specimen in the BMNH, Dejean evidently did not write *Elater soleatus* on the label (Fig. 21) after the original description of the species was published (Say 1834) or after it was republished (Say 1839). This different label treatment may have been a factor in causing Candèze to accept Dejean's name and redescribe the specimen as *I. oblitus*, and obscure the origin of the specimen. Candèze frequently adopted Dejean's elaterid species names and subsequently made them available either in their original or new combinations. Although Candèze may not have been aware of Say's (1834) original description of *E. soleatus*, he knew of Say's (1839) posthumous republication of the description; yet, he followed J. L. LeConte (1853) and treated "*Dicrepidius soleatus*" as *incertae sedis*.

The label evidence suggests that the holotype of *I. oblitus* was a gift to Dejean from J. E. LeConte. Yet, the presence of the Say label, apparently in Say's hand, the known exchanges between Say and Dejean, the history of the collections of both men, and Dejean's predilections against using Say's taxonomic names suggest the potential that this specimen could have originally been sent by Say. The morphology of this specimen is consistent with LeConte's (1853) interpretation of the species and the regarding of both names as synonymous by Horn (1878). Despite the equivocal provenance of the specimen, there is no other known historical specimen available (ICZN 1999, Art. 72.4.1.1) to select as a lectotype of *E. soleatus*. Yet, there remains a reasonable possibility that a syntypical Say specimen of *E. soleatus* may be found. Therefore, in accordance with Art. 74 and given the conspecificity determined for *I. oblitus* and *E. soleatus*, and the nomenclatural need to establish a firm identity for *E. soleatus* without meeting the conditions for designation of a neotype (ICZN 1999, Art. 75), this Dejean specimen is **here designated the lectotype** of *E. soleatus*. The designation of *I. oblitus* Candèze, 1859 as a subjective synonym begins with Horn (1878), but it now becomes an objective junior synonym of *E. soleatus* Say and is consistent with ICZN Art. 72.6.

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