A journal of world insect systematics

INSECTA MUNDI

1012

Acmaeodera (Coleoptera: Buprestidae): A new species of *Acmaeodera* Eschscholtz, 1829 from the southwestern United States, with three new synonymies, new state and host records, and a key to species occurring east of the Rocky Mountain states

Jason A. Hansen

USDA-APHIS-PPQ
Los Indios, Texas 78567, USA

Date of issue: October 27, 2023

Center for Systematic Entomology, Inc., Gainesville, FL

Hansen JA. 2023. *Acmaeodera* (Coleoptera: Buprestidae): A new species of *Acmaeodera* Eschscholtz, 1829 from the southwestern United States, with three new synonymies, new state and host records, and a key to species occurring east of the Rocky Mountain states. Insecta Mundi 1012: 1–52.

Published on October 27, 2023 by
Center for Systematic Entomology, Inc.
P.O. Box 141874
Gainesville, FL 32614-1874 USA
http://centerforsystematicentomology.org/

Printed copies (ISSN 0749-6737) annually deposited in libraries

Florida Department of Agriculture and Consumer Services, Gainesville, FL, USA
The Natural History Museum, London, UK
National Museum of Natural History, Smithsonian Institution, Washington, DC, USA
Zoological Institute of Russian Academy of Sciences, Saint-Petersburg, Russia

Electronic copies (online ISSN 1942-1354) in PDF format

Archived digitally by Portico.
Florida Virtual Campus: http://purl.fcla.edu/fcla/insectamundi
University of Nebraska-Lincoln, Digital Commons: http://digitalcommons.unl.edu/insectamundi/
Goethe-Universität, Frankfurt am Main: http://nbn-resolving.de/urn/resolver.pl?urn:nbn:de:hebis:30:3-135240

1012: 1–52 **INSECTA MUNDI** 2023

Acmaeodera (Coleoptera: Buprestidae): A new species of *Acmaeodera* Eschscholtz, 1829 from the southwestern United States, with three new synonymies, new state and host records, and a key to species occurring east of the Rocky Mountain states

Jason A. Hansen

USDA-APHIS-PPQ
Los Indios, Texas 78567, USA
jason.a.hansen@usda.gov

Abstract. *Acmaeodera natlovei* **new species** (Coleoptera: Buprestidae) is described from the southwestern United States. Details of phenology, geographic range, larval, flower and adult host plants, and similar species are discussed. *Acmaeodera yuccavora* Knull, 1962 is **newly synonymized** with *Acmaeodera conoidea* Fall, 1899. *Acmaeodera thoracata* Knull, 1974 and *A. bryanti* Van Dyke, 1953 are **newly synonymized** with *Acmaeodera neoneglecta* Fisher, 1949. New state and host records are reported for United States. A key to the 46 species of *Acmaeodera* occurring east of the Rocky Mountain states is provided.

Key words. Polycestinae, Acmaeoderini, jewel beetles, North America, taxonomy.

ZooBank registration. urn:lsid:zoobank.org:pub:E03CF02E-D212-4AF1-8E3B-5AE3463D2A71

Introduction

Acmaeodera Eschscholtz, 1829 is one of the most speciose buprestid genera in America north of Mexico (Nelson et al. 2008). Many species are notoriously variable in size and markings, making identification challenging. Adding to the difficulty, it has been well over a century since the last comprehensive review of *Acmaeodera* was published (Fall 1899). Since that time, nearly 100 additional species have been described from the United States, yet only a few regional keys have been produced, mostly for areas where species diversity is low (Barr 1971; Wellso et al. 1976; MacRae 1991; Harpootlian and Bellamy 2014).

Acmaeodera in the United States and Canada generally can be divided into eastern and western species by the Rocky Mountains, which cut a path across North America from Alaska to New Mexico. Roughly one-third of the known species in America north of Mexico fall east of this geographic divide, most occurring in the state of Texas, where ten distinct ecoregions provide diverse habitats (Gould et al. 1960). The main objective of this work is to provide important updates to the taxonomy, distribution, and biology of several species of the eastern fauna. A key to the 46 species occurring east of the Rocky Mountain states is provided.

Materials and Methods

A review of the literature was conducted for each species to better understand their unique morphology, distribution, and habits. Morphological characters of each species were examined and compared. All type specimens were examined physically with the exception of *Acmaeodera yuccavora* Knull, 1962, for which detailed images provided by the Chicago Field Museum were deemed sufficient. Series images of species in Appendix 1 (Fig. 4–50) are arranged in alphabetical order for ease of use in conjunction with the key.

Images were taken using a Nikon SMZ18 microscope with mounted Nikon Digital Sight DS Fi-2 camera. Stacked images were rendered using Helicon Focus 6 software and individually edited for lighting and placement using Adobe Photoshop Elements 2019.

Label data for primary types is cited verbatim with a vertical bar (|) separating data on separate lines, double vertical bar (||) separating data on different labels. Other label data is not necessarily transcribed exactly as seen on the label. Dates are formatted day, month, then year, separated by periods. Label data appears in the order of state, county, more specific locality data, host when available, collection method when available, collection date, collector(s). Number of specimens are in parentheses along with sex when available, and collection abbreviation where the specimen(s) is housed is in square brackets [ ]. New state, adult, floral and larval host records are indicated in bold after the label data. Definition of floral, adult, and larval hosts follow MacRae (2006). The following are abbreviations used in citing label data: Co. = County; coll. = collected; Det. = Determined by; elev. = elevation; em.= emerged; *ex* = from; FM = Farm to Market Road; flwers = flowers; Ft. = Fort; Hwy. = Highway; Jct. = junction; mi. = miles; Mt(s). = mountain(s); N.P. = National Park; nr. = near; Rd. = Road. Plant taxa follow the USDA PLANTS database (USDA, NRCS 2023).

The following collection abbreviations are used for depositories of specimens:

AJSC Ashley J. Schmitz Collection, Corpus Christi, Texas, USA
ANSP Academy of Natural Sciences, Philadelphia, Pennsylvania, USA
CMNH Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA
DJHC Daniel J. Heffern Collection, Houston, Texas, USA
FMNH Field Museum of Natural History, Chicago, Illinois, USA
FSCA Florida State Collection of Arthropods, Gainesville, Florida, USA
INHS Illinois Natural History Survey, Champaign, Illinois, USA
JABIC Jeff A. Back Insect Collection, Hewitt, Texas, USA
JAHC Jason A. Hansen Collection, Los Indios, Texas, USA
JPHC Jeffrey P. Huether Collection, Geneva, New York, USA
LSAM Louisiana State Arthropod Museum, Baton Rouge, Louisiana, USA
OSAC Oregon State University, Corvallis, Oregon, USA
POKC Paul Kauffman Collection, Morristown, Arizona, USA
RLWE Richard L. Westcott, Salem, Oregon, USA
TAMU Texas A&M University, College Station, Texas, USA
TCMC Ted C. MacRae Collection, Wildwood, Missouri, USA
TJHC Tyler J. Hedlund Collection, Champaign, Illinois, USA
WFBM W.F. Barr Entomological Collection, University of Idaho, Moscow, Idaho, USA

Results and Discussion

Acmaeodera natlovei Hansen, new species

(Fig. 1a–f)

Description. Holotype female: 7.0 mm long, 2.5 mm wide; ground color shiny black above and below; head and pronotum immaculate; elytra with narrow yellow vittae from umbone to subapex, vestiture above and below short and white with setae narrow and flattened in shape.

Head. Convex, weakly depressed at middle, front and vertex densely umbilicate-punctate, each puncture with a single white seta; clypeus depressed at base, densely punctate, triangularly emarginate medially; antennae reaching middle of pronotum, serrate from antennomere 5, 5–11 wider than long. *Pronotum.* Immaculate, about twice as wide as long, widest at middle, clothed with short white setae, sides arcuately rounded, carinate laterally at suture, disc finely punctate, laterally umbilicate-punctate, slight subbasal depression medially and two deeper depressions basolaterally, anterior margin bisinuate, slightly produced medially, posterior margin truncate. *Elytra.* Elytra with sides subparallel to middle then broadly rounded, tapering to conjointly rounded apices, disc marked with narrow yellow vittae from umbone to subapex, base as wide as posterior edge of pronotum, with deep scutellar depression; subbasal depression adjacent to elytral suture and posterior to umbone; striately punctured, strial punctures separated by less than their diameter on disc, third lateral stria split near basal third after 10 punctures; intervals with single row of fine punctures, each with a single white seta; second lateral interval much wider and inflated posterior to umbone, densely punctate with punctation somewhat confused; costal margin weakly serrate medially becoming stronger toward apex.

Venter. Venter clothed in short, white, setae that are flattened in shape; proepisternum projecting less than the length of antennomere 2 past prosternum, punctures large, umbilicate; anterior edge of prosternum straight; prosternal process densely punctate, about two times as wide as diameter of procoxa; mesepisternum, metepisternum and metacoxae coarsely punctate; abdominal ventrites finely, densely punctate with recumbent setae; fifth abdominal ventrite more coarsely punctate apically, lacking raised carina; legs with femoral setae shorter than width of femur; tarsal claw with ungual tooth short and acute.

Materials examined. The holotype labeled "TX: Jeff Davis Co., Hwy 17 | 19.4 mi. south of Balmorhea | 30.7649, −103.7595 | Sweeping flwers, 14.v.2020 | JA Hansen & T. Hedlund || HOLOTYPE | *Acmaeodera* | *natlovei* | Hansen" [red rectangular label]. Holotype deposited at FMNH. ARIZONA, Gila Co., Tonto Creek., 6.vii.1977, unknown collector, (1♀) [TAMU]; Sierra Ancha Mts., no date, D.K. Duncan, (3♂) [WFBM]; Sierra Ancha Mts., Haigler Creek, 2.vi.1933, Parker, (1) [WFBM]; Maricopa Co., Phoenix, no date, C. Palm, (1♀) [WFBM]; Mohave Co., Hualapai Mt. Park, on *Purshia* sp. (Rosaceae), 30.vi.1966, R.L. Westcott, (4♀, 5♂) [RLWE]; same locality, 30.vi.1966, E.J. Allen, (2♂,

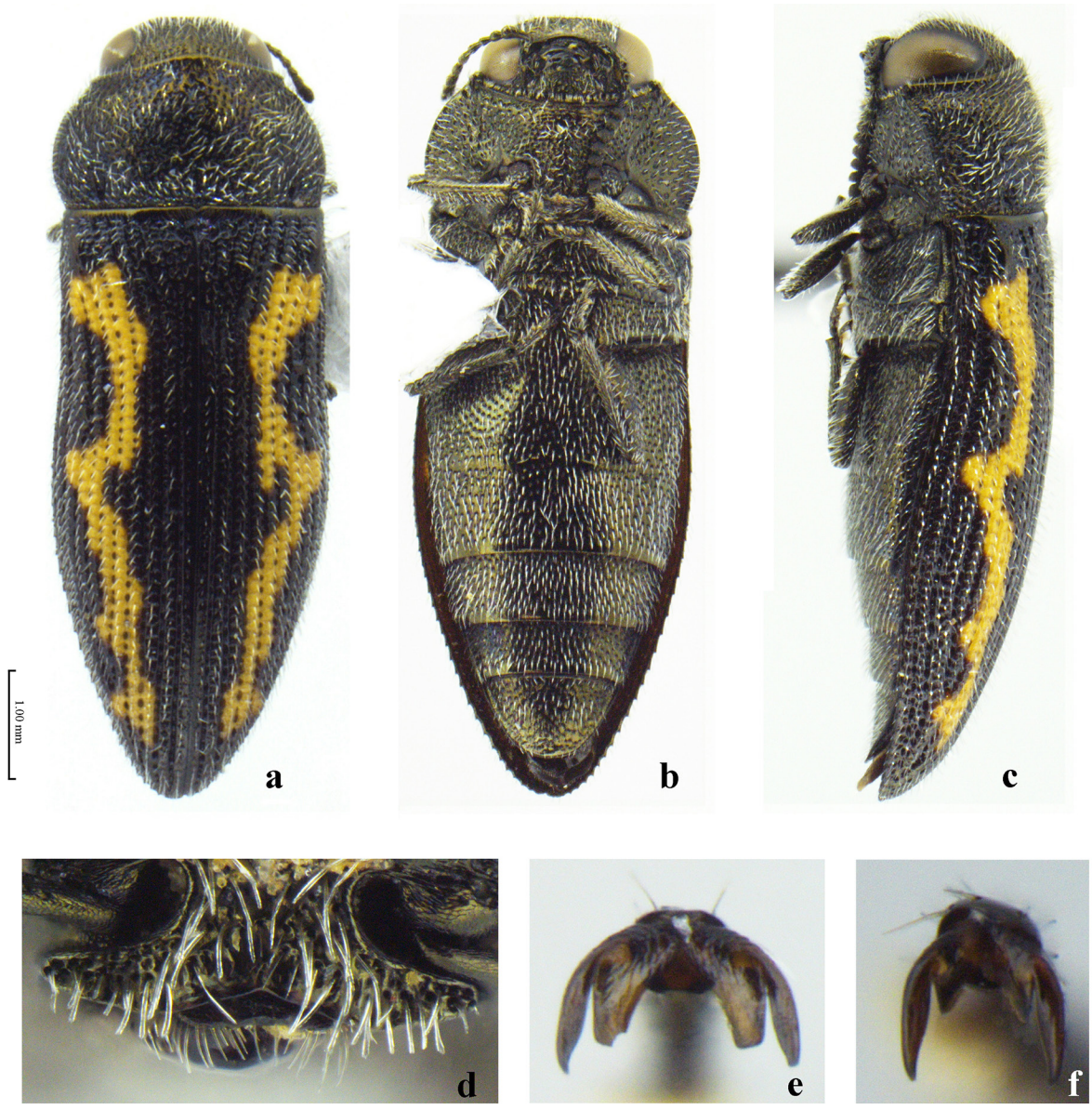

Figure 1. *Acmaeodera natlovei* **new species**. **a)** Holotype, dorsal view. **b)** Holotype, ventral view. **c)** Holotype, lateral view. **d)** Holotype, clypeus. **e)** Paratype protarsal claw ♂. **f)** Paratype protarsal claw ♀.

1♀) [WFBM]; same locality, on *Fallugia* sp. (Rosaceae), 18.vi.1985, W.F. Barr, (1♀) [WFBM]; Yavapai Co., Prescott, 2 mi. west of Thumb Butte, on *Robinia* sp. (Fabaceae), 19.vi.1985, W.F. Barr, (2) [WFBM]; Yarnell, elev. 4783', on *Erigeron divergens* Torr. & A. Gray (Asteraceae), 1.vi.1966, J.H. Davidson, J.M. Davidson & M.A. Cazier, (1♀) [WFBM]; Prescott National Forest, Big Bug Creek, 3 mi. west of Poland Jct., 30.v.1970, R.L. Westcott, (2♀, 1♂) [RLWE]; 5.7 mi. south of Prescott, elev. 5280', on *Erigeron divergens*, 7.vi.1966, J.M. Davidson & M.A. Cazier, (1♀) [WFBM]; same data except on *Purshia mexicana* (D. Don) Henrickson, (1♀) [RLWE]; Prescott, 18.vi.1976, D. Ahart, (1♂) [TAMU]; NEW MEXICO**,** Chaves Co., 32.8655, −104.9852, 16.vi.2021, A.J. Schmitz, (9 ♀, 6♂) [AJSC]; Eddy Co., 9.9 mi. southwest of Whites City, 3740', 12.v.1989, T. Griswold, (1♀) [RLWE]; 5–10 mi. south Carlsbad, 25–27.ix.1990, Androw & Brattain, (1) [TCMC]; 10 mi. south of Carlsbad, *ex* dead *Celtis* sp. (Ulmaceae), em. 15.ix.1994, D.J. Heffern, (3♀) [DJHC]; Valencia Co., Chaves City, 12 mi. west of Hope, beating cactus blossom, 11.vi.1983, F.M. Beer, (1) [RLWE]; Paratypes, [yellow rectangular labels], TEXAS**,** Brewster Co., Big Bend N.P., Chisos Mts., Pine Canyon, 1.vii.1972, R.L. Westcott, (1♀) [TAMU]; Big Bend N.P., Oak Springs, on thistle blossom, 24.vi.1971, G.H. Nelson, (2♀, 1♂) [FSCA]; same data except 25.vi.1971, (1) [FSCA]; same locality, pan trap, 18.vi.1999, S. Droege, (1♀) [TAMU]; Big Bend N.P., north of Rosillos Mts., Buttrill Springs, 22.iii–8.iv.1991, Wharton & Whitefield, (1♀) [TAMU]; Big Bend N.P., on flower, 22.v.2001, D.W. Sundberg, (1♀) [FSCA]; 15 mi. west of Marathon, 26.vi.1994, J.E. Wappes, (1♂) [TAMU]; Big Bend N.P., Chisos Mts., 29.iv.1974, G.V. Manley, (5) [TAMU]; Big Bend N.P., Chisos Mts., 5.v.1974, G.V. Manley, (2♂) [TAMU]; Big Bend N.P., Chisos Mts., Oak Canyon, Window Trail, on small white flower of *Erigeron* sp., 12.iv.2010, R.L. Westcott, (2♀) [RLWE]; same locality, elev. 4800', 21.vi.1994, T.C. MacRae, (1) [TCMC]; 20 mi. south of Alpine, 30.1212, −103.5807, 20.v.2021, J.A. Hansen, (1♂) [JAHC]; Crockett Co., Ozona, 21.v.2009, S.G. Wellso, (1♀) [TAMU]; Culberson Co., Guadalupe Mts. N.P., ½ mi. northwest of Pine Springs, on flower of *Fallugia paradoxa* (D. Don) Endl. ex Torr., 29.iv.1972, R.L. Westcott, (1♂) [RLWE]; Jeff Davis Co., 19.4 mi. south of Balmorhea on Hwy. 17, 30.7649, −103.7595, sweeping flowers, 14.v.2020, J.A. Hansen & T.J. Hedlund (159) [JAHC, TJHC, TAMU, FSCA]; Hwy. 17, 30.7648, −103.7393, sweeping roadside, 14.v.2020, J.A. Hansen, (8♀, 6♂) [TAMU]; 7.4 mi. north of Ft. Davis on Hwy. 17, 308113, −103.7576, 18.v.2021, A.J. Schmitz, (2♂) [AJSC]; Ft. Davis, Hwy. 17, 30.6489, −103.8398, 18.v.2021, A.J. Schmitz, (4♀) [AJSC]; Ft. Davis, Hwy. 17, 30.6096, −103.8788, 18.v.2021, A.J. Schmitz, (4♀, 3♂) [AJSC]; 4.7 mi. northeast of Ft. Davis, Hwy. 17, 30.6495, −103.8352, 3.vii.2021, A.J. Schmitz, (1♀) [AJSC]; 25 mi. northeast Ft. Davis, on morning glory flowers, 30.v.1989, W.F. Barr, (2♀, 4♂) [WFBM]; same locality, sweeping grass, 30.v.1989, W.F. Barr, (14♀, 6♂) [WFBM]; no specific location, 12.v.2003, S.G. Wellso, (3♀, 3♂) [TAMU]; Hwy. 118, 30.6045, −103.9038, dug from dead *Juglans microcarpa* Berl. (Juglandaceae) branch 3 inches in diameter, beetle dead, coll.13.v.2020, J.A. Hansen, (1♀) [JAHC]; ESPY Ranch, FM-1832, 30.8104, −103.9219, landed on white beat sheet, 14.v.2020, J.A. Hansen, (3♀, 4♂) [JAHC]; 15.8 mi. northeast Ft. Davis, Hwy. 17, 30.76483, −103.759348, elev. 4200', on flower *Verbena* sp. (Verbenaceae), 28.iv.2021, T.C. MacRae, (1) [TCMC]; same data except swept from roadside vegetation, (1) [TCMC]; Davis Mts., Limpia Canyon, 17–20.vi.1961, R.L. Westcott, (4♀, 7♂) [TAMU, RLWE]; Davis Mountains State Park, Limpia Canyon Primitive Area, elev. 5050', *ex* small dead branch *Celtis laevigata* Willd. var. *reticulata* (Torr.) L.D. Benson coll. 17.v.1994, em. v.1996, T.C. MacRae, (1♀) [TCMC]; same data except, *ex* dead branch *Celtis laevigata* var. *reticulata* coll. 24.x.2001, em. 1–14.vi.2003, (1♀) [TCMC]; Hwy. 118, Lawrence E Wood Picnic Area, 30.706182, −104.104849, on *Ratibida columnifera* (Nutt.) Wooton & Standl. (Asteraceae), 2.vii.2017, J.A. Back, (1) [JABIC]; Ft. Davis, 27–29.viii.1962, H.R. Burke, (1) [TAMU]; 4 mi. southeast of Ft. Davis, Hwy. 118, 13.vi.1968, G.H. & D.E. Nelson, (1♀) [FSCA]; Ft. Davis, Hwy. 118, Caldwell Ranch Gate, 30.7422, −104.1396, 13.v.2020, J.A. Hansen, (2♂) [JAHC]; 21 mi. south of Kent, 12.vi.1983, collector unknown, (1♀) [FSCA]; Pecos Co., 29 mi. south of Ft. Stockton, on *Ratibida columnifera*, 24.v.1980, R.L. Westcott, (1♂) [RLWE]; Ft. Stockton, 28 mi. southwest on US-385, 13.v.2003, S.G. Wellso, (1♀) [TAMU]; same locality, 5.vi.1992, E.G. Riley, (1♂) [TAMU]; Ft. Stockton, 6.iv.1993, S.G. Wellso, (1) [TAMU]; Reeves Co., Toyahvale, 0.4 mi. south of FM-3078 on Hwy. 17, elev. 3347′, 30.9371, −103.7917, 28.iv.2021, swept from roadside vegetation, T.C. MacRae, (1) [TCMC]; same data except 24.v.2022, on flower *Machaeranthera pinnatifida* (Hook.) Shinners (Asteraceae), (1) [TCMC]; Sutton Co., Sonora, 13.v.2009, S.G. Wellso, (3) [TAMU]; no specific location, 12.v.2009, S.G. Wellso, (1♂) [TAMU].

Variation. Shape of the clypeus varies from triangularly emarginate to sinuate but never broadly emarginate. Pronotal shape can be widest at middle to widest just behind middle in some specimens. Yellow elytral markings vary from narrow vittae extending from umbone to subapex, as seen in the holotype (Fig. 1a), to broken vittae appearing as a posthumeral C-shaped maculation and two converging, oblique maculations on the apical third of the elytra. In some specimens these are broken up further (see Appendix 1, Fig. 23). Specimens are subcylindrical to more robust. A series of 200 specimens revealed one with the costal edge of the elytra entire; all other specimens had the costal edge serrate as described for the holotype.

Sexual dimorphism. In males the ungual tooth of the protarsal claw is at least half as long as the outer claw with the tip distinctly truncate (Fig. 1e). Females can be separated from males by the short, acute ungual tooth of the protarsal claw (Fig. 1f). Females range in size from 5–7 mm long, 1.9–2.8 mm wide and males 5–6.5 mm long, 1.5–2.1 mm wide. On average, females are larger than males. The female genitalia are typical of the Acmaeodera tubulus species group (e.g., *A. natlovei*, *A. neoneglecta* Fisher, 1949, *A. neglecta* Fall, 1899, *A. opuntiae* Knull, 1966, *A. tubulus* [Fabricius, 1801]).

Distribution. Arizona, New Mexico, Texas.

Biology. *Celtis laevigata* var. *reticulata* Torr. and *Juglans microcarpa* Berl. are the only confirmed larval plant hosts of *A. natlovei*. A large series was collected in Jeff Davis Co., Texas (30.7649, −103.7595) where neither of these two hosts were apparent, leading the author to believe the larval host range is likely broader than currently known. Adults on *Robinia* sp., also on flowers of C*irsium* Mill. (Asteraceae), *Convolvulus equitans* Benth. (Convolvulaceae), *Diospyros texana* Scheele (Ebenaceae), *Erigeron divergens*, *Fallugia paradoxa*, *Lygodesmia texana* (Torr. & A. Gray) Greene (Asteraceae), *Machaeranthera pinnatifida*, *Opuntia* sp. (Cactaceae), *Purshia mexicana* and *P. stansburiana* (Torr.) Henrickson, *Ratibida columnifera* and *Verbena* sp. Adults alighted on a white beat sheet laid on the ground, along with individuals of *Acmaeodera gillespiensis* Knull, 1941 and *Acmaeodera quadrivittatoides* Nelson and Westcott, 1995.

Peak flight of *A. natlovei* occurs May and June, with museum specimens dated as early as April, and a solitary specimen collected in late August from Ft. Davis, Texas. The latter likely represents an extreme end of the species natural flight period.

Etymology. The specific epithet is in honor of the African American cowboy, Nat Love. He was born into slavery but eventually made his mark as a free man in the southwestern United States herding cattle. In the latter half of the 19th century, he traveled much of the land between Arizona and Texas on horseback and eventually authored an autobiography of his many adventures.

Remarks. *Acmaeodera natlovei* has been confused in collections with *Acmaeodera conoidea* Fall, 1899 for decades because the two sometimes share similar elytral markings and robustness, but *A. natlovei* is easily separated from that species by having the clypeus triangularly emarginate medially and by the split of the third lateral stria more or less at the basal third. In contrast, the clypeus of *A. conoidea* is very broadly emarginate and the third lateral stria is split near the umbone after only a few punctures. *Acmaeodera natlovei* can also be separated from *Acmaeodera neglecta* and *A. opuntiae*, the latter two having the third lateral stria split near the umbone as in *A. conoidea*. Based on the split of the third lateral stria and more bulbous medial lobe of the aedeagus (Fig. 2a–e), *A. natlovei* is most closely related to *A. tubulus* and *A. neoneglecta*. It can be distinguished by being larger in size on average, usually more robust, and most easily by the characteristic elytral markings and darker color, which differ from those typically seen in either of the former two species. *Acmaeodera tubulus* can sometimes be robust but has distinct spots (usually eight), whereas *A. natlovei* has elytral spots consolidated into vittae or has vittae broken into 3–4 larger yellow spots. *Acmaeodera neoneglecta* can be separated from *A. natlovei* by its more bronzed luster and when vittae are present in the former, they are extremely irregular or wider than seen in specimens of the latter. Based on examination of over 1,000 Texas specimens, geographical differences between the three species are as follows: *A. tubulus* occurs throughout the eastern and midwestern United States to central Texas, *A. neoneglecta* is restricted to central Texas south into Mexico, and *A. natlovei* occurs in west Texas, New Mexico, and Arizona. In Arizona, *A. natlovei* may be confused with *Acmaeodera cazieri* Knull, 1960 and *Acmaeodera ligulata* Cazier, 1940, to both of which it can bear a superficial resemblance. *Acmaeodera cazieri* differs by being larger, more robust, having the prosternum much more convex, elytral vittae never broken and abdominal ventrites 1–4 transversely reticulate between punctures laterally. *Acmaeodera ligulata* can be separated readily by its coarsely punctate pronotum and more cylindrical shape.

Figure 2. Male genitalia, Acmaeodera tubulus species group. **a)** *A. natlovei* **new species**. **b)** *A. neoneglecta*. **c)** *A. tubulus*. **d)** *A. neglecta*. **e)** *A. opuntiae*.

Synonyms

Acmaeodera conoidea Fall, 1899

Acmaeodera conoidea Fall 1899: 31.
Acmaeodera yuccavora Knull 1962: 2. **New synonymy.**

(Fig. 3a–f)

The two syntypes of *A. conoidea*, one of which was designated lectotype by Westcott and Bílý (2018) [ANSP], were compared to detailed images of the holotype of *A. yuccavora*, provided by the Chicago Field Museum as well as various Arizona specimens of the latter from private collections [JAHC, POKC, RLWE]. In my opinion, the types are conspecific. The original series of *A. conoidea* in the Horn collection was described as "small" by Fall (1899) and likely did not represent the full range of variation within the species. It is perhaps not a coincidence that Cazier (1940) noted similarities between *A. conoidea* and *A. subbalteata* LeConte, 1863, just as Knull (1962) later remarked on similarities between *A. yuccavora* and *A. subbalteata*, as *A. conoidea* and *A. yuccavora* represent the same species. The original description of *A. yuccavora* notes four irregular transverse yellow elytral markings, although Knull acknowledges the markings vary considerably and connect in some specimens to form vittae, as seen in the two existing *A. conoidea* syntypes (Fig. 3; Knull 1962; Westcott and Bílý 2018). Notably absent from the description of *A. yuccavora* is a comparison to *A. conoidea*, understandable since Knull did not have access to the type series at the time, long before the designation of the *A. conoidea* lectotype. The last published account of the type series was Cazier (1940), who mistakenly declared the type lost.

Horn's series of *A. conoidea* was apparently composed of at least three specimens, only two could be located over a century later and were subsequently designated as the lectotype and paralectotype, respectively (Westcott and Bílý 2018). Careful study of these types made it clear the previously concept of *A. conoidea*, as represented in published distribution records and among many specimens in collections, was in error. During the course of study for this work, specimens of the Acmaeodera tubulus species group from multiple collections were examined. Among those were specimens from west Texas labeled as *A. conoidea* that did not align with Fall's (1899) description, but invariably represented the previously undescribed species, *A. natlovei*.

Confusion between *A. conoidea* and *A. natlovei* undoubtedly came about due to misplacement of the type series, variability among specimens of both species, and the subsequent misidentifications that appear to have

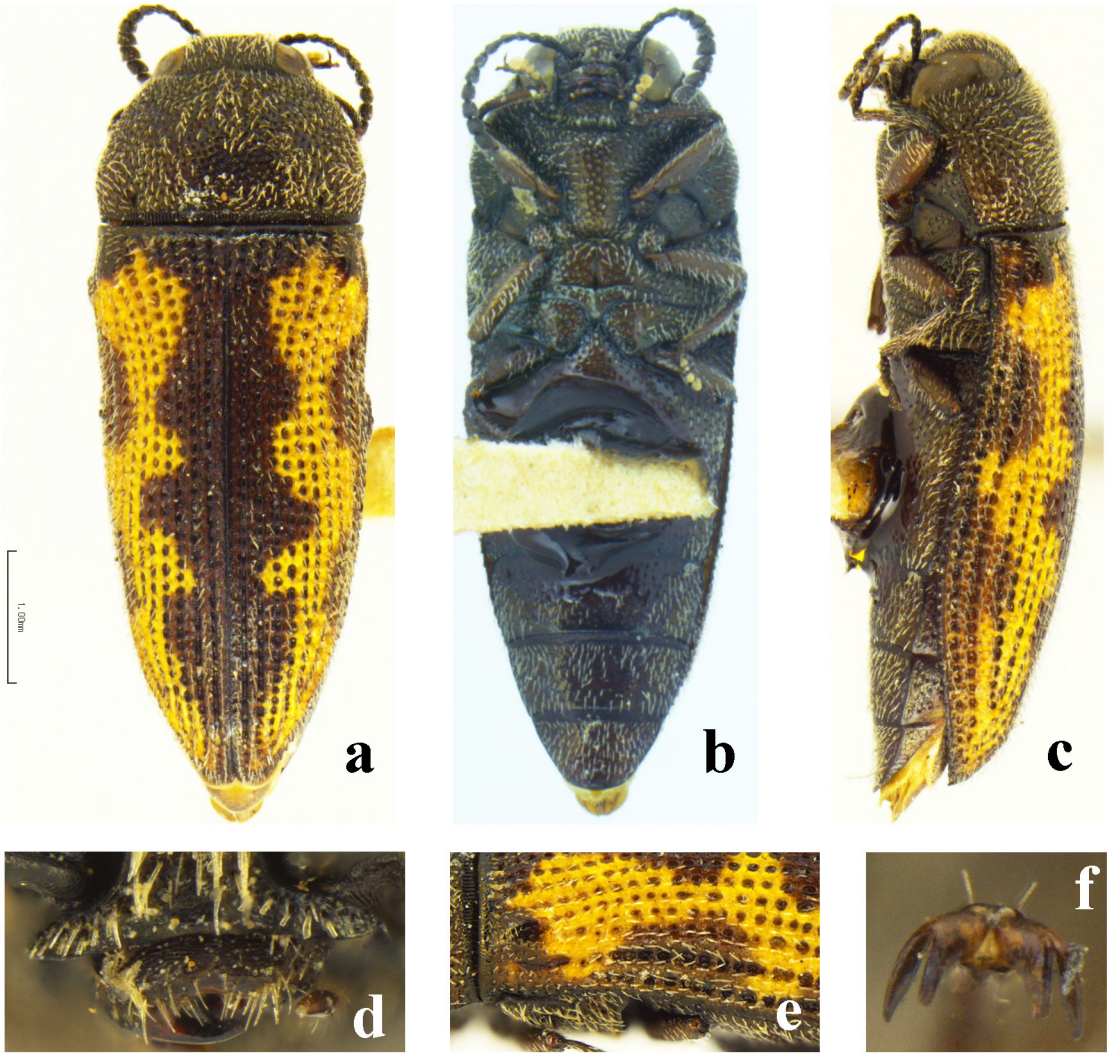

Figure 3. *Acmaeodera conoidea* Fall, paralectotype ♂. **a)** Dorsal view. **b)** Ventral view. **c)** Lateral view. **d)** Broadly arcuate clypeus **e)** Third stria split near umbone. **f)** Protarsal claw.

been relied upon for comparison. *Acmaeodera conoidea* can easily be separated from all similar species of Texas *Acmaeodera* by its broadly emarginate clypeus, third lateral strial split near the umbone, and larval host.

Biology. Due to confusion with *A. natlovei*, a reexamination of host records reported in the literature for *A. conoidea* is warranted. Burke (1918) reports rearing *A. conoidea* from dead flower stalks of sotol, *Dasylirion wheeleri* S. Watson (Liliaceae), a record repeated in Chamberlin (1926) but using the common name Spanish dagger in error. Burke's host record was thought to be based on a misidentification until recently, when *A. conoidea* was reared from a sotol stalk in Arizona, confirming the larval host record: Arizona, Santa Cruz Co., Ruby Rd., Atascosa Trailhead, elev. 4701′, 12R 486024 3474474 UTM, *ex Dasylirion wheeleri* coll. 20.iv.2018, em. viii.17–ix.14.2019, P. Kaufman [POKC]. Larval host records of *A. conoidea* from *Ulmus crassifolia* Nutt. (Ulmaceae), *Juglans* sp., and *Celtis laevigata* var. *reticulata* are also in question (Westcott et al. 1979; MacRae and Nelson 2003). The record from *U. crassifolia* in south Texas was found to be based on a misidentified specimen of *A. neoneglecta*, a common species in the Texas Rio Grande Valley (Ted MacRae, pers. comm.). Unfortunately, the previously reported specimen of *A. conoidea* reared from *Juglans* sp. (Westcott et. al. 1979) could not be examined. Considering misidentification of *A. natlovei* specimens was common at the time for the previously stated reasons and the timing of its emergence (i.e., May), it is highly likely the specimen represents *A. natlovei*. Further supporting evidence

was the discovery of a dead *A. natlovei* adult in its pupal chamber within a dead branch of *Juglans macrocarpa*, in Ft. Davis, Texas (personal observation). The solitary specimen of *A. conoidea* reared from *C. laevigata* var. *reticulata* (MacRae and Nelson 2003) was examined by the author and determined to also represent *A. natlovei*. During the preparation of this manuscript, additional specimens came to light, also reared from *Celtis* sp. collected in Eddy Co., New Mexico near Carlsbad, as noted above in Materials Examined.

Acmaeodera neoneglecta Fisher, 1949

Acmaeodera neoneglecta Fisher 1949: 336.
Acmaeodera bryanti Van Dyke 1953: 104. **New synonymy.**
Acmaeodera thoracata Knull 1974: 143. **New synonymy.**

The holotype of *Acmaeodera bryanti* Van Dyke, 1953 was examined and found to be an immaculate form of *A. neoneglecta*. The lack of yellow markings represents one extreme of the range of natural variation among specimens of *A. neoneglecta*. It is not unprecedented to find melanic specimens among other species in the genus (Westcott and Barr 1998). Records of *Acmaeodera bryanti* and *A. neoneglecta* are completely sympatric from central to south Texas. No hosts have been recorded for *A. bryanti*, but that is likely due to how rarely the melanic form is encountered. Four undetermined specimens from Brazos Co. to Val Verde Co. in Texas, suspected to be *A. bryanti*, were examined. Two were entirely melanic except for a very small, faint, yellow mark near the elytral apex on one side. The other two had no yellow markings. In every aspect the four specimens were identical to *A. neoneglecta* except for reduced or lack of elytral markings and undoubtedly represent that species.

The holotype of *Acmaeodera thoracata* Knull, 1974 also appears to be synonymous with *A. neoneglecta*, by far the most common member of the Acmaeodera tubulus species group in south Texas, where the only known specimen of *A. thoracata* was collected (Knull 1974). Examination of the holotype of *A. thoracata* revealed three unique morphological characters that separate it from other species in the group and which provide further insight into its rightful taxonomic placement. The novel characters in question are: elytron lacking serration laterally (notably missing from the original description), prothorax widest anterior to middle, and lack of punctation medially on the pronotal disc. Examination of variation within the Acmaeodera tubulus species group and other closely related species in the genus reveal these characters, while rare, are not unique to *A. thoracata*.

Lack of serration along the costal edge of the elytra was found to be a rare character state for *A. natlovei* and mirrored the character found in the *A. thoracata* holotype, suggesting it may be a developmental anomaly occurring within the Acmaeodera tubulus species group or possibly the genus in general.

While pronotal shape can be a useful character in separating some species within the genus, it can and does vary among conspecifics. For example, the pronotum of *A. ligulata* varies between being widest near the middle to just in front of middle as seen in *A. thoracata* (Cazier 1940). Many other species in the genus also have slight variations of pronotal shape among specimens which, on rare occasion, do not match their generally accepted morphology (personal observation). This would suggest there is some degree of plasticity during development when pronotal shape is determined. While no specimens of *A. neoneglecta* exhibiting the same lack of punctation medially on the pronotum were found, pronotal punctation does vary among species within the Acmaeodera tubulus species group from fine, distinct punctures to wider, shallower ones. The prothorax of the *A. thoracata* holotype is finely punctate, as is often seen in specimens of *A. neoneglecta*, but differs by the glabrous nature of the medial portion of the disc. This is apparently due to increased spacing of the punctures in a small area of the pronotum and can easily be explained as a developmental deformity, which is further supported by an additional character that is not mentioned in the description of the holotype or evident in Knull's drawing of the specimen. The elytral base of the *A. thoracata* holotype is decidedly asymmetrical. On one side the base adjacent to the scutellar area juts upward in an unusual fashion. Conversely, the opposite elytron is deeply impressed adjacent to the umbone with the base less dramatically, but still unnaturally declivous. These distortions of the elytral base do not appear to be due to mechanical damage, leading the author to conclude that it is a developmental deformity. The deformity is of sufficient severity that it may have made lifting the elytra difficult, possibly interfering with normal flight. With no other specimens known, it is the opinion of the author that the suite of characters pointed to defining *A. thoracata* are not evidence of a unique speciation event but instead a combination of poor pupal development and normal variation within the species *A. neoneglecta*.

New Records

***Acmaeodera gibbula* LeConte, 1858.** TEXAS, Val Verde Co., Pecos River bridge & Hwy. 90, 29.7103, −101.3536, *ex* dead *Vachellia rigidula* (Benth.) Seigler & Ebinger (Fabaceae) coll. x.2022, em. 1−10.v.2023, J.A. Hansen, (3♀, 2♂) [JAHC], **new larval host**.

***Acmaeodera immaculata* Horn, 1878.** TEXAS (**new state record**), El Paso Co., 15 mi. east of El Paso, 25.v.1980, unknown collector, Det. R.L. Westcott [OSAC, RLWE]; Winkler Co., nr. Kermit, 2.5 mi. west of Hwy. 115 on FM874, 31.9444, −103.0110, elev. 2979′, on flower *Oenothera* sp. (Onagraceae), 6.vi.2018, T.C. MacRae & J.P. Huether, (6) [TCMC], **new floral host**. This species may be present in the Texas panhandle as well, where the known larval host, *Krascheninnikovia lanata* (Pursh) A. Meeuse & Smit. (Chenopodiaceae), occurs.

***Acmaeodera maculifera* Horn, 1894.** TEXAS**,** Brewster Co., Big Bend N.P., on flower *Anisacanthus linearis* (Hagen) Henrickson & Lott (Acanthaceae), 25.vi.1985, P.E. Scott, (1) [LSAM], **new floral host**.

Acmaeodera miliaris* Horn, 1878.** NEW MEXICO, Eddy Co., Guadalupe Mts., Sitting Bull Falls, 5000′, 18.viii.1998, R.D. Worthington, (1) [TAMU]. TEXAS, Brewster Co., Big Bend N.P., on flower ***Anisacanthus linearis, 25.vi.1985, P.E. Scott, (1) [LSAM], **new floral host**; 7.5 mi. south of Alpine on Hwy. 118, on flowers *Thelesperma megapotamicum* (Spreng.) Kuntze (Asteraceae), 21.vi.2003, T.C. MacRae, (3) [TCMC], **new floral host**; Starr Co., Roma, Loma Blanca Rd., 26.6140, −99.0001, on flowers *Helianthus annuus L.* (Asteraceae), 30.iv.2023, J.A. Hansen, (3♀, 2♂) [JAHC]**, new floral host**; Val Verde Co., Pecos River bridge & Hwy. 90, 29.7103, −101.3536, *ex* dead *Vachellia rigidula* coll. x.2022, em. 1−10.v.2023, J.A. Hansen, (1♂), **new larval host** [JAHC]. 11.6 mi. west of Comstock on Hwy. 90 at Pecos River, on flowers *Thelesperma simplicifolium* A. Gray, 25.vi.2003, T.C. MacRae, (2) [TCMC], **new floral host**; same data except on flowers *Wedelia acapulcensis* Kunth var. *hispida* (Kunth) Strother (Asteraceae), (1) [TCMC], **new floral host**. An earlier report of *A. miliaris* from New Mexico was thought to be a misidentification of *A. rubronotata* by the authors (Fall and Cockerell 1907). Given the location of the specimen, in a mountainous area of southwestern New Mexico, I agree the specimen was most likely *Acmaeodera rubronotata* Laporte and Gory 1835, which is common on roadside flowers north of Silver City, New Mexico (personal observation). Other records from Arizona, Colorado, and Utah (Chamberlin 1926, Bellamy 2008) are also likely specimens of *A. rubronotata* and were not included in Nelson et al. (2008), undoubtedly for that reason. Before now the most westerly confirmed record of *A. miliaris* was from Ft. Davis, Texas (Westcott 1979). The specimen above confirms the presence of *A. miliaris* in New Mexico, but only in the southeastern portion of the state.

***Acmaeodera mixta* LeConte, 1860.** ARKANSAS (**new state record**), Sevier Co., DeQueen Lake Wildlife Management Area, 25.v.2019, D.J. Heffern, (1) [TCMC]; NEW MEXICO, Bernalillo Co., Cibola National Forest, Capulin Picnic Ground, 35.2158, −106.4154, elev. 8899′, 3.vi.2018, beaten from living *Robinia neomexicana* A. Gray, T.C. MacRae & J.P. Huether, (3) [TCMC], **new adult host**; Chaves Co., 10.0 mi. west of Caprock on Hwy. 380, nr. Mescalero Sand Dunes, 33.4185, −103.8796, elev. 3974′, on flower *Aphanostephus ramosissimus* DC (Asteraceae), 5.vi.2018, T.C. MacRae & J.P. Huether, (1) [TCMC], **new floral host**; OKLAHOMA, Comanche Co., Medicine Park, Jack Laughter Park, 34.7243, −98.4937, elev. 1355′, on flower *Gaillardia pulchella* Foug. (Asteraceae), 10.vi.2019, T.C. MacRae & R.S. Thoma, (3) [TCMC], **new floral host**; Medicine Park Primitive Campground on West Lake Drive, 34.7245, −98.4990, elev. 1268′, on flowers *G. pulchella* & *Thelesperma filifolium* (Hook.) A. Gray (**new floral host**), T.C. MacRae & R.S. Thoma, 9.vi.2019, (12) [TCMC].

***Acmaeodera neglecta* Fall, 1899.** NEW MEXICO (**new state record**), Eddy Co., Klondike Gap Rd. and 412A, 32.131°N/104.717°W, 5790′, *ex Quercus gambelii* Nutt. (Fagaceae) coll. 3.x.2014, em. vi.2015, D.J. Heffern & B. Raber, (2) [TAMU], **new larval host**; TEXAS, Val Verde Co., Gold Mine Canyon, 29.8022, −100.8344, on flowers *Echinocereus enneacanthus* Engelm. (Cactaceae), 19.v.2022, J.A. Hansen, (2♀) [JAHC], **new floral host**.

***Acmaeodera neoneglecta* Fisher, 1949.** OKLAHOMA, Comanche Co., Medicine Park Primitive Campground on West Lake Drive, 34.724457, −98.498971, elev. 1268′, on flower *Coreopsis grandiflora* Hogg ex Sweet (Asteraceae), 9.vi.2019, T.C. MacRae & R.S. Thoma, (3) [TCMC], **new floral host**; same data except on flower *Thelesperma filifolium*, (6) [TCMC], **new floral host**. Nelson et al. (2008) lists eight larval hosts for *A. neoneglecta*, six of them are in the plant family Fabaceae. However, they overlooked *Baccharis neglecta* Britton (Asteraceae) (Boldt and Robbins 1987).

***Acmaeodera obtusa* Horn, 1878.** OKLAHOMA, Comanche Co., Medicine Park, Jack Laughter Park, 34.7243, −98.4937, elev. 1355′, on flower *Gaillardia pulchella*, 10.vi.2019, T.C. MacRae & R.S. Thoma, (1) [TCMC], **new floral host**; TEXAS, Winkler Co., nr. Kermit, 2.5 mi. west of Hwy. 115 on FM-874, 31.9444, −103.0110, elev. 2979′, on flower *Baccharis sarothroides* A. Gray (Asteraceae), 6.vi.2018, T.C. MacRae & J.P. Huether, (6) [TCMC], **new floral host**.

***Acmaeodera opuntiae* Knull, 1966.** TEXAS, Crane Co., Jct. 1053 & 1233, 10–26.v.1997, J.E. Wappes, (1) [TAMU]; Gonzales Co., Palmetto State Park, on *Opuntia* sp. flower, 28.iv.1988, C.B. Barr, (5) [LSAM, TCMC]; Real Co., Ranch Rd. 337 E., 29.7194, −99.6574, 18.iv.2020, J.A. Hansen, (2♂) [JAHC]; Starr Co., La Morita Rd., 26.5660, −98.8538, beaten from *Prosopis glandulosa* Torr. (Fabaceae), 1.iv.2023, J.A. Hansen, (15) [JAHC], **new adult host**; Same data except 14.iv.2023, J.A. Hansen, (6) [JAHC]; Beaten from same host, Sanchez Rd., 26.5921, −99.0022, 13.iv.2023, J.A. Hansen, (1) [JAHC]; Roma, Loma Blanca Rd., 26.6140, −99.0001, on flowers *Helianthus annuus*, 30.iv.2023, J.A. Hansen, (1♀, 1♂) [JAHC], **new floral host**; Uvalde Co., 28.iv.1982, R.L. Stone, (2) [LSAM, TCMC]; Val Verde Co., Pecos River and Hwy. 90, 29.7136, −101.3572, *ex* dead *Vachellia rigidula* coll. x.2022, em. Iv.2023, J.A. Hansen, (1♀, 1♂) [JAHC], **new larval host**; Val Verde Co., Devils River riparian site, 29.7985, −101.0008, pitfall trap along river, 7.iii–9.iv.2021, B. Raber & D. Heffern, (1) [DJHC]; Winkler Co., Monahans Sands, Route 874, 3–7 mi. east-northeast Jct. with Route 18, 6.vi.2018, J. Huether, (1) [JPHC]. Specimens that emerged from *V. rigidula* were confirmed using setal width, split of the third lateral elytral interspace, and examination of the male genitalia, as shown in Fig. 2a–e. Historically, *Acmaeodera opuntiae* has been thought to be restricted to southern Texas. While more common in areas of Starr and Hidalgo Co. the above records show *A. opuntiae* to have a much wider geographic range, extending into parts of west Texas. Previously the westernmost record was Zapata Co., Texas (MacRae 2006). Its presence in west Texas suggests a wider larval host range than is currently known, since both *Karwinskia humboldtiana* (Schult.) Zucc. (Rhamnaceae) and *V. rigidula* do not occur in Crane or Winkler Co. (USDA, NRCS 2023). The presence of individuals of *A. opuntiae* on *P. glandulosa* in two different Starr Co. locations, on different days, suggests adults were not merely resting on the plant. Adults may be feeding on the blooms; the plant may serve as a larval host, or both may occur. The association with mesquite merits further investigation since one of its known hosts, *V. rigidula* is in the same plant family.

***Acmaeodera ornata* (Fabricius, 1775).** TEXAS (**new state record**), Fannin Co., Fannin Lake, 33°46′47″N, 96°09′34″W, 29.iv.2004, E. Riley, (3) [TAMU]; Madison Co., 4 mi. east of Midway, 20.iv.2014, T.R. Clifton [TAMU]; ILLINOIS (**new state record**), Pope Co., [Mt. Golcanda]?, 28.iv.1992, J.K. Bouseman [INHS]; Union Co., Pine Hills Recreation Area, 3.v.1959, J.K. Bouseman, (2) [INHS]. In Texas, this species appears to be restricted to the northeastern portion of the state.

***Acmaeodera ornatoides* Barr, 1972.** OKLAHOMA, Comanche Co., Medicine Park Primitive Campground on West Lake Drive, 34.724457, −98.498971, elev. 1268′, on flower *Gaillardia pulchella*, 9.vi.2019, T.C. MacRae & R.S. Thoma, (3) [TCMC], **new floral host**.

***Acmaeodera princeps* Kerremans, 1908.** Starr Co., La Morita Rd., 26.5660, −98.8538, feeding on flower *Prosopis glandulosa*, 1.iv.2023, J.A. Hansen, (1) [JAHC], **new floral host**.

***Acmaeodera pulchella* (Herbst, 1801).** OKLAHOMA, Le Flore Co., Ouachita National Forest, Ouachita Trail south of Winding Staircase Campground, 34.7093, −94.6831, elev. 2383′, on flower *Krigia* sp. (Asteraceae), 8.vi.2019, T.C. MacRae & R.S. Thoma, (1) [TCMC], **new floral host**.

***Acmaeodera quadrivittatoides* Nelson & Westcott, 1995.** TEXAS, Winkler Co., nr. Kermit, 2.5 mi. west of Hwy. 115 on FM-874, 31.9444, −103.0110, elev. 2979′, on flower *Oenothera* sp., 6.vi.2018, T.C. MacRae & J.P. Huether, (1) [TCMC], **new floral host**.

***Acmaeodera robigo* Knull, 1954.** Texas, Edwards Co., 2 mi. northwest Camp Wood, 29.6826, −100.0277, on flower *Pinaropappus roseus* (Less.) Less. (Asteraceae), 14.iv.2018, K.W. Wright, (1) [TAMU], **new floral host**.

***Acmaeodera tubulus* (Fabricius, 1801).** Texas, Brazos Co., College Station, *ex Quercus sinuata* Walter var *sinuata* coll. 31.xii.1985, em. 25.iii.1986, S.G. Wellso & J.A. Jackman, (1) [TAMU], **new larval host**; Bryan, FM-1688 nr. Brazos River, *ex Styphnolobium affine* (Torr. & A. Gray) Walp. (Fabaceae) coll. 31.xii.1985, em. 2–9.iii.1986, J.A. Jackman & S.G. Wellso, (4) [TAMU], **new larval host.** COLORADO (**new state record**), Alamosa Co., Alamosa,

25.vi.1981, J. Glaser, (1) [CMNH, mislabeled?].

Key to species of *Acmaeodera* occurring east of the Rocky Mountain states

The following key includes the known fauna east of the Rocky Mountain states. *Acmaeodera cuneata* Fall, 1899 is omitted despite its inclusion in the Texas fauna by Nelson et al. (2008) and Bellamy (2008), which was done in error. *Acmaeodera disjuncta* Fall, 1899 was recently synonymized with *Acmaeodera opacula* LeConte, 1858 (Hansen and Westcott 2023) and this taxonomic change is reflected in the key. *Acmaeodera amplicollis* LeConte, 1866 is included, despite not being listed from Texas in Nelson et al. (2008) and Bellamy (2008). It was likely excluded from the Texas fauna because the only Texas record of this species was collected in the Davis Mountains (Westcott et al. 1979) with a suspect collection date of April 11th, seemingly much too early for this Summer/Fall species. The label data indicate the specimen was caught in a light trap during a trip the collector made through the southwestern United States, of which Ft. Davis was only one of the stops made (Doug Yanega, University of California-Riverside, pers. comm.). Also significant is no other specimen from the Ft. Davis area (a popular destination for insect collectors) or Texas as a whole have come to light since that time, 58 years ago. The time of year and lack of additional Texas specimens makes it likely the specimen was collected at one of the other stops the collector made within the known geographic range of *A. amplicollis* and was simply mislabeled. It is still possible *A. amplicollis* occurs in far west El Paso Co., Texas in the vicinity of the Franklin Mountains, which have a similar habitat to the Organ Mountains in New Mexico, roughly 25 miles to the north, where *A. amplicollis* is known to occur. For this reason, *A. amplicollis* is included in the key and Appendix 1 despite the lack of a credible record from Texas.

Due to extreme variability of markings among specimens of many of the species included in this work, series plates of each species, which demonstrate the range of variation that exists among available specimens, are arranged in alphabetical order. The user is encouraged to freely consult the images as needed (Appendix 1). The separation of species in the Acmaeodera tubulus species group and the Acmaeodera pulchella species group (e.g., *A. pulchella*, *A. mixta*, *A. immaculata*) uses generally accepted characters, which should successfully identify the majority of individuals. Even so, some specimens within these two complexes may be difficult to determine and require the attention of a specialist. In such cases, caution is advised. Both complexes present challenges that will likely require molecular investigation to resolve, especially in areas where populations of the closely related species in question overlap.

1. Pronotal disc cribrately punctate **2**
— Pronotal disc not cribrately punctate **4**

2(1). Venter with branched setae on proepisternum, femora and laterally on first three abdominal ventrites . . . . . ***A. cribricollis* Horn**
— Venter without branched setae on proepisternum, femora and laterally on first three abdominal ventrites **3**

3(2). Pronotum uniformly convex, two basolateral depressions shallow (south Texas and Mexico) . . . . . ***A. tildenorum* Nelson and Westcott**
— Pronotum not uniformly convex, middle and two basolateral depressions deep (south Florida, Bahamas, and Cuba) . . . . . ***A. marginenotata* Chevrolat**

4(1). Lateral elytral interval 2 or 3 prominent **5**
— Lateral elytral intervals not prominent **8**

5(4). Elytra with red markings on apical third **6**
— Elytra with only yellow markings on apical third **7**

6(5). Costal margin of elytra flared nearly horizontal, second lateral interval less prominent than the third; pronotum reflexed, with yellow laterally . . . . . ***A. paradisjuncta* Knull**
— Costal margin of elytra vertical, second lateral interval much more prominent than third; pronotum not reflexed, immaculate . . . . . ***A. miliaris* Horn**

7(5). Elytra with irregular vittae and clothed with white setae, 4.5–7.5 mm . . . . . ***A. parkeri* Cazier**
— Elytra without vittae and clothed with dark setae, 7–10 mm . . . . . ***A. gillespiensis* Knull**

8(4). Dorsally clothed with long, white, recumbent setae, apex of setae contacting dorsum **9**
— Dorsally clothed with short or long setae of various colors, apex of setae freestanding, not contacting dorsum **10**

9(8). Elytra with two red spots on apical third . . . . . ***A. uvaldensis* Knull**
— Elytra without red spots on the apical third . . . . . ***A. pinalorum* Knull**

10(8). Pronotum with orange spot laterally; elytra with seven orange spots arranged longitudinally in two rows, occasionally coalescing (south Florida, Brazil and Columbia) . . . ***A. xanthosticta* Laporte and Gory**
— Pronotum with yellow spot laterally or immaculate; elytra with yellow or red maculations **11**

11(10). Femora with setae straight and flattened in shape, equal to or shorter than width of femur **12**
— Femora with setae often sinuous or curved and not flattened in shape, usually longer than width of femur **20**

12(11). Third lateral stria split near umbone or independent (0–5 punctures) **13**
— Third lateral stria split within basal third (≥6 punctures) **16**

13(12). Each elytron with two yellow vittae (sometimes vittae faintly separated); pronotum with or without yellow spot laterally . . . . . ***A. quadrivittatoides* Nelson and Westcott**
— Each elytron with single yellow vitta, never with two; pronotum immaculate **14**

14(13) Robust, elytra with wide yellow vittae . . . . . ***A. riograndei* Nelson**
— Cylindrical, elytra most often without vittae, occasionally with vittae or elytra mostly yellow **15**

15(14). Elytra clothed with wide setae, 3.0–5.5 mm (west to south Texas) . . . . . ***A. opuntiae* Knull**
— Elytra clothed with narrow setae, 3.0–7.5 mm (Arkansas, Missouri, Oklahoma, Texas excluding south) . . . . . ***A. neglecta* Fall**

16(12). Elytra with red-orange vittae or mostly red-orange . . . . . ***A. robigo* Knull**
— Elytra with yellow markings only **17**

17(16) Each elytron usually with 6–8 small yellow spots that occasionally coalesce, rarely reduced (eastern to midwestern U.S.) . . . . . ***A. tubulus* (Fabricius)**
— Each elytron with vittae or larger irregular yellow markings or fewer and larger yellow spots **18**

18(17). West Texas to Arizona . . . . . ***A. natlovei* new species**
— Central to south Texas **19**

19(18). Body cylindrical; elytral markings extremely variable, sometimes with narrow irregular vittae, less commonly wide vittae, rarely immaculate; pronotum black-bronze (central Texas to Mexico) . . . . . ***A. neoneglecta* Fisher**
— Body more robust; elytra with wide yellow vittae; pronotum black (Known only from south Texas) . . . . . ***A. starrae* Knull**

20(11). Elytra with yellow and red markings **21**
— Elytra with yellow markings only **29**

21(20). Lateral edge of pronotum not visible throughout from above, not explanate **22**
— Lateral edge of pronotum visible throughout from above, strongly to weakly explanate **26**

22(21). Elytra with large, solitary, mediolateral red spot, extending from costal margin to third lateral interval . . . . . ***A. davidsoni* Barr**
— Elytra with yellow markings and smaller red spots laterally **23**

23(22). Elytra with small, scattered yellow maculations, sometimes forming narrow transverse bands . . . . . ***A. rubronotata* Laporte and Gory**
— Yellow elytral maculations consolidated into fewer large spots arranged longitudinally **24**

24(23). Elytra usually with three to four red spots laterally, centered on the third lateral interspace and spaced more or less evenly from umbone to apical third; pronotum with sides gradually converging from base to apex, widest at base . . . . . ***A. gibbula* LeConte**

— elytra with one to two red maculations restricted to apicolateral half of elytra; pronotum arcuately rounded from base to apex or subparallel on basal half, widest at middle **25**

25(24). Pronotum widest and subparallel on basal fourth, not inflated; elytra apicolateral red stripe almost always broken . . . . . ***A. recticollis* Fall**

— Pronotum widest at basal third, distinctly inflated; elytra with apicolateral red stripes almost always entire . . . . . ***A. tiquilia* Westcott and Barr**

26(21). Elytra with many small, scattered, yellow spots laterally, identical to the yellow markings dorsally; pronotum usually immaculate, sometimes with small, basolateral, yellow mark . . . . . ***A. haemorrhoa* LeConte**

— Elytra with lateral, yellow stripe extending from base to about middle, sometimes interrupted midway, dorsum mostly immaculate or with a few larger yellow maculations; pronotum almost always with basolateral, short or elongate, yellow mark **27**

27(26). Robust; third lateral elytral interval more convex than the second and fourth at apical third; lateral stripe from base to about middle usually broken; apical bands both marked with red . . . . . ***A. opacula* LeConte**

— Not robust; third lateral elytral interval not more convex than second or fourth at apical third; lateral stripe from base to about middle usually not broken; one or both apical bands marked with red . . **28**

28(27). Elytra with dorsal surface mostly immaculate, two transverse red bands on apical third coalescing to form a single, wide, transverse band ornamented with 0–3 black spots (south Arizona and south Texas to Central America) . . . . . ***A. flavomarginata* (Gray)**

— Elytra with dorsal surface immaculate or not, one or both apical bands marked with red, broken by suture (Arizona, Colorado, New Mexico and west Texas) . . . . . ***A. amabilis* Horn**

29(20). Umbone flanked by yellow stripes, typically joining by middle **30**

— Umbone not flanked by yellow stripes **31**

30(29). Pronotum reflexed, wider than elytral base . . . . . ***A. amplicollis* LeConte***

— Pronotum not reflexed, not wider than elytral base . . . . . ***A. scalaris* Mannerheim**

31(29). Pronotum golden green, very densely punctate throughout (*A. amplicollis* sometimes has golden green pronotum) . . . . . ***A. auritincta* Fall**

— Pronotum not golden green, punctation variable **32**

32(31). Elytra yellow with few to many dark spots and/or dark irregular markings, without transverse bands . . **33**

— Elytra immaculate, with yellow spots, yellow irregular markings or transverse bands **38**

33(32). Pronotum black . . . . . ***A. scalaris* Mannerheim**

— Pronotum brassy to bronze **34**

34(33). Pronotal margin explanate, constricted near base, hind angles produced . . . . . ***A. maculifera* Horn**

— Pronotal margin not explanate or constricted near base, hind angles not produced **35**

35(34). Pronotum moderately to deeply depressed basomedially, lateral depressions deep; in lateral view costal edge of elytra sharply bent upward posterior to metacoxa . . . . . ***A. princeps* Kerremans**

— Pronotum lightly depressed or uniformly convex basomedially, lateral depressions not deep; in lateral view costal edge of elytra nearly straight posterior to metacoxa **36**

36(35). Pronotum deeply, coarsely punctate . . . . . ***A. variegata* LeConte**

— Pronotum finely punctate **37**

37(36). Vestiture of head white; lateral margin of pronotum rounded under. On average smaller 4.7–8.5 mm. larval host: *Krascheninnikovia lanata* . . . . . ***A. immaculata* Horn**

— Vestiture of head light brown to brown; lateral margin of pronotum not rounded under. On average larger 6.5–13 mm. larval hosts: *Acacia* sp., *Avicennia* sp., *Celtis* sp., and *Prosopis* sp. . . . ***A. mixta* LeConte**

38(32). Pronotum deep blue or with blue-green sheen **39**

— Pronotum bronzed or black **40**

39(38). Pronotum immaculate and explanate, sides visible from above throughout . . . ***A. flavopicta*** **Waterhouse**
— Pronotum dark blue with yellow, basolateral spots, not explanate, sides not visible from above throughout . . . . . ***A. obtusa*** **Horn**

40(38). Pronotum black **41**
— Pronotum dark bronzed to brassy **46**

41(40). Pronotum moderately to deeply depressed basomedially **42**
— Pronotum lightly depressed or uniformly convex basomedially **44**

42(41). Pronotum with large yellow spot basolaterally; elytra with four transverse bands . . . . . ***A. macra*** **Horn**
— Pronotum immaculate or sometimes with a small yellow spot basolaterally; elytra with scattered yellow spots and/or irregular, thin, transverse bands **43**

43(42). Posthumeral yellow spot attenuated, more or less straight; dorsum sometimes with blue reflections, (Oklahoma, Texas, New Mexico) . . . . . ***A. ornatoides*** **Barr**
— Posthumeral yellow spot long and slightly curved; dorsum without blue reflections (eastern U.S.) . . . . . ***A. ornata*** **(Fabricius)**

44(41). Pronotum with sides gradually converging from base to apex, widest at base; elytra with five yellow spots arranged longitudinally on the disc, three yellow spots on basal two-thirds, centered on the third lateral interspace, and three to four yellow spots along the costal edge . . . . . ***A. delumbis*** **Horn**
— Pronotum not widest at base, elytra with transverse bands **45**

45(44). Dorsum, deep shiny black; elytra with two short, yellow, transverse bands at middle, oblique band at apical third and a subapical dot (Texas) . . . . . ***A. wenzeli*** **Van Dyke**
— Dorsum, not shiny black; elytra usually with four transverse bands, sometimes confused (southeastern U.S.) . . . . . ***A. texana*** **LeConte**

46(40). Pronotum moderate to deeply depressed basomedially **47**
— Pronotum lightly depressed or uniformly convex basomedially **48**

47(46). Pronotum coarsely punctate, not shiny; elytra often with four transverse bands broken at suture . . . . . ***A. bowditchi*** **Fall**
— Pronotum less coarsely punctate, shiny; elytra with irregular transverse bands and yellow markings . . . . . ***A. consors*** **Horn**

48(46). Pronotum immaculate (rarely with very small yellow dot laterally) . . . . . ***A. texana*** **LeConte**
— Pronotum with yellow spot laterally, never immaculate **49**

49(48). Pronotum deeply, coarsely punctate . . . . . ***A. variegata*** **LeConte**
— Pronotum shallowly, finely punctate **50**

50(49). Vestiture of head white; lateral margin of pronotum rounded under. On average smaller 4.7–9.0 mm, larval host: *Krascheninnikovia lanata* . . . . . ***A. immaculata*** **Horn**
— Vestiture of head mostly light brown to brown; lateral margin of pronotum not rounded under. On average larger 6.5–13 mm **51**

51(50). Elytral apex usually entirely black (occasionally with yellow spots), setae dark brown to black. (Eastern U.S. and Canada) . . . . . ***A. pulchella*** **(Herbst)**
— Elytral apex black with two yellow spots (occasionally all black), setae light brown to brown. (Southwestern U.S.: Nebraska south to Texas and west to Utah and Arizona) . . . . . ***A. mixta*** **LeConte**

*Likely to occur in far west Texas though no valid records currently exist from the state.

Acknowledgments

Many individuals and institutions were invaluable resources during my study, providing expert advice, specimens, new distribution, or host records and in some cases accompanying me in my collecting efforts. My combined interactions with Jeff Back (Hewitt, Texas), Josh Basham (USDA-APHIS, Pharr, TX), Tyler Hedlund (Illinois

Natural History Survey, Champaign, Illinois), Dan Heffern (Houston, Texas), Paul Kaufman (Morristown, Arizona), Ted MacRae (Wildwood, Missouri), Brian Raber (Houston, Texas), Ed Riley (College Station, Texas), Ashley Schmitz (Corpus Christi, Texas), Bruce Tilden (Yerington, Nevada), Stan Wellso (Bastrop, Texas) and Rick Westcott (Salem, Oregon) added immensely to my knowledge of the genus, for which I am extremely grateful to them all. The California Academy of Sciences, Florida State Arthropods Collection, Philadelphia Academy of Sciences, Chicago Field Museum, W.F. Barr Collection and especially Texas A&M were generous with loans of specimens, without which this work would have been impossible. I would like to thank Stephanie Ware and Charles Benoit (Chicago, Illinois) for the beautifully detailed images of the *A. yuccavora* holotype held in the Chicago Field Museum, which I compared to the *A. conoidea* lectotype and paralectotype. In addition, I thank Elias Gonzalez (USDA-APHIS, Los Indios, Texas) for his support in my efforts. Ted MacRae, Rick Westcott, and Josh Basham provided honest and thorough reviews that helped improve the manuscript, for which I thank them immensely. Lastly, I thank my wife Meg Hansen, who sacrificed much of her valuable time to facilitate the necessary collecting and study needed to complete this work.

Literature Cited

Barr WF. 1971. Family Buprestidae. p. 55–89. In: Hatch MH (ed.). Beetles of the Pacific Northwest, part V, Rhipiceroidea, Sternoxi, Phytophaga, Rhynchophora, and Lamellicornia. University of Washington Publications in Biology 16: 1–662 + xiv.

Bellamy CL. 2008. A world catalogue and bibliography of the jewel beetles (Coleoptera: Buprestoidea). Volume 1: Introduction; Fossil Taxa; Schizopodidae; Buprestidae: Julodinae - Chrysochroinae: Poecilonotini. Pensoft Series Faunistica No. 76. Pensoft Publishers; Sofia-Moscow. 625 p.

Boldt PE, Robbins TO. 1987. Phytophagous and pollinating insect fauna of *Baccharis neglecta* in Texas. Environmental Entomology 16: 887–895.

Burke HE. 1918. Notes on some southwestern Buprestidae. Journal of Economic Entomology 11(2): 209–211.

Cazier MA. 1940. New North American *Acmaeodera* with synonymical and miscellaneous notes on other species (Coleoptera: Buprestidae). The Wasmann Collector 4(1): 17–29.

Chamberlin WJ. 1926. Catalogue of the Buprestidae of North America north of Mexico. W.J. Chamberlin; Corvallis, Oregon. 289 p.

Fall HC. 1899. Synopsis of the species of *Acmaeodera* of America North of Mexico. Journal of the New York Entomological Society 7(1): 1–37.

Fall HC, Cockerell TDA. 1907. The Coleoptera of New Mexico. Transactions of the American Entomological Society 33: 145–272.

Hansen JA, Westcott RL. 2023. A new synonym of *Acmaeodera opacula* LeConte, 1858 (Coleoptera: Buprestidae) and lectotype designations for *Acmaeodera amabilis* Horn, 1878 and *Acmaeodera disjuncta* Fall, 1899. Insecta Mundi 0984: 1–4.

Harpootlian PJ, Bellamy CL. 2014. Jewel beetles (Coleoptera: Buprestidae) of South Carolina. South Carolina Agriculture Forest Research System; Clemson, South Carolina. 127 p.

Knull JN. 1962. A new yucca–inhabiting *Acmaeodera* from Arizona. Ohio Journal of Science 62(1): 2–3.

Knull JN. 1974. A new species of *Acmaeodera*, with notes on other species of Buprestidae (Coleoptera). The Coleopterists Bulletin 28(3): 143–144, fig. 1.

Gould FW, Hoffman GO, Rechenthin CA. 1960. Vegetational areas of Texas, Texas A&M University. Texas Agricultural Experiment Station, Leaflet No. 492: 1–4.

MacRae TC. 1991. The Buprestidae (Coleoptera) of Missouri. Insecta Mundi 5(2): 101–126.

MacRae TC. 2006. Distributional and biological notes on North American Buprestidae (Coleoptera), with comments on variation in *Anthaxia* (*Haplanthaxia*) *cyanella* Gory and *A.* (*H.*) *viridifrons* Gory. The Pan-Pacific Entomologist 82(2): 166–199.

MacRae TC, Nelson GH. 2003. Distributional and biological notes on Buprestidae (Coleoptera) in North and Central America and the West Indies, with validation of one species. The Coleopterists Bulletin 57(1): 57–70.

Nelson GH, Walters GC Jr., Haines RD, Bellamy CL. 2008. A catalog and bibliography of the Buprestoidea of America North of Mexico. The Coleopterists Society, Special Publication No. 4; Potomac, Maryland. iv + 1–274 p.

USDA, NRCS. 2023. The PLANTS Database. National Plant Data Team, Greensboro, NC, USA. Available at http://plants.usda.gov (Last accessed May 2023.)

Van Dyke EC. 1953. New Coleoptera from western North America (Carabidae, Melasidae, Buprestidae, Curculionidae). The Pan-Pacific Entomologist 29(2): 102–107.

Wellso SG, Manley GV, Jackman JA. 1976. Keys and notes on the Buprestidae (Coleoptera) of Michigan. The Great Lakes Entomologist 9(1): 1–22, fig. 1–11.

Westcott RL, Barr WF. 1998. A new species of *Acmaeodera* (Coleoptera: Buprestidae) from Big Bend N.P., Texas, with synonymy for other species occurring in the United States. Insecta Mundi 12(1–2): 53–57.

Westcott RL, Barr WF, Nelson GH, Verity DS. 1979. Distributional and biological notes on North and Central American species of *Acmaeodera* (Coleoptera: Buprestidae). The Coleopterists Bulletin 33(2): 169–181.

Westcott RL, Bílý S. 2018. Lectotype designations in *Acmaeodera* Eschscholtz and *Anthaxia* Eschscholtz, and new synonymy in *Phaenops* Dejean and *Anthaxia* (Coleoptera: Buprestidae). Zootaxa 4471(3): 590–594.

Received May 26, 2023; accepted 18 September, 2023.
Review editor M.J. Paulsen.

Appendix 1

Habitus photos of *Acmaeodera* species east of the Rocky Mountain States.

Figure 4. *Acmaeodera amabilis* Leconte.

Figure 5. *Acmaeodera amplicollis* Leconte.

Figure 6. *Acmaeodera auritincta* Fall.

Figure 7. *Acmaeodera bowditchi* Fall.

Figure 8. *Acmaeodera consors* Horn.

Figure 9. *Acmaeodera cribricollis* Horn.

Figure 10. *Acmaeodera davidsoni* Barr.

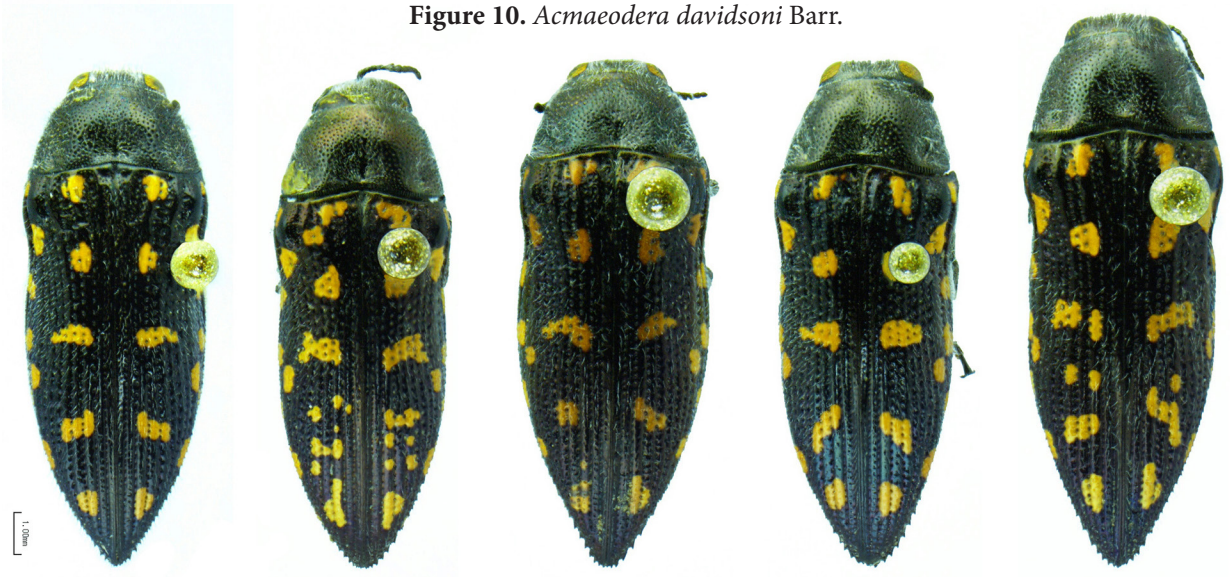

Figure 11. *Acmaeodera delumbis* Horn.

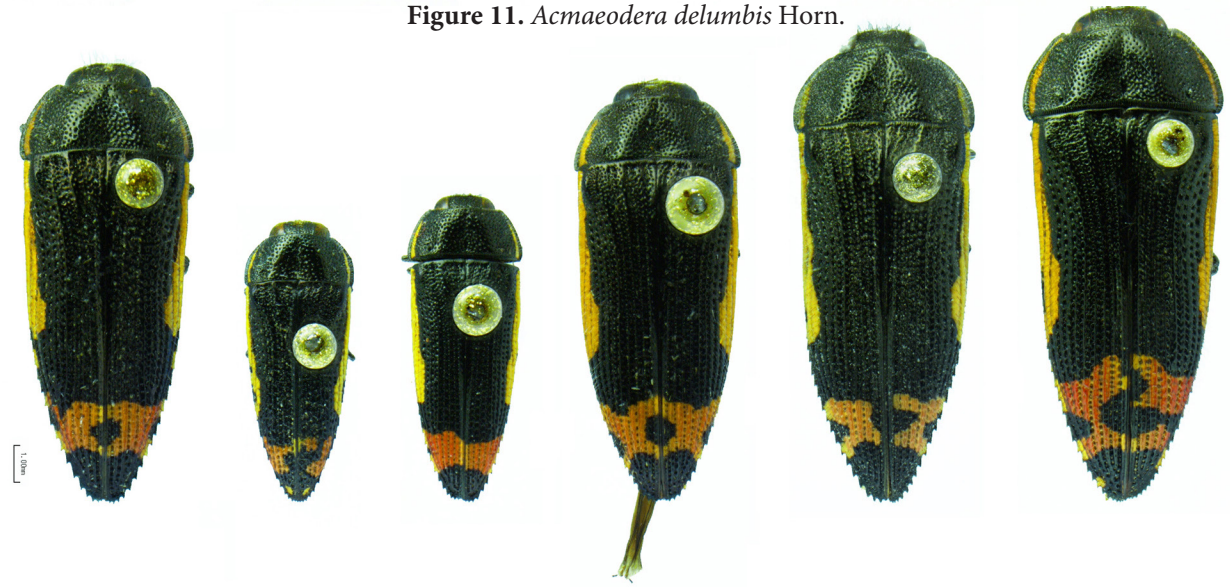

Figure 12. *Acmaeodera flavomarginata* (Gray).

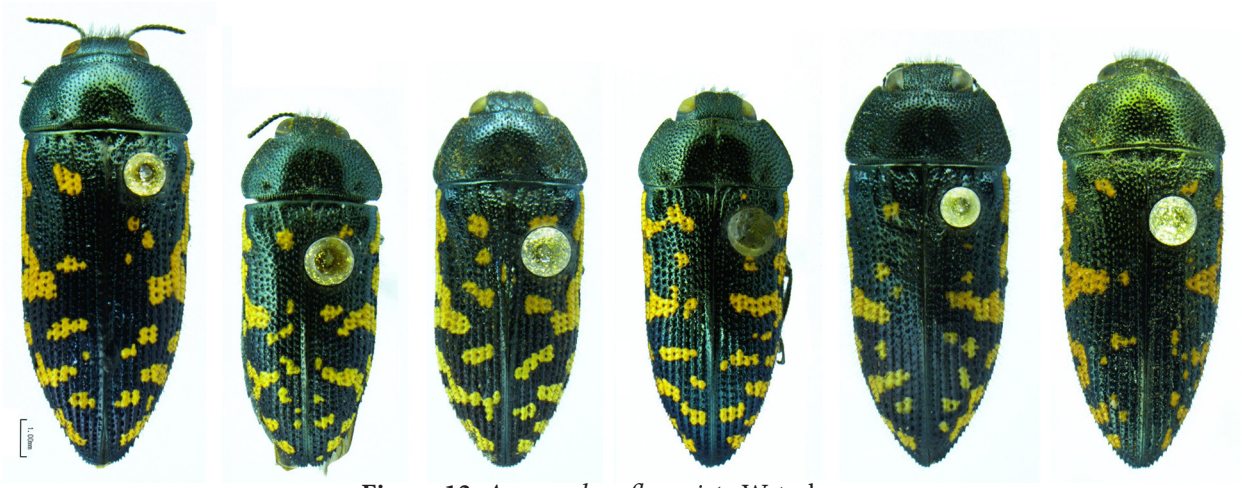

Figure 13. *Acmaeodera flavopicta* Waterhouse.

Figure 14. *Acmaeodera gibbula* LeConte.

Figure 15. *Acmaeodera gillespiensis* Knull.

Figure 16. *Acmaeodera haemorrhoa* LeConte.

Figure 17. *Acmaeodera immaculata* Horn.

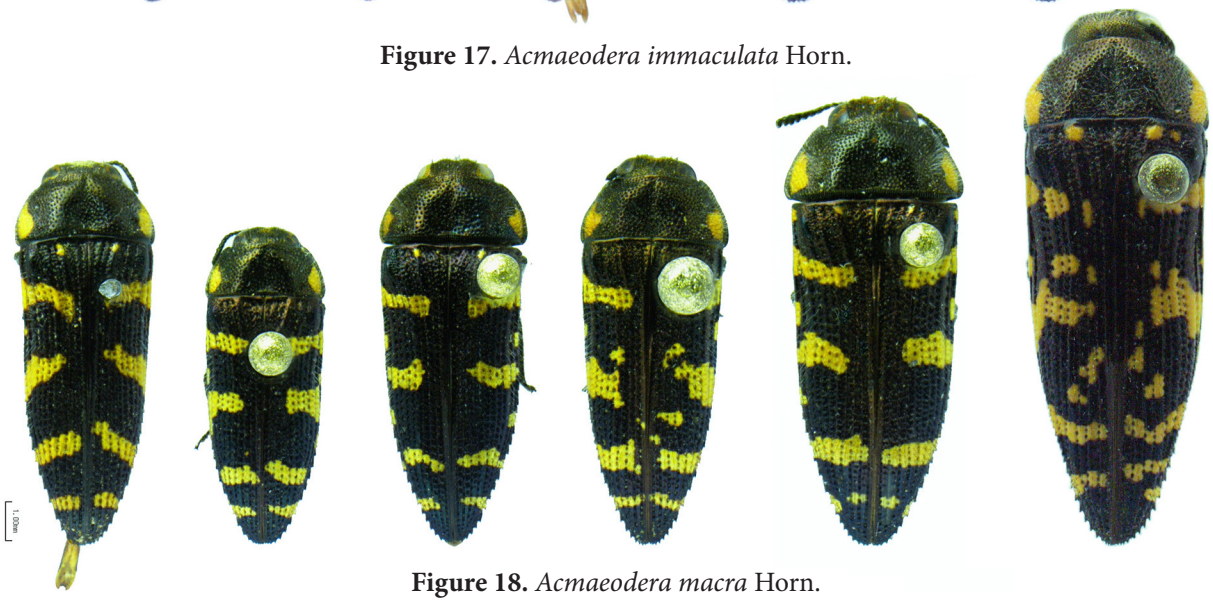

Figure 18. *Acmaeodera macra* Horn.

Figure 19. *Acmaeodera maculifera* Horn.

Figure 20. *Acmaeodera marginenotata* Chevrolat.

Figure 21. *Acmaeodera miliaris* Horn.

Figure 22. *Acmaeodera mixta* LeConte.

Figure 23. *Acmaeodera natlovei*, **new species**.

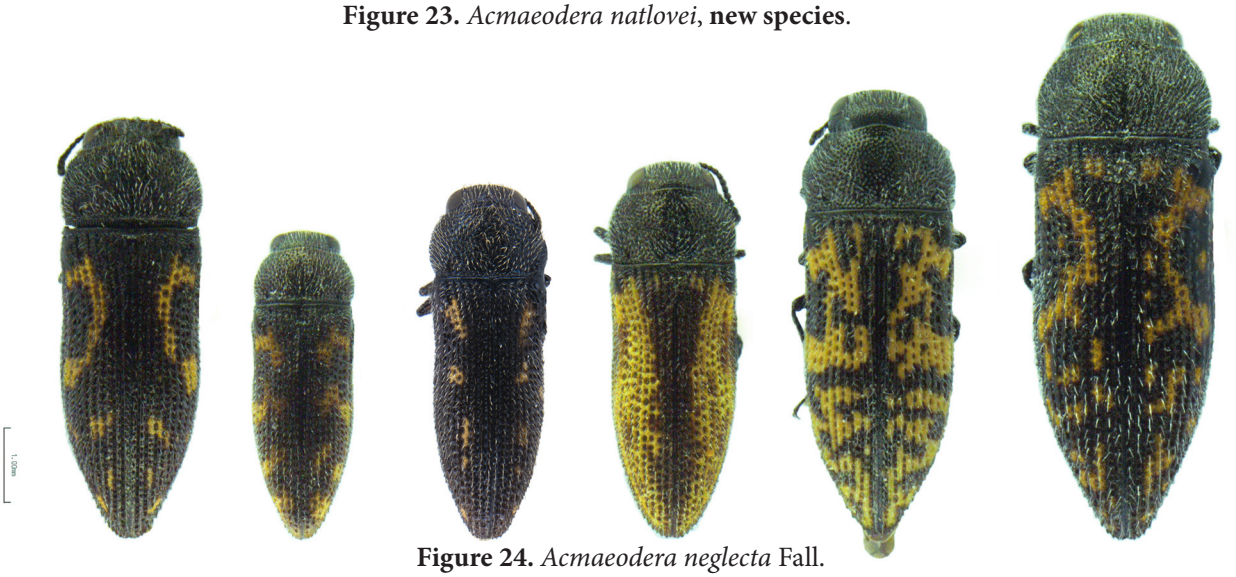

Figure 24. *Acmaeodera neglecta* Fall.

Figure 25. *Acmaeodera neoneglecta* Fisher.

Figure 26. *Acmaeodera obtusa* Horn.

Figure 27. *Acmaeodera opacula* Horn.

Figure 28. *Acmaeodera opuntiae* Knull.

Figure 29. *Acmaeodera ornata* (Fabricius).

Figure 30. *Acmaeodera ornatoides* Barr.

Figure 31. *Acmaeodera paradisjuncta* Knull.

Figure 32. *Acmaeodera parkeri* Cazier.

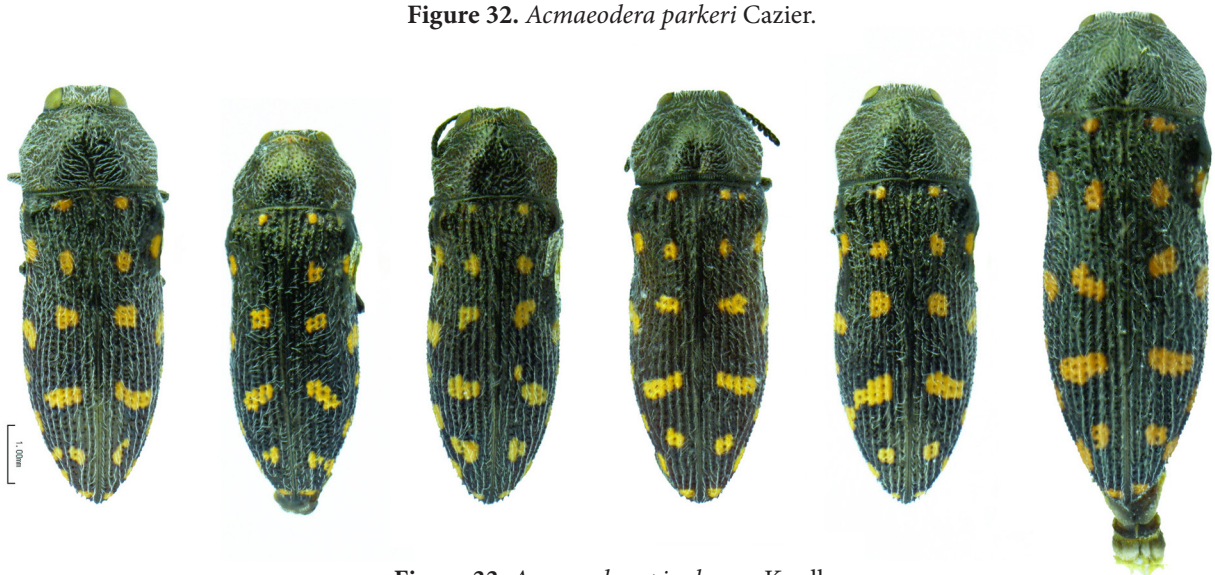

Figure 33. *Acmaeodera pinalorum* Knull.

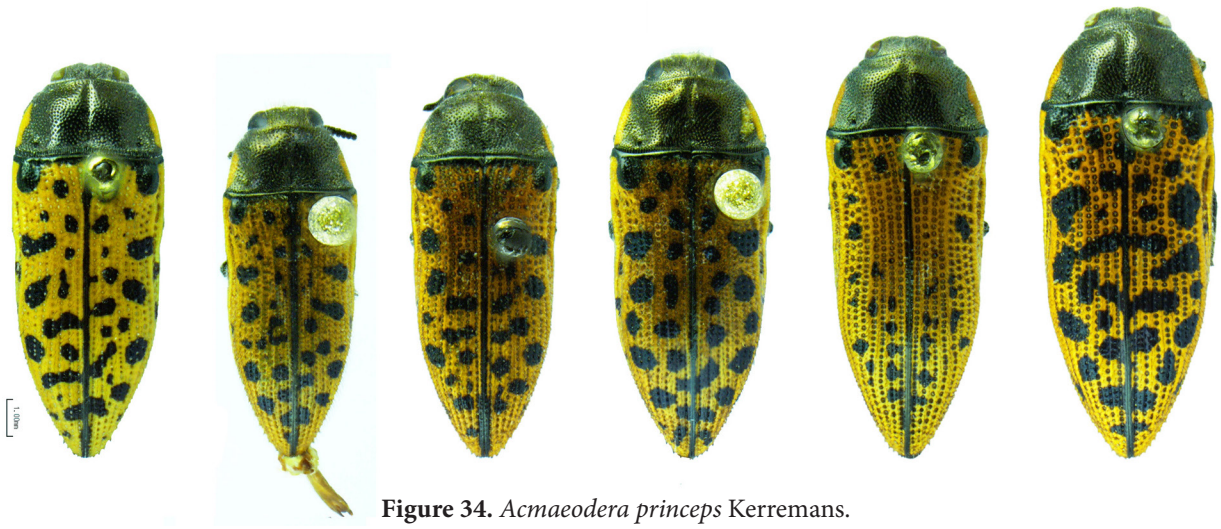

Figure 34. *Acmaeodera princeps* Kerremans.

Figure 35. *Acmaeodera pulchella* (Herbst).

Figure 36. *Acmaeodera quadrivittatoides* Nelson and Westcott.

Figure 37. *Acmaeodera recticollis* Fall.

Figure 38. *Acmaeodera riograndei* Nelson.

Figure 39. *Acmaeodera robigo* Knull.

Figure 40. *Acmaeodera rubronotata* Laporte and Gory.

Figure 41. *Acmaeodera scalaris* Mannerheim.

Figure 42. *Acmaeodera starrae* Knull.

Figure 43. *Acmaeodera texana* LeConte.

Figure 44. *Acmaeodera tildenorum* Nelson and Westcott.

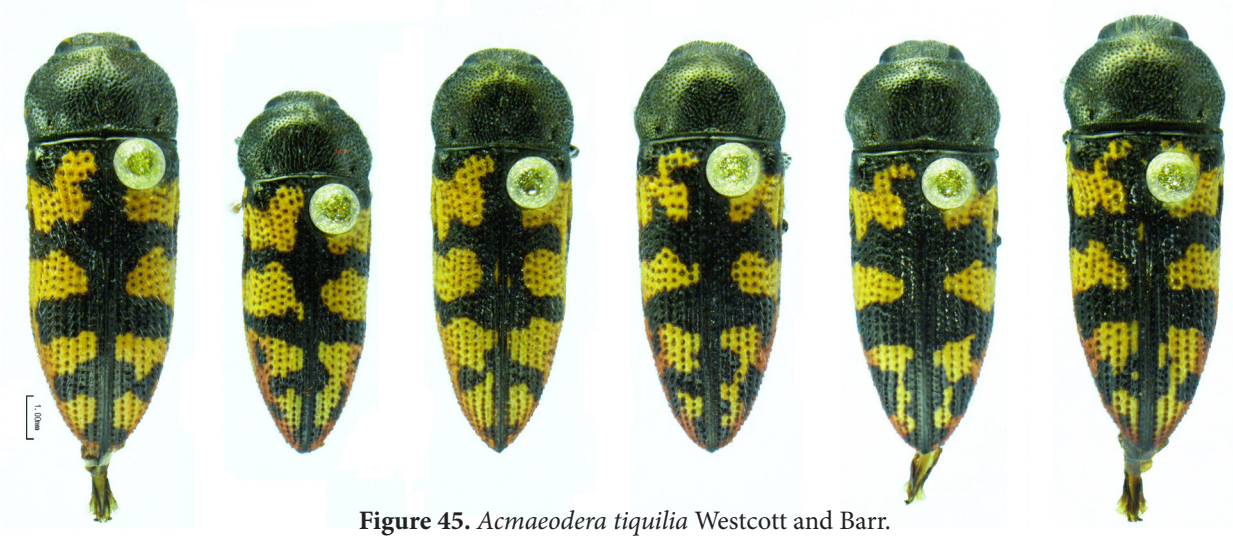

Figure 45. *Acmaeodera tiquilia* Westcott and Barr.

Figure 46. *Acmaeodera tubulus* (Fabricius).

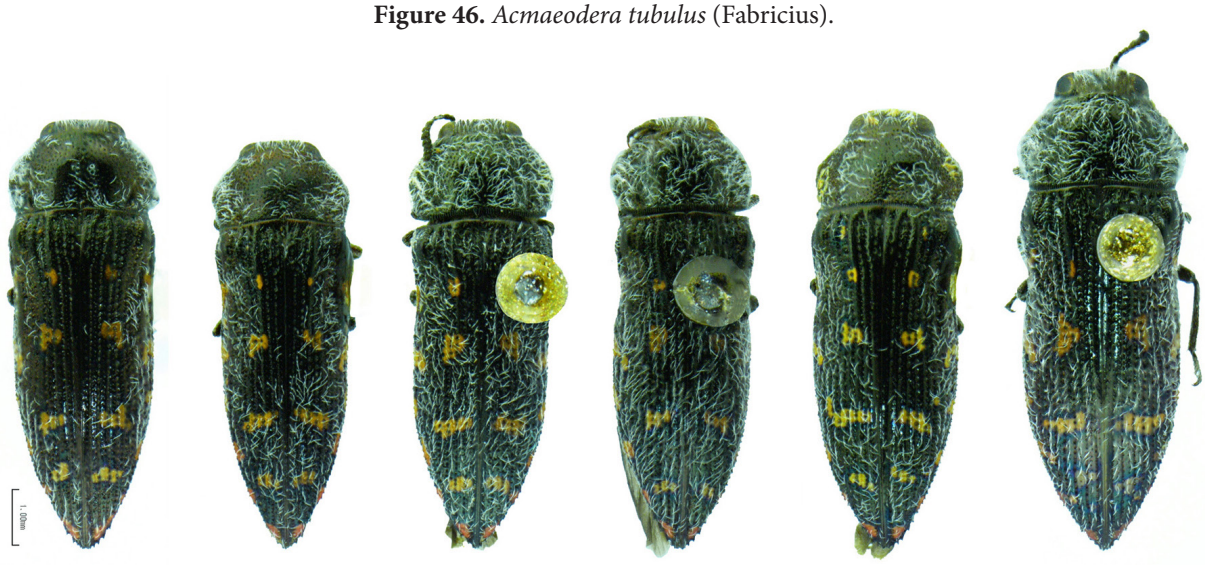

Figure 47. *Acmaeodera uvaldensis* Knull.

Figure 48. *Acmaeodera variegata* LeConte.

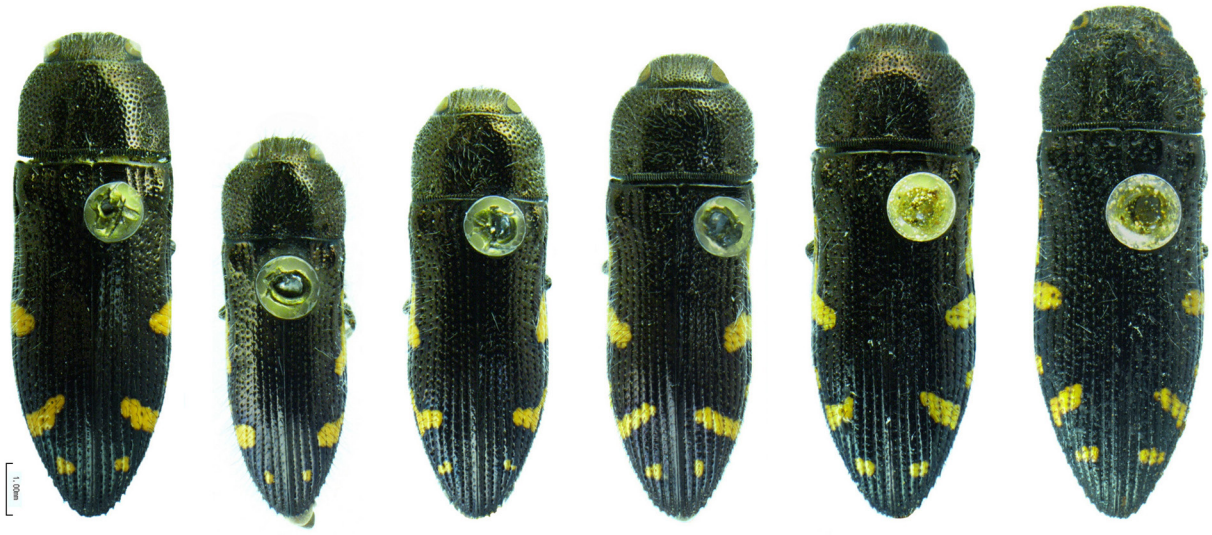

Figure 49. *Acmaeodera wenzeli* Van Dyke.

Figure 50. *Acmaeodera xanthosticta* Laporte and Gory.