A journal of world insect systematics

INSECTA MUNDI

0984

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Date of issue: April 28, 2023

Center for Systematic Entomology, Inc., Gainesville, FL

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.

Published on April 28, 2023 by
Center for Systematic Entomology, Inc.
P.O. Box 141874
Gainesville, FL 32614-1874 USA
http://centerforsystematicentomology.org/

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

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0984: 1–4 **INSECTA MUNDI** 2023

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Abstract. Lectotypes are designated for *Acmaeodera amabilis* Horn, 1878 and *Acmaeodera disjuncta* Fall, 1899 (Coleoptera: Buprestidae). The defining characters of *Acmaeodera opacula* LeConte, 1858 are compared with those of *A. disjuncta* Fall, 1899, as well as habitat and host plant. *Acmaeodera disjuncta* is **synonymized** with *A. opacula*. The distinguishing characters of congeners whose general appearance at times can resemble *A. opacula* are discussed, and a **new state record** for Mexico is provided for *A. opacula*.

Key words. Polycestinae, Nearctic, taxonomy, jewel beetles, new state record.

ZooBank registration. urn:lsid:zoobank.org:pub:AA3C1BA7-9BF8-45F7-84D6-362B52305931

Introduction

Acmaeodera Eschscholtz, 1829 is a large and taxonomically difficult genus. For example, there are over 300 species known from the United States and Mexico combined (Bellamy 2008) and many more await description, the large majority from Mexico. Here we provide taxonomic and nomenclatural clarification regarding *Acmaeodera opacula* LeConte, 1858 that resolves long-standing questions about the taxon, using morphology, plant preference, and distribution. Lectotypes are designated for *Acmaeodera amabilis* Horn, 1878 and *Acmaeodera disjuncta* Fall, 1899, two species with which *A. opacula* has historically been compared. Also, a new state record for Mexico is provided for *A. opacula*.

Materials and Methods

Plant names are taken from USDA, NRCS (2022). Collection abbreviations referenced here follow Evenhuis (2022) when listed there and include the following:

CMNH Carnegie Museum of Natural History, Pittsburgh, Pennsylvania, USA
FSCA Florida State Collection of Arthropods, Gainesville, Florida, USA
JAHC Jason A. Hansen, Los Indios, Texas, USA
MCZC Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA
NSCH Nathan Schiff, Stoneville, Mississippi, USA
OSAC Oregon State University, Corvallis, Oregon, USA
RLWE Richard L. Westcott, Salem, Oregon, USA
TAMU Texas A & M University, College Station, Texas, USA
UCDC University of California, R.M. Bohart Museum of Entomology, Davis, California, USA

The *A. opacula* holotype, two *A. disjuncta* syntypes, and a syntype of *A. amabilis* held at the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts were examined and compared to material from CMNH, FSCA, JAHC, NSCH, RLWE and TAMU.

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

Results and Discussion

The taxonomic quandary of *Acmaeodera opacula* LeConte, 1858 (Fig. 1a–b) has persisted for well over a century and a half, taxonomists choosing to wait for more specimens before coming to a resolution (Barr 1975). To clear up confusion surrounding this species it is necessary to examine the published works of our predecessors concerning it and associated species. The holotype of *A. opacula* bears a green disc which indicates it was collected in the state of New Mexico, but this conflicts with the stated type location of "El Paso". This incongruence between the disc and type location may be due to the fluidity of the New Mexico–Texas border in the mid-19th century (Baldwin 1930). The original description of *A. opacula* was in Latin (LeConte 1858); it was brief and insufficient to differentiate it from many species subsequently described. Horn (1878) provided a more complete description of its distinguishing characters, which help separate it from its congeners. *Acmaeodera disjuncta* (Fig. 1c–d) was described from an Arizona series of specimens in Horn's collection determined as both *A. opacula* and *A. amplicollis* LeConte, 1866. Fall (1899) maintained *A. opacula* and *A. amplicollis* as distinct species but noted in his description of *A. disjuncta* that *A. opacula* was "… not very well defined." Much later, Cazier (1940) synonymized *A. amabilis* (Fig. 1e–f) with *A. opacula* using size, shape, elytral markings and punctation of the prosternum as justification. His action appears to have been ignored by subsequent taxonomists. Based on examination of the type material we consider that synonymy to be in error.

In 1978, W. F. Barr visited the Museum of Comparative Zoology, Harvard University, and placed his lectotype labels on specimens of 35 species plus two synonyms in the genus *Acmaeodera* that were described by either Fall, Horn, or LeConte. However, none has been published. Based on our work here, and especially the high degree of variability exhibited by the taxa involved, it is important for nomenclatural stability that these taxa be tied to a type specimen. The type of one of the species treated here, *A. opacula*, MCZC 2720 (MCZbase 2022a), is a holotype by monotypy. For *A. amabilis* we choose as lectotype the former syntype that was labeled as lectotype by Barr, MCZC 33807 (MCZbase 2022b). Horn (1878) described that species from two specimens, both from Arizona. The second becomes a paralectotype and is in the Ulke Collection at CMNH. For *A. disjuncta* we choose as lectotype the former syntype that was labeled as lectotype by Barr, MCZC 24410 (MCZbase 2022c). Fall (1899) described that species from "… a series in the Horn collection." Besides the lectotype, two specimens are in MCZC and become paralectotypes: MCZC 521604 (MCZbase 2022d) and MCZC 521605 (MCZbase 2022e). The locality given for all three is "Ariz."

Acmaeodera opacula LeConte 1858: 69.

Acmaeodera disjuncta Fall 1899: 9. **New synonymy.**

The holotype of *A. opacula* shares several characters with *A. disjuncta* that lead us to consider the two species conspecific. The most significant of these characters involves the lateral elytral intervals. The first lateral interval is more inflated basally, the second more convex about the middle and the third most convex at the apical third of the elytra. In most specimens this pattern gives the specimen a rather robust appearance, but the convexity of the intervals can vary as demonstrated by specimens of *A. opacula* from Fabens, Texas [NSCH] and several other specimens across NM and AZ [FSCA], which show reduced convexity of the lateral intervals similar to the holotype.

The dorsal markings of *A. opacula* can also be highly variable and it is instructive to consider common patterns here in regard to their taxonomic value. For instance, the lateral elytral stripe of *A. opacula* is almost always broken or nearly so at some point along the basal third of the elytra (Fig. 1b, d; Horn 1878, fig. 2). In addition, the two apical bands are always marked with red, though sometimes only laterally. The lateral yellow stripe of the pronotum is broad and reaches four-fifths of the pronotal length. It is not uncommon for some specimens

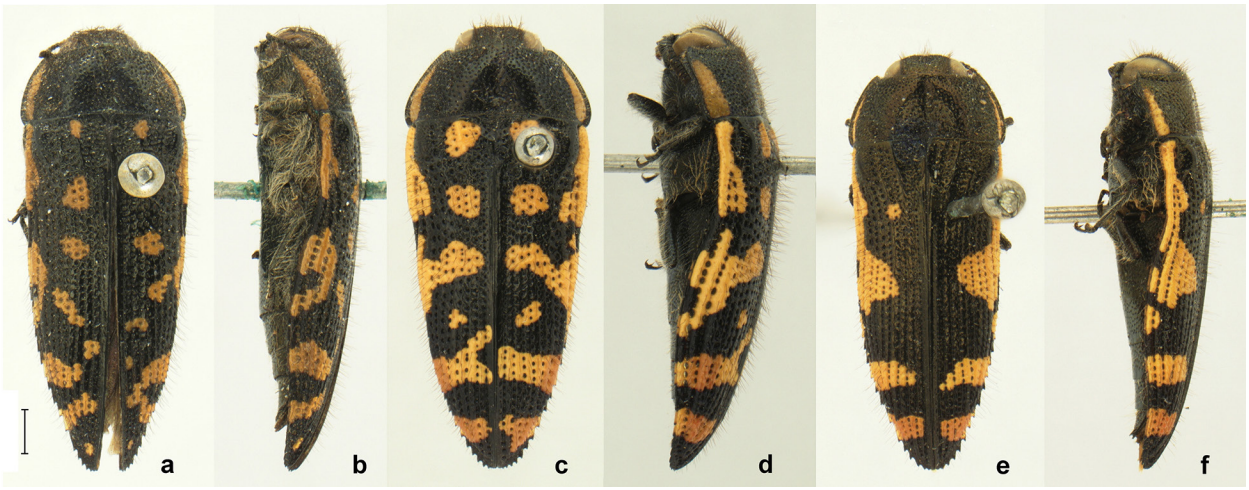

Figure 1. *Acmaeodera* spp. **a)** *A. opacula* (holotype), dorsal. **b)** Same, lateral. **c)** *A. disjuncta* (lectotype), dorsal. **d)** Same, lateral. **e)** *A. amabilis* (lectotype), dorsal. **f)** Same, lateral. Each image in scale, scale line = 1 mm.

of *A. opacula* to exhibit a lighter shade of red on the apical elytral bands. Such is the case with the holotype, on which red is very faintly marked. It is possible the color was faint to begin with; however, more likely it faded with the passage of time or was muted by prolonged storage in fluid, presumably alcohol, before being pinned (Fall 1899). This may have caused the specimen to become distorted, especially if it was teneral when collected, such that the elytra are not fused apically (Fig. 1a). Regardless, the characters of the holotype are within the range of phenotypic variation seen among specimens that were placed under *A. disjuncta*; i.e., lateral elytral stripe broken, both apical bands marked with red (albeit faintly), and broad pronotal stripe on each side. This further supports synonymy of the two species.

Another important factor to consider is habitat. *Acmaeodera opacula* was described from "El Paso" (Texas), which is in the Chihuahuan Desert Ecoregion. *Acmaeodera opacula* was not listed from Texas under its synonym in the world catalog or the most current North American catalog (Bellamy 2008; Nelson et al. 2008) but has been commonly collected as far east as the Pecos River Bridge in Val Verde Co., Texas by the first author and was recorded from the Chisos Mountains by Chamberlain (Chamberlin 1926). The distribution of *A. opacula* mirrors that of its only known larval host, *Fouquieria splendens* Engelm. (Fouquieriaceae) in Texas (Westcott 1991, as *A. fisheri* Cazier). This plant host has historically been widespread in El Paso, but its occurrence has undoubtedly diminished due to development over the past century and a half.

Acmaeodera opacula can exhibit a similar appearance to species within what we are calling the flavomarginata species group (i.e., *A. amabilis*, *A. chiricahuae* Barr, 1972, *A. flavomarginata* (Gray, 1832), *A. jubata* Barr, 1992, *A. reflexa* Barr, 1992), though it does not appear closely related to them. *Acmaeodera opacula* can be separated from those species by the increased convexity of the first three lateral intervals of the elytra, which usually give it a more robust appearance, and the more coarsely punctate elytra (Horn 1878; Fall 1899). Species within the flavomarginata group, with the exception of *A. flavomarginata*, appear to occur only at higher elevations, in environments far different from where *A. opacula* occurs.

The following represents a new Mexican state record for *A. opacula*: **NUEVO LEÓN**, Hwy. 85, 1 mi N Río Salado, C. R. Ward, 17-X-70 [UCDC]; 5 mi W Doctor Arroyo, 4-VII-74, Clark, Murray, Ashe & Schaffner [FSCA]; 16 mi N La Gloria, 19-IX-75, J. Powell & J. Chemsak [FSCA]; 18 mi W Monterrey, 3950′, 15-X-57 [OSAC]; same except 15 mi W, 3250′ [OSAC]; 9 mi. west Iturbide, 3-VII-1974, Clark, Murry, Ashe, Schaffner [TAMU].

Acknowledgments

We thank Phil Perkins and Crystal Maier (MCZC) for their help accessing the type material needed for our work, and the Museum of Comparative Zoology for permission to use images of the types; Jim Zablotny, Fenton,

Michigan, for advice on improving said images; Elias Gonzales, Los Indios, Texas, for his support of this work; Robert Androw at Carnegie Museum of Natural History, Pittsburgh, Pennsylvania for his significant help with information about specimens, notably *Acmaeodera amabilis*; and the two reviewers Norman Woodley, Hereford, Arizona and Henry Hespenheide, Hermosa Beach, California, for their insightful evaluation of our manuscript.

Literature Cited

Baldwin PM. 1930. A historical note on the boundaries of New Mexico. New Mexico Historical Review 5(2): 117–137.

Barr WF. 1975. Taxonomic notes and new synonymies of some North American *Acmaeodera* (Coleoptera: Buprestidae). Journal of the Kansas Entomological Society 48(3): 411–421.

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.

Cazier MA. 1940. New North American *Acmaeodera* with synonymical and miscellaneous notes on other species (Coleoptera: Buprestidae). The Wassmann Collector 4(10): 17–29.

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

Evenhuis NL. 2022. The insect and spider collections of the world website. Available at: http://hbs.bishopmuseum.org/codens/ (Last accessed May 2022.)

Fall HC. 1899. Synopsis of the species of *Acmaeodera* of America north of Mexico. Journal of the New York Entomological Society 7(1): 1–38.

Horn GH. 1878. Revision of the species of *Acmaeodera* of the United States. Transactions of the American Entomological Society and Proceedings of the Entomological Section of the Academy of Natural Sciences 7: 2–27.

LeConte JL. 1858. Description of new species of Coleoptera, chiefly collected by the United States and Mexican Boundary Commission, under Major W. H. Emory, U.S.A. Proceedings of the Academy of Natural Sciences of Philadelphia 10: 59–89.

MCZbase. 2022a. Holotype of *Acmaeodera opacula*. Available at https://mczbase.mcz.harvard.edu/guid/MCZ:Ent:2720 (Last accessed July 2022.)

MCZbase. 2022b. Syntype of *Acmaeodera amabilis*. Available at https://mczbase.mcz.harvard.edu/guid/MCZ:Ent:33807 (Last accessed July 2022).

MCZbase. 2022c. Syntype of *Acmaeodera disjuncta*. Available at https://mczbase.mcz.harvard.edu/guid/MCZ:Ent:24410 (Last accessed July 2022.)

MCZbase. 2022d. Syntype of *Acmaeodera disjuncta*. Available at https://mczbase.mcz.harvard.edu/guid/MCZ:Ent:521604 (Last accessed July 2022.)

MCZbase. 2022e. Syntype of *Acmaeodera disjuncta*. Available at https://mczbase.mcz.harvard.edu/guid/MCZ:Ent:521605 (Last accessed July 2022.)

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 4: 1–274 + iv.

USDA, NRCS. 2022. The PLANTS Database. Available at http://plants.usda.gov (Last accessed May 2022.)

Westcott RL. 1991. Distributional, biological, and taxonomic notes on North America Buprestidae. Insecta Mundi 4(1–4): 73–89.

Received November 29, 2022; accepted March 15, 2023.
Review editor Paul Skelley.