A new species of *Acmaeodera* (Coleoptera: Buprestidae) from Big Bend National Park, Texas, with synonymy for other species occurring in the United States

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Abstract: *Acmaeodera tiquilia* Westcott and Barr, new species, from Big Bend National Park, Texas is described, figured, and discussed in considerable detail, particularly in relation to the similar and partially sympatric *A. recticollis* Fall. A neotype is designated for *A. quatuordecimspilota* Obenberger and that species is synonymized with *A. ornata* (Fabricius). Additionally, *A. gibbula gila* Knull is synonymized with *A. gibbula* LeConte; *A. nautica* Van Dyke is synonymized with *A. simulata* Van Dyke.

Introduction

Discovery of a new species of *Acmaeodera* in Big Bend National Park, Texas, requires its description for use in faunal lists and more general works on the Buprestidae of that region. This description, plus synonymy in the genus, is also provided for inclusion in catalogues on Buprestidae that are in preparation by colleagues. Collection codens (in parentheses) follow Arnett, *et al.* (1993) or are as given in the acknowledgments. In verbatim label data, "(h)" denotes hand written, "(p)" or no indication means printed, "/" indicates a separate label.

Acmaeodera tiquilia Westcott and Barr, new species

(Figures 1, 4, 6 and 7)

Holotype, female: 9.6 mm long, 3.5 mm wide; elongate-robust, elytra strongly flattened above, sides almost vertical; head, pronotum, underside and appendages shining black, vaguely brassy-green in certain lights; elytra black, each with 4 light yellow discal markings with thin brown borders (Figure 1), first and second reaching lateral margin, third broadly interrupted and fourth eclipsed laterally by a light red band that extends from anterior border of third marking to apex, pale yellow humeral spot present.

Head convex above, slightly flattened medially, deeply depressed transversely above clypeus which is broadly, shallowly emarginate; surface densely, coarsely, rather shallowly punctate; vestiture long, mostly light brownish above, white below; antennae serrate from segment 5, reaching slightly beyond middle of pronotum. Pronotum 1.9X wider than long, widest at middle, strongly convex, with a shallow basal median depression which is distinctly deeper in front of sutural base and with a vague, narrow median depression in front of middle; front margin broadly, but slightly lobed medially; front angles not produced, narrowly rounded; hind margin subtruncate, deflexed from in front of umbones; lateral margins entire, abruptly constricted at hind angles, slightly reflexed on anterior 1/2, visible from above only at front angles; sides strongly arcuate, swollen on posterior 1/2 above lateral margin; surface with rather dense, medium and shallow punctations medially, becoming coarsely, deeply reticulate-punctate laterally, anterior 1/2 almost entirely with light brown setae, posterior 1/2 with long, dense white setae at sides and along front margin. Elytra 2.1X longer than wide, widest along basal 1/4, equal to greatest pronotal width, extreme base slightly constricted and equal to width of pronotal base; sides strongly sloping almost vertical apically from second discal marking, subparallel on basal 1/2 then gradually convergent to narrowly rounded apex; humeral angle rather strongly, acutely produced lateroventrally; umbone very

prominent; lateral margin broadly, shallowly emarginate near basal 1/4, finely and somewhat sparsely serrate along apical 1/4; sutural area flattened along basal 1/2, becoming strongly elevated apically; surface rather discretely, yet densely and deeply punctate-striate throughout, first 3 striae especially distinct and impressed apically, with punctations smaller and more elongate; laterally and basally, other strial punctations becoming equal to or greater than size of lateral pronotal punctations; first 5 rows of punctations (excluding short, basal sutural row) separated by more than the width of a punctation, discrete basally; rows 5-8 separated by width of a punctation or less; rows 8-10 generally more widely spaced, especially by the prominently convex ninth interval; remaining intervals flattened except for a portion of the eighth shortly before it ends apically; punctations of intervals fine throughout; vestiture considerably less dense than on pronotum, mostly consisting of long, erect, light brownish setae on disc, setae on sides shorter, recumbent to subrecumbent, mostly whitish with a few brown ones apically. Ventral surface with long, moderately dense setae which are distinctly more dense at sides of first 3 visible abdominal sterna; prosternum slightly convex on middle, front margin slightly retracted from front angles of pronotum, with a weakly developed rounded prominence on either side of shallowly emarginate middle; abdomen with medium-fine punctations moderately placed on middle, which become denser and slightly larger at sides, except first visible sternum coarsely and densely punctate laterally; last visible sternum subtriangular, narrowly rounded apically with a distinct thickened triangular submarginal ridge. Ungual tooth with apex angularly rounded. Ovipositor as in Figure 4.

Material examined. Holotype (CASC) labeled: "Lower Pine Cyn., Big Bend N.P., TEX VII-16-84/on flowers of *Tiquilia canescens* /W.F. Barr Collector/Holotype *Acmaeodera tiquilia* Westcott & Barr" (h; red card). Paratypes all from Texas [Brewster Co.], Big Bend National Park, on flowers of *Tiquilia greggii*, 16/17-VII-84, with exceptions noted: same data as holotype (2, except 1 on *T. canescens*); 6 mi SE Panther Jct. (8); 2.4 mi W Panther Jct. (1), all W. F. Barr; Pine Canyon Road, 29°15'13", 103°11'30", 1160-1190 m (1); Glenn Springs Road, 29°15'48", 103°08'50", 945 m (15); 1.6 mi W Basin Jct. (5) (the last 3 localities correspond to the first 3); 10.3 mi W Basin Jct., 960 m (6), all R. L. Westcott; Glenn Springs Road, 15-VII-86 (10); Lower Pine Canyon, 14-VII-86 (10), all G. H. Nelson; Rio Grande Village, 16-VII-80, "Bio.Note No.31 80, A. Hook" (1, no host). Paratypes deposited in BBNP, CLBC, DSVC, FSCA, GCWC, GHNC, NMPC, RLWE, TCMC, TTUC, USNM, WFBC, ZMAS.

Variation. The elytral maculation is quite uniform in appearance, though some difference in the markings occurs as follows: The yellow ones are variably shaped, more or less discrete, the third and fourth sometimes longitudinally connected. Laterally there may be considerable coalescence of markings, especially apically. The apicolateral red marking varies in hue and may extend to the hind margin of the second yellow marking and/or be interrupted apically. In a sample of 40 specimens, the humeral elytral spot, which is located below the umbone, is present on both sides on 37 and coalesces with the first elytral marking on 22. It is present only on one side of one specimen and is absent on two specimens.

Sixteen specimens have some arrangement of submarginal yellow to yellowish-brown lateral pronotal spots, at most (seen on 2) consisting of a smaller spot on each side near apical angle and a larger (usually) postmedian-subbasal spot on each side. The most common condition (7) is the latter pair only. Even the largest spots are scarcely discernible to the naked eye. In addition, 2 specimens (1 also having all 4 submarginal spots) bear a minute median spot at the apical 1/5.

The front margin of the prosternum varies from being weakly to strongly produced on each side of middle, which is broadly truncate to weakly emarginate. The subapical structure of the last visible sternum varies from a rather vaguely defined ridge, usually with a distinct triangularly to broadly rounded apex, or more rarely a well defined broadly to narrowly rounded plate. It is of interest to compare this with a general comment on the genus made by Fall (1899:3): "It may be thick or thin, broadly or narrowly rounded, truncate or angulate, with regular or irregular edge, but I have never in the hundreds of specimens examined discovered any variation in type within specific limits."

Length: R=8.0-9.9 mm, mean 9.1 mm; females, N=16, R=8.3-9.9 mm, mean 9.4 mm; males, N=24, R=8.0-9.9 mm, mean 8.9 mm.

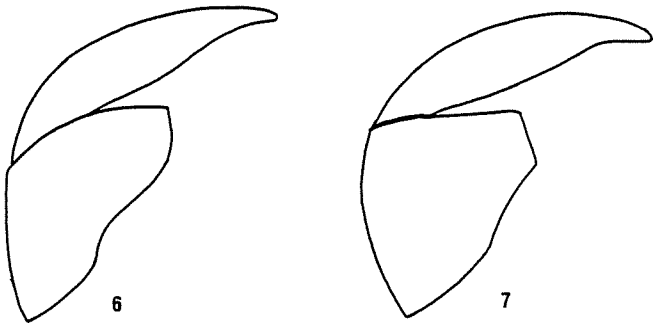
Comparison. This species appears most closely related to *A. recticollis* Fall (Figure 2), with which it is partially sympatric, and *A. recticolloides* Westcott, a species restricted to extreme southern California and northern Baja California. It is closer to the former, differing as follows: *A. recticollis* averages larger, with vestiture longer

and denser, particularly underneath. The ground color is brown, rather than black; though an exception is a specimen from Boquillas Canyon, Big Bend National Park, which has the ground color black with a slight bluish reflection. The elytral maculation of *A. tiquilia* is more extensive and usually less discrete, consisting basically of 4 rather than 5 spots; and the lateral red stripe usually is entire, while it is broken on 30 of 31 specimens of *A. recticollis*. In the latter, the pronotum is less convex, and the sides are not so strongly rounded. In *A. tiquilia* the sides of the elytra are steeper and the apices together are narrowly rounded, while in *A. recticollis* the apices are more pointed. The ovipositors differ as can be seen in Figures 4 and 5.

Biology. All specimens of *A. tiquilia* were collected on, or flying to or from, flowers of *Tiquilia greggii* (Torrey & Gray) A. Richardson, except 2 from *T. canescens* (Candole) A. Richardson. In contrast, *A. recticollis* has usually been collected from the stems of its hosts, *Ephedra* spp. A specimen recorded "on *Fallugia*" by Fall and Cockerell (1907:180), is labeled "on fls. of *Fallugia acuminata*, eating petals" (=*F. paradoxa* (D. Don) Endlicher). Specimens were collected from flowers of mesquite, *Prosopis* sp., in Texas, El Paso Co., Fabens Exit, I-10, 24-IV-92, WFBC; Hudspeth Co., near Sierra Blanca, 8-VI-87, BKDC. The related *A. recticolloides* has been collected from its host, *Ephedra californica* Torrey, with few exceptions (Westcott, 1971). Plants in the genus *Ephedra* were observed at all sites where *A. tiquilia* was collected. If this beetle is found to use another genus as a larval host, greater divergence from its relatives would be indicated.

There is evidence that *A. tiquilia* is temporally and, perhaps in large part, spatially isolated from *A. recticollis* in the Big Bend area, where despite much collecting, very few of the latter species have been found. All but one specimen known to us have been collected near Lajitas from middle to late April. The exception is an aged specimen taken 4 July in Boquillas Canyon. All but one specimen of *A. tiquilia* were collected at elevations 250-625 m higher that those localities along the Rio Grande. Elsewhere, we have seen specimens of *A. recticollis* collected from late April to late June, at elevations ranging to just over 1525 meters.

Remarks. In the genus *Acmaeodera*, the designation of an allotype has not often been made in United States literature because, as a rule, the sexes exhibit little outward difference. Some authors have attributed to the female (when holotype sex has been designated, usually it is the male) such differences as "slightly more robust", "usually larger", "last ventral abdominal segment more acutely rounded", etc. While these attributes are not false, neither have we found them to be reliable in differentiating the sexes; there are too many exceptions. Several authors have noted the sexual difference in antennae in some smaller species; however, no apparently reliable difference exists among the majority of species. While the female *A. tiquilia* generally is "slightly more robust", the male often appearing a bit more parallel sided, a better external character was found to separate them with almost certainty: the shape of the ungual tooth, the apex of which is angularly rounded in females (Figure 6), truncate to subtruncate in males (Figure 7). Variation occurs, but by examining all tarsal claws it usually is possible to sex a specimen without checking the genitalia. Secondary sexual differences in ungual teeth were first noted by Fall (1899) for "... certain small species ..." This character was used extensively by Volkovitsh (1979), and to a lesser degree by Nelson and Westcott (1995).



Figures 6-7, Ungues of *A. tiquilia*, female and male respectively.

Etymology. This species is named for the adult host plant genus *Tiquilia*, the United States species of which formerly were placed in *Coldenia*. The latter has been restricted to one Old World species (D. S. Verity, *in litt.*).

Acmaeodera gibbula LeConte

Acmaeodera gibbula LeConte, 1858, Proc. Acad. Nat. Sci. Philadelphia, 10:69.

Acmaeodera gibbula gila Knull, 1930, Entomol. News, 41:16. **New synonymy**.

In Knull's (1930) paper *A. gibbula gila* was described as a subspecies; however, it is desig-

nated as a variety on his type and determination labels. It is known only from the holotype collected at San Carlos, Gila Co., Arizona, and in our opinion represents a rare totally melanic phenotype of the wide ranging and highly variable *A. gibbula*. Although we have not seen a similar specimen, nevertheless some degree of melanism in otherwise highly maculate species is not uncommon in the genus.

Acmaeodera ornata (Fabricius)

Buprestis ornata Fabricius, 1775, Syst. Entomol., p. 220.

Acmaeodera ornata: Eschscholtz, 1829, Zool. Atlas I, p. 8.

Acmaeodera quatuordecimspilota Obenberger, 1917, Neue Beitr. Syst. Insektenk., 1:55; Barr, 1975, J. Kansas Entomol. Soc. 48:418. **New synonymy**.

Acmaeodera quatuordecimspilota long has been an enigma, known only by the holotype (NMPC) from "North America". It was redescribed by Barr (1975), who suggested that it might be a "distinctly maculate specimen of one of the early spring-appearing Arizona species, perhaps *A. depressa* Barr." However, clearly these are not the same species, nor do they appear to be closely related. We compared a photographic slide of the type of *A. quatuordecimspilota* with 12 specimens of *Acmaeodera ornata*, a widespread and variable species from the eastern United States. The elytra of the holotype are slightly less parallel anteriorly, the apex is narrower than the average for *A. ornata*, and the elytral maculation is more reduced and discrete than on most specimens of that species examined. Nevertheless, we considered these variable characters and the taxa conspecific. Then specimens were sent to our colleague S. Bílý, NMPC, who confirmed our judgment. Later he informed us that the type was lost during reconstruction work at the museum. Since several years have passed without it being located, establishment of a neotype is warranted and we base it on a specimen (Figure 3) almost identical to the holotype of *A. quatuordecimspilota*: Neotype male, 9.1 mm long X 3.8 mm wide, deposited in NMPC, labeled "USA, AR [Arkansas], Ozark Nat. For., Newton Co., F. S. Rd. 1209 at Buck Brook, 14.V.1986, DA Pollock/*Acmaeodera quatordecimspilota* [sic!] Obenb. (h), det. W. F. Barr/ACMAEODERA (p) *ornata* (F.), matches well holotype of *14-spilota* Ob. (h), det.R.L. Westcott 1992/NEOTYPE *Acmaeodera quatuordecimspilota* Obenberger, R. L. Westcott & W. F. Barr, 1994" (h; red card).

Acmaeodera simulata Van Dyke

Acmaeodera simulata Van Dyke, 1937, Bull. Brooklyn Entomol. Soc., 32:108.

Acmaeodera nautica Van Dyke, 1945, Pan-Pacific Entomol., 3:106; Westcott *et al.*, 1979, Coleopts. Bull., 33:176. **New synonymy**.

This species was described from a specimen collected near Lafayette, Contra Costa Co., California and related to *A. prorsa* Fall. We have examined the type and another specimen collected on nearby Mt. Diablo, considering them to be a blue color variant of *A. simulata*. Most specimens of the latter have a distinct aeneous reflection; however, we examined two specimens from SW Oregon (ODAC, RLWE), one with a distinct bluish reflection, the other dark bluish-black. Van Dyke (1937) recorded specimens of *A. simulata* bred from two species of oaks.

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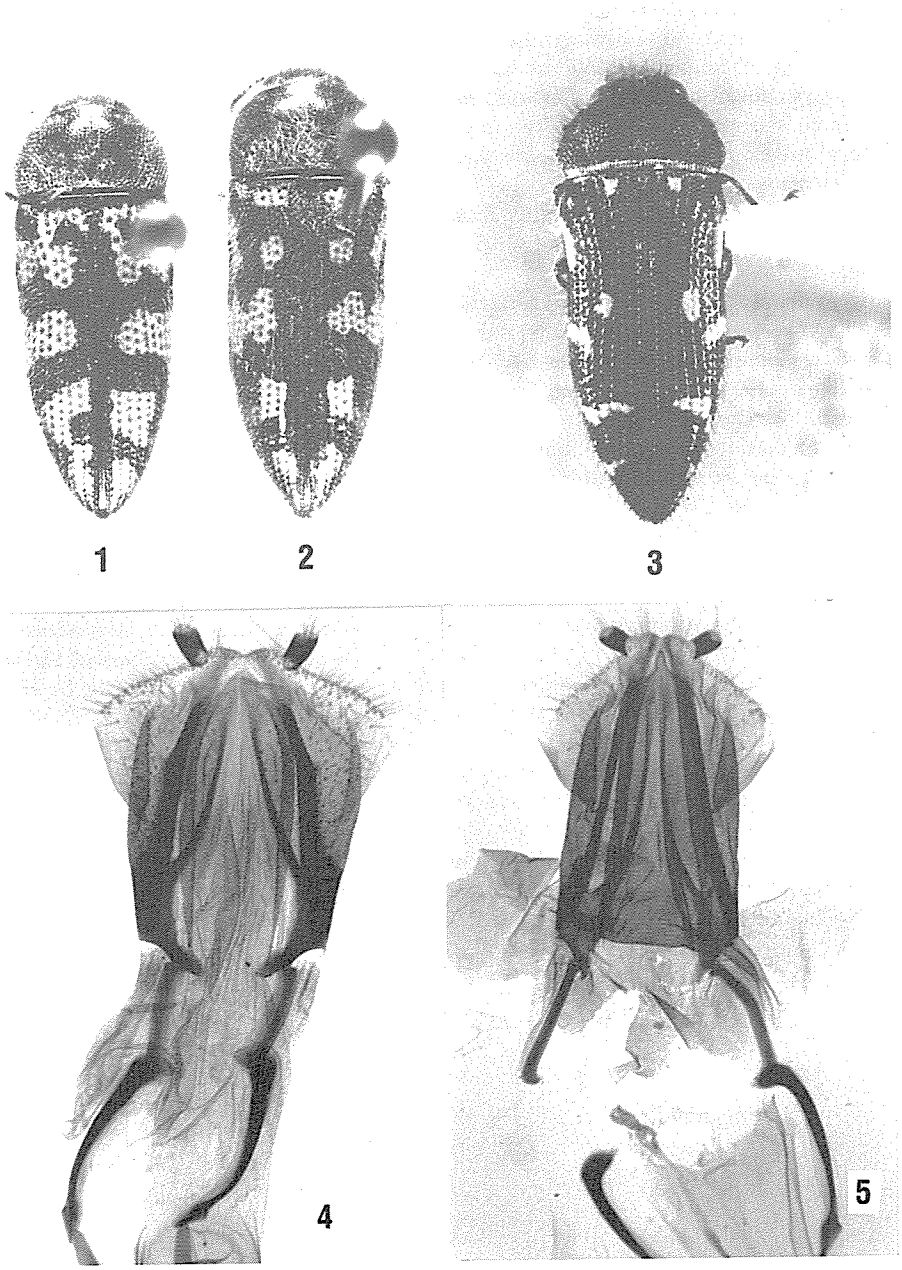

Figures 1-5. Figs. 1-3, dorsal habitus of (1) *Acmaeodera tiquilia*; (2) *A. recticollis*, and (3) neotype of *A. quatuordecimguttata*; figs. 4-5, ovipositors of (4) *A. tiquilia,* and (5) *A. recticollis.*