Two New Species of Antaeotricha Zeller from Southeastern Arizona (Gelechioidea: Elachistidae: Stenomatinae)

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TWO NEW SPECIES OF *ANTAEOTRICHA* ZELLER FROM SOUTHEASTERN ARIZONA (GELECHIOIDEA: ELACHISTIDAE: STENOMATINAE)

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ABSTRACT. . Two new species, *Antaeotricha baboquivariensis* and *Antaeotricha duckworthi*, are described from southeastern Arizona. Photographs are included of the type imagoes and their associated genitalia. Habitat images and a distribution map for the two new taxa are provided.

Additional key words: *Antaeotricha baboquivariensis*, *Antaeotricha demotica*, *Antaeotricha duckworthi*, *Antaeotricha zelotes*, Arizona, Elachistidae, Gelechioidea, North America, Stenomatinae, Taxonomy.

For the past several seasons, I have collected specimens of various *Antaeotricha* species from the southwestern United States using black light. Several undescribed species have been collected during this sampling. Duckworth (1964) reviewed the North American Stenomatinae and described two new species of *Antaeotricha*, expanding the North American species total to fifteen. These same fifteen species were listed by Hodges (1983). I subsequently have described the strongly maculated gray *Antaeotricha arizonensis* (Ferris, 2010), and the glossy white *A. utahensis* from New Mexico and Utah (Ferris, 2012), which brings the total to seventeen for described species from North America. During a recent examination of uncurated *Antaeotricha* specimens in a storage drawer, I discovered two additional species from Arizona that do not match any of the currently described North American or extralimital species.

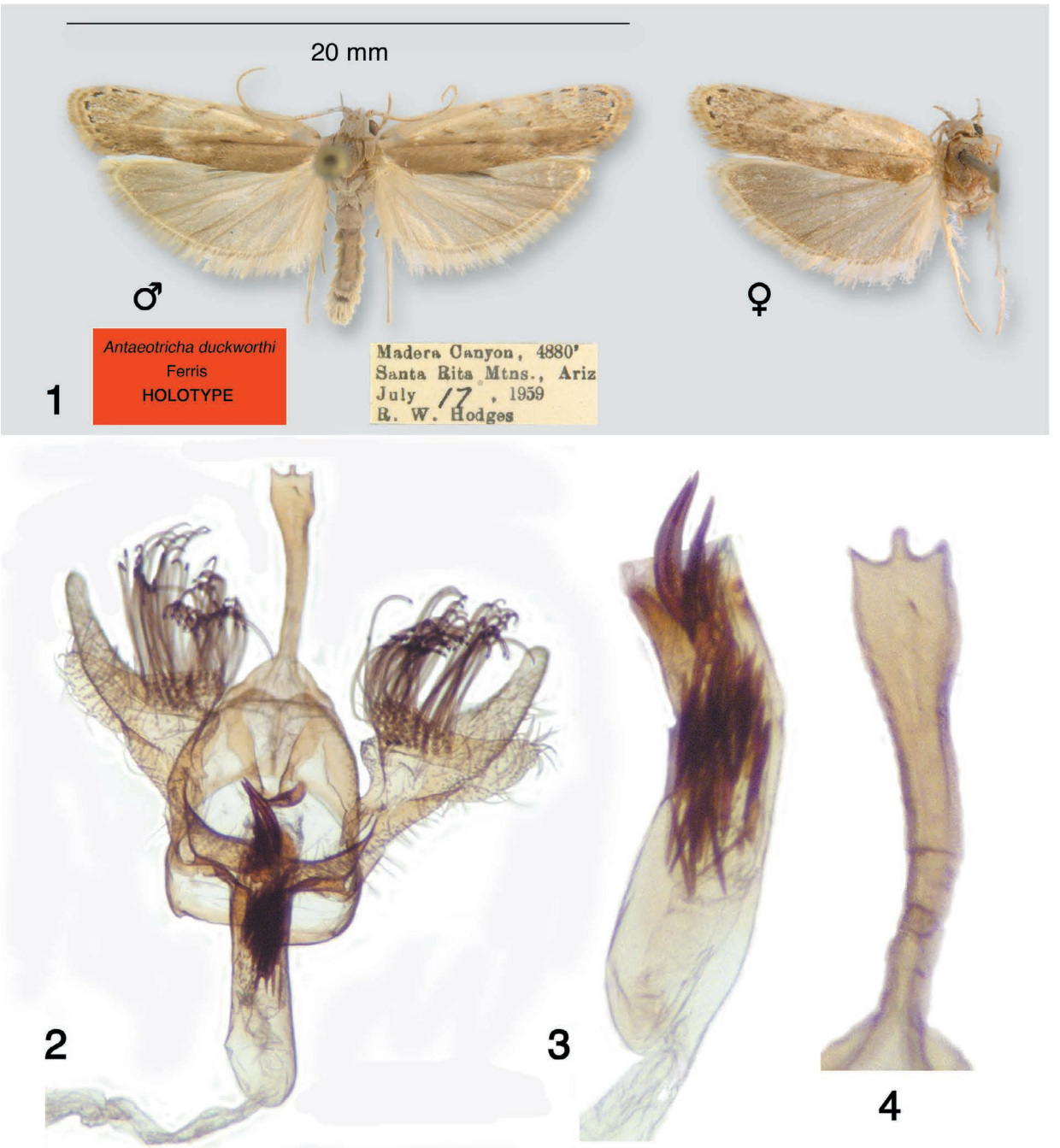
Genus *Antaeotricha* is restricted to the New World with the majority of the species occurring in Central and South America. Lee and Brown (2009) listed 382 species in the Neotropical region, five of which also occur in North America. The total number of described species is thus 394 with the addition of those that occur in North America only. The vast majority of the species were originally described by Meyrick (1914) and Walsingham (1909–15). Meyrick did not provide illustrations, while Walsingham illustrated adults of a number of species, but oddly enough not some that he described in the same publication. Clarke (1955) published a catalog of the Meyrick type specimens in The Natural History Museum [formerly British Museum (Natural History)] with photos of the adults and genitalia. The interested reader is directed to the bibliography provided by Duckworth (1964) for additional author citations relating to species descriptions and some larval host plants.

The larval host plants of many of the North American *Antaeotricha* are unknown. Several species use *Quercus* (Duckworth, 1964), and the Southwestern moths occur in oak habitat with oak as the presumed larval host. Aiello (1981) published some life history information for a species in Panama. Janzen and Hallwachs (2009) document numerous larval hosts used by *Antaeotricha* in Costa Rica.

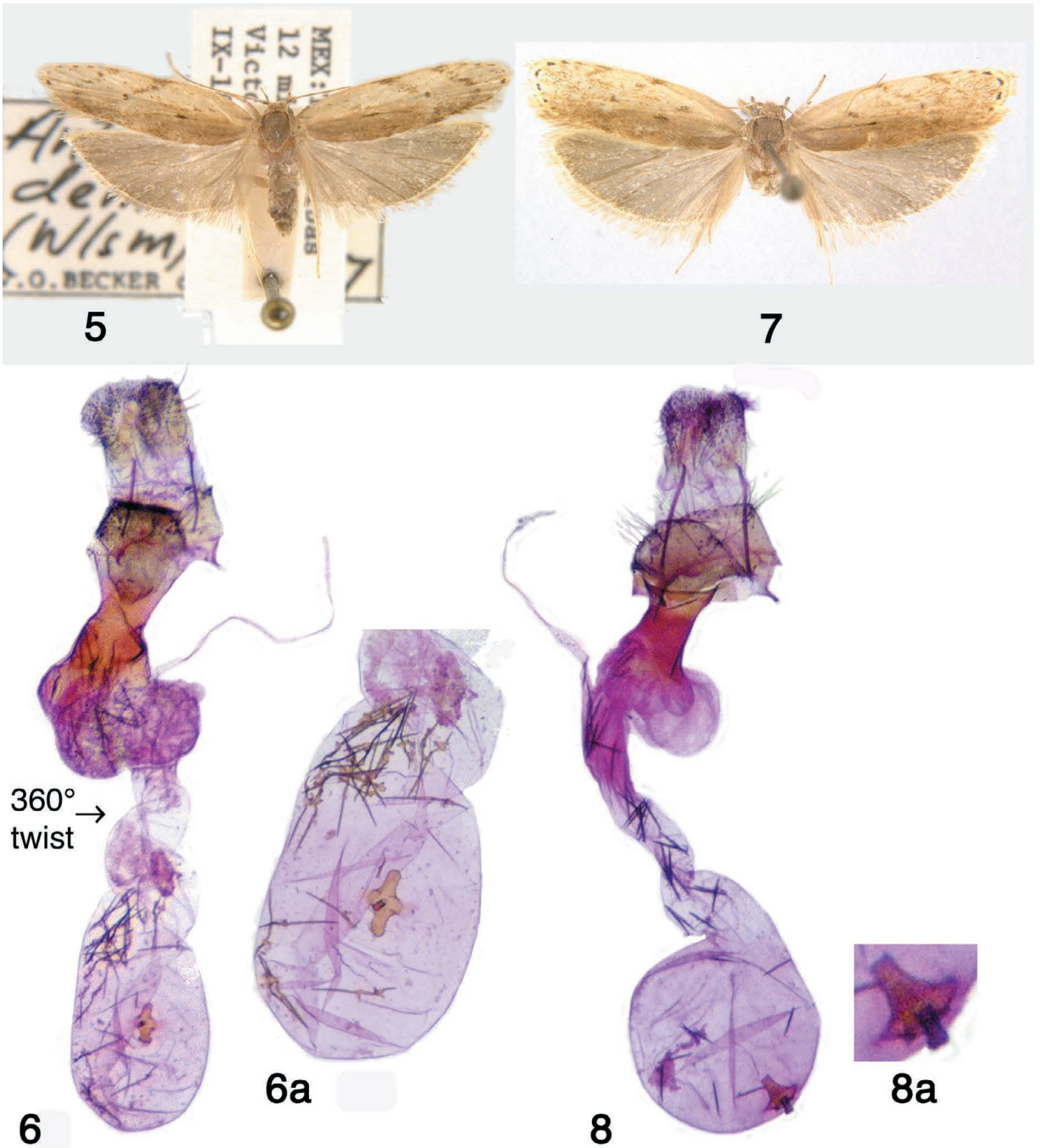
Members of the genus *Antaeotricha* are moderately large for Microlepidoptera, with forewing lengths in the North American species varying from about 7–15 mm, depending upon species. Females tend to be larger than the males, and are frequently less heavily maculated. With the exception of the gray *Antaeotricha arizonensis*, the dorsal forewiing color is white. When present, maculation may be gray, brown, fuscous, or pale orange-brown. There is frequently a dark bar along the inner margin basally. Other regions of the forewing may exhibit small spots and/or narrow transverse bands. In some species, such as *A. furcata* (Wlsm.), the forewings of the males are strongly maculated, while the females may be nearly immaculate. Neotropical species display many additional wing patterns.

The genus *Antaeotricha* is most easily recognized by the anatomy of the male genitalia. The lightly sclerotized valves are narrow tapering to a rounded tip. The prominent harpe has a thumb-like costal projection bearing long, bifurcate, recurved setae (Figs. 2, 10–11). The form of the uncus is diagnostic for many species, and can usually be viewed under magnification while gently brushing away the abdominal terminal scales.

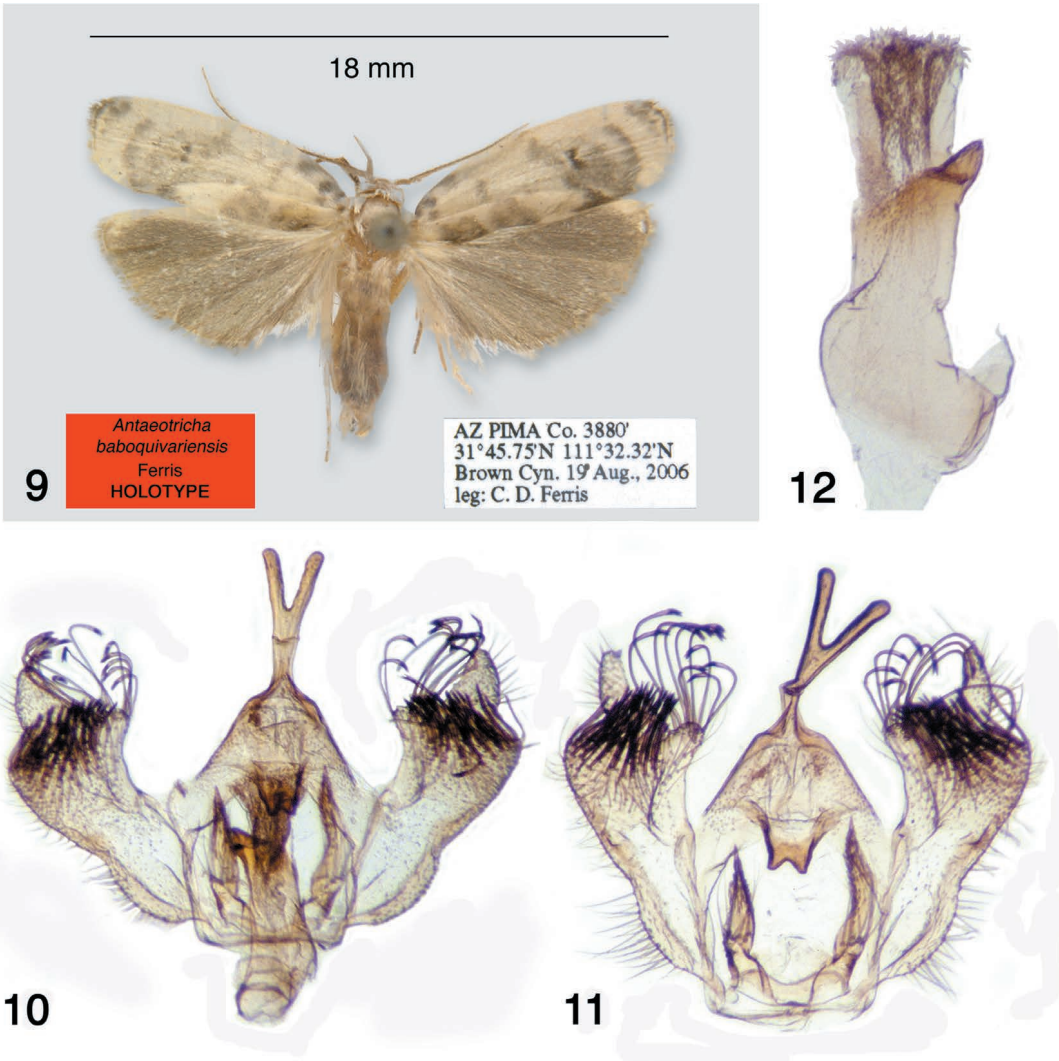
In the two new species, the tip of the uncus is broadly spatulate with three sharp projections along the apical margin, producing a trident-like aspect (Figs. 2, 4) in the first species (*duckworthi*) collected from multiple sites in southeastern Arizona, however, in the second species (*baboquivariensis*) from the Baboquivari Mts.,



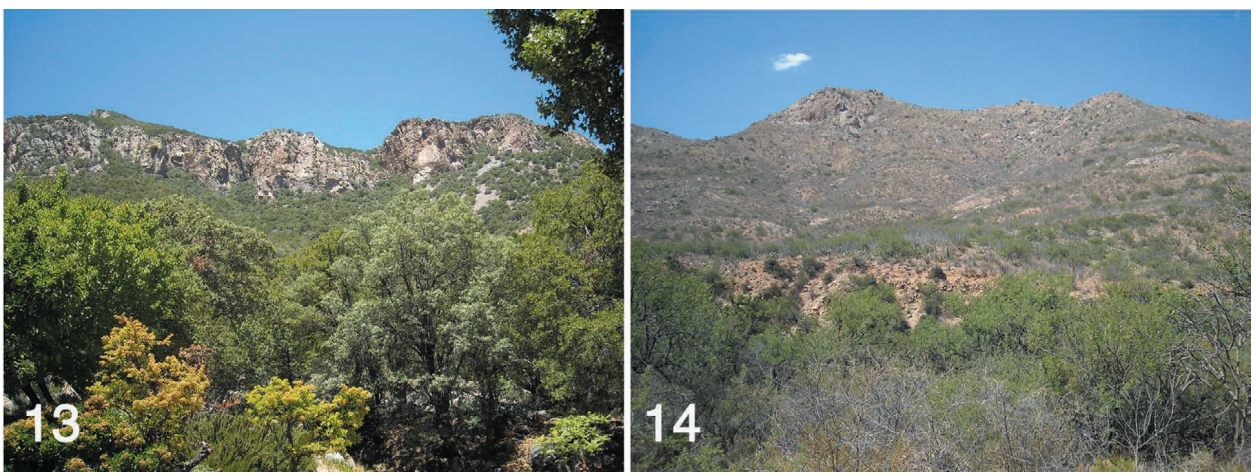
FIGS. 1–4. *Antaeotricha duckworthi*. **1,** adult male holotype and female paratype (right wings and genitalia of female paratype mounted on USNM slide #76386). **2–4,** male genitalia. **2,** genital capsule, aedeagus *in situ*. **3,** aedeagus (enlarged). **4,** uncus.



FIGS. 5–8. **5–6,** *Antaeotricha demotica* (Victoria, Mexico). **5,** adult female. **6,** female genitalia. **6a,** enlarged view of corpus bursae and signum. **7–8,** *Antaeotricha duckworthi*(Cochise Co., Arizona). **7,** adult female. **8,** female genitalia. **8a,** enlarged view of signum. Note the presence of male cornuti in the ductus bursae of both species.



FIGS. 9–12. *Antaeotricha baboquivariensis*. **9,** adult male holotype. **10–12,** male genitalia. **10,** genital capsule, aedeagus *in situ*. **11,** genital capsule from another specimen, aedeagus removed. **12,** enlarged view of aedeagus, vesica partially everted.



FIGS. 13-14. **13,** Carr Canyon, Huachuca Mts. habitat. **14,** Brown Canyon, Baboquivari Mts. habitat.

Pima Co., Arizona, it is deeply incised forming a long bifurcation (Figs. 10–11). No other known North American species have these configurations, nor could I find any similar extralimital species

In the possibility that one or both species might have been described from Mexico, or Central and South America, I examined available literature (especially Clarke, 1955 and Walsingham, 1909–1915) and contacted several museums and individual collectors requesting the loan of any look-alike material. No matches were found during the literature search. No specimens from Mexico or elsewhere were found to be matched to either species, although some additional specimens from Arizona were found of *Antaeotricha duckworthi* [Essig Museum (EME), University of California–Berkeley and Smithsonian Institution (USNM), Washington, DC]. *Antaeotricha zelotes* (Wlsm.) [Mexican states of Oaxaca, Sinaloa, Veracruz] looks rather similar to the latter, but the genitalia in both sexes are very different in structure, as described in the associated "Diagnosis." A closer look-alike is *A. demotica* (Wlsm.) originally described from Guerrero, Mexico and Guatemala. The female type in the British Museum (NH) was examined by photograph. It has not been dissected. A series of additional female specimens (males are apparently unknown) in the EME from Tamaulipas, Mexico determined as *A. demotica* by V. O. Becker was examined and a dissection made. Again no match was found as described in the associated "Diagnosis." The only other species found in which the male has a deeply incised uncus is *A. segmentata* Meyrick [TL British Guiana] (Clarke, 1955, pl. 58, figs 2–2b), but the other genital structures and the imago bear no resemblance to the moth from the Baboquivari Mts.

MATERIALS AND METHODS

Specimens were collected in bucket traps of my design using 8 watt BL fluorescent tubes operated from electronic power converters connected to 12 volt motorcycle batteries. Genitalia were dissected after macerating the abdomens in hot 10% KOH for fifteen minutes. Temporary slides were prepared using glycerin as the suspension medium. The genitalia preparations by the author are stored in glycerin in polyethylene genitalia vials attached to the specimen pins. Prepared balsam slides of wing venation and genitalia accompanied the USNM loan material.

Antaeotricha duckworthi Ferris, **new species**
(Figs. 1–4, 7–8)

Diagnosis. The combination of dorsal forewing markings separates *Antaeotricha duckworthi* from other North America species: two narrow postmedian parallel transverse golden-brown lines; a series of small dark brown spots extending from the apical region of the costa along the outer margin to the tornus; a wide golden-brown diffuse longitudinal band extending along the inner margin from the base and tapering toward the tornus. The broad trident form of the uncus apex in males is unique among known North American species (Figs. 2, 4). In most specimens, the uncus can be seen clearly by gently brushing away the abdominal terminal scales. The moth can be confused with the Mexican *A. zelotes* and *A. demotica*. From *A. zelotes*, it can be distinguished immediately by genital characters. In males of *A. zelotes*, the basal 0.5 of the uncus is rather uniform in width, then broadens gradually over the next 0.4, and then attenuates to a weakly pointed apex in the distal 0.1, as opposed to the trident-like apex found in *A. duckworthi*. While the forewing maculation of *A. demotica* is similar to that of *A. duckworthi*, the forewings taper markedly toward the outer margin (Fig. 5), whereas in *A. duckworthi* the forewing width remains essentially unchanged (Figs. 1, 7). In the female genitalia of *A. demotica*(Fig. 6) there is a 360° twist in the ductus bursae, the corpus bursae is oval, the ductus seminalis originates from the base of a bulge at the top of the ductus bursae, and the signum has serrated edges, whereas in *A. duckworthi* there is no twist in the ductus bursae, the corpus bursae is spherical, the ductus seminalis originates from the tubular portion of the ductus bursae, and the signum has smooth edges.

Description. *Imago*: Glossy, sexes similar except antenna and genitalia. Except wings, remaining body parts (*thorax, legs, abdomen*) are covered by yellowish-white scales; a very few widely scattered individual brown scales occur on the legs and lateral abdomen. *Head*. Antenna (flagellum and scape) creamy white; ciliated ventrally in male, length of curved cilia about twice width of flagellomere; cilia in female. Haustellum tan, basal portion with creamy-white scales. Labial palpus upcurved extending well above vertex. *Tarsi*. Yellowish white blending to pale tan apically; pulvilli white, claws brown. *Wings*. Forewing length: males (n = 8) 9–10.5 mm, ave. = 9.5 mm; females (n = 26) 9–11.5 mm, ave. = 10.4 mm; elongate (length-to-width ratio = 4) with rounded apical margin. Yellowish white, anterior surface of wing very sparsely intermixed with minute individual brown scales; posterior surface with pale golden-brown scales forming a diffuse horizontal band; two narrow postmedian parallel transverse lines of conjoined pale golden-brown spots extending from costa to inner margin; both curving basad towards margin; area between distad line and outer margin darker than central pale region; small dark brown spots extend from apical section of costa along outer margin to tornus. Fringe pale yellowish white. Ventral surface of forewing dark golden brown shading to paler along costa and outer margin. Fringe pale yellowish white. Dorsal hindwing pale fuscous, darkening toward outer margin. Ventral hindwing centrally brownish fuscous shading to yellowish white along outer margin. *Male genitalia* (Figs. 2–4; 4 dissections). Uncus decurved with long narrow basal portion expanding to a squamiform trident-like tripartite apical process. Gnathos upcurved (flattened in Fig. 2 by slide preparation) at midpoint with distal portion tapering to a rounded tip. Vinculum broadly U-shaped. Anellus without distinct lobes. Valva basally broad

gradually narrowing to a rounded tip; harpe thumblike bearing many long recurved bifurcate setae. Aedeagus (phallus) long with bend near middle (length about 5 times diameter): vesica with multiple apparently deciduous (see Fig. 8) robust rod-like cornuti with pointed ends; three large curved cornuti with sharp tips extend from tip of aedeagus. *Female genitalia* (Fig. 8; 6 dissections). Papilla analis basally broad and straight with rounded apex, sparsely covered with short fine hairs. Apophyses posteriores well developed; anterior apophyses vestigial. Sterigma broad. Ductus bursae broad and lightly sclerotized immediately below sterigma to auxiliary spherical sac, then narrowing to long membranous tube expanding as it opens into spherical corpus bursae; ductus seminalis arises from ductus bursae just below and opposite to spherical sac. Signum near fundus a large cross with central outwardly projecting oblong plate perpendicular to base; plate nearly rectangular with rounded edges and corners.

Types. Holotype male (Fig. 1): ARIZONA, [Pima/Santa Cruz Co. line], Santa Rita Mts., Madera Canyon, 4880' (1488m), 17.vii.1959, R. W. Hodges. Deposited in National Museum of Natural History (USNM), Washington DC. Six paratypes deposited in USNM; same locality and collector as holotype: 1♂, 9.vii.59, USNM slide #76385; 1♂, 17.vii.59, USNM slide #76461; 1♂, 29.vii.59, USNM slide #76462; 1♀, 24.vii.59, USNM slide #76386; 1♀, 30.vii.59, USNM slide #76464; 1♀, 4.viii.59, USNM slide #76463. Slides contain genitalia and right wings cleared to show veins. Two additional paratypes in USNM: ARIZONA, [Santa Cruz Co.], Santa Rita Mts., Madera Canyon, 5000' (1530m), 25.viii.79, 1♀, R. Leuschner & R. Crandall; Santa Cruz Co., 5000' (1530m), 9.viii.87, 1♂, R. Leuschner. In Essig Museum of Entomology, University of California, Berkeley, CA: ARIZONA, Cochise Co., Huachuca Mts., 5800' (1769m), 3.viii.86, 1♂, J. Brown & J. Powell. In C. D. Ferris collection: ARIZONA, Cochise Co., Huachuca Mts., Carr Canyon, 5615' (1713m), 21.viii.04, 1♂ (dissected), 27♀ (4 dissected); 27.vi.05, 1♀.

Biology. Unknown; adults from late June to late August. Collection localities are moderately dry forest with oak and mixed conifer species (Fig. 13).

Distribution. To date, known only from southeastern Arizona (Fig. 15).

Etymology. This species is named in honor of W. Donald Duckworth, whose revision of the North American Stenomidae initiated my interest in the group.

Remarks. As previously noted, the cornuti attached to the vesica in males of *A. duckworthi* are apparently deciduous, as indicated by their presence in the female genitalia (Fig. 8). Although the males of *A. demotica* are apparently unknown, it can be inferred from Fig. 6 that they too have long, slender, needle-like cornuti (longer and thinner than those of *A. duckworthi*).

Antaeotricha baboquivariensis Ferris, **new species** (Figs. 9–11)

Diagnosis. Females unknown. In habitus, *Antaeotricha baboquivariensis* most closely resembles *A. schlaegeri* (Zeller) and *A. leucillana* (Zeller). Visual separation of these species is not reliable. In *A. baboquivariensis*, there is a dark gray broken bar extending along the costa from the base to approximately 0.2 costal length. In the other two species, this region is either unmarked, or there are two small gray spots. The dorsal hindwings of *A. schlaegeri* are pale, in *A. leucillana* they are fuscous, and in *A. baboquivariensis* they are dark fuscous. *A. schlaegeri* has been recorded from the Huachuca Mts. of Arizona, but there are no Arizona records for *A. leucillana*. The deeply incised bifurcate uncus (Figs. 10–11) of *A. baboquivariensis* provides unequivocal separation from all other known North American species. The uncus of *A. schlaegeri* is uniformly slender with rounded apex (Duckworth, 1964, fig. 1); the uncus of *A. leucillana* has a widely expanded bifid tip (Duckworth, 1964, fig. 4).

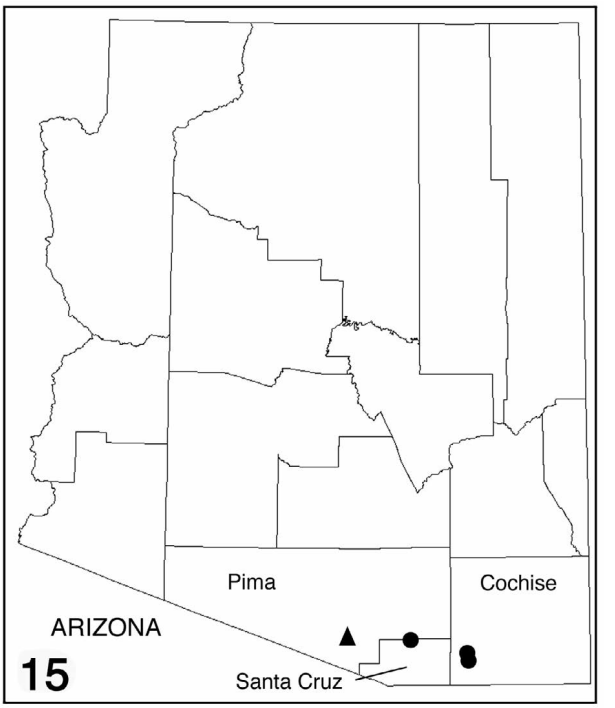


FIG. 15. Distribution map. Circles = *Antaeotricha duckworthi*; triangle = *A. baboquivariensis*.

Description. *Head*. Antenna scape brown, flagellum brown with narrow light brown rings at junction of each flagellomere, ciliated ventrally, cilia curved with length about equal to width of flagellomere. Haustellum pale tan, basal portion with white scales. Labial palpus upcurved extending well above vertex, segments 1–2 dark tan on outer surface, light tan on inner surface, segment 3 very light tan. Frons and vertex creamy white. *Thorax*. Creamy white. *Legs*: foreleg brown dorsally, shading to whitish ventrally and in tarsi; midleg similar to foreleg, but paler; hindleg whitish tan speckled with a few isolated brown scales; tarsal claws brown, pulvilli white. *Abdomen*: Pale tan with a few widely spaced single dark brown scales. *Wings*. Forewing length: (n = 5) 7–9 mm, ave. = 8.3 mm; length-to-width ratio about 2.6 with a slightly rounded distal margin. Dorsal forewing white with five transverse zones/bands with diagonal margins: 1. basal third of wing with mottled gray wide irregular bar along inner margin, white central area and narrow gray irregular bar along costa.; 2. white band; 3. gray band with irregular distal border and two central black conjoined irregular spots; 4. white band with convex distal margin and central narrow pale gray band; 5. gray roughly triangular apical patch with narrow white submarginal band. Fringe scales white with those near apex gray tipped. Ventral forewing pale fuscous centrally becoming very pale along margins; fringe scales nearly white. Dorsal hindwing dark fuscous, pale along inner margin, fringe scales nearly white. Ventral hindwing centrally pale fuscous becoming very pale along margins and fringe. *Genitalia* (Figs. 10–12); 2 dissections). Uncus

decurved, divergently bifurcated along apical half from basal stem; bifurcation with two narrow equal tines, each rounded apically. (Figs. 10–11). Gnathos widened basally, gradually tapering to a slightly upcurved [flattened by slide preparation] deeply notched tip (Fig. 11). Vinculum U-shaped. Anellus with two large robust slightly subequal lobes projecting upward to level of gnathos. About one-third length from base, each lobe begins to bow outward and is partially encircled by row of robust nearly transparent, pointed setae of length about one-third the remaining distance to the tip. Above base of these setae, each lobe tapers to a sharp point and has a scobinate surface. Valva basally broad tapering to narrow rounded tip; harpe thumblike bearing many long recurved bifurcate setae. Aedeagus short with bulbous base (length about 2 times diameter) bearing a triangular heavily-sclerotized projection on apicolateral margin. Vesica without cornuti, but membrane outer surface densely covered with small close-set tubercles.

Types. Holotype male (Fig. 9): ARIZONA, Pima Co., Baboquivari Mts., Brown Canyon, 3880' (1183m), 19.viii.2006, C. D. Ferris. Deposited in Carnegie Museum, Pittsburgh, PA. Paratypes: 4 males (2 dissected), same data as holotype, in C. D. Ferris collection.

Biology. Unknown; adults in late August. Collection locality is a riparian desert mountain canyon with a wide range of vegetation that includes oak (Fig. 14).

Distribution. To date, known only from the type locality (Fig. 15).

Etymology. The species name (adjective) denotes the geographic locality where the type series was collected.

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LITERATURE CITED

AIELLO, A. 1981. Life History of *Antaeotricha* sp. (Lepidoptera: Oecophoridae: Stenomatinae) in Panama. Psyche 88:163–168.

CLARKE, J. F. G. 1955. Catalogue of the type specimens of Microlepidoptera in the British Museum (Natural History) described by Edward Meyrick. 2:11–531, plates 1–263.

DUCKWORTH, W. D. 1964. North American Stenomidae (Lepidoptera: Gelechioidea). Proc. United States Nat. Mus. 116:23–72.

FERRIS, C. D. 2010. A new *Antaeotricha* species from southeastern Arizona (Gelechioidea: Elachistidae: Stenomatinae). ZooKeys 57:59–62.

————. 2012. A new *Antaeotricha* species from Utah and New Mexico (Gelechioidea: Elachistidae: Stenomatinae). Journal of the Lepidopterists' Society 66(3):168–170.

HODGES, R. W., et al. 1983. Check List of the Lepidoptera of American North of Mexico. E. W. Classey Ltd. and the Wedge Entomological Foundation. xxiv + 284 pp.

JANZEN, D. H. AND HALLWACHS, W., 2009. Dynamic database for an inventory of the macrocaterpillar fauna, and its food plants and parasitoids, of Area de Conservacion Guanacaste (ACG), northwestern Costa Rica (nn-SRNP-nnnnn voucher codes) <http://janzen.sas.upenn.edu>.

LEE, S. AND BROWN, R. L. 2009. Revised checklist of Elachistidae in Neotropical region. http://mississippientomologicalmuseum.org.misstate.edu/Researcgtaxapages/Lepidoptera/Elachistidae/Checklists/Neotropical-Elachistidae.html.

MEYRICK, E. 1915. Exotic Microlepidoptera, vol. 1. Taylor and Francis, London, 640 pp.

WALSINGHAM, L. 1909–1915. *In* Godman, E.D. & Salvin, O. Biologia Centrali-Americana. Insecta. Lepidoptera–Heterocera, vol. IV. Taylor and Francis, London, 404 pp., plates 1–10.

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