

Revision of the weevil genus *Epimechus* Dietz (Coleoptera: Curculionidae: Anthonomini)

Wayne E. Clark

Department of Entomology and Plant Pathology
Alabama Agricultural Experiment Station
Auburn University
Auburn, AL 36849-5413, U.S.A.

Horace R. Burke

Department of Entomology
Texas A&M University
College Station, TX 77843, U. S. A.

Abstract. *Epimechus curvipes* Dietz is designated as type species of the genus *Epimechus* Dietz. Ten additional species from western North America, including four new species, are assigned to the genus: *E. aemulus* Fall; *E. flavirostris* Fall; *E. mimicus* Dietz; *E. adspersus* Dietz; *E. mobilis* Fall; *E. nevadicus* Dietz; *E. molina*, **new species** (Arizona, Baja California Norte); *E. combustus*, **new species** (Arizona, New Mexico, Utah); *E. signum*, **new species** (Arizona, Coahuila, Colorado, New Mexico, Saskatchewan, Texas, Utah) and *E. hesperius*, **new species** (Arizona, California, Colorado, Guanajuato, Idaho, Nevada, New Mexico, Nuevo León, South Dakota, Texas, Utah, Wyoming). These are distinguished from other Anthonomini by the short, simple tarsal claws. The names *Epimechus modicus* Fall, *E. soriculus* Dietz, and *E. nanulus* Fall are placed in **new synonymy** under *E. curvipes*. **Lectotypes** are designated for *E. adspersus* and *E. nevadicus*. Two species formerly in *Epimechus* are transferred the subgenus *Cnemocyllus* Dietz in *Anthonomus* Germar: *E. arenicolor* Fall as *Anthonomus arenicolor* (Fall), **new combination**, and *E. canoides* Fall as *Anthonomus canoides* (Fall), **new combination**. Adults of species of *Epimechus* have been collected on plants in the genera *Baccharis*, *Chrysothamnus*, *Ericameria*, *Gutierrezia*, *Haplopappus*, *Senecio* and *Tetradymia* (all Asteraceae).

Introduction

The genus *Epimechus* Dietz (1891) was established for five species of Anthonomini based on having "simple, divaricate claws." The validity of this character was called into question by Fall (1901) and Burke (1968), however, both of whom pointed out that some anthonomines with simple claws have close affinities to species of *Anthonomus* assigned to the subgenus *Cnemocyllus* Dietz. Burke (1968) asserted that "a comprehensive study will be necessary before the relationships of these species can be determined." This revision is a contribution toward such a study providing a rationale for delimitation of *Epimechus*, descriptions of each of the species, and a key for identification of the species.

Materials and Methods

Specimens of 814 adult weevils were examined. These are deposited in the collections of the following individuals and institutions (letter codens identify the collections in the text): **AMNH**, American Museum of Natural History, New York, New York, U.S.A.; **BYUC**, Brigham Young University, Provo,

Utah, U.S.A.; **CASC**, California Academy of Sciences, San Francisco, California, U.S.A.; **CDAE**, California State Collection of Arthropoda, Sacramento, California, U.S.A.; **CHAH**, Collection of H. A. Hespenheide, Los Angeles, California, U.S.A.; **CISC**, California Insect Survey, University of California, Berkeley, California, U.S.A.; **CMNC**, National Museum of Natural Sciences, Ottawa, Ontario, Canada; **CNCI**, Canadian National Collection of Insects and Archnids, Ottawa, Canada; **CWOB**, Collection of C. W. O'Brien, Tallahassee, Florida, U.S.A.; **ELSC**, Collection of E. L. Sleeper, Long Beach, California, U.S.A.; **HAHC**, Collection of H. and A. Howden, Ottawa, Canada; **ICCM**, Carnegie Museum, Pittsburgh, Pennsylvania, U.S.A.; **INIA**, Colección de Insectos, Instituto Nacional de Indestigaciones Agrícolas, México, D.F., México; **MCZC**, Museum of Comparative Zoology, Cambridge, Massachusetts, U.S.A.; **OSUC**, Ohio State University, Columbus, Ohio, U.S.A.; **OSUO**, Entomological Museum, Oregon State University, Corvallis, Oregon, U.S.A.; **TAMU**, Texas A&M University, College Station, Texas, U.S.A.; **UCDC**, University of California Davis, Davis, California,

U.S.A.; USNM, National Museum of Natural History, Washington, D. C., U.S.A..

The largest and smallest specimens available were measured with an ocular micrometer in a dissecting microscope as follows: total length is the distance from anterior edge of eye to elytral apex in lateral view; width is the distance across elytra at widest point, in dorsal view; length of pronotum, dorsally, is the distance from anterior to posterior margins. Exact label data are cited for types. Separate labels are indicated by brackets ([]), each separate line by a slash (/).

Epimechus Dietz

Epimechus Dietz 1891:257. **Type species:** *Epimechus curvipes* Dietz (here designated). Fall 1901:256; 1907:267; 1913:59-63; 1928:239. Blatchley 1916:277. Kissinger 1964:52, 56. Burke 1968:69. Hatch 1971:344-345. O'Brien and Wibmer 1982:111-112.

Diagnosis. The species of *Epimechus* are Anthonomini with short, simple tarsal claws (Fig. 33) that are fairly stout in most species, but are slender in *E. mimicus*. The metatibia of the male is curved in the type species and one other species (Figs. 24, 23), but it is straight in most of the species (Figs. 25-32). The antennal funiculus has 7 segments in some species and 6 in others. The profemur is minutely toothed or unarmed. The metafemur is unarmed and narrower than the profemur.

Plant associations. Species of *Epimechus* are associated with plants in the family Asteraceae. Meager label data indicating collection of adults on plants other than Asteraceae probably do not represent actual host associations. The site of larval development is known for only *E. curvipes*, which is reported by Boldt and Robbins (1992; 1994) to develop in galls on *Baccharis salicifolia* and other species of *Baccharis*, probably as inquiline in galls incited by other insects.

Taxonomic History. Without designating a type species, Dietz (1891) placed five species in *Epimechus*: *E. mimicus* Dietz, *E. soriculus* Dietz and *E. adpersus* Dietz from California, *E. nevadicus* Dietz from Nevada, and *E. curvipes* Dietz from Nevada and New Mexico. Fall (1901) added *E. arenicolor* Fall from Arizona and *E. aemulus* Fall from California; Fall (1907) described *E. nanulus* Fall and *E. stragulus* Fall from New Mexico; and Fall (1913) added *E. gracilis* Fall from Nevada and New Mex-

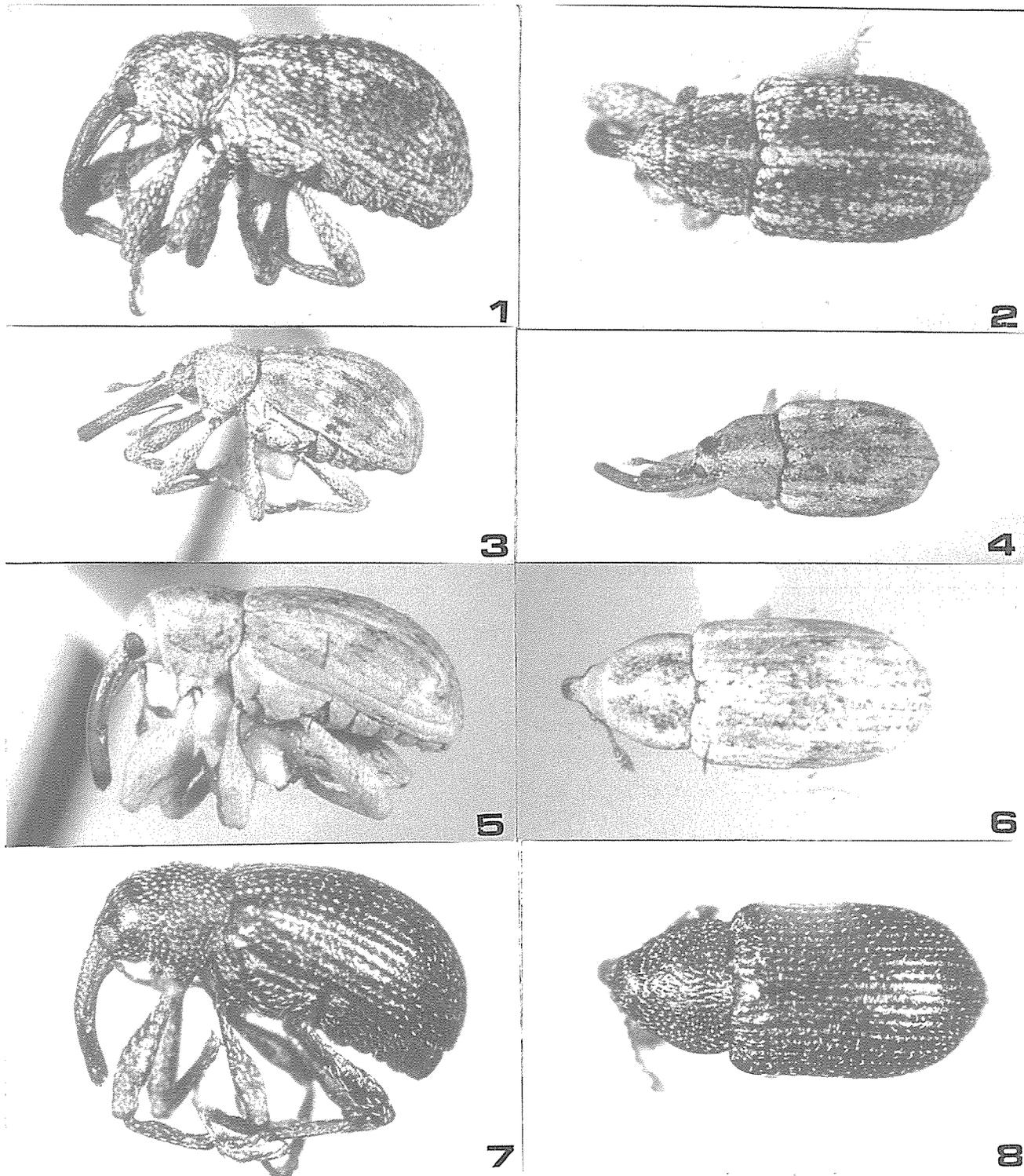
ico, *E. canoides* Fall from Texas, *E. modicus* Fall from Arizona and *E. mobilis* Fall from California. Fall (1928) also described *E. flavirostris* from California. Later, Fall (1934) stated that *Anthonomus baccharidis* Pierce "... is an *Epimechus* and seems to be identical with *arenicolor* Fall." Fall's equivocation would seem to account for Kissinger's (1964) statement that *Epimechus* contained 15 species, though the species were not listed by name. O'Brien and Wibmer (1982) listed the species of *Epimechus* by name. Their list of 14 species includes *A. baccharidis* as synonym of *E. arenicolor*, as well as *E. gracilis* as synonym of *Anthonomus tenuis* Fall (Burke 1975), along with the anthonomine from Oregon described as *E. alutaceus* by Hatch (1971). The name applied by Blatchley (1916) to an anthonomine from Florida, *Epimechus nivosus* Blatchley, was placed in synonymy under *Anthonomus disjunctus* LeConte by Burke (1971). More recently, *E. stragulus* was transferred to *Chelonychus* Dietz, and *E. alutaceus* was placed in *Magdalinops* by Clark and Burke (2001).

Kissinger (1964) separated *Epimechus* from most other anthonomines by the simple tarsal claws. The problem with this arrangement was summed up by Burke (1968:69) who noted that adults of *E. arenicolor* "have simple tarsal claws, but otherwise resemble members of the subgenus *Cnemocyllus* of *Anthonomus*."

Fall (1901) asserted that *E. arenicolor* Fall "must by the simple claws be placed in *Epimechus*," although "in every other respect it is closely allied to the members of the subgenus *Cnemocyllus*." Similarly, Burke (1968:69) noted that some of the species "have simple tarsal claws while others have a small tooth at the base of each claw" and concluded that these "... are clearly not congeneric." Although all examined *E. arenicolor* and most *E. canoides* Fall have simple tarsal claws like those of *E. curvipes*, these two species are more closely related to *Anthonomus jacobinus* and its allies than to the other species of *Epimechus*. This is indicated by close similarity in general appearance, the structure of the metatibia of the male, and especially the male genitalia. These are thus removed from *Epimechus* and transferred to the subgenus *Cnemocyllus* in *Anthonomus* as *Anthonomus arenicolor* (Fall), **new combination**, and *Anthonomus canoides* (Fall), **new combination**.

Key to species of *Epimechus*

1. Antennal funiculus with 7 segments 2



Figs. 1-8. *Epimechus* spp., habitus, lateral and dorsal views. 1) *E. curvipes*, male, 8 mi. E Flagstaff, Arizona. 2) *E. curvipes*, male, 8 mi. E Flagstaff, Arizona. 3) *E. aemulus*, female, holotype. 4) *E. aemulus*, female, holotype. 5) *E. flavirostris*, male, Tucson, Arizona. 6) *E. flavirostris*, male, Tucson, Arizona. 7) *E. mimicus*, male, 6 mi. S Dune Lakes, California. 8) *E. mimicus*, male, 6 mi. S Dune Lakes, California.

- 1'. Antennal funiculus with 6 segments 5
 2(1). Pronotum and elytra with integument broadly exposed between small, sparse scales (Figs. 7, 8); metatibia of male straight, with small apical mucro (Fig. 25) *E. mimicus*
 2'. Pronotum and elytra with integument at most narrowly exposed between scales or concealed beneath broad, dense, imbricated scales (Figs. 1, 2, 5, 6); metatibia of male strongly curved, with large apical mucro (Figs. 23, 24) 3
 3(2). Integument of pronotum and elytra completely concealed beneath dense, broadly imbricated scales (Figs. 5, 6); rostrum sparsely punctate basally, smooth and shining throughout, glabrous, except at extreme base, integument pallid; body form elongate (Figs. 5, 6); median lobe of aedeagus abruptly narrowed apically, not strongly constricted basally in dorsal view (Fig. 36), broadly, evenly curved in lateral view (Fig. 37); pygidium of male not channeled middorsally 4
 3'. Integument of pronotum and elytra exposed to varying degrees between rows of slightly to non-imbricated scales (Figs. 1, 2); rostrum rugose punctate basally, punctulate distally, with sparse, narrow scales basally, integument dark; body form stout (Figs. 1, 2); median lobe of aedeagus strongly constricted in basal 1/4, not strongly constricted apically in dorsal view (Fig. 34), strongly sinuate in lateral view (Fig. 35); pygidium of male shallowly channeled middorsally *E. curvipes*
 4(3). Elytra with dense humeral patch of broad, imbricated scales (Figs. 3, 4); scales on pronotum and elytra without glossy or "lacquered" appearance *E. aemulus*
 4'. Elytra without dense humeral patch (Figs. 5, 6); scales on pronotum and elytra with glossy or "lacquered" appearance *E. flaviviridis*
 5(1). Pronotum and elytra with sparse vestiture of mostly non-imbricated scales, integument broadly visible between scales (Figs. 9, 10)
 *E. adspersus*
 5'. Pronotum and elytra with dense vestiture of broadly imbricated scales, integument mostly concealed beneath scales (Figs. 11-22) 6
 6(5). Metatibial mucro of male long, extended nearly perpendicular to long axis of tibia in lateral view, strongly curved (Fig. 32); rostrum curved basally, straighter distally (Fig. 21)
 *E. hesperius*
 6'. Metatibial mucro of male shorter, more oblique to long axis of tibia in lateral view, not strongly curved (Figs. 27, 29, 30, 28); rostrum more
 nearly evenly curved (Figs. 11, 13, 15, 17, 19)
 7
 7(6). Broad, pallid scales forming fairly distinct elytral vittae (Figs. 11, 12); rostrum distinctly stout and fairly straight basally (Fig. 11)
 *E. mobilis*
 7'. Broad, pallid scales more generally interspersed among narrower, darker scales, not forming elytral vittae (Figs. 13-20); rostrum not distinctly stout and straight basally (Figs. 13, 15, 17, 19) 8
 8(7). Elytra short, broad (Fig. 20); scales on pronotum and elytra narrowly imbricated *E. molina*
 8'. Elytra long and narrow (Figs. 14, 16, 18); scales on pronotum and elytra more broadly imbricated 9
 9(8). Metatibial mucro extended nearly perpendicular to long axis of tibia (Fig. 31); small, length 1.5-1.8mm; median lobe of aedeagus narrowly extended apically (Fig. 36) *E. signum*
 9'. Metatibial mucro more obliquely oriented to long axis of tibia (Figs. 29, 30); larger, length 1.5-2.9mm; median lobe of aedeagus not narrowly extended apically (Figs. 42, 43) 10
 10(9). Rostrum narrow, shallowly punctate, smooth, shining (Fig. 15); elytra subparallel-sided in dorsal view (Fig. 16) *E. combustus*
 10'. Rostrum stout, deeply punctate (Fig. 13); elytra slightly expanded posteriorly (Fig. 14)
 *E. nevadicus*

Epimechus curvipes Dietz

Figs. 1, 2, 23, 34, 35

- Epimechus curvipes* Dietz 1891:259, pl. V, Fig. 32. Lectotype (designated by Fall 1913:60). United States. Nevada. [Nev.] [W. G. Dietz/ Coll.] [Type/ 2000] [Epimechus/ curvipes/ Dietz] [LECTOTYPE/ Epimechus/ curvipes/ Dtz./ des. H. R. Burke] (male, MCZC). Paralectotypes (2). United States. Nevada. [Nev.?] [E./ curvipes/ Dtz] [TYPE/ Epimechus/ curvipes/ W. G. Dietz/ 8160] [PARALECTOTYPE/ Epimechus/ curvipes/ Dtz./ des. H. R. Burke] (1 male, MCZC). New Mexico. [N M] [W. G. Dietz/ Coll.] [Type/ 2000] [PARALECTOTYPE/ Epimechus/ curvipes/ Dtz./ des. H. R. Burke] (1 male, MCZC); [N.M.] [Coolidge] [65] [Wickham] [Collection of Chas. W. Leng] (1, BYUC).
Epimechus modicus Fall 1913:60-61. Holotype. United States. Arizona. Pima Co.: [Santa Rita Mts./ Ariz. 5 to 8000 ft./ July, F. H. Snow.] [Epimechus/ modicus/ Fall/ type.] [M.C.Z./ Type/ 25186] [H. C. FALL/ COLLECTION] [Epimechus/ modicus/ Fall.] (female, MCZC). New synonymy.