A NEW GENUS AND SPECIES OF NORTH AMERICAN COROEBINI BEDEL WITH A DISCUSSION OF ITS RELATIONSHIPS WITHIN THE TRIBE (COLEOPTERA: BUPRESTIDAE)

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Reprinted from THE COLEOPTERISTS BULLETIN
Vol. 41, No. 2, June 1987
Made in United States of America
A NEW GENUS AND SPECIES OF NORTH AMERICAN COROEBINI BEDEL WITH A DISCUSSION OF ITS RELATIONSHIPS WITHIN THE TRIBE (COLEOPTERA: BUPRESTIDAE)

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ABSTRACT

A new genus and species, Leptismadora algodonrs Velten, of the agriline tribe Coroebini is described from southeastern California. The genus is compared with its tribal relatives from North and South America and its apparent closest relative, Eudiadora Obenberger, from Argentina.

The recent discovery of a strikingly divergent buprestid, in an area of southeastern California that is generally thought to have been well collected, provides us the opportunity to discuss its apparent affinities in relation to current problems in the tribal definitions of Agrilinae.

The spelling of the tribal type-genus, Coroebus Gory & Laporte, was emended from the more traditional spelling, Coraebus, by Méquignon as cited by Théry (1942). This correction requires the same emendation for the spelling of the tribal name.

The acronyms used for institutions and collections which will receive type specimens are based upon the system of Arnett et al. (1986), with the following not found in that work: ACAS—A. Cobos collection, Almeria, Spain; BLCE—B. Levey collection, Walthamstow, U. K.; GAWC—G. A. Williams collection, Lansdowne, N. S. W., Australia; HMCG—Hans Muhle collection, Pfaffenhofen, West Germany; MTCJ—M. Toyama collection, Nishinomiya, Japan; RKVC—R. K. Velten collection, Riverside, California; and TMCC—T. Moore Rodriguez collection, Laja, Chile.

DISCUSSION

The Coroebini Bedel (Agrilinae) has the largest number of genera (150+) of any buprestid tribe. The species have been most successful in the tropical and subtropical regions, with the largest number of regionally endemic taxa found in the Afrotropical, Madagascan, Indo-Oriental and Neotropical regions.

Until now the Coroebini was represented in North America (north of Mexico) only by Eupristocerus cogitans (Weber), a monotypic genus with strongest

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ties to the Palaearctic tribal fauna, closest perhaps to the type-genus *Coroebus* Gory & Laporte.

Preliminary examination of several species of *Paragrilus* Saunders using characters found to be tribally definitive within the Agrilinae (Bellamy 1986a, b, 1987a, b, unpublished data), i.e., the single lateral carina on the pronotum, subequal lengths of the metatarsal segments and the ovipositor with ventral opposing setal "brushes," show that this genus would probably be better placed in the Coroebini rather than in the Agrilini. *Paragrilus* also possesses characters which point to relationships with the Old World genera currently placed in the Cylindromorphinae Portevin, as well as several genera of Trachyinae Gory & Laporte. It is apparent, however, that the last definition of Nearctic higher taxa (Nelson 1982) did not allow a satisfactory placement for *Paragrilus* and it is hoped that the following key will provide a better view of the relationships of the four North American agriline genera.

### Key to the Genera of North American Agrilinae

1. Pronotum with entire lateral marginal carina and one submarginal carina (Agrilini) .......... *Agrilus* Curtis
   - Pronotum without submarginal carina, sometimes without any lateral carinae (Coroebini) .......... 2

2. Frons with deep longitudinal groove (Fig. 2); ovipositor with ventral pair of opposing setal "brushes" (Fig. 11); pronotum without lateral carinae (Fig. 7); body covered with squamose setae .......... *Lepismadora* Velten, gen. nov.
   - Frons without deep groove, although disc may be longitudinally depressed between eyes; ovipositor without ventral "brushes," more or less similar to dorsal aspect; pronotum with lateral carinae; body only sparsely setose .......... 3

3. Antennae free in repose; anterior prosternal margin very feebly bi-lobed .......... *Eupristocerus* Deyrolle
   - Antennae in repose received in grooves in hypomera ventrad to pronotal marginal carinae; anterior prosternal margin strongly convex medially .......... *Paragrilus* Saunders

*Genus Lepismadora* Velten, gen. nov.

Type-species: *Lepismadora algodones* Velten, sp. nov.

**Description.** Small, length less than 7.0 mm; subcylindrical; elongate ovoid; dorsal surface moderately and ventral surface densely clothed with squamose setae.

*Head* (Fig. 2): Frons flat with deep narrow longitudinal sulcus confluent with angularly arcuate sulcus between supra-antennal prominences, slightly elevated carina parallel to inner margin of eye joining supra-antennal prominence with small angular prominence near upper pole of eye; vertex broadly convex when viewed from front; eyes large, prominently convex, inner margins widely diverging dorsally; antennal cavities small, circular, separated by distance slightly more than twice individual width; frontoclypeus feebly elevated, slightly narrowed between antennal cavities, laterally depressed ventrad to antennae; apical margin arcuately emarginate medially, laterally more or less straight to opposite ventral apex of eye, gena with broadly rounded subacute lobe; labrum slightly wider than exposed length, punctate, distal margin feebly emarginate medially, sparsely clothed with elongate appressed setae. *Antennae* generally covered with squamae; serrate from antennomere 5.

*Pronotum* (Fig. 7): Wider than long; anterior margin slightly arcuate medially; pos-
Fig. 1. *Lepismadora algodones* Velten, sp. nov., dorsal habitus (scale bar = 1 mm).
terior margin bisinuate; disc convex, not separated from hypomeron by carina. *Scutellum* triangular.

**Elytra** (Fig. 7): At base wider than pronotum; epipleural lobe slightly deflexed, vaguely differentiated from disc.

**Pygidium:** Partially visible from above.

**Thoracic sternites** (Figs. 4, 7): Prosternum with anterior margin entire, without lobes; prosternal process lateroapically rounded to very narrow acuminate apex; sternal cavity for reception of prosternal process formed by mesosternum laterally and at apex by metasternum; mesosternum partially internally hidden beneath prosternal process when viewed from below; metepimeron partially hidden beneath anterolateral projection of basal abdominal sternite; metacoxal plate with posterior margin broadly arcuately emarginate.

**Legs:** Generally covered with squamae; femora fusiform; protibiae slightly arcuate, meso- and metatibiae straight, all unarmed; tarsomeres subequal in length, 1–4 successively slightly longer, ventral pulvilli increasing in size distad; tarsomere 5 slightly longer than 3 and 4 together, claws stout, deeply bifid with outer tooth slightly longer.

**Abdominal sternites** (Fig. 7): Basal sternites slightly expanded laterally, partially visible from above; suture between sternites and pleurites hidden beneath elytra; suture between sternites 1 and 2 only vaguely indicated laterally beneath squamae; sutures between remaining sternites visible, more or less evenly transverse; sternite 5 with lateral margin rounded, apex subtruncate, with submarginal carina parallel to margin.

**ETYMOLOGY.** The feminine generic name is a combination of the Greek *Lepos,* referring to the scales, and *dora,* a Greek noun (hide, skin) within the Coroebini to connote relationship to *Eudiadora* Obenberger.

**REMARKS.** Following Good (1925) and recent comments concerning coroebine wing venation (Bellamy 1986a:100), the metathoracic wing has the typical coroebine configuration observed for Afrotropical relatives, as follows: 1) a two-branched first anal vein (1A, 1A.), a three-branched second anal vein (2A., 2A., 2A.) and a single third (3A.) and fourth (4A.) anal veins and 2) the radiomedial crossvein (r-m) is only vaguely indicated. A significant difference from previously examined tribal relatives (Bellamy 1986a, unpublished data) is that the radial cell (r) is open basally. The ovipositor (Fig. 11) follows the general configuration for the majority of examined tribal relatives (see comments, Bellamy 1987b) by having an asymmetrical dorsal/ventral aspect. The structure is short, with two short apical coxites on the dorsal surface, while the ventral face is lobed laterally with an opposing pair of dense setal “brushes.”

*Lepismadora* differs significantly from most of its tribal relatives including *Eudiadora,* the predicted sister genus, by the presence of the two pairs of prominences on the head (Fig. 2), the absence of lateral marginal carinae on the pronotum (Figs. 7, 8a), the reduced elytral epipleura and the vague carina between the epipleuron and elytral disc (Figs. 7, 8b), the dorsal and subelytral orientation of the carinae between the abdominal pleurites and sternites (Figs. 7, 8c), the male genitalia with asymmetrical parameres (Fig. 9) and the basally open radial cell of the wing (Fig. 6r). The specific generic relationships will be discussed following the species description.

**Lepismadora algodones** Velten, sp. nov.

Figs. 1, 2, 4, 6, 7, 9–11

Holotype male. Length 5.2 mm, width 2.0 mm; head, antennomeres, pronotum, scutellum, elytral margin, underside and femora brassy green; elytral disc, tibiae and tarsomeres 1–4 a stramineus color; squamose setal covering dense on head, along midline and lateral portion of pronotum and generally on underside; pronotal disc and elytra with squamae irregular, partially replaced by stout setae as shown in Fig. 1; pronotum coarsely alveolate punctate beneath squamae, surface otherwise more finely punctate.

**Head,** when viewed from above, narrower at widest point than pronotum. **Antenna** with antennomere 1 subgeniculate, swollen; 2 subequal to 1; 3 and 4 subequal, individual length and width about ½ that of 2; serrate from 5, width
Figs. 2, 4, 6, 7, 9–11. *Lepismadora algodones* Velten. Figs. 3, 5, 8, *Eudiadora pulchra* (Obenberger). 2, 3, head, frontal view. 4, 5, thoracic sternites, ventral view (Mc = mesocoxa; Ms = mesosternum; Mt = metasternum; Pc = procoxa; Ps = prosternum). 6. Metathoracic wing, dorsal view (r = radial cell; r-m = radiomedial crossvein; 1A₁ = first branch of 1st anal vein; 1A₂ = second branch of 1st anal vein; 2A₁ = first branch of 2nd anal vein; 2A₂ = second branch of 2nd anal vein; 2A₃ = third branch of 2nd anal vein; 3A₁ = 3rd anal vein; 4A₁ = 4th anal vein). 7, 8, lateral view (a, lateral pronotal carina; b, epipleuron; c, lateral abdominal carina). 9, 10, male genitalia, dorsal and lateral views, respectively. 11, ovipositor, posterior view. Scale bars = 1 mm.
to length ratio slightly increasing distally with 10 narrower than 9; 11 narrower
than 10, apex truncate. Pronotum ca. 2.5× as wide as long, widest at apical
2/3; posterolateral angles acute; lateral margins, when viewed from above, sinuate
from base to before middle, then arcuate to apex. Scutellum slightly wider than
long, basal margin feebly convex, basolateral angles roundly acute, disc slightly
depressed. Elytra widest opposite humeri, ca. 1.7× as long as wide; humeri
moderately elevated, slightly oblique; lateral margins narrowing past epipleura,
more or less subparallel to apical 1/3, then serrulate and gradually attenuate to
narrowly, separately rounded apices. Pygidium with feebly elevated longitudi-
dinal median carina obscured by dense broadly elongate setae; sides feebly
widening to rounded lateroapical angles, apical margin broadly arcuate. Gen-
italia (Figs. 9, 10) with parameres asymmetrical, fused from base to past apical
1/3 ventrally, only partially fused dorsally; median lobe asymmetrical.

VARIATION. The size varies in the type-series: length 4.0–6.5 mm, width
1.4–2.1 mm. Females differ from males by being generally larger and slightly
more robust. The color varies both allometrically and sexually in the type series
with the smaller males exhibiting a cupreous tint and the larger specimens
tending to be a more brassy green. The females tend to be more uniformly
brassy with a greenish tint. The color of the squamae also varies somewhat,
but this might represent an age factor, which is further exemplified by the
variable and irregular covering of the squamae, particularly on the elytra,
probably due to abrasion. The last visible sternite is sexually dimorphic, another
previously observed trend within the tribe (Bellamy 1986a). The submarginal
carina on the male is truncate apically and very feebly serrulate, while on the
female the carina is slightly emarginate medially, slightly more strongly ser-
rulate and also more strongly produced posteriorly.

MATERIAL EXAMINED. Holotype, male (CASC): U.S.A.: CALIFORNIA: IM-
PERIAL CO., Algodones Sand Hills, 7.2 mi W. Glamis, 18.VI.1986. R. K. &
M. I. Velten, D. S. Verity; 159 paratypes: 49 ex., same data as holotype; 8 ex.,
same data except, 15.VI.1986; 40 ex., same data except, 21.VI-1986, R. K.
Velten and A. J. Mayor; 49 ex., same data except, 27.VI.1986, D. S. Verity;
18 ex., same data except, 1.VII.1986, D. B. Dozier; 5 ex., same data except,
Paratypes are deposited in ACAS, BKDC, BLCE, BMNH, CASC, CDAE,
CHAH, CISC, CLBC, DSVC, FMNH, FSCA, GAWC, GCWC, FHNC, HMCG,
LACM, MTCJ, MNHN, NMPC, RKVC, RLWE, TMCC, VCRC, USNM and
WFBC.

ETYMOLOGY. The specific name is exactly that of the general type locality,
the Algodones Sand Hills of southeastern California.

REMARKS. The majority of the type-series was collected by sweeping flow-
ering Tiquilia plicata (Torrey) Richardson (Boraginaceae). Adults were active
during the hottest part of the day and were observed feeding on the flowers
and foliage or at rest on the foliage. Several other adults were observed at rest
on dead twigs on the soil surface.

RELATIONSHIPS WITHIN THE COROEBINI

The overall morphology of Lepismadora is closest to that of two examined
species of Eudiadora from Argentina, as shown in Figures 2–5, 7, 8. Thus, we
predict that Eudiadora is the probable sister genus of Lepismadora from a very
ancient lineage dichotomy.

The cylindrical body and anteroposteriorly compressed prosternum suggest
a possible ancient relationship between Meliboeithon Obenberger, Eudiadora and Lepismadora. These appear to be apomorphic characters that are repeated within several independent lineages of Coroebini and may have some cause/effect on the putative association between at least some of the species and monocot hosts. This has recently been demonstrated in the genus Lepidoclema Bellamy and Holm (1985) for two new grass-associated species from the Namib desert, by associations for species of Paracephala Saunders and Meliboeithon in Australia (Bellamy 1987b) and by comments by M. G. Volkovitsch (in litt.) regarding the association of Clema deserta Semenov with grasses in the cold deserts of the Soviet Union.

The presence of the deep longitudinal groove on the frons is a character that L. algodones shares with species of four Neotropical coroebine genera, Trypantius Waterhouse, Cyphothorax Waterhouse, Dismorpha Gistel (=Stenogaster Solier) and Eudiadora and three Australian coroebine genera, Ethon Gory and Laporte, Synechocera Deyrolle and Meliboeithon. The presence of the groove on the frons should not be given too much importance, when considered against overall morphology and, indeed, this was recently demonstrated in a cladistic study of the Australian coroebine genera (Bellamy 1987b), with the groove apparently being symplesiomorphic and perhaps atavistic in nature. The same conclusion would seem to be true for the New World coroebines, which possess this groove, as Trypantius, Dismorpha and Cyphothorax all show a number of morphological differences from both Eudiadora and Lepismadora.

Another character state that seemingly repeats in derived coroebine lineages is that of the male genitalia having, at least partially, fused parameres. This character is found in species of several otherwise apomorphic genera in the Afrotropical region, Lepidoclema, Promeliboeus Obenberger, Pseudoclema Théry and Anadontodora Obenberger and in the Australian Dinocephalia Obenberger (Bellamy 1987b). The almost entirely exposed pygidium is a character shared by Lepismadora and Lepidoclema and suggests that a number of the similarities between these two genera are prerequisite adaptations induced independently by similar habitats. This possibility leads us to speculate that Lepismadora may have a similar biology with oviposition taking place at the external root-crown/substrate (sand) interface of one of very few dune perennial shrubs or grasses which inhabit the Algodones sand hills. An additional apomorphy is the dense covering of squamose setae, which is also found in Lepidoclema, although this may be an adaptive character for protection against desiccation in arid regions. It is interesting to note that several unrelated buprestids, e.g., Acmaeodera ephedrae Barr, A. yumae Knnull and Acmaeoderoides straminea Nelson, collected at the same general locality and habitat type as Lepismadora possess a dense setal covering along with a similar golden stramineus elytral color.

The geographical relationship between Lepismadora and Eudiadora can best be termed amphitropical, even though Crowson (1980) preferred the term amphipolar, with Eudiadora having at least one species found in the Catamarca desert region of northwestern Argentina.

ACKNOWLEDGMENTS

We would like to thank the following individuals: firstly, Mimi Velten, for finding the first specimen of this exciting new beetle; D. S. Verity, Botanical Gardens, U.C.L.A., for helping to collect a large portion of the type-series; G.
H. Nelson, College of Osteopathic Medicine of the Pacific, Pomona, Calif., and R. L. Westcott, Oregon Dept. of Agriculture, Salem, for their comments, suggestions and critical review of the manuscript; H. A. Hespenheide, Dept. of Biology, Univ. of Calif., Los Angeles, for comments and suggestions; M. G. Volkovitsh, Soviet Academy of Sciences, Leningrad, U.S.S.R., for his comments; Sue Thomson, Nat. Coll. of Insects, Pretoria, R.S.A., for the excellent dorsal habitus illustration (Fig. 1) and lastly to Prof. E. Holm, Univ. of Pretoria, for his continuing support and encouragement for one of us (CLB).

Literature Cited


(Received 7 January 1986; accepted 9 January 1987)