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A new species of 'jumping shore beetle' in the genus *Mexico* Spilman from the Bahamas (Coleoptera: Limnichidae: Thaumastodinae)

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Abstract. A second species of the genus *Mexico* Spilman, *Mexico morrisoni* n.sp, (Limnichidae, Thaumastodinae) is described from the Bahama Islands.

Introduction

While studying arthropod diversity and allochthonous-based food webs in the Bahamas, Dr. Lloyd Morrison ran yellow pan traps on small, unnamed islets between the Harvey Cays and Staniel Cay in the central Exuma Cays (Morrison, in prep.). These islets consist primarily of marine limestone, with little or no sand, and most were less than 200 m^2 in size. Most of these islets had no naturally occurring plants, but a few had one or two species of vascular plants. Although all of the islets had emergent areas, all could be inundated by heavy wave action during storms or at very high tides. Few insects are able to withstand submergence or quickly recolonize recently submerged areas. In this study, the only insects found in abundance were collembolans, a ceratopogonid dipteran (W. Grogan, unpublished manuscript), and the limnichid beetle described here. This limnichid was found on a majority of the islets, of all sizes and emergent types studied.

Materials and Methods

Specimens are deposited in the following collections: (EMEC) Essig Museum of Entomology, University of California, Berkeley CA; (FSCA) Florida State Collection of Arthropods, Gainesville FL; (MAIC) Mike Ivie, Montana State University, Bozeman MT; (USNM) United States National Museum, Smithsonian Institution, Washington DC.

THAUMASTODINAE Champion 1924

Diagnosis. Thaumastodine limnichids can be recognized by their hypognathous head with large, narrowly separated, dorsally placed eyes; enlarged mesocoxae; heavily spined hind legs; and a tarsal formula of 4-4-4 or 4-5-5. See Spilman (1959) for a lengthy description.

Remarks. The subfamily Thaumastodinae consists of 5 genera and 15 species (Spangler 1995, Spangler et al. 2001, Hernando and Ribera 2003): *Acontosceles* Champion with 3 species from Japan to the Philippines and west to India, *Babalimnichus* Satô with 3 species in Japan and Taiwan, *Martinius* Spilman with 3 species from the Americas, *Mexico* Spilman now with 2 species from Mexico and the Bahamas, and *Pseudeucinetus* Heller with 4 species widespread in Asia.

Spilman (1972) gives a key to the world's genera of Thaumastodinae. Wooldridge (1975) overlooked *Mexico* in his key to the New World genera of the Limnichidae. Shepard (2002) presents a key to genera north of Mexico: *Mexico* is not presently known to occur there. *Babalimnichus*, only recently described from eastern Asia, does not appear in any of these keys (see note under Remarks below).

Mexico **Spilman 1972**

Type species: *Mexico litoralis* Spilman 1972, by monotypy.

Diagnosis. Length 1.6-2.0 mm. Eyes widely separated, distance half or more of eye length. Antennal groove of gena with 2 parts; a dorsal setose and densely punctate part distinctly separated from a ventral glabrous, shining, impunctate (Fig. 4-5). Antenna 11 segmented, antennomere III tightly fitting on apex of antennomere II; antennal club of 4 segments. Elytral apex with margin bearing about 10 small teeth. Male genitalia with parameres shortened, length less than median lobe; median lobe with 3 sclerotized parts. Tarsal formula 4-4-4.

Remarks. *Martinius*, the only other New World thaumastodine, differs from *Mexico* by having 7 segmented antenna; a one part, broad, setose antennal groove; and an untoothed, rounded elytral apex. The 3 species of *Martinius* occur in Cuba, Panama, and Ecuador (Spilman 1959, 1966; Wooldridge 1988).

Babalimnichus (Satô 1994) appears closely related to *Mexico*, sharing all of the generic characters outlined above, except for the possible development of the antennal groove on the gena. This structure was not mentioned by Satô, but it seems likely that the two genera are congeneric.

Mexico morrisoni Skelley, n.sp.
(Figs. 1-6)

Description. Holotype male, length 1.9 mm, width 1.0 mm. Fitting the description of *M. litoralis* as given by Spilman (1972), except for the following characters.

Body slightly more elongate (Fig. 3, 6). Coarse dorsal punctures prominent, 3-4 times wider than fine punctures, separated by one puncture diameter. Dorsal surface covered with dense, mixed coarse and fine, setiferous punctures; setal coloration creates a pattern of prominent color bands (Fig. 6), white bands wider than brown bands. Legs and associated spines entirely black. Dorsal separation of eyes equal to 0.6 length of eye in lateral view.

Male genitalia (Figs 1-2) with parameres half length of median lobe; median lobe (= penis, Spilman 1972) with 3 distinct sclerotized parts, 2 lateral parts and a dorsal part; dorsal part club shape with constricted tip and middle; parts of median lobe narrowly separated, not fused and slightly movable.

Variation. Length 1.6-2.0 mm, width 0.8-1.0 mm. No notable variation nor external sexual dimorphism was observed.

Remarks: The only other species known in the genus, *M. litoralis* (Fig. 7), differs from *M. morrisoni* in being slightly broader, having dark brown legs with contrasting black spines, less prominent coarse dorsal punctures separated by 2 puncture diameters, eyes separated by about 0.8 times eye length, and the color pattern not as prominent, with brown bands much wider than the white bands. In addition, the parameres of *M. litoralis* are 0.75 times the length of the median lobe, and the median lobe is not narrowed at the middle, nor separated into 3 distinct parts. However, the median lobe of *M. litoralis* has 3 sclerotized areas that are more tightly connected and appear to act as a single unit. *Mexico litoralis* is found on the west coast of Mexico, while *M. morrisoni* is found in the Bahama Islands.

Material examined. Holotype male with following label data: "**BAHAMAS**: Central Exuma Cays, 24°12.6'N-76°29.4'W, Dec.-2002, pan traps, L. Morrison, BR-11" (FSCA).

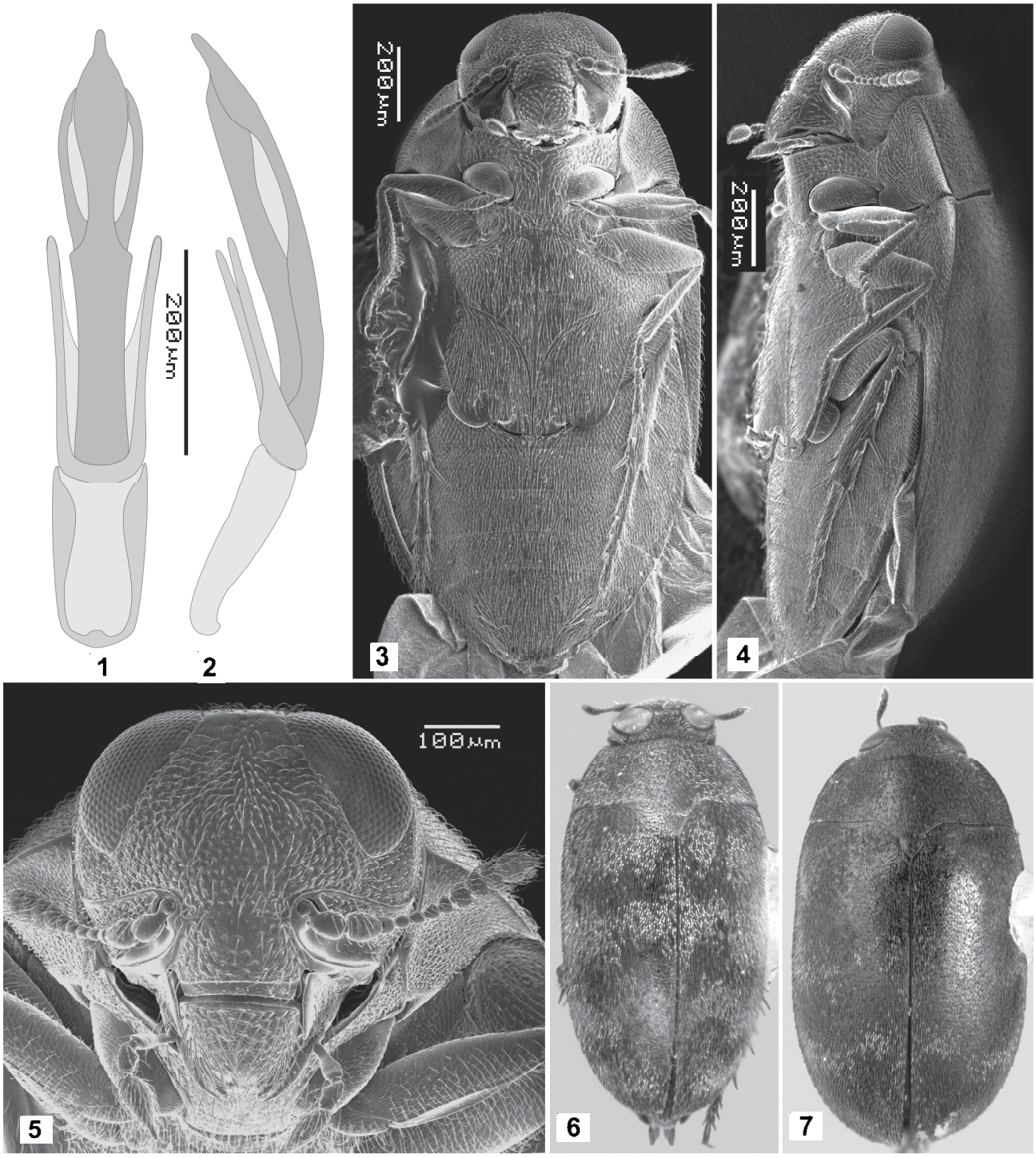
Paratypes (22 total in EMEC, FSCA, MAIC, USNM): (3) same data as holotype; (4) same data except, 24°12.1'N-76°28.7'W, May-2003, BR-16; (3) same data except, 24°12.0'N-76°28.5'W, Dec.-2002, BR-17; (9) same data except, 24°09.8'N-76°28.6'W, May-2003, BR-37; (3) same data except, 24°09.0'N-76°27.9'W, 17. The number at the end of each set of data, "BR-...," are codes referring to Dr. Morrison's study.

Comments

Thaumastodines are known to jump (Spilman 1966, 1972), having been called the 'jumping shore beetles' (Hernando and Ribera 2003), and are difficult to catch. This behavior could explain the unusual development of the metacoxa and hind legs.

Intertidal areas, especially on isolated islets, are not the usual places entomologists think to look for specimens. At least one limnichid is reported to feed on algae (Paulus 1970), and given the scarcity of plants in intertidal areas, that may be their food source in this niche.

Some limnichids (e.g.*Throscinus* LeConte, *Hyphalus* Britton, and the Cephalobyrrhinae) are known to occur in intertidal zones or tidal mud flats (Shepard 2002, Hernando and Ribera 2004, Shepard 1979 respectively). In the Thausmastodinae, *Acontosceles* (Champion 1924) and *Pseudeucinetus* (Spangler 1995) in Asia is found in riparian areas. However, other members of the Thaumastodinae appear to prefer intertidal or brackish waters. Members of the genera *Martinius*, *Babalimnichus,* and *Mexico* are known to occur in "high and mid-tide rock crevices" (Spilman 1972), "brackish lagoon" (Wooldridge 1988), "moist sand among the mangroves and 'dog-teeth' limestone in the intertidal zone" (Spilman 1966), "tide pools on a rocky seashore, though they may have jumped in the pools from rocky walls" (Satô 1994), "coral reefs at



Figures 1-7. *Mexico* species. 1-6) *Mexico morrisoni*; 1) Male genitalia, dorsal view; 2) Male genitalia, lateral view; 3) Ventral habitus; 4) Lateral habitus; 5) Head, anterior view; 6) Dorsal habitus; 7) *Mexico litoralis*, dorsal habitus.

low tide" (Satô 1994), and "coral cliff by sea" (Hernando and Ribera 2003). Suspected larvae of *Babalimnichus masamii* Satô were collected in an intertidal area (Yoshitomi and Satô 2001). It seems likely that this overlooked niche may hold many more taxa in other places around the world.

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