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Additions to paleotropical *Bruchidius* associated with Desmodieae (Coleoptera: Chrysomelidae: Bruchinae)

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Abstract. Three species of Bruchinae are reported for the first time from Vietnam as feeding in seeds of members of leguminous tribe Desmodieae (Fabaceae - Faboideae). Two of them are new to science and described in genus *Bruchidius*: *B. hoangi* and *B. madaguiensis*. A redescription of *B. minutissimus* (Motschulsky) is also provided.

Key words: entomology, taxonomy, Coleoptera, Bruchinae, new species, Desmodieae, *Alhagi, Dendrolobium, Desmodium*.

INTRODUCTION

Desmodieae are a leguminous tribe of Faboideae (or Papilionoideae) with numerous members in tropical regions; it is composed of 27 genera, of which *Desmodium* and *Lespedeza* are the largest. About 190 Desmodieae species are present in Vietnam according to Pham-Hoàng Hô (2002). Recent contributions by Delobel (2010a, b) for Asian Desmodieae and Chan et al. (2011) for world *Desmodium* have unveiled an unsuspected diversity of Bruchinae associated with this large group of plants.

I report here on three *Bruchidius* species reared from pod samples of *Dendrolobium lanceolatum*, *Desmodium gangeticum* and *Tadehagi triquetrum* that were collected in Vietnam. This brings the number of seed beetles species known to be associated with Desmodieae in Vietnam to sixteen, and to nineteen (or twenty) species for Asia as a whole. Techniques used for sample collection and rearing were similar to those described earlier (Delobel & Delobel 2003). Leguminous host plants were identified using the Flora of Vietnam (Pham-Hoàng Hô 2002), and botanical names were updated according to ILDIS (2014); I am greatly indebted to Dr. H. Ohashi (Tohoku University Herbarium, Sendai), who identified samples of *D. gangeticum* from Madagui. Abbreviations used: MNHN, Muséum national d'Histoire naturelle, Paris; CBAD, author's collection.

SPECIES DESCRIPTION

Bruchidius hoangi n. sp.

Type material

Holotype: Male, VIETNAM, Ba Ria – Vung Tau Province, Phuoc Buu, Ho Coc, 14.ii.2011, ex *Dendrolobium lanceolatum*, H. & A. Delobel coll., MNHN. Paratypes: 4 males, 5 females, same data as holotype, one male dissected, genitalia in drop of DMHF, MNHN (7), CBAD (2).

Description

Length (pronotum-pygidium): 1.6-2.0 mm; width: 1.1-1.3 mm.

Body stout, thick, pygidium subvertical. Integument almost entirely black; antenna testaceous, except segments 8-10 with apex, and apical half of last segment, darkened, four anterior legs testaceous to light brown, with last tarsal segment black; posterior legs black, except tarsal segments 2-4 partly or entirely brown.

Vestiture dense, made of scaly setae well covering integument, greyish, yellowish and light brown; pronotum disc with mixed yellowish and greyish setation, whitish laterally and on prescutellar lobes, last visible tergite white, with denser setation on basal triangle, along midline and on sides. On elytra, brownish setae form small patches: two on interval 3, 7 and 9, and less conspicuous areas on remaining intervals.

Male. Head short, eyes moderately bulging, maximum head width 1.46 times width behind eyes; eyes separated by 0.18 times head width including eyes; face short and narrow, with distance between posterior rim of eyes and apex of clypeus / distance between eyes = 4.0; eye shallowly cleft, width at bottom of sinus composed of 8 ommatidia; carina on frons well defined, interocular tubercule absent. Punctation of face dense, rather shallow, clypeus shining. Antenna (Fig. 1) moderately elongated, measuring about 70% body length (excluding head); antennal segments 1-3 submoniliform, 4-10 slightly widened towards apex, 1.2 to 1.3 times longer than wide, 11 oval (L/W = 1.8). Length of antennomeres: 1.8; 1.0; 1.5; 1.9; 2.0; 2.0; 2.2; 1.9; 1.9; 2.0; 3.3.

Pronotum subtrapezoidal, slightly campaniform, with greatest width at base (W/L = 1.32), its sides almost straight, not expanded behind eyes, with shallow oblique impression on sides of basal lobe. Pronotum disc with punctures strong and dense, ocellate, coalescent. Elytra 1.1 times longer than combined width, their sides convex; disc slightly concave basally; two tubercles at base of striae 3 - 5. Striae on disc deep, with large punctures; interstriae with strong microsculpture, on shining background.

Hind femur moderately incrassate, mesoventral margin with strong acute preapical denticle; hind tibia strongly widened towards apex, its carinae well defined; tibial mucro about 1.5 times longer than width of tarsomere 1 at base; lateral denticle about one third mucro length, and dorsal denticles inconspicuous.

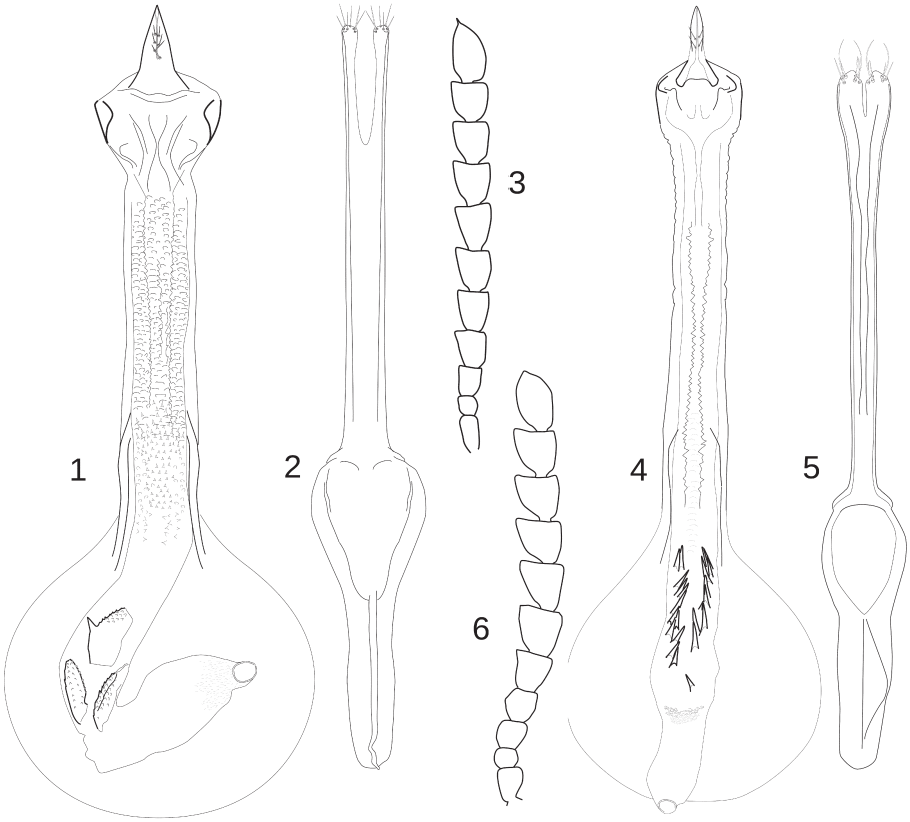
Abdomen telescoped, ventrite 1 with a very small patch of denser setation in basal angle, ventrite 5 emarginated, half as long medially as sternite 4; last visible abdominal tergite shield-shaped, slightly longer than wide, with apex not turned under.

Genitalia: Median lobe (Fig. 2) of moderate length, moderately stout (maximum width excluding basal hood / total length = 0.16), greatly widened apically; basal hood small, not emarginate; ventral valve large, subtriangular, moderately sclerotized, bearing a median group of 6 setae; dorsal valve braced by a wide sclerotized ring; internal sac lined with poorly sclerotized blunt tubercules on ventral wall of endophallus, and small teeth on dorsal wall; distally smooth, with three large sclerites bearing rows of minute denticles, the proximal one with a large straight tooth; gonopore large, ring-shaped. Basal strut (Fig. 3) with narrow keel; lateral lobes fused on one fourth of their length; apex of parameres with 6 small setae.

Female. Similar to male, but ventrite 5 not emarginated, longer than ventrite 4. Antennae shorter and darker than in male.

Etymology

The species is dedicated to Tran Cong Hoang, for his keen and helpful interest in the discovery of new Vietnamese seed beetles.



1-6. Male *Bruchidius*: 1-3 – *B. hoangi* n. sp.; 4-6 – *B. madaguiensis* n. sp.; 1, 4 – median lobe; 2, 5 – lateral lobes and tegminal strut; 3, 6 – antenna

Host plants

Reared from seeds of *Dendrolobium lanceolatum* (Dunn) Schindl., a small tree present in Cambodia, Southern China, Laos, Thailand, and Vietnam (Ohashi 1973).

Discussion

In Delobel's key (2010), it would run to *B. phuanensis* Delobel, but it is smaller, with smaller and less conspicuous dark spots than the latter; in addition, the internal sac of *B. phuanensis* is devoid of large dented sclerites.

Distribution

Vietnam

***Bruchidius madaguiensis* n. sp.**

Type material

Holotype: Male, VIETNAM, Lâm Đồng *Province*, Đạ Huoai, KDL Madagui, ex *Desmodium gangeticum*, 11.i.2012, H. & A. Delobel, genitalia on cardboard, MNHN. Paratypes, 19 males, 13 females, same data as holotype, three males dissected, genitalia in drop of DMHF, MNHN (28), CBAD (4); 2 males, 1 female, same data but 15.ii.2012, MNHN.

Description

Length (pronotum-pygidium): 1.4-1.6 mm; width: 0.8-1.0 mm.

Body stout, rather thick, pygidium subvertical. Integument black, with four basal antennal segments testaceous, segment 5 darkened, anterior leg testaceous from femur base, median leg from femur apex; posterior leg black, except tarsal segments 1-4 partly reddish, particularly on underside.

Vestiture made of thin whitish, yellowish and dark brown setae, not completely covering integument; pronotum disc dark yellowish with a narrow white midline, its sides mostly white, interstriae 1-2 yellowish, on elytra, dark spots follow the usual pattern and form a well-defined black area at base on interstriae 3-8 and on intervals 5-10, just beyond middle; elytral apex black on internal half, whitish on external half; white setae are particularly dense on prescutellar lobe and along the longitudinal midline on pronotum, on pronotum sides, on two elongated spots on elytral interstria 3; they also form an acute triangle at base of last visible tergite.

Male. Head short; eyes strongly bulging, maximum head width about 1.4 times width behind eyes; eyes separated by 0.19 times head width including eyes; face moderately wide, with distance between posterior rim of eyes and apex of clypeus / distance between eyes = 3.6; eye deeply cleft, width at bottom of sinus composed of 4-5 ommatidia; carina on frons well defined, interocular tubercule strong, shining. Face alutaceous, with scattered puctures. Antenna (Fig. 4) long, measuring 67% body length; antennal segments 1-3 submoniliform, 4 subtriangular, following segments subserrate, eccentric, 11 oval (L/W = 1.8). Length of antennomeres: 1.7; 1.0; 1.3; 1.6; 1.9; 2.3; 2.3; 2.2; 2.2; 2.2;3.2.

Pronotum subtrapezoidal, slightly campaniform, with greatest width at base (W/L = 1.4), its sides feebly convex in middle, not expanded behind eyes; regularly convex in side view, without oblique impression on sides of basal lobe; cuticle with small, dense, coalescent and ocellate punctures on shagreened background. Elytra 1.1 times longer than combined width, their sides convex, maximum width beyond middle; disc not flattened; tubercle at base of interstriae 3 and 4 well developed, with minute teeth. Striae on disc narrow, stria 1 conspicuously deeper; interstriae wide and flat, with strong microsculpture.

Hind femur moderately incrassate; mesoventral margin with small, acute preapical denticle; hind tibia apically strongly widened, with dorsomesal and ventral carinae complete, other carinae barely discernible; mucro 1.2 times longer than width of tarsomere 1 at base; lateral denticle obtuse, about 1/3 mucro length, and dorsal denticles minute.

Abdomen strongly telescoped ventrally, with ventrite 5 emarginate, medially inconspicuous; ventrite 1 basally with an elongated, poorly defined patch of dense white setae. Last visible abdominal tergite shield-shaped, 1.1 times longer than wide at base, strongly convex, though with apex not turned under.

Genitalia: Median lobe (Fig. 5) elongated, thin, slightly widened apically (maximum width excluding basal hood / total length = 0.11); basal hood moderately wide, not emarginate; ventral valve strong, acutely triangular, with apex pointed, bearing two central groups of 2 setae; dorsal valve braced by a narrow sclerotized ring; internal sac lined with strands of small weakly sclerotized tubercles; saccus with two rows of large spines; distal bulb with thin multifid spicules, gonopore subcicular. Basal strut (Fig. 6) with a large and transparent keel; lateral lobes cleft to 10% their length; apex of parameres with a small conical expansion and six setae.

Female. Similar to male, but last visible tergite slanted about 20°, almost flat; base of ventrite 1 without area of dense white setation; last ventrite 3 times longer on midline than ventrite 4.

Etymology

This species is named after its locus typicus, the Madagui forest resort (Khu Du Lịch Rừng), 11°25’44”N, 107°34’43”E in Lâm Đồng Province.

Host plants

Larvae develop in the seeds of a local population of *Desmodium gangeticum* (L.) DC. with hairy stem and very short petioles (Ohashi, *in litt*.); the species is common throughout the tropical regions of the Old World, including Australia (ILDIS 2012).

Discussion

In Arora’s key (1980), this species would run to *B. mussooriensis* Arora, a beetle with uniform pubescence, median lobe with three sclerotized plates and truncated ventral valve. In Delobel’s key (2010b), it would run to *B.anderssoni*, a species with slightly lighter dorsal vestiture (in particular, basal and apical black elytral markings more extended in *B. madaguiensis*), with large sclerotized plates in saccus. Male genitalia in *madaguiensis* bear some similarities with those of *B. phuanensis* and *B.*

meibomiaca as the saccus have none of the large sclerites seen in other species of the group. *B. anderssoni* is known to feed in the larval stage in seeds of the same host plant as *B. madaguiensis*: *D. gangeticum* (Delobel, 2010b).

Distribution
Vietnam.

Bruchidius minutissimus (Motschulsky)

Bruchus minutissimus Motschulsky, 1858: 97.
Bruchidius minutissimus (Motschulsky): Vazirani, 1975: 747.

Studied material
2 males, 1 female, VIETNAM, Lâm Đồng Province, Di Linh, Gung Ré forest, pk 17 QL28, 26.xii.2011, ex *Tadehagi triquetrum*, H. & A. Delobel, CBAD.

Redescription
Length (pronotum-pygidium): 1.3-1.6 mm; width: 0.8-1.0 mm.

Body stout, thick, pygidium subvertical. Integument almost entirely black; base of antenna lightened (segments 2-3 testaceous, 1 and 4 brown), anterior (from middle of femur) and median legs (from extreme apex of femur) testaceous, with last tarsomeres darkened.

Vestiture made of whitish, yellowish and olive brown setae; white setae are denser on basal lobes of pronotum, on short fasciae at middle and second third of third interstria. Pronotum olive brown on disc (except short median line), whitish laterally, last visible tergite white. On elytra, dark setae form a large transverse stripe a little behind middle on interstriae 3 to 10, and two circular spots before and beyond white fascia of third and fourth interstria; apex black, with a few white setae.

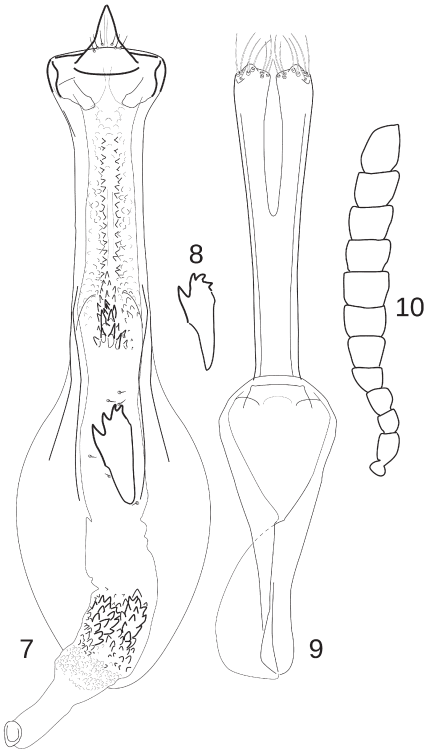
Male. Head short, wide; eyes moderately bulging, maximum head width 1.38 times width behind eyes; eyes separated by 0.25 times head width including eyes; face short and wide, with distance between posterior rim of eyes and apex of clypeus / distance between eyes = 2.66; eye deeply cleft, width at bottom of sinus composed of 4 ommatidia; carina on frons strong and wide, interocular tubercule shining. Punctation of face dense, rather shallow, clypeus strongly alutaceous. Antenna (Fig. 7) short, measuring about half body length (excluding head); antennal segments 1 to 3 submoniliform, 4 slightly widened towards apex, about as long as wide, 5-10 slightly transverse, 11 oval (L/W = 1.5). Length of antennomeres: 1.4; 1.0; 1.2; 1.2; 1.5; 1.6; 1.7; 1.6; 1.7; 1.7; 2.8.

Pronotum narrowly slightly campaniform, with greatest width at base (W/L = 1.32), its sides almost straight, not expanded behind eyes, with shallow oblique impression on sides of basal lobe. Pronotum disc with punctures strong and very dense, ocellate, coalescent. Elytra 1.1 times longer than combined width, their sides convex; disc flattened; a tubercle at base of striae 3 and 4, with a minute tooth visible at base at base

of stria 4. Striae on disc wide, with strong punctures basally; interstriae with strong microsculpture, coriaceous on disc. Hind femur moderately incrassate, mesoventral margin with small acute preapical denticle; hind tibia apically strongly widened, its carinae hardly discernible; apex of tibia with mucro longer than width of tarsomere 1 at base; lateral denticle about half mucro length, and dorsal denticles minute.

Abdomen strongly telescoped, with ventrite 5 emarginated, as long medially as sternite 4; ventrite 1 basally with a large patch of dense short setae. Last visible abdominal tergite shield-shaped, slightly longer than wide, with apex not turned under.

Genitalia: Median lobe (Fig. 8) of moderate length, moderately stout (maximum width excluding basal hood / total length = 0.17), subcylindrical, widened apically; basal hood small, not emarginated; ventral valve subtriangular, moderately sclerotized, bearing two lateral groups of 3 setae; dorsal valve braced by a wide sclerotized ring; internal sac basally lined with moderately sclerotized blunt tubercles; saccus smooth, with a large roof-like sclerite Fig. 9) ending proximally in four teeth, distally two heaps of sclerotized teeth; gonopore large, ring-shaped. Basal strut (Fig. 10) with wide transparent keel; lateral lobes fused on 47% their length; apex of parameres with 7-8 setae.



7-10. Male *Bruchidius minutissimus* (Mots.): 7 – median lobe; 8 – internal sac sclerite, variation; 9 – lateral lobes and tegminal strut; 10 – antenna

Female. Similar to male, but ventrite 5 not emarginated, longer than ventrite 4. Antennae shorter and darker than male.

Host plants

Reared from seeds of *Tadehagi triquetrum* (L.) H. Ohashi (Leguminoseae, Fabaceae, Desmodieae). This species is widespread in Southern and Southeastern Asia, and in Australia, introduced in Réunion and Mauritius islands (ILDIS 2012). Strangely, Kumar *et al.* (2010) report this insect as feeding on the leaves of jambolan (*Syzygium cumini* (L.) Skeels) in India.

Discussion

External and genital morphology is quite similar with that of *B. brincki* and *B. nebulatus*. Like *B. hoangi, B. minutissimus* is characterized by a saccus showing proximally an odd sclerite (roof or gutter-shaped) and a pair of strong, dented sclerites distally to the former, as in most species associated with Desmodieae (Delobel 2010a, b).

Distribution

India, Vietnam.

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