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A New Parasitic Bee of the Genus *Braunsapis* from India (Hymenoptera: Apidae: Allodapini)

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ABSTRACT: A new species of allodapine bee (Apidae, Xylocopinae, Allodapini), *Braunsapis bislensis,* is described from southern India. To judge by its reduced mouthparts and scopa, it is a social parasite, perhaps in nests of *B. puangensis* (Cockerell).

KEY WORDS: *Braunsapis,* Allodapini, social parasite, India, *Humboldtia* domatia

Allodapine bees usually nest in hollow stems or similar small cavities in plants and the inhabitants of such a nest frequently constitute a tiny eusocial colony with two to several adult female bees. Presumably this life style, which is unique among bees and probably ancestral for the Allodapini (Tierney *et al.,* 2002), has led to repeated development of social parasites. These are other allodapines, close relatives of and frequently congeneric with their hosts (reviews by Michener, 1970, 2000, pp. 27, 604). Parasitic allodapines have reduced mouthparts and are unknown as visitors of flowers; they eat in the nests of their hosts. Therefore, they are almost never captured with nets by collectors. They are found by opening the nests of the hosts; a female apparently replaces the egg-layer or queen function of the host (Reyes and Michener, 1990; Batra *et al.,* 1993). The discovery of a new parasitic species is thus an unusual event.

The only genus of Allodapini known in tropical Asia is *Braunsapis,* and of 19 species recognized by Reyes (1991), only two are parasitic, *B. breviceps* (Cockerell) from Java and Malaysia and *B. kaliago* Reyes and Sakagami from near Delhi, India. These two species are closely related to one another and probably represent a single origin of parasitic behavior. The species described below, from southern India, is quite different and probably represents an independent origin of parasitism. Although *B. breviceps* and *kaliago* have been studied in some detail (Reyes and Michener, 1990; Batra *et al.,* 1993), this is not yet true for the new species. We are confident that it is parasitic because of its reduced scopa and short proboscis but observations to verify its parasitic behavior and interactions with hosts have not yet been made.

The abbreviations T and S are used below for metasomal terga and sterna. Thus T6 is the sixth metasomal tergum.

The new species was found in Bisle, a wet evergreen forest in the Western Ghats of India, situated in Hassan District of Karnataka State. The bees were collected from the stem domatia of the ant-plant, *Humboldtia brunonis* Wall. (Fabaceae, Caesalpinioideae) at an altitude of 700 to 750 m. The domatia were not opened; one bee was taken from the entrance of each. Therefore there is no firm evidence of the host of the parasitic species. The nonparasitic *Braunsapis* similarly taken from nearby domatia (and therefore a probable host) appears to be *B. puangensis* (Cockerell). We have only females, which agree with specimens of *B. puangensis.* Males, however, have much more distinctive specific characters and, given the similarities among females of *Braunsapis* species, we would be more confident if we had males.

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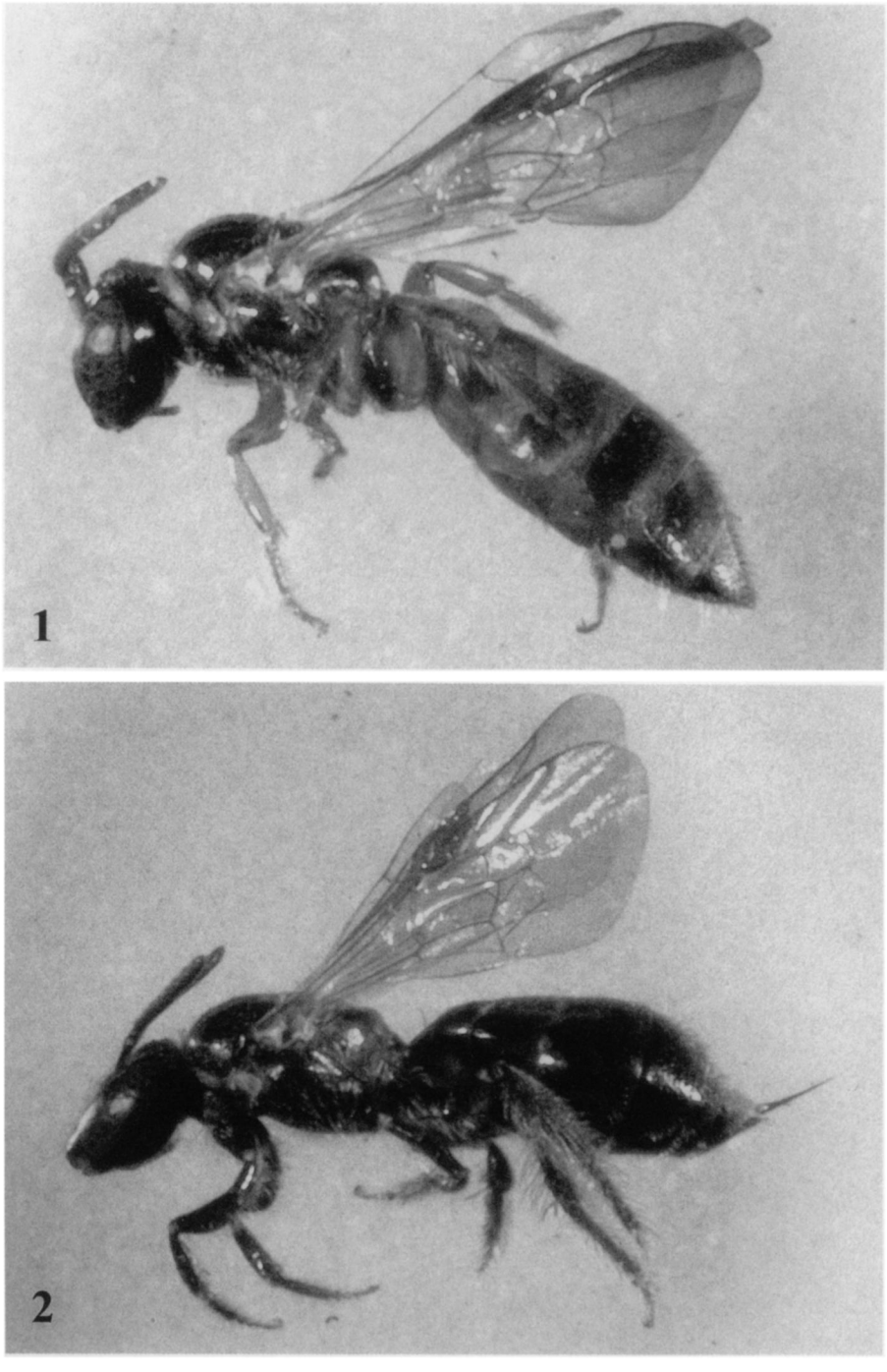
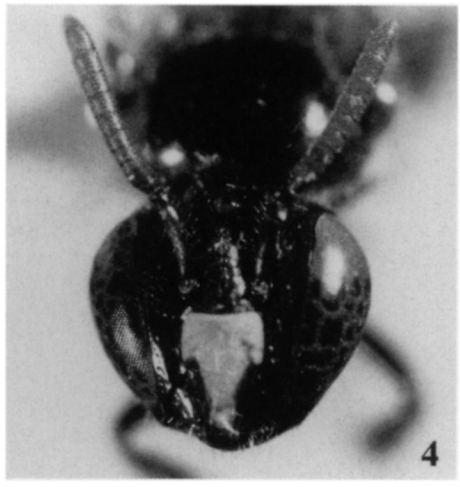


Figs. 1, 2. Lateral views of female *Braunsapis*. 1, *B. bislensis* holotype. 2, *B. puangensis*.



Figs. 3, 4. Faces of female *Braunsapis*. 3, *B. bislensis* holotype. 4, *B. puangensis*.

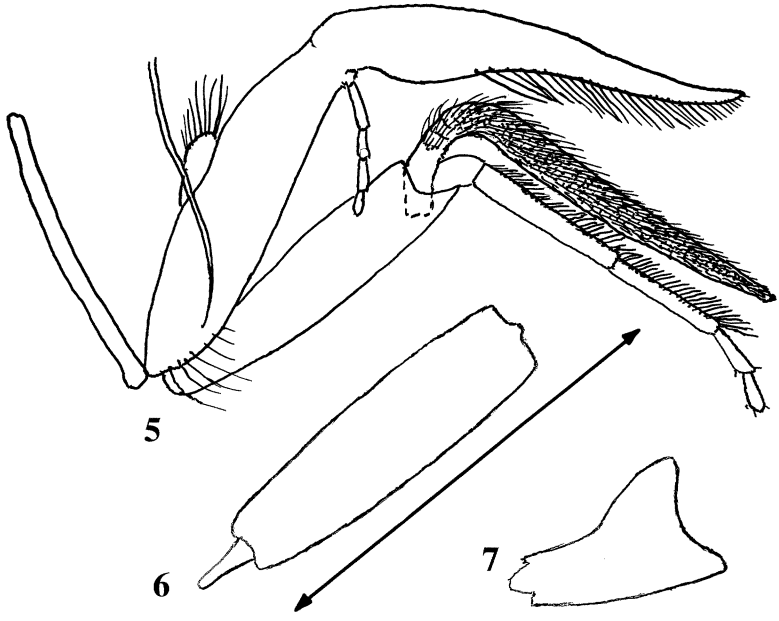
Braunsapis bislensis Michener and Borges, new species

The commentaries and descriptions below are based on females; males are unknown. The habitus is shown in Fig. 1, for comparison with that of the presumed host (Fig. 2).

In Reyes' (1991) key to females of Oriental species of *Braunsapis, B. bislensis* is a problem at the first couplet, for T6 is unmodified, but the mouthparts and scopa are reduced as in other parasitic species. If one considers only the tergal character in couplet 1, and goes to 3, the new species runs to *B. clarihirta* Reyes, found from southeast Asia and Indonesia to the Philippines, a species that has normally developed mouthparts and scopa and thus is presumably not parasitic.

As indicated in Fig. 5, the mouthparts are less reduced than those of *Braunsapis breviceps* and *kaliago,* illustrated by Reyes (1991), who also showed mouthparts of a nonparasitic species, *B. hewitti* (Cameron), for comparison. In *B. bislensis* the galea is at least as long as the stipes, the first two segments of the labial palpus together are nearly as long as the prementum, and the maxillary palpus is relatively long. Nonetheless the proboscis is distinctly reduced compared to that of nonparasitic species. The mouthparts of *B. puangensis* are similar to those of *B. hewitti.* The prementum and stipes of *B. bislensis* are about 25% shorter than those of *B. puangensis* (bodies of the same size), while the mentum and distal mouthparts (galea, glossa, labial palpi) are even more reduced (Figs. 5, 6). T6 of *B. bislensis* is much more like that of ordinary female *Braunsapis* than the scoop-shaped T6 of *B. breviceps* and *kaliago,* illustrated by Reyes (1991, fig. 103). The strongly bidentate apex of S6 of *B. bislensis* (Fig. 10) is unusual and possibly related to the parasitic way of life. The scopa of *B. bislensis* seems fully as reduced as that of *B. breviceps* and *kaliago;* the dense somewhat coppery hairs of the upper tibial surface (reminding one of the genus *Allodape*) probably should not be regarded as scopal hairs. But in total the modifications associated with parasitism seem somewhat less in *B. bislensis* than in *B. breviceps* and *kaliago.*

Face as in Fig. 3. Body length 5.5 mm. Head and dorsum of thorax black, genal area and rest of thorax dark brown except yellow brown posterior margin of pronotum (seeming white because of white hairs) and narrow brown parapsidal lines extending almost full length of scutum in holotype only. Antenna dark brown above, pale brown beneath except scape which is whitish beneath. Metasomal terga dark brown, posterior margins of T1 to



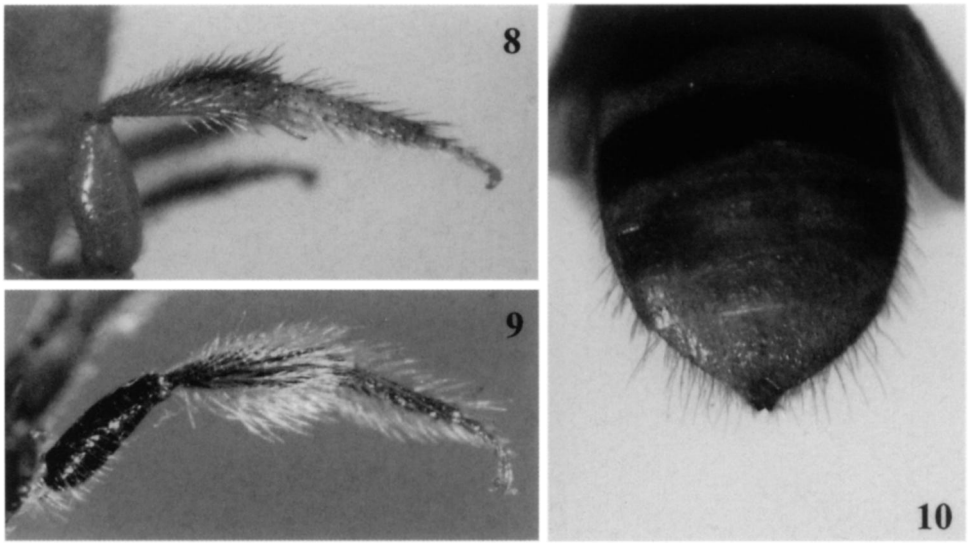
Figs. 5–7. Mouthparts of female *Braunsapis bislensis.* 5, Lateral view of proboscis of holotype. 6, Ventral view of mentum and prementum of holotype; the line with arrows indicates the relative length of the prementum in *B. puangensis* of the same body size. 7, Mandible of paratype.

T5 broadly yellow brown transparent (or in paratype T5 and T6 entirely yellow-brown); sterna pale yellow brown. Legs, including coxae, brown, mid and hind trochanters and femora particularly pale yellow brown. Yellowish white markings as follows: entire clypeus; paraocular line along lower half of eye margin, well separated from clypeus, narrow except at lower extremity (Fig. 3); labrum except for brownish lateral extremities; mandible (very strongly ivory color) except for black apex and brownish margins; under side of antennal scape; posterior lobe of pronotum; tegula (largely transparent); and axillary sclerites.

Head distinctly broader than long (Fig. 3). Clypeus depressed, broadly concave, not or scarcely visible in lateral view, extending little below lower ends of eyes; middle of epistomal suture not raised, gently concave; scape reaching lower part of anterior ocellus; malar space longer than diameter of base of first flagellar segment; mandible narrowly tridentate; labrum about three times as wide as long; proboscis when folded in repose with apex in middle of proboscidial fossa; galea and first two segments of labial palpus strongly fringed (Fig. 5); maxillary palpus 4-segmented (not counting small basal structure), almost half as long as stipes (Fig. 5); mentum shorter than width of prementum (Fig. 6). Basitibial plate not indicated. Scopa reduced, only a few nearly simple hairs, not longer than tibial diameter, on under surface (Fig. 8); upper surface on distal half of tibia with dense, somewhat coppery hairs (Fig. 8). T6 with surface gently convex, apex entire, translucent. S6 with apex bidentate (Fig. 10), projecting slightly beyond T6.

Surface sculpturing much as in *Braunsapis puangensis* but clypeus dull, without conspicuous large punctures; hair bases on terga relatively small and weak, so that terga are smoother than in *B. puangensis.*

Pubescence sparse, short, pale yellowish to brassy, denser and whiter on pronotal lobes and collar (posterior dorsal pronotal margin). Hairs of distal terga slender, slanting, simple, not coarse and blunt as in many nonparasitic species.



Figs. 8–10. Structures of *Braunsapis* females. 8, Hind leg of *B. bislensis* paratype, outer surface. 9, Same for *B. puangensis*. 10, Apex of metasoma of *B. bislensis* paratype, dorsal view. The bidentate apex is that of S6. (When this photograph was taken the sting was retracted; after some manipulation it is now partly extruded.)

Holotype female and one paratype female: Bisle Ghat, Hassan District, Karnataka, India, 6 May, 2002 (Renee M. Borges). For collection details, see above. The holotype will be deposited in the National Pusa Insect Collection, Indian Agricultural Research Institute, New Delhi. The paratype is in the Entomology Division, Natural History Museum, University of Kansas, Lawrence. The mouthparts of the holotype and the damaged head of the paratype are preserved in glycerine in microvials on the respective pins.

This species is named for the Bisle Forest in which it was found, in recognition of the forest's value as a natural repository of biological diversity, a remnant of the endangered evergreen forests of India.

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