

cular analysis, ascribed the association of sex chromosomes to the presence of several 247 bp repeats in the rDNA intergenic spacers.

Since majority of previous reports on satellite association are based on either conventional staining or silver staining, confusion in establishing the reasons for association has prevailed for long. In recent years, FISH has proved to be a highly sensitive and powerful technique in locating DNA sequences, particularly repetitive DNA on chromosomes. In the present investigation on *P. ovata*, FISH has clearly established the association of rDNA rather than nucleolar proteins. Such associations could lead to nucleolar chromosome polymorphism through unequal crossing over among rRNA genes. There are numerous instances of such a polymorphism in plants and animals<sup>16</sup>.

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## *Vombisidris humboldticola* (Hymenoptera: Formicidae): a new arboreal ant species from an Indian ant plant

The 12 known species of *Vombisidris* range from India to Queensland, Australia, with most of them occurring in Malaysia and Indonesia<sup>1</sup>. These ants are poorly represented in earlier collections, perhaps because they nest and forage arboreally and would thus tend to be overlooked by most ant-collectors<sup>2</sup>. The only known species from India (Mudigere, Karnataka) is *Vombisidris occidua* Bolton, collected from low vegetation<sup>1</sup>.

The species described here is the second *Vombisidris* from the Western Ghats. Also described is the queen of this new species. Queens of only three species of *Vombisidris* are known<sup>1,2</sup>. The workers along with the queen are known to nest in the domatia of two *Humboldtia* spp.; *H. decurrens* Bedd. (Figure 1a) and *H. brunonis* Wall.

*Humboldtia* spp. comprise a complex of six species endemic to the Western Ghats–Sri Lanka hotspots, three of which are myrmecophytes. These myrmecophytes possess structures called domatia (Figure 1b) that are swollen internodes, which harbour ants in them. These plants also possess extra floral nectarines, which are

present on the leaves, bracts and stipules. *Vombisidris humboldticola* feed from the extra floral nectar of these plants (pers. obs.). The ant colony is relatively small, with 20–30 individuals in one domatia. Whether this is because they find it hard to compete with other arboreal genera, or have specialized lifeways, is unknown<sup>1</sup> and needs to be studied. It appears that *V. humboldticola* is confined to the myrmecophyte *Humboldtia* spp. and is not recorded elsewhere (B. Bolton, pers. commun.).

*Vombisidris* Bolton, 1991:1. Type species: *Vombisidris philax* Bolton, by original designation.

Genus diagnosis. Palp formula 5,3. Mandibles short triangular, the masticatory margin with 5 teeth, uniquely arranged. The large apical tooth followed by two smaller teeth (third smaller than second), then a long diastema and two small basal teeth. Antennae 12 segmented with a strongly defined three-segmented club. Sides of head usually with a strong sinuate subocular groove. Promesonotum not domed-convex; propodeum bispinose<sup>1,3,4</sup>.

*Vombisidris humboldticola* sp. nov.

Description of holotype. Worker (Figure 2). Total length 2.40 mm, head length (HL) 0.67 mm, head width (HW) 0.56 mm, cephalic index (HW/HL × 100) 83, scape length (SL) 0.51 mm, scape index (SL/ HW × 100) 91, pronotal width 0.36 mm, alitrunk length 0.90 mm, maximum diameter of eye 0.12 (0.21 × HW).

Head longer than broad (CI). Sides of head behind eyes feebly convergent posteriorly with rounded occipital corners. Faint vestiges of frontal carinae present, extending back from the posterior extremities of the frontal lobes to beyond the level of the posterior margins of the eyes, subocular groove complete, the groove running from the mandibular insertion to the anteroventral margin of the eye, then passing through a shallow angle and continuing along the sides to the lateroccipital margin, the region of the lateroccipital margin of the head where the subocular groove ends slightly concave (Figure 2); antennal scape relatively long (SI); eyes relatively small (0.21 × HW) with 10 ommatidia in the longest row.

Alitrunk elongate and low in profile, mesonotum unarmed, in dorsal view, sides

of mesonotum slightly convex; metanotal groove absent, in profile, propodeal spines long and arched and appear to be set low down; propodeal spines four times longer than the distance separating their bases, propodeal spiracle below the level of the spine, propodeal declivity reticulate rugulose. Legs relatively long; maximum length of hind femur (0.61 mm) greater than head width.



**Figure 1.** *a*, *Humboldtia decurrens*, a myrmecophyte of the Western Ghats. *b*, Slit domatium (swollen internode) of *H. decurrens*.



**Figure 2.** *Vombisidris humboldticola*; lateral view.

In dorsal view, petiolar node distinctly longer than wide and sides of the node almost straight, petiolar spiracle at the midlength of the peduncle. First gastral tergite smooth, except for a band of short basigastral costulae feebly present immediately behind the post petiole, the spaces between the basigastral costulae smooth.

Head, alitrunk, petiole and post-petiole reticulate-rugulose. Gaster smooth. Hairs on dorsal surface elongate and more densely present on head. Colour yellowish-brown, with abdomen darker brown and legs yellow.

Holotype. Worker, India: Kerala, Trivandrum, Shankilli (8°49'03"N and 77°03'08"E), 9.ii.2004. Merry Zacharias. Collected from domatia of *H. decurrens*.

Paratypes. One worker and one queen collection data same as holotype.

Other materials examined. (Series deposited at the British Museum of Natural History (BMNH), London) six workers, India: Karnataka, Makut Reserve Forest, 13–18 km S. Virajpet, 28.iii.1997, in internode of *H. brunonis* (K. V. Krombein).

Eight workers and one queen, India: Karnataka, Makut, 15.iv.1999, in domatia of *H. brunonis* (L. Gaume) (Bolton, pers. commun.).

Description of queen. HL 0.74 mm, HW 0.60 mm, cephalic index (HW/HL × 100) 81, SL 0.72 mm, Scape index (SL/HW × 100) 120, pronotal width 0.52 mm, alitrunk length 1.12 mm, maximum diameter of eye 0.19 (0.32 × HW) with 12 ommatidia in the longest row.

Relatively small when compared to other described queens of *Vombisidris* sp., i.e. *V. australis* Wheeler, *V. bilongrudi* Taylor and *V. renatae* Taylor<sup>2</sup>, but proportionately larger than the workers. The general features of shape, sculpturing and pilosity are similar to workers. It differs from the workers by the presence of relatively large eyes, presence of ocelli and propodeal spines being relatively shorter and less convergent.

Type repository. Holotype will be deposited at the Insect Museum of Ashoka Trust for Research in Ecology and the Environment, Bangalore, Karnataka, India and the paratype will be deposited at BMNH, London.

Etymology. The species name indicates 'Vombisidris that dwells in *Humboldtia* plants'.

*V. humboldticola* is similar to *V. occidua* described from India in the following characters: (1) subocular groove complete and (2) metanotal groove absent. However, *V. humboldticola* differs from *V. occidua* in the following characters: (1) faint vestiges of frontal carinae present that extend beyond the posterior margins of the eyes in contrast to their absence in *V. occidua*. (2) Propodeal spines longer and arched than in *V. occidua*. (3) In dorsal view, the sides of the petiole node are almost straight when compared to the convex petiole node in *V. occidua*. (4) Dorsal surface of petiolar node in profile less convex than in *V. occidua*. (5) Colour yellowish-brown with abdomen darker brown and legs yellow, whereas in *V. occidua*, the head, alitrunk and waist segments are all dark brown, contrasting strongly with the much lighter yellow legs (B. Bolton, pers. commun.).

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