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Redescription of the fig wasp genus *Sycophilodes* Joseph (Chalcidoidea: Pteromalidae: Epichrysomallinae) with description of a new species from India

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Abstract

Sycophilodes Joseph is a non-pollinating fig wasp genus so far reported only from *Ficus benghalensis* L. The genus *Sycophilodes* is revised with redescription of the male and the first description of the female of its only currently included species, *S. moniliformis*. A second species, *Sycophilodes uluberiaensis* Pramanik & Dey **sp. nov**. is described. Available keys are modified and supplemented to facilitate identification of *Sycophilodes* and a key for distinguishing both sexes of the two included species is presented. All type specimens are deposited in the National Pusa Collection, IARI, New Delhi.

Key words: non-pollinating fig wasp, taxonomy, identification key, *Ficus benghalensis*

Introduction

Sycophilodes Joseph (Chalcidoidea: Pteromalidae: Epichrysomallinae), a monotypic genus of non-pollinating fig wasps, was established by Joseph (1961) based on a single male of *Sycophilodes moniliformis* Joseph reared from syconia of *Ficus benghalensis* L. (Moraceae) collected from the Botanical Gardens, Trivandrum, Kerala, India. We reared males and females of two species of *Sycophilodes* from syconia of *F. benghalensis* collected from Delhi and West Bengal. The female of *S. moniliformis* was collected for the first time and we established that the other species represented by both females and males is new. In this article, *Sycophilodes* is revised, the male of *S. moniliformis* is redescribed, and the new species along with the female of *S. moniliformis* is described and illustrated in detail. A key for distinguishing both sexes of the two species of *Sycophilodes* is also provided.

Hill (1967) formally established the subfamily Epichrysomallinae and classified it in Torymidae. Since then the placement of this subfamily has been subjected to several familial changes within Chalcidoidea. Wiebes classified it in Pteromalidae (Bouček *et al*. 1981), but Bouček (1988) moved it to Agaonidae. Subsequent phylogenetic analyses did not support this placement and left Epichrysomallinae unclassified to family (Gibson *et al*. 1999; Rasplus *et al*. 1998). Recently, based on detailed phylogenetic analyses, Epichrysomallinae was classified in Pteromalidae (Heraty *et al*. 2013).

Sycophilodes was originally placed in the subfamily Idarninae of the now unrecognized family Callimomidae (Joseph 1961). Narendran and Sheela (1993) included this genus in Epichrysomallinae along with nine other genera. They provided a key to the Oriental genera, mostly based on females, but based on a single male for this genus. Because most of the genera in Epichrysomallinae are based upon females, but *Sycophilodes* on a male, revision of this genus is required to include females. Here we redescribe and illustrate the male of *S. moniliformis* Joseph along with providing the first description of females of this species, describe and illustrate both sexes of a new species in the genus, provide modified keys to differentiate *Sycophilodes* from other epichrysomalline genera, and provide a key to the species of *Sycophilodes* based on both males and females.

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same number of setae on the scutellum, and a weak occipital carina, *Sycophilodes* females are differentiated by their bilobed lower clypeal margin (*vs* a nearly straight lower clypeal margin) and the mesoscutum being about as long as wide (*vs* mesoscutum a little more than 1.5× its median length) (Narendran & Sheela 1993). Males of *Epichrysomalla* Girault share the same antennal formula as *Sycophilodes* males but differ from the latter by having the mesoscutellum broadly bordering the mesoscutum and by the absence of an occipital carina (Bouček 1988). Both males and females of *Meselatus* Girault and *Sycophilomorpha* Joseph and Abdurahiman share the same antennal formula as *Sycophilodes*. *Meselatus* is distinguished from *Sycophilodes* by having at least 3 bristles on either side of the scutellum (*vs* 2 bristles), the fore wing often with distinct infumation below the parastigma and marginal vein (*vs* no infumation) (Bouček 1988), labial palpi 2-segmented (*vs* 4-segmented) and antennae inserted at middle of head (*vs* lower half of face, slightly above imaginary line connecting lower margin of eyes) (Chen *et al*. 1999). *Sycophilomorpha* is distinctly different from *Sycophilodes* because of the presence of a very strong occipital carina (*vs* weak occipital carina) and rudimentary postmarginal vein (Joseph & Abdurahiman 1969, figs 5, 13) (*vs* postmarginal vein at least half as long as stigmal vein). When erecting the genus, Joseph (1961) mentioned that the thorax of *Sycophilodes* strongly resembles *Sycobia* type, but *Sycophilodes* is distinct from *Sycobia* Walker due to the presence of an occipital carina (*vs* absent) and a distinct postmarginal vein (*vs* rudimentary).

Within *Sycophilodes*, the *S. uluberiaensis* females are clearly distinguished from female *S. moniliformis* by the postmarginal vein being half the length of the stigmal vein (Figs 29, 30) (*vs* postmarginal vein as long as stigmal vein), scape 2× (*vs* scape 3×) as long as pedicel , clava 3× (*vs* 2.5×) as long as preceding funicular segment and axilla with one long seta on upper part of posterior half in addition to a row of 5 setae on lower half (*vs* with one long seta on upper part of posterior half in addition to 2 small setae at lower corner). Males of *S. uluberiaensis* are differentiated by having the basal stalk of the stigmal vein short and thick (Figs 39, 40) (*vs* long and slender), torular-ocular distance 3× (*vs* 2.3×) intertorular distance, interspiracular distance 3× (*vs* 4.3×) distance between spiracle and posterior propodeal margin, and fore femur 1.6× (*vs* 2×) the length of the fore coxa.

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