A NEW SPECIES OF AGAONID WASP (HYMENOPTERA, CHALCIDOIDEA) POLLINATING *FICUS KRISHNAE* C.DC. (MORACEAE)[1]

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(*With sixteen text-figures*)

Key words: *Eupristina (E.) rehmani, Eupristina (E.) masoni, Eupristina (E.) belgaumensis, Ficus krishnae, F. drupaceae* var. *pubescens, F. benghalensis.*

Eupristina (Eupristina) rehmani sp. nov. pollinating *Ficus krishnae* C.DC. is described and a short note on the taxonomic status of the host plant is given.

INTRODUCTION

The fruits of all species of *Ficus* are colonized by a heterogenous group of insects of the family Agaonidae (Hymenoptera, Chalcidoidea), commonly called fig insects or fig wasps. Fig insects of the subfamily Agaoninae are the exclusive pollinators of their hosts. Genus *Eupristina* Saunders are the pollinators of *Ficus* spp. of section *Conosycea* (Miq.) to which *Ficus krishnae* C.DC. belongs. *Ficus krishnae* is a small to medium sized banyan, commonly known as 'Krishna bor' or 'butter cup of Krishna'. This tree has a fair distribution in North and Central India, but is rare in South India.

An agaonid pollinator of *F. krishnae* is described here and the taxonomic status of its host *Ficus* is evaluated.

The type specimens are presently kept in the collection of the Museum of Department of Zoology, University of Calicut (ZDC).

Eupristina (Eupristina) rehmani sp. nov.

FEMALE

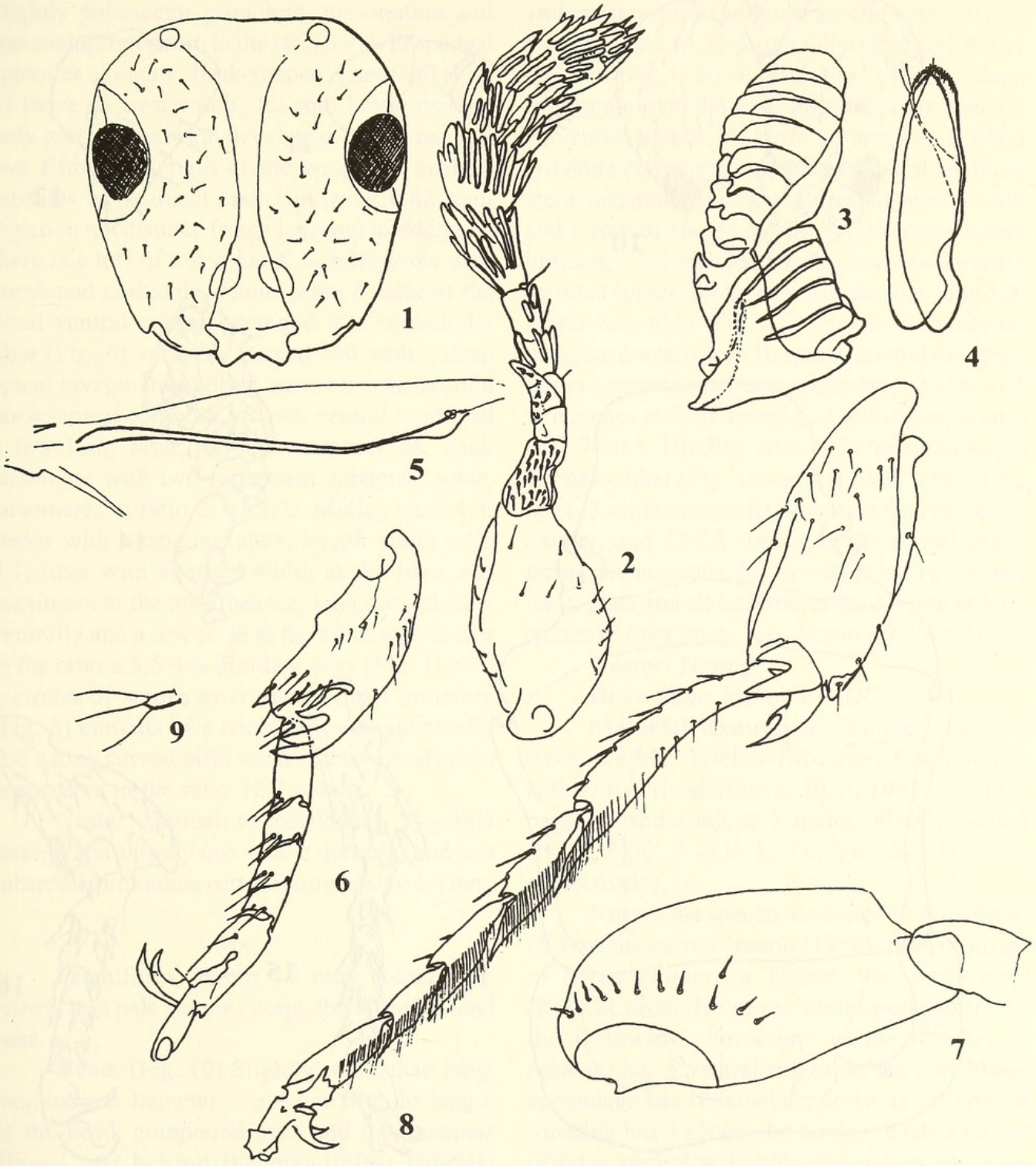
Length 2.2 mm; colour generally black, antennal scape, femur and coxa yellowish on ventral side.

Head: (Fig. 1) almost as long as wide and 2.5 times the longitudinal diameter of the compound eye (5:2); eyes positioned a little posteriorly; cheek almost equal to eye length, margins of the facial groove more divergent anteriorly.

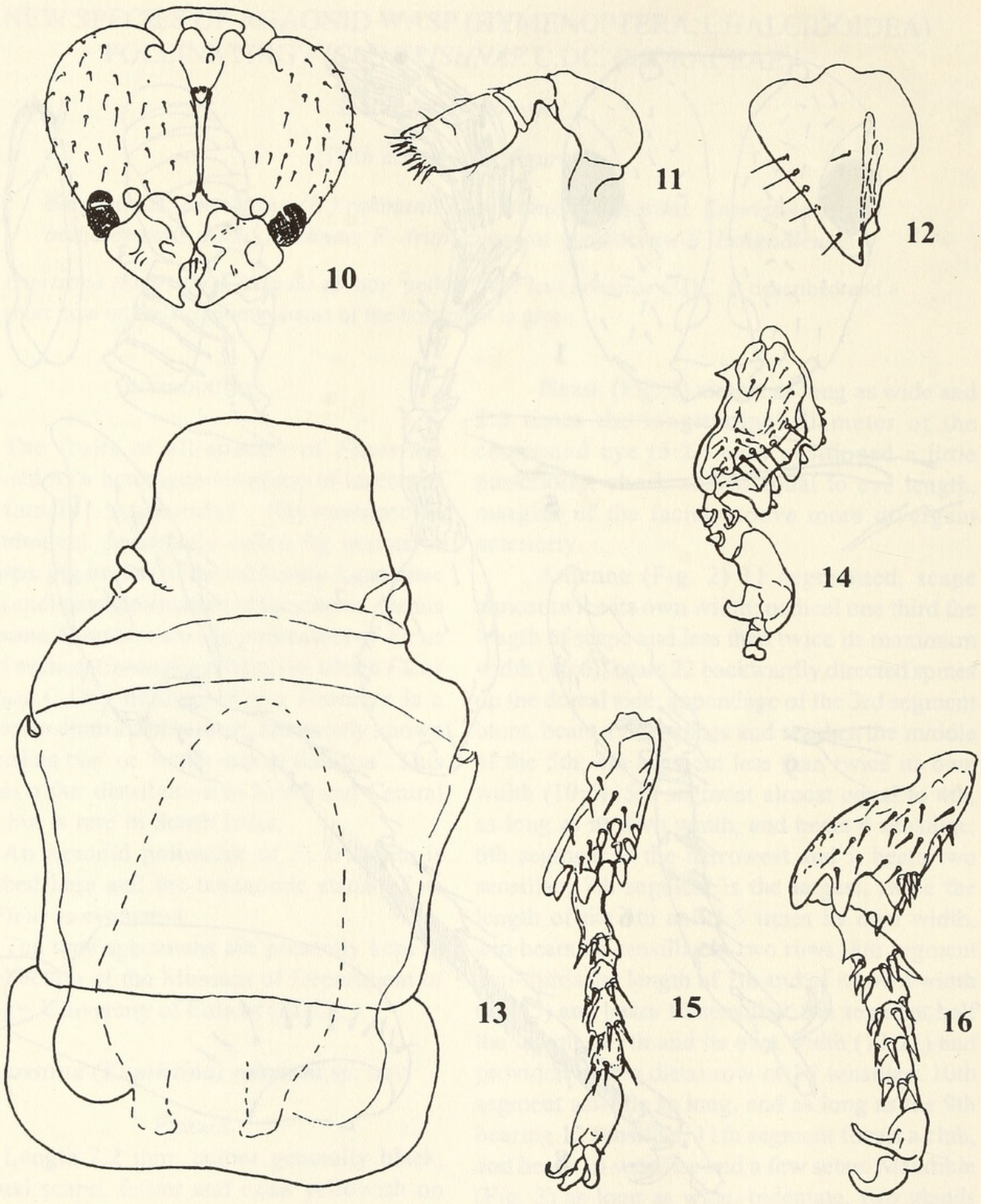
Antenna (Fig. 2) 11 segmented, scape almost twice its own width; pedicel one third the length of scape and less than twice its maximum width (10:6), bears 22 backwardly directed spines on the dorsal side; appendage of the 3rd segment blunt, bears a few spines and reaches the middle of the 5th; 4th segment less than twice its own width (10:6); 5th segment almost equal to 4th, as long as its own width, and bears 4 sensillae; 6th segment is the narrowest and it bears two sensillae; 7th segment is the largest, twice the length of the 5th and 1.5 times its own width, and bears 16 sensillae in two rows; 8th segment two-thirds the length of 7th and of its own width (21:15) and bears 16 sensillae; 9th segment half the length of 7th and its own width (12:21) and provided with a distal row of 16 sensillae; 10th segment as wide as long, and as long as the 9th bearing 12 sensillae; 11th segment forms a club, and bears 16 sensillae and a few setae. Mandible (Fig. 3) as long as wide, bidentate, two glands and with 5 ventral ridges; mandibular appendage twice the length of the mandible, thrice its own width, 10 lamellae present, and first 6 lamellae produced into lateral teeth; labio-maxillary complex (Fig. 4), the labium bearing two setae.

[1]Accepted May, 1997

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Figs. 1-9: *Eupristina* (*Eupristina*) *rehmani* sp. nov. Female:
1. Head; 2. Antenna; 3. Mandible; 4. Labio-maxillary complex; 5. Forewing; 6. Foretibia & tarsus; 7. Hind coxa; 8. Hindtibia & tarsus; 9. Pygostyle.
(Figs. 1 & 5 X100, 2-4 & 6-9 X400)



Figs. 10-16: *Eupristina (Eupristina) rehmani* sp. nov. Male:
10. Head; 11. Antenna 12. Mandible; 13. Thorax; 14. Foretibia & tarsus; 15. Midtibia & tarsus; 16. Hindtibia & tarsus.
(Figs. 10 & 13 X100, 11, 12 & 14-16 X400)

Thorax: Pronotum 1.5 times its own width, slightly pubescent; pronotum, mesonotum and metanotopropodeum in the ratio 8:4:3. Propodeal spiracles elongate, flask-shaped. Forewing (Fig. 5) twice its own width, 1.2 mm long, hyaline, only premarginal vein developed, which reaches two fifths the length of the wing and bears 3 pustules at its distal end. Hindwing 0.82 mm, venation not distinct, fringe long and middorsally there is a tuft of a few hairs. Foreleg coxa with comb and corbicula; femur bears 6 setae at the basal ventral corner, arranged in a semicircle; tibia (Fig. 6) ventrally curved and with a deep apical invagination; tibial armature consists of a dorso-apical comb of 3 claws, ventral tooth and a few long setae; tarsus pentamerous, each tarsomere with two prominent subapical setae, tarsomeres in ratio 2:1:1:1:2. Midleg coxa 4:3, femur with a tapering apex, length width ratio 4:1, tibia with shortest width at the base and maximum at the apex bearing long curved claw ventrally and a few setae at the apex; tarsomeres in the ratio 8:5:5:4:6. Hindleg coxa (Fig. 7) with a circlet of spines proximally; tibial armature (Fig. 8) consists of a tricuspid tooth antiaxially and a long curved bifid tooth at the ventral apex; tarsomeres in the ratio 12:7:6:4:7.

Gaster: Normal; pygostyle (Fig. 9) with 4 setae, 2 apical (only one visible dorsally) and two subapical; protruding part of the ovipositor 1.4 mm.

MALE

Vermiform, length 1.9 mm; colour dark brown, legs pale yellow except dorsal half of hind coxa.

Head: (Fig. 10) Slightly wider than long, longitudinal diameter of eye one fifth the length of the head; compound eyes and the antennae placed just behind the mandibles; shortest distance between the antennal toruli and the distance from the antennal toruli to the compound eyes are in the ratio 5:1. Antenna (Fig. 11) 4 segmented; scape length: width ratio 2:1; scape, pedicel and club in the ratio 2:1:2. Mandible (Fig. 12) 5:4, bidentate, two glands.

Thorax: (Fig. 13) Pronotum, mesonotum and metanotopropodeum in the ratio 3:1:2. Foreleg coxa (4:3) proximally tapering; femur (2:1) as long as coxa; tibia (Fig. 14) has a deep invagination on the axial plate which is lined on its ventral margin by a row of long setae; tibial armature consists of a dorsal comb of three blunt teeth, one more apicad, a bifurcated ventral tooth and a row of spines on the dorsal comb; tarsus bimerous, 1st tarsomere with three backwardly directed spines. Midleg coxa wider than long 5:8; femur 8:7; tibia (Fig. 15) with 6-10 spines on the plate dorsally and 10 spines around the apex; tarsus pentamerous, tarsomeres with a row of 5 to 6 spines at their apices and in the length ratio 11:7:7:6:15. Hindleg coxa 6:5; femur broad at the base; tibia (Fig. 16) with 4 blunt teeth at the apex, 3 on the antiaxial plate and the remaining axially, and 12-14 spines on the dorsal plate; tarsus pentamerous; 1st tarsomere has two spines on its plate and all tarsomeres have a row of long spines at their apex; tarsal ratio 10:7:6:6:10.

Gaster: Normal

Host: *Ficus krishnae* C.DC.

Material Examined: Female holotype, INDIA: Kerala, Trichur (Museum Compound), coll. D.R. Priyadarsanan, 10.xii.1993, 2 female paratype and allotype 2 males. Slide mounted (Nos. ZDC A-XII/1, 1a, 1b, A-XII/2, 2a respectively).

Note: This species is related to *Eupristina (E.) belgaumensis* Joseph (1954), the pollinator of *Ficus glomerata* Thunb. var. *pubescens* (Roth.) Corner. However, these species differ in the following characters: In the female, *E. rehmani* has 5 ventral ridges on the mandibles, appendage has 10 lamellae, dorso-axial comb of foretibia has 3 claws, the hindcoxa has a circlet of setae around and ovipositor valves are twice the gaster, while *E. belgaumensis* has 6 ventral ridges to the mandible, appendage with 8 lamellae, 5 teeth to the dorso-axial comb of foretibia; hindcoxa is devoid of circlet of setae and ovipositor valves are only 1.7 times the gaster. In the males of *E. rehmani*, head is 1.33

times its width and foretibia has 3 teeth on the dorsal comb, while in *E. belgaumensis* the head is as long as wide and foretibia has 6 teeth on its dorsal comb.

Taxonomic position of *Ficus krishnae* C.DC.

Prain (1906) pointed out that *F. krishnae* shares many features with *F. benghalensis* L. and Corner (1965) treated it as a variety of *F. benghalensis* L. Studying the unique features of the development of its back-pocketed leaf, Unnikrishnan and Hema (1990) recommended revision of Prain's opinion.

In a mutualistic co-evolution, the phylogenic relationship of each partner must be congruent with the relative phylogeny of the other (Brooks 1985). A comparison of the classification of *Ficus* and the fig insects reveals that barring a few exceptions (Wiebes 1968, Compton 1990, Berg and Wiebes 1992) fig insects are species-specific, and related *Ficus* spp. have related pollinator wasps (Wiebes 1963, 1994; Wiebes and Abdurahiman 1980). So no wasp can propagate its kind or effect pollination in any plant except its specific host.

Ficus benghalensis is pollinated by *E. masoni* Saunders (1883). The presence of a pollinator species of its own, i.e. *Eupristina (E.) rehmani,* prevents the chances of *Ficus krishnae* being cross pollinated with *F. benghalensis.* This favours the view that independent species status must be accorded to *Ficus krishnae.*

Etymology: The new species is named after Dr. U.C. Abdurahiman, Professor of Zoology, University of Calicut, in honour of his contribution to our knowledge of fig insects.

ACKNOWLEDGEMENTS

I thank the Head of the Department of Zoology, University of Calicut, Kerala for providing necessary facilities and Dr. U.C. Abdurahiman, Professor of Zoology, University of Calicut, for inspiration.

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Priyadarsanan, D R . 1999. "A new species of agaonid wasp (Hymenoptera, Chalcidoidea) pollinating Ficus krishnae C.DC. (Moraceae)." *The journal of the Bombay Natural History Society* 96, 106–110.

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