

First report of *Hestiasula castetsi* (Bolivar, 1897) from Kerala, India with description of unique male specimens (Mantodea: Hymenopodidae: Acromantinae)

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Abstract

The praying mantid species *Hestiasula castetsi* Bolivar (1897) belonging to the family Hymenopodidae is reported for the first time from Kerala, India with the description of the unique male. Two male specimens were collected from the Aralam Wildlife sanctuary of Kannur district, Kerala located in the southern Western Ghats. This species is diagnosed by the general form, by the very different form of frontal sclerite, wings and prolonged titillator of the genital. The genital of this species is quite unique and hence its placement under genus *Hestiasula* needs future research.

Keywords: Genital Complex, *Hestiasula castetsi*, Male Description

Introduction

The genus *Hestiasula* Saussure, 1871 is characterized by the smooth disc of frontal sclerite and the external spine-bearing edge of fore femur not serrated. In the genus *Ephestiasula* Giglio-Tos (1915) which is very close to *Hestiasula*, the frontal sclerite is transverse, superior margin angulated, medial longitudinal groove deep and blunt anteriorly divergent carinae and the external spine-bearing edge of fore femur serrated.

The present specimens are characterized by the different forms of carinae and tubercles on the disc of frontal sclerite, different patterns of the warning marks on the inside of fore femur, difference in coloration of wings and structure of genital complex. The male genital was dissected for description and comparison as far as possible. Though the identity of the specimen is currently fixed as *Hestiasula castetsi* which forms a new record of the species from the state of Kerala, its placement in the genus seems doubtful and may go to an undescribed genus if detailed studies are undertaken based on larger number of specimens from more geographical areas. Both the male specimens are dry preserved and have been

deposited at Zoological Survey of India, Western Ghat Regional Centre, Kozhikode, Kerala (ZSIK).

Taxonomy

Class: INSECTA

Order: MANTODEA Latreille, 1802

Family: HYMENOPODIDAE Giglio-Tos, 1915

Subfamily: ACROMANTINAE Brunner de Wattenwyl, 1893

Tribe: **Acromantini** Brunner de Wattenwyl, 1893

Description

Hestiasula castetsi (Bolivar, 1897) (Figure 1-11)

1897. *Pachymantis castetsi* Bolivar, 66: 313-314, Holotype female (MNMS), type locality India: Kodaikanal, Tiruchirapalli.

1927. *Hestiasula castetsi*: Giglio-Tos, 50: 545.

2014. *Hestiasula castetsi*: Mukherjee et al. 30: 12.

Head and thorax yellowish brown, abdomen dark brown (Figures 1 & 2). Head (Figures 3 & 4) triangular, covered with scattered blackish patches and dots. Eyes

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brown with yellowish patches ocelli large and prominent, reddish brown. Antennae filiform, with minute setae, basal 4 segments yellowish brown, rest brownish black. Vertex (Figure 4) dorsally blackish brown, without tubercle; lateral lobes rounded and raised a little above eyes, frontal sclerite (Figure 3) transverse, pentagonal, surface yellowish brown with black dots. Disc flat with two raised basal triangular carinae, upper angles of which touch the sinuated superior edge of the frontal sclerite forming an enclosed middle oval area. This oval area contains a pair of tubercles. On either sides of the triangle, there are paired minute elevations. Middle of the superior edge forms a blunt tubercular point that overhangs the disc.

Pronotum (Figure 2): Dorsally with prominent black patches and dots; prozona medially raised with a median shallow groove, indicated only in middle; lateral divergent carinae weakly raised; metazona with fine median carina, lateral margins at maximum dilation sharply angulated, ventral part black.

Forelegs (Figure 5&6): External face pale yellowish brown with scattered black patches and dots on femora and tibia; tarsus pale brownish black, Coxa jet black on both the surfaces. Trochanter black on the internal face, in fore femur, the superior edge is not perfectly rounded off but a short length of middle is straight, external edge smooth, not serrated. Internally, superior half of dilated region is rough and yellow; its basal ½ portion jet black and separated from this patch, a nearly triangular black patch in distal half of length; inferior internal half smooth, shining yellow, basal ¼ portion jet black; this half with a big nearly rounded black patch almost in middle and a small triangular black patch proximal to former and the two connected by black line along row of spines. Thus the patches form two yellow spots encased by black along row of spines but open dorsally. Claw groove lies in between basal black patch and proximal smaller black patch of lower half. Disc of femur dirty white, Discoidal spines 4, middle two spines uniformly blackish brown, 1st and 2nd black at tips only. External spines 4, basal two closer, all black at tip only, edge scanty tuberculated. Internal spines 13 (6 longer jet black), smaller spines black at tip only. Tibia (Figure 6) internally pale blackish at upper half, lower half yellowish brown, with 12 internal spines, all pale brownish black; external spines 14, all bent

at base and close beset compared to the internal spines (however not much close as in many species of the family Hymenopodidae), proximally 1st minute and indistinct. Tarsal segments internally black.

Middle and hind legs: Middle legs uniformly yellowish white while hind legs uniformly brownish black; both covered uniformly with black dots; coxae and femora covered with dense stiff hairs; femora with minute genicular spine.

Wings (Figure 1): Both wings exceed the end of abdomen; completely transparent although their costal areas very pale brownish and hardly sub-opaque.

In fore wings, stigma transparent; long veins of fore wings are marked by alternating deep brown and whitish patches. The cross veins of costal area reticulated. Anal area reticulated anal membrane hardly opaque; anal vein 2 branched.

In hind wings, long veins and cross veins of costal area marked by alternating deep brown and pale brown spots and this pattern hardly visible in discoidal area; veins of anal areas uniformly pale brown along length; all cross veins parallel.

Abdomen: Tergites blackish brown with lateral white patches at junction of two tergites ventral surface of abdomen blackish brown, densely hairy. Supra anal plate (Figure 7) transverse, carinated, posterior edge widely rounded. Cerci 11 segmented, rounded and setaceous, a little thickened at distal half; apical segments conical.

Genitalia (Figure 8-11): Hypophallus nearly triangular with its distal portion narrowed and rounded; its right lateral margin is deeply indented where a thick curved and chitinized spine is lodged.

Left epiphallus broadly big oval plate; titillator curved and broad ribbon like; this ribbon a little twisted distally, proximally narrowed and a little curved; and its apex widely rounded bearing many long bristles. Entire of left epiphallus lightly chitinized.

Pseudophallus well chitinized; a thick finger like structure; its posterior end narrowed to a blunt point which slightly curves up (dorsally); a short blunt projection on right side from almost middle of length; dorsal prolongation of pseudophallus gradually narrow

and less chitinized; its left margin near middle bears long bristles.

The right epiphallus comparatively small; its dorsal portion quite broad, less chitinized; its posterior portion suddenly narrowed and twisted on inside; this twisted part is well chitinized and bears similar bristles as seen on titillator.

Materials examined: 1 male, India: Kerala: Kannur district, Aralam Wildlife sanctuary, Valayamchal, 10.3014° N, 76.5928° E, 08.iii.2014, coll. Jafer Palot, Reg. No. ZSI/WGRC/IR/INV/4826(ZSIK); 1 male, Kerala, Kannur district, Aralam Wildlife sanctuary, coll. P. M. Sureshan, 11.iii.2016, Reg. No. ZSI/WGRC/IR/INV/6086 (ZSIK).

Measurements (mm): Total length 21.6; pronotum 3.71 (prozona 1.82, metazona 1.83); foreleg: coxa 5.9, femur 7.32, tibia 4.39, tarsi 3.54; middle leg: coxa 2.69, femur 4.64, tibia 3.44, tarsi 3.75; hind leg: coxa 2.47, femur 5.11, tibia 5.2, tarsi 4.1; abdomen 11.5; forewing 21; hind wing 19.

Distribution: India: Tamil Nadu: Kodaikanal; Kerala: Kannur district, Aralam WLS; Sri Lanka.

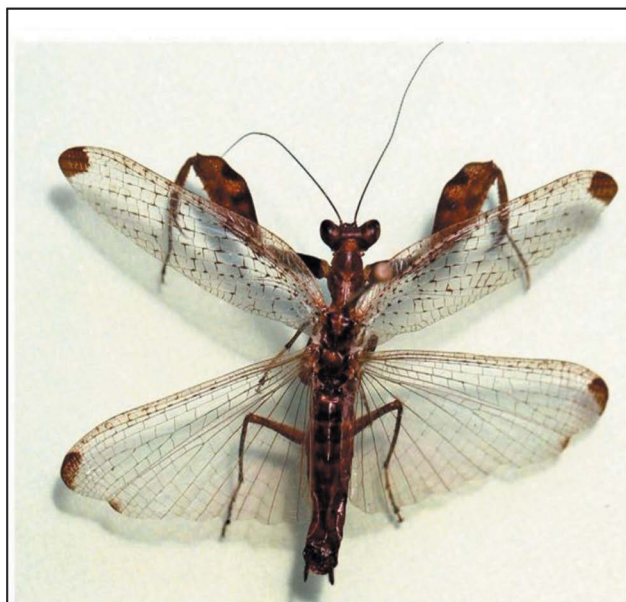


Figure 1. Dorsal view of male.

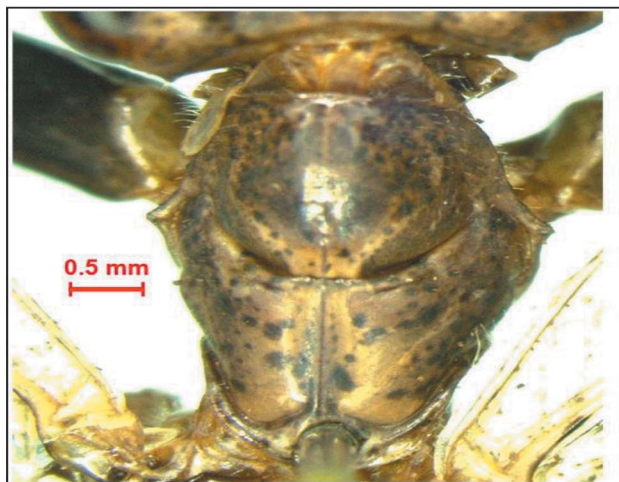


Figure 2. Pronotum.

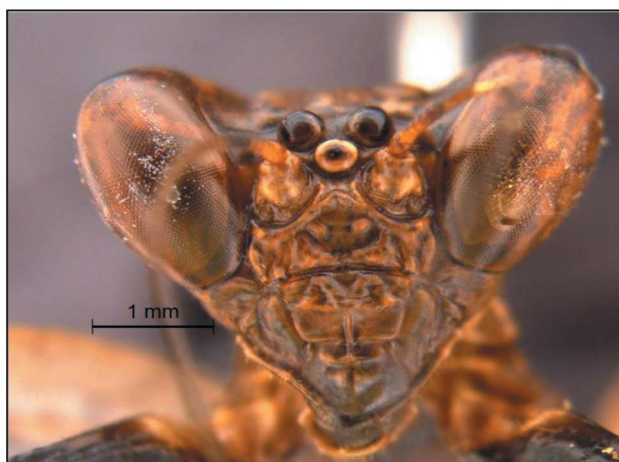


Figure 3. Front view of head.



Figure 4. Vertex, dorsal view.

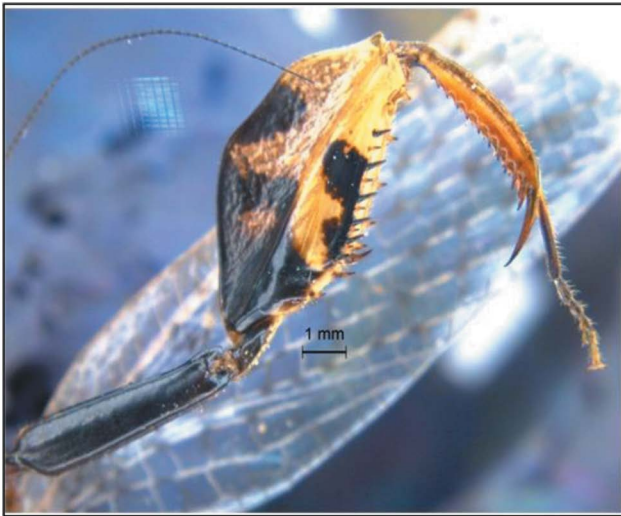


Figure 5. Inner view of left fore leg.

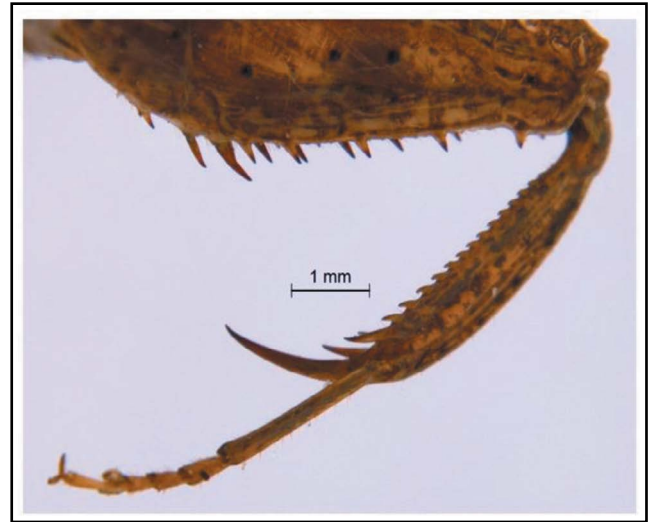


Figure 6. Outer view of right fore leg.

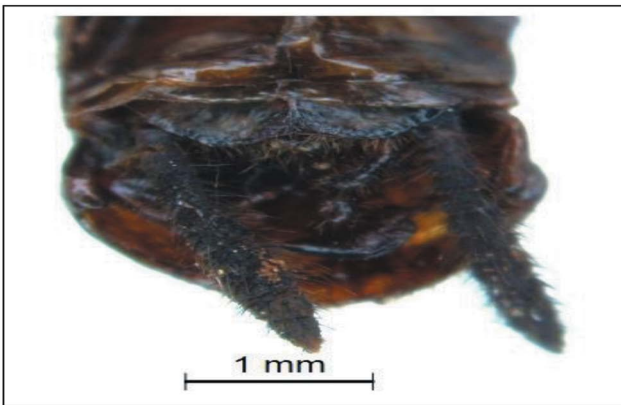


Figure 7. Apex of abdomen.



Figure 8. Photo of left epiphallus and hypophallus.



Figure 9. Photo of right epiphallus.



Figure 10. Genital, in situ photo.

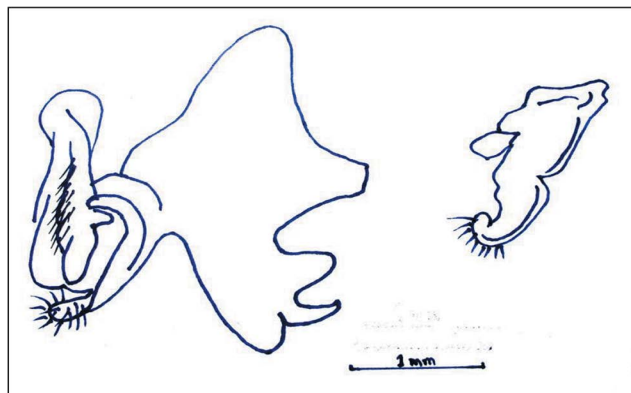


Figure 11. Drawing of genital.

Discussion

The images of syntype *Pachymantis castetsi* female, Bolivar from Paris museum show some distinct differences with the present specimen. These are the fore femur of syntype externally with no visible paired black oblique patch and the black oblique patch on the hind wings of syntype is completely different in position and shape from the present specimen. However, the disc of frontal sclerite of the syntype is not visible in the image. The male of this species is distinct by the paired brown spots at apices of both wings and by the pattern on inside of forelegs. However, by the irregular disc of frontal sclerite, this specimen may belong to genus *Ephestiasula* than to

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genus *Hestiasula*. However, in the fore leg of the present species, the colouration of coxa, trochanter and pattern on inside of fore femur is different from the species under the genus *Ephestiasula*. The external spine-bearing edge of fore femur is not serrated in *Hestiasula*, but this is not always true (Werner (1931) for *Hestiasula brunneriana*). The distal spine of hypophallus is narrowed posteriorly with thick curved and chitinized spine; the spine is minute in *E. pictipes*. The pseudophallus is beset with bristles and has specific shape. Titillator is curved and broad ribbon like. A comparison of the genitalia of other species under genus *Hestiasula* is required to understand the species properly. Future revision of the two genera will unfold interesting properties of the species. This is supported by the observations by Ehrmann and Borer (2015) on *Hestiasula brunneriana* from Nepal and India regarding colour pattern on the inside of fore femur and suggested further studies on more collection and genitalia. Collection and study of both male and female together for sexual dimorphism, if any, is even more important. The species is only known from Tamil Nadu and thus a new record from Kerala.

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