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TWO NEW SPECIES OF *ZAISCHNOPSIS* ASHMEAD (HYMENOPTERA : EUPELMIDAE) FROM INDIA AND A REVISED KEY TO ORIENTAL SPECIES

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INTRODUCTION

Ashmead (1896) erected the genus *Ischnopsis* (type species *I. opthalmica* Ashmead). As the name *Ischnopsis* is preoccupied by *Ischnopsis* Walsingham (1881) in Lepidoptera, Ashmead (1904) provided a replacement name, *Zaischnopsis*, for *Ischnopsis* Ashmead. Boucek (1988) synonymised *Zaischnopsis* with *Anastatus* Motschulsky. Gibson (1995) reestablished the generic status of *Zaischnopsis* and also synonymised *Eupelmoides* Masi (1917) with *Zaischnopsis*. This genus is represented in all regions and is very speciose in the tropical regions where there are numerous undescribed species (Gibson, 1995). The genus *Zaischnopsis* contains 27 species in the world of which 8 species are from the Oriental Region and three species from the Indian subcontinent (from India) (Walker, 1852, 1862; Girault, 1915, 1919; Narendran *et al.*, 2004, 2007; Gibson, 2005; Noyes, 2009). In this paper, two new species viz., *Zaischnopsis mampadicus* Narendran and Girish Kumar sp. nov. and *Zaischnopsis stom* Narendran and Girish Kumar sp. nov. are described from India. A revised key to separate Oriental species of *Zaischnopsis* is also provided.

The Holotypes of the new species described here are deposited in the 'National Zoological Collections' of the Zoological Survey of India, Kolkata (NZSI).

MATERIALS AND METHODS

All the species were collected by using triangular sweep net specially made for the purpose. The collected specimens were killed by using ethyl acetate and were mounted on cards. The mounted specimens were held on No. 3 Asta insect pins of size 38 mm × 0.5 mm. Taxonomic studies were done by using Wild Heerbrugg Stereozoom microscope (made in Switzerland) and drawings were made using the drawing tube of the microscope.

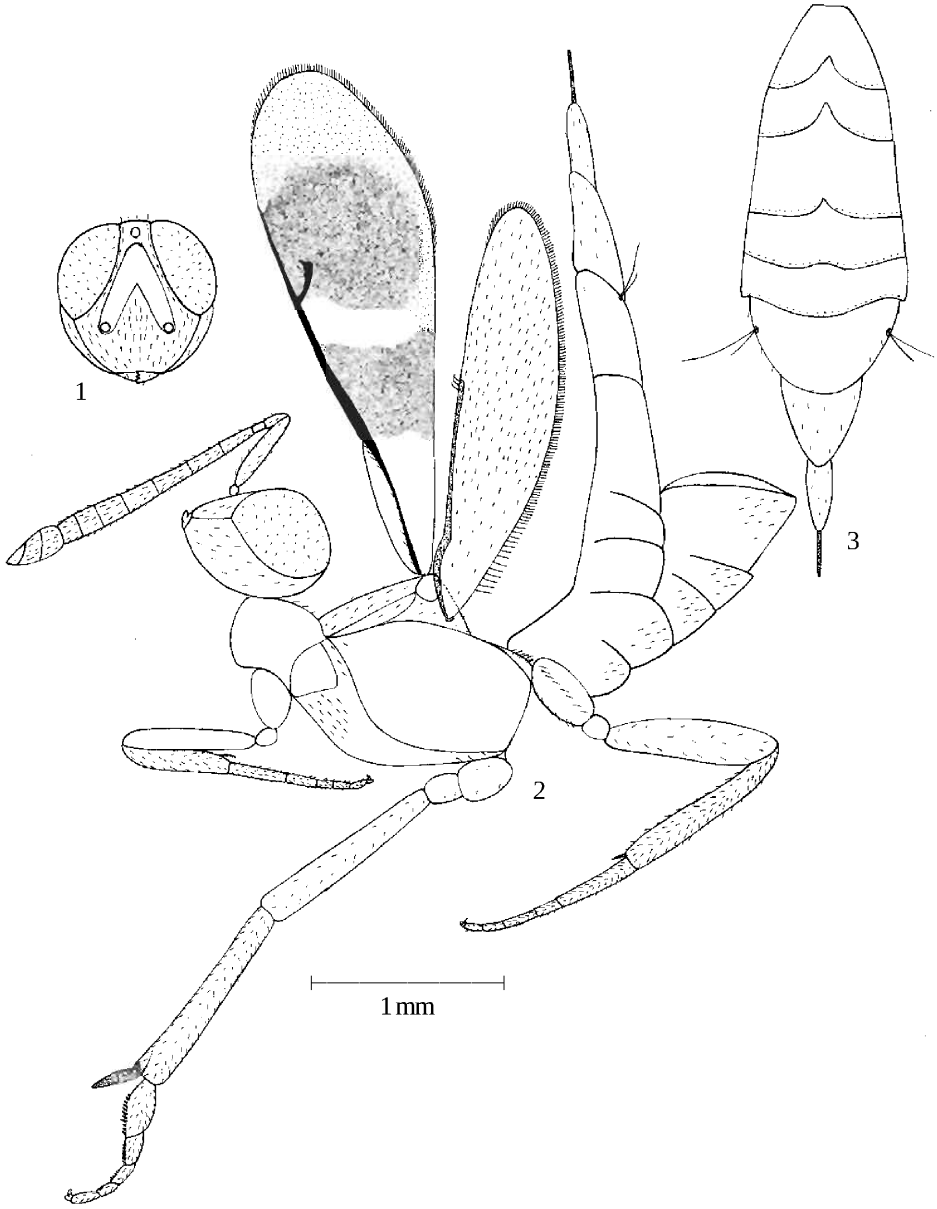
The following abbreviations are used in the text: F1- F8 = Funicular segments 1 to 8; MV = Marginal vein; NZSI = 'National Zoological Collections' of the Zoological Survey of India, Kolkata; PMV = Postmarginal vein; SMV = Submarginal vein; STV = Stigmal vein; T1= First gastral tergum.

RESULTS

Zaischnopsis mampadicus Narendran and Girish Kumar sp. nov.

(Figs. 1-3)

Female : *Holotype* : Length including ovipositor sheath 5.2 mm (exserted part of ovipositor 0.25 mm). Head slightly dark with metallic green lustre; eyes brown; ocelli reflecting pale yellow; palpi dark brown; mandible dark brown with base slightly paler. Antenna brownish black with slight metallic green lustre on scape. Mesosoma dark with metallic green lustre on metapleuron and sides of pronotum. Forewing (Fig. 2) infuscate beyond base of parastigma except for a hyaline cross band extending from MV towards posterior margin, but not reaching posterior margin,



Figs. 1-3 : ***Zaischnopsis mampadicus*** Narendran and Girish Kumar sp. nov. Female. Fig. 1. Head front view; Fig. 2. Body profile; Fig. 3. Gaster dorsal view

infuscation slightly lighter at apical part. Legs brownish black with following yellowish to white : mid and hind tarsi except last tarsal segment and claws brown to brownish black; mid tibial spur and apical pegs of mid tibia and tarsi black. Gaster black without any metallic lustre; syntergum pale brown except at base brownish black; ovipositor sheath pale brown.

Head : Scrobal depression with distinct dorsal margin separated from anterior ocellus by a distance less than the diameter of anterior ocellus (Fig. 1). Frontovertex strongly reticulate from scrobal channel to posterior ocelli; gena posterior to malar sulcus strongly and longitudinally striate- reticulate with conspicuous white lanceolate scattered setae. channel and scrobes strongly reticulate to transversely reticulate strigose; frons strongly reticulate; interantennal region strongly reticulate, with sparse setae; lower parascrobal region with scattered white setae not differentiated from other setae on face. Eyes with minute sparse pubescence; vertex and occiput coriaceous- reticulate with short pale white setae. Antenna (Fig. 2) with scape reticulate- strigose on outer and inner sides; flagellum

elongate, increasing in width towards apex with apical funicular segment transverse.

Mesosoma : Pronotum with a median deep furrow; mesoscutum entirely striate- reticulate, moderately setose, setae white and lanceolate. Scutellar- axillar complex punctate-reticulate. Acropleuron anteriorly with sparse white lanceolate setae. Metacoxa with dense, lanceolate white setae ventrolaterally and dorsally. Propodeum with callus broadly bare posterior to spiracle, setose anterior to and mesal to spiracle and with dense white setae postero-laterally. Forewing (Fig. 2) 3.21x as long as wide; relative lengths of veins: SMV = 32; MV = 33; STV = 9; PMV = 20; forewing distinctly shorter in length than metasoma (excluding ovipositor sheath).

Metasoma (Fig. 3) : 1.84x as long as mesosoma in profile, excluding ovipositor sheaths; syntergum 0.71x preceding tergum in lateral view (Fig. 2); ovipositor sheaths exserted distinctly beyond syntergal flange, 0.09x gaster length in lateral view.

Male : Unknown.

Host : Unknown.

Biology : Unknown.

Distribution : India : Kerala.

Material examined : Holotype : Female, India, Kerala, Malappuram dist., Mampad, 10 km west of Nilambur, 26-31.xii.2007, coll. Santhosh, S. (NZSI Reg. No. 11487/ H3).

Discussion : This new species comes close to *Zaischnopsis keralensis* Narendran but distinctly differs from it in having: (1). Mid tibial spur black (in *Z. keralensis* mid tibial spur yellow); (2). Gaster distinctly longer than mesosoma (1.84x) (in *Z. keralensis* gaster a little longer than mesosoma (1.09)); (3). Ovipositor sheaths distinctly exserted beyond syntergal flange (in *Z. keralensis* ovipositor sheaths exserted only very slightly beyond syntergal flange); (4). MV almost equal or slightly longer than SMV (33 : 32) (in *Z. keralensis* MV distinctly longer than SMV (58 : 46); (5). Antenna with last funicular segment transverse (in *Z. keralensis* antenna with apical three funicular segments transverse); (6). Scrobal depression separated from anterior ocellus by a distance less than the diameter of anterior ocellus (in *Z. keralensis* scrobal depression separated from anterior ocellus by a distance equal to 2x diameter of anterior ocellus).

Etymology : The species is named after the locality from where the holotype is collected.

Zaischnopsis stom Narendran and Girish Kumar sp. nov. (Figs. 4-8)

Female : *Holotype* : Length including ovipositor sheath 3.94 mm (exserted part of ovipositor 0.53 mm). Head slightly dark with metallic green lustre; palpi and mandible dark brown. Antenna brownish black. Eyes and ocelli reddish brown. Mesosoma dark with metallic green lustre on metapleuron and sides of pronotum. Forewing (Fig. 6) hyaline basally and a hyaline spot below MV and a very narrow longitudinal hyaline stripe at the lower margin opposit to the base of MV, infuscation moderate with lighter at apical part. Legs yellow with following blackish brown parts: fore and hind coxa entirely, mid coxa basally, fore and hind femur except at base and apex, fore tibia except at base and apex, apical pegs of midtibial and apical pegs of mid tarsi, all claws. Gaster black without any metallic lustre, syntergum concolorous with preceding gastral segments. Ovipositor sheath brown except at apices yellow.

Head : Dorsal margin of scrobal depression not distinct (Fig. 4); frontovertex strongly reticulate from scrobal channel to posterior ocelli; frons strongly reticulate; interantennal region strongly reticulate, with sparse setae; lower parascrobal region with scattered white setae not differentiated from other setae on face; channel and scrobes finely reticulate to transversely reticulate strigose; vertex and occiput coriaceous-reticulate with short pale white setae; gena posterior to malar sulcus strongly and longitudinally striate-reticulate with conspicuous white lanceolate scattered setae. Eyes with sparse minute pubescence; Antenna (Fig. 5) with scape reticulate- strigose on outer and inner sides; flagellum elongate, slightly increasing width towards clava, apical funicular segments not transverse.

Mesosoma : Pronotum with a median deep furrow; mesoscutum entirely striate- reticulate, sparsely setose, setae white and lanceolate. Scutellar- axillar complex punctate- reticulate. Acropleuron anteriorly with sparse

white lanceolate setae. Metacoxa with dense, lanceolate white setae ventrolaterally and dorsally. Propodeum with callus broadly bare posterior to spiracle, setose anterior to and mesal to spiracle and with dense white setae postero-laterally. Forewing (Fig. 6) 2.96x as long as wide; relative lengths of veins: SMV = 31.5; MV = 34.5; STV = 12; PMV = 23; forewing slightly longer than mesosoma (excluding ovipositor sheath).

Metasoma (Fig. 8) : 2.07x as long as mesosoma in profile excluding ovipositor sheaths; syntergum 0.20x preceding tergum in dorsal view; ovipositor sheaths exserted distinctly beyond syntergal flange, 0.29x gaster length in profile.

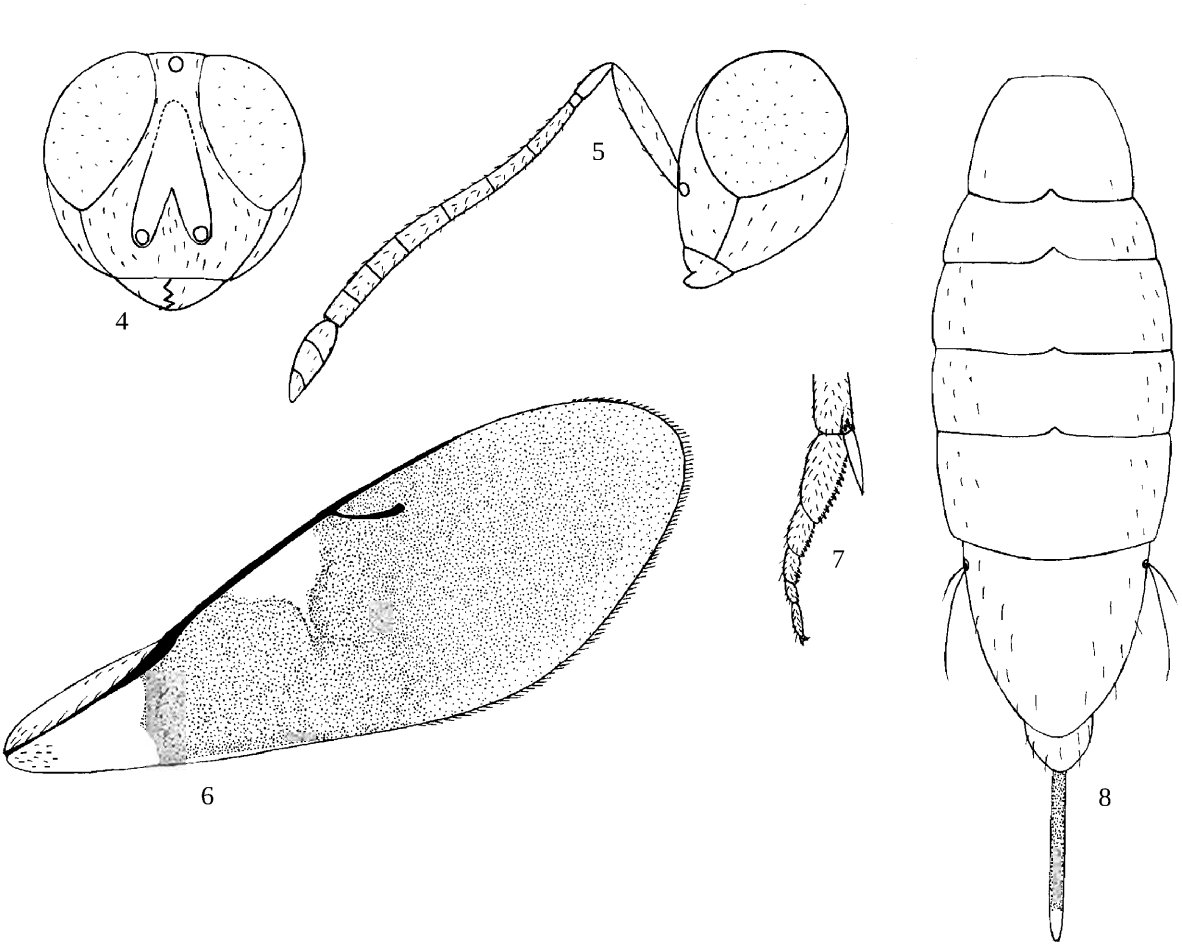
Male : Unknown.

Biology : Unknown.

Distribution : India : Kerala.

Material examined : Holotype : Female, India, Kerala, Malappuram Dist., Calicut University Campus, 3.x.2001, coll. T.C. Narendran and Party (NZSI Reg. No. 11491/ H3).

Discussion : This new species comes close to *Zaischnopsis bathericus* Narendran but distinctly differs from it in having: (1). Forewing with one hyaline spot in the middle (in *Z. bathericus* forewing with two hyaline spots in the middle); (2). A very narrow longitudinal hyaline stripe at the lower margin of forewing opposit to the base of MV (in *Z. bathericus* no such longitudinal hyaline stripe at the lower margin of forewing opposite to the base of MV); (3). Legs yellow with following blackish brown parts: fore and hind coxa entirely, mid coxa basally, fore and hind femur



Figs. 4-8 : ***Zaischnopsis stom*** Narendran and Girish Kumar sp. nov. Female. Fig. 4. Head front view; Fig. 5. Head and antenna side view; Fig. 6. Forewing; Fig. 7. Apex of mid tibia with tarsi; Fig. 8. Gaster dorsal view.

except at base and apex, fore tibia except at base and apex, apical pegs of midtibial and apical pegs of mid tarsi, all claws (in *Z. bathericus* legs black with the following parts yellowish white: apex of mid tibia, apex of hind coxa, hind trochanter, base of hind femur, basal half and apical one third of hind tibia and all tarsi of all legs (except black pegs of apex of mid tibia and of mid tarsi)); (4). Ovipositor sheaths exserted distinctly beyond (5x as long as) syntergal flange (in *Z. bathericus* ovipositor sheath exserted a little beyond syntergal flange).

Etymology : The species name is arbitrary combination of letters.

Key to Oriental species of *Zaischnopsis* Ashmead

(Modified from Narendran *et al.*, 2007)

1. F6 and clava white; F3 to F5 brown; PMV longer than MV which is 'punctiform'; STV longer than PMV; dorsum of mesosoma except sides narrowly of scutellum black. Singapore. .... *kooki* (Girault)

– Characters not as above; partly or completely different. 2

2. Scape foliaceously dilated; gaster completely metallic; F2- F4 equal in size, 2x longer than wide; F1 quadrate; mesoscutum without a raised median area but with a median carina; middle tibial spur black, at least at base. Indonesia (Java). .... *magniscapus* (Girault)

– Characters not as above; partly or completely different. 3

3. F2 to F4 equal, longest funicular segment 3x longer than F1 which is sub quadrate; F5 and F6 longer than wide; F8 nearly square; pedicel as long as F3; PMV 2x as long as STV; middle tibial spur metallic; raised triangle of 'cephalic' scutum (= mesoscutum) about one- third surface, with a nearly complete median carina from it; coxae, femora and most of tibiae with metallic lustre; host: eggs of locusts. Indonesia (Java). .... *locustae* (Girault)

– Characters not as above; partly or completely different. 4

4. Gaster cupreous, lanceolate, varied with green; head black with bluish green reflection on lower part; hind femur completely dark brown; MV a little shorter than SMV. Indonesia. .... *fascipennis* (Walker)

– Characters not as above; partly or completely different. 5

5. Mid tibial spur black; legs coppery coloured; gaster spindle shaped, depressed, purple, hairy, very much longer than 'the chest' (= mesosoma); ovipositor sheath 'tawny' (= brownish yellow), very short; forewing brown, colourless at base and having an almost colourless band across the middle. China (Hong Kong). .... *tubiatus* (Walker)

– Characters not as above; partly or completely different. 6

6. Forewing with one (Fig. 6) or two hyaline spots in the middle. 7

– Forewing with a single hyaline cross band in the middle (Figs. 2). 9

7. Forewing with one or two hyaline spots in the middle (Fig. 6); a very narrow longitudinal hyaline stripe at the lower margin of forewing opposit to the base of MV. India (Kerala). .... *stom* Narendran and Girish Kumar sp. nov.

– Forewing with two hyaline spots in the middle; no longitudinal hyaline stripe at the lower margin of forewing opposit to the base of MV. 8

8. Forewing with an opaque hyaline spot near base of MV; F6 wider than long; clava longer than combined length of F6+ F7+ F8. India (Kerala). ... . *bathericus* Narendran

– Forewing without an opaque hyaline spot near base of MV; middle hyaline spot not as above; F6 longer than wide; clava shorter than combined length of F6 + F7 + F8. India (Bihar). .... *biharensis* (Narendran)

9. Mid tibial spur black; gaster distinctly longer than mesosoma; ovipositor sheath exserted distinctly beyond syntergal flange; MV almost equal or slightly longer than SMV (33 : 32); scrobal depression separated from anterior ocellus by a distance less than the diameter of front ocellus. India (Kerala). ..... *mampadicus* Narendran and Girish Kumar sp. nov.

– Mid tibial spur yellow; gaster a little longer than mesosoma; ovipositor sheath exserted only very slightly beyond syntergal flange; MV distinctly longer than SMV; scrobal depression separated from anterior ocellus by a distance equal to 2x the diameter of front ocellus. India (Kerala). .... *keralensis* Narendran

SUMMARY

Two new species of *Zaischnopsis* Ashmead viz., *Zaischnopsis mampadicus* Narendran and Girish Kumar sp. nov. and *Z. stom* Narendran and Girish Kumar sp. nov. are described from India and their affinities to the closest relatives are discussed. A revised key to separate Oriental species of *Zaischnopsis* is also provided.

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