

Description of Male, Larva and Pupa of
Heizmannia (Mattinglyia) discrepans (Diptera: Culicidae),
With Notes on Variations in Female Morphology

by

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ABSTRACT. The male, larva and pupa of *Heizmannia (Mattinglyia) discrepans* (Edwards) described here for the first time, show that this species is close to *Hz. (Mat.) catesi*. The larva has a conspicuous long maxillary "horn" which is a unique feature among the culicine larvae of the Indian subcontinent.

INTRODUCTION

The female type of *discrepans* was originally described in the genus *Haemagogus* Williston (Edwards, 1922), and later transferred to *Aedes* by Mattingly (1957). This author noted its similarity to species of the genus *Heizmannia* subgenus *Mattinglyia*, but preferred to retain it in *Aedes* until males and early stages were described (Mattingly, 1970). However, Reinert (1973) transferred *discrepans* to *Heizmannia* subgenus *Mattinglyia* Lien after reexamining the holotype female. We have collected males, larvae and pupae of this species in the Western Ghats, India and the descriptions that follow confirm that this species belongs to *Heizmannia (Mattinglyia)*.

Nomenclature and chaetotaxy used follow after Bram (1967), Harbach and Knight (1980, 1981) and Reinert (1975) except for terminology of the maxilla which follows that used by Tanaka *et al.* (1979). In pupal and larval descriptions the range of setal branching is followed by the modal value in parentheses.

MALE. Identical with the description of female given by Reinert (1973), except for the following:

Head. Antenna strongly plumose with fine, long brown hairs, except two distal flagellomeres which are elongated, with short hairs. **Thorax.** Scutal integument blackish-brown, with sub-metallic reflections; scutellar setae on median lobe with 2-6 long and 1-4 short setae, on lateral lobes 2-3 long and 0-3

short setae; antepnotum with 4-8 setae; postpronotum with 2-5 long and 0-2 short setae; post spiracular area covered with broad overlapping silvery scales, with one dark, long seta (16 specimens) or 2 setae (2 specimens). Wing. Cell R₂ about equal to the length of vein r₂₊₃. Abdomen. Integument blackish-brown, terga I-VII each covered with broad, blackish-brown scales and with large laterobasal patches of broad silvery scales on II-VII which extend onto dorsal surface to form complete basal bands on VII alone in 6 specimens, VI-VII in 10 specimens, V-VII in 1 specimen, IV-VII in 1 specimen. In addition, above the complete bands there are one to 4 tergites with scattered silvery scales dorsally not forming complete bands, these are observed from tergites III to VI but never on II. Genitalia (Fig. 1). Distimere conspicuous, simple, inclined like bird's beak with prominent projecting appendage; no subapical lobe, 4-6 subapical leaflets overlapping several apical setae; basimere having two conspicuous tufts of proximal claspette setae (pcl), the apical one with dense cluster of flattened, partially serrated leaflets and basal one with only 2-5 leaflets, bent 90° at the tip and 2-4 thick, short spines at the base; distal claspette (dcl) with 4-6 long setae; harpago absent; paraproct attenuated, sclerotized distally, aedeagus with 2 lateral plates each with 8-10 teeth; IX tergum concave, lobed with 2-5 setae on each side; IX sternum slightly sclerotized on both sides with central sclerotized arm bearing 4 bristles.

PUPA (Fig. 1). Cephalothorax. Respiratory trumpet conical, about four times as long as width at middle, meatus occupying more than three-fourths of its length; 1-CT with 1-2(1) branches; 2-CT with 1-2(2) branches; 3-CT bifid; 4-CT with 1-3(2) branches; 5-CT with 1-2(1) branches; 6, 7-CT long, single, 6-CT shorter than 7-CT, in one specimen 7-CT was trifid at the tip; 8-CT with 2-5(2) branches; 9-CT long, always single. Metanotal plate. 10-CT with 1-3(2) branches; 11-CT long, always single; 12-CT shorter than 11-CT with 1-2(1) branches, sometimes split at apex. Abdomen (Fig. 1). Integument of terga II-VIII covered with minute ridges; seta 1-I well developed, dendritic, with 20-48 branches, number of branches very variable even in the same specimen; 2,3,5,7,9,-I always single; 4-I with 3-4(4) branches; 6-I with 1-2(2) branches; 2,6,7,9-II single; 1-II with 2-6(4) branches; 3-II with 1-4(1) branches; 4-II with 2-4(3) branches; 5-II with 1-2(2) branches; 0,2,3,6,9,10,11,14-III single; 1-III with 1-4(2) branches; 4-III with 1-4(2) branches; 5-III with 1-2(1) branches; 7-III with 1-2(2) branches; 8-III with 2-4(3) branches; 0,2,5,6,9,10,11,14-IV single; 1-IV with 1-4(1) branches; 3-IV bifid; 4-IV with 2-4(3) branches; 7-IV with 1-2(2) branches; 8-IV with 2-3(3) branches; 0,2,5,6,9,10,11,14-V single; 1-V with 1-2(1) branches; 3-V with 1-3(2) branches; 4-V with 2-4(2) branches; 7-V with 2-4(2) branches; 8-V with 2-3(3) branches; 0,6,9,10,11,14-VI single; 1-VI with 1-3(1) branches; 2,3,4,5,7-VI with 1-2(1) branches; 8-VI with 2-4(3) branches; 0,2,10,11,14-VII single; 1,3,4,5,7-VII with 1-2(1) branches; 6-VII with 1-3(3) branches; 8-VII with 2-4(2) branches; 9-VII with 2-6(4) branches, occasionally variable number in one individual; 0,14-VIII single; 4-VIII with 1-2(2) branches; 9-VIII with 4-9(8) branches. Paddle. Ovoid, fringed on three-fourths of the outer margin; seta 1-P with 1-4(2) branches, sometimes number of branches varies on different sides of same specimen.

LARVA (Fig. 2). Antenna. Simple, long, about one-fourth width of the head, very few spicules; seta 1-A beyond the middle, with 1-4(2) branches; 2-6-A all simple.

Head. 1, 8-C always single, stout; 3-C with 1-2(1) branches; 4-C with 16-27 branches which are split toward ends into 2-4 secondary branches; 5-C with 12-19 long feathered branches; 6-C with two equal, long branches, occasionally single; 7-C with 12-21 barbed branches; 9-C single or 2-branched, rarely 3-branched; 10-C with 2-4(2) branches; 11-C with 9-15 branches sub-divided near tip; 13-C with 1-2(1) branches, both 12 and 13-C very delicate and slender; 14-C with 3-6(3) branches; 15-C with 3-10 branches; mentum with 10-13(11) teeth on either side of central tooth; maxilla well developed, with well sclerotized, striated, conspicuous maxillary horn originating near base of maxillary brush, protruding in front of head (Fig. 2), mesostipes and palpostipes with well developed sensory setae, cardinal seta (1-Mx) thick, always bifid. Abdomen (Fig. 2). Seta 0,2,4-VIII always single; 1-VIII with 3-6(4) barbed branches; 3-VIII with 2-4(4) barbed branches; 5-VIII with 1-4(2) barbed branches; 14-VIII single or bifid; comb composed of 18-37 scales (occasionally 45) arranged in a triangular patch, each scale with a moderately long median spine (very rarely bifid or trifid), with short denticles restricted to laterobasal area; saddle incomplete with spicules, acus absent; 4 anal papillae, moderately long with conical apices, both the pairs are about the same shape and size; 1-X always bifid, long; 2-X with 4-6(5), long branches (in one specimen bifid); 3-X with 2-3(2), long branches; ventral brush with 4 pairs of multiple setae, each one composed of 3-6 branches. Siphon. 2.7 to 3.0 times the length of saddle, spiculate; acus absent; pecten on basal half of siphon composed of 7-17 teeth (exceptionally 25) arranged irregularly, simple or with occasionally a basal denticle, usually all about the same size, but in two specimens the basal pecten teeth very short; seta 1-S long, bifid (rarely with 4 branches), barbed, arising about half way along length of siphon, very close to last pecten tooth; 2,6,8,9-S single.

SPECIMEN DATA. Allotype male (A-278) with associated larval and pupal skins, Chinchona Estate, Valparai, Anaimalai Hills, Coimbatore District, India, collected as larva on 24.1.86 in a hole in fallen log inside forest near Chinchona plantation. Deposited in the U. S. Museum of Natural History together with 2 males and 2 females with associated skins, and one male with mounted genitalia. Two males and two females with associated larval and pupal skins and one male with mounted genitalia deposited in British Museum (Natural History); one male and one female with associated larval and pupal skins and mounted male genitalia in the collections of the National Institute of Virology, Pune, India; one male and one female with associated larval and pupal skins and mounted male genitalia in the collections of the National Institute of Communicable Diseases, New Delhi, India.

DISTRIBUTION. Specimens examined 15♂♂ and 15♀♀, chinchona Estate, Valparai, Anaimalai Hills, Tamil Nadu. 11♂♂ and 10♀♀, Noolpuzha, Wynaad, Kerala. A total of 20 larval and 20 pupal skins examined.

TAXONOMIC DISCUSSION. Examination of the male, larva and pupa of *Heizmannia* (*Mattinglyia*) *discrepans* makes it clear that this species is very close to *Hs.* (*Mat.*) *catesi*. The male genitalia resembles *catesi*, especially in the shape of distimere, the form of the IX tergum, sternum and paraproct. The shape and number of the setae on the proximal claspette, subapical leaflets and apical setae of the basimere differs. The pupa is almost identical with that of *catesi*,

and keys out to this species by Mattingly's (1970) key. Careful comparison of material of the two species is required to see whether the minor differences in the form of the setae on metanotal plate, and abdominal segments which are shown in Mattingly's (1970) illustrations are consistent enough to differentiate the species. In *catesi* minute hairs are illustrated on the paddle, but in *discrepans* these are only present just above the fringe, and there are minute ridges on abdominal segments II-VIII. The larva differs from other *Heizmannia* larvae, and indeed from all culicine larvae in the southeast Asian region except some species of *Topomyia*, in having long and prominent maxillary "horns". In common with other larvae of *Heizmannia* it has head seta 4-C large and conspicuous, 6-C markedly anterior to 5 and 7-C (Mattingly, 1971).

The adult females examined showed some variation in numbers of thoracic setae and in abdominal markings. On the thorax, scutellar setae on median lobe from 5-11 and on lateral lobe from 4-7(5), anteprenotal setae ranged from 6-10, postspiracular setae from 1-2(1). There are complete basal silvery bands on abdominal tergites extending from segment IV-VII in 18% of the specimens, V-VII in 36% of the specimens, and on VI-VII in 45% of the specimens. In addition, above the complete bands there are one to three tergites with scattered silvery scales dorsally, which do not form complete bands, these are observed from tergites III-V but never on II.

BIONOMICS. Larvae were collected from bamboo stumps and holes in fallen trees found in dense forest, both close to and far from human habitations at low altitudes (800-1100 m, msl). They were found in association with *Aedes* (*Stegomyia*) *aegypti*, *Armigeres* (*Armigeres*) *subalbatus*, *Culex* (*Lophoceraomyia*) *flavicornis*, *Tripteroides* (*Rachionotomyia*) *affinis* and *Uranotaenia* (*Pseudoficalbia*) *novobscura novobscura*. Two Hz. (*Mat.*) *discrepans* emerged from samples of dry mud in bamboo stumps, which indicates an egg stage resistant to dessication.

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ABBREVIATIONS USED IN FIGURES

Male Genitalia

Ae	=	Aedeagus
dcl	=	Distal claspette
IX-S	=	Sternum 9
IX-Te	=	Tergum 9
pcl	=	Proximal claspette
Ppr	=	Paraproct

Pupa

CT	=	Cephalothorax
I-IX	=	Abdominal segments 1 to 9
MP	=	Metanotal plate
P	=	Paddle
T	=	Respiratory trumpet

Larva

A	=	Antenna
C	=	Head
CS	=	Comb scale
Dm	=	Dorsomentum
PT	=	Pecten tooth
S	=	Siphon
VIII, X	=	Abdominal segments 8, 10

Maxilla

1-Mx	=	Cardinal Seta
Mx B	=	Maxillary brush
MX H	=	Maxillary horn
Mst	=	Mesostipes
Pst	=	Palpostipes
PS	=	Palpal sensoria
SS	=	Stipital sensoria

Fig.1

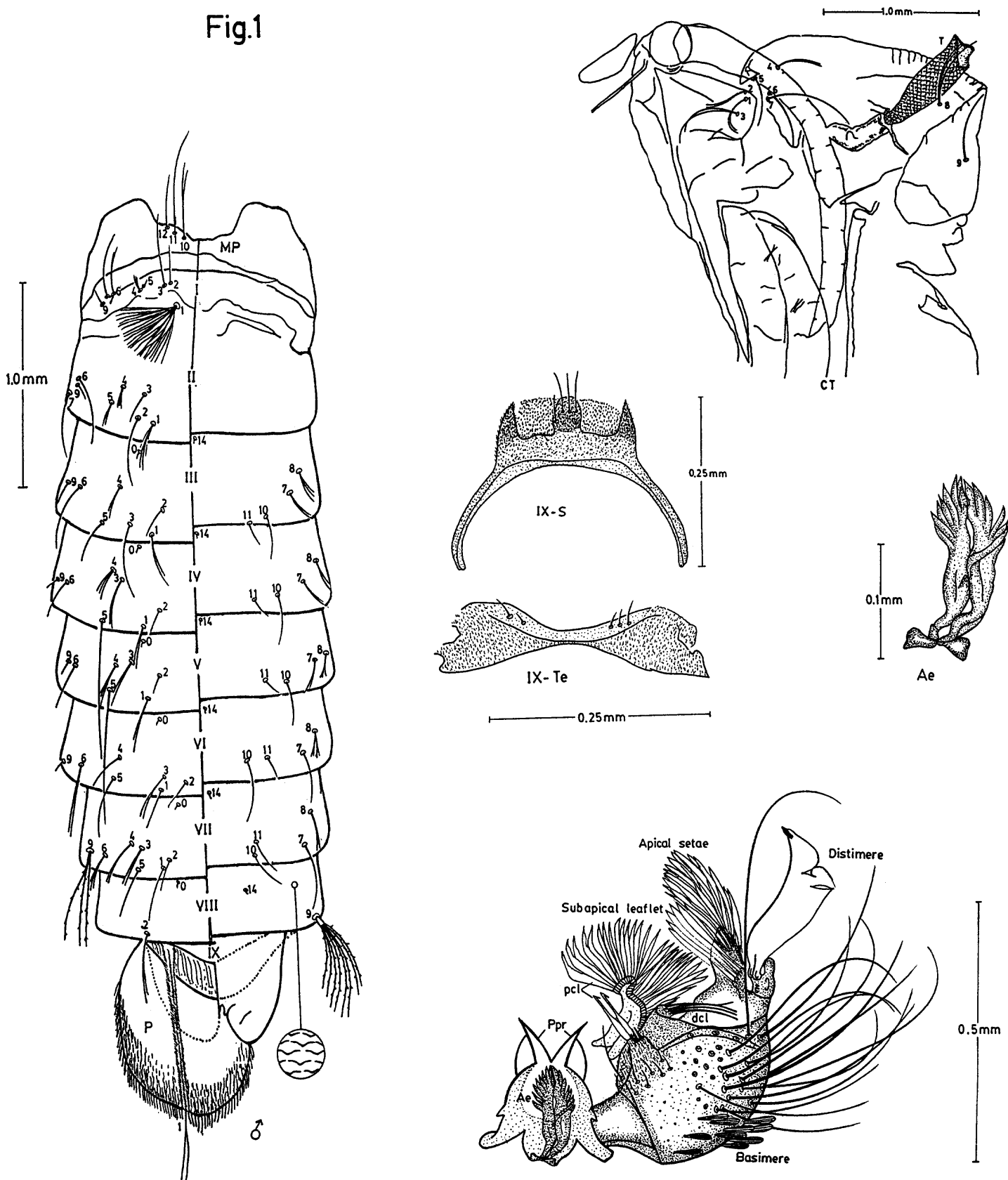


Fig.2

