

Notes on the Genus Heizmannia and the Inclusion in
Subgenus Mattinglyia of Two Species Previously Placed
in Aedes Subgenus Uncertain (Diptera: Culicidae)¹

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ABSTRACT

The female types of discrepans (Edwards) and tripunctata (Theobald) are re-described and the habitus and genitalia are illustrated for the female of discrepans. These 2 species are transferred from Aedes Meigen to the subgenus Mattinglyia Lien of Heizmannia Ludlow. Notes on the latter genus are given.

INTRODUCTION

While doing revisionary work on the subgenera of Aedes Meigen from Southeast Asia, it was necessary to compare three new species with the type of discrepans which was originally described by Edwards (1922a: 291) in the genus Haemagogus Williston but later transferred by Mattingly (1957: 5, 20) to the genus Aedes subgenus unknown. After examining the holotype of discrepans it was evident that it belonged to the subgenus Mattinglyia Lien of genus Heizmannia Ludlow and not to the genus Aedes. The species tripunctata was first described by Theobald (1908: 288) as a Stegomyia Theobald, but Edwards (1922b: 450) moved it to Haemagogus and later Mattingly (1957: 5, 20) transferred it to Aedes subgenus unknown. Because of its close similarity to discrepans I am also transferring it to the subgenus Mattinglyia.

These 2 species conform very well with the following characters of the genus Heizmannia given by Mattingly (1970): eyes well separated in front; head covered with broad decumbent scales, scales on vertex and lateral surfaces dark except for a dorsal anteromedian patch of silvery ones and similar scales on lateral surface; scutum covered with broad or moderately broad scales; acrostichal and dorsocentral setae absent (occasionally 1-2 dorsocentral setae on each side of posterior area of prescutellar space); scutellum with broad flat scales on all lobes; alula of wing with 2 rows of broad or moderately broad scales (1 row on fringe and other row above); and antepnota large (nearly contiguous in subgenus Heizmannia and moderately separated in subgenus Mattinglyia). He also used the presence of setae on the mesopostnotum to define the nominate subgenus and their absence to characterize the subgenus Mattinglyia.

Two new characters of generic importance are the presence of broad silvery scales covering the prosternum and the absence of setae on the upper mesepisternum. These two characters (used in combination with the above-mentioned

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features) aid in separating adults of Heizmannia (especially the subgenus Mattinglyia) from the genus Aedes. Adults of the latter genus are easily distinguished from the subgenus Heizmannia by the absence of setae on the meso-postnotum. Those Aedes with scales on the prosternum can be separated from both subgenera of Heizmannia (especially Mattinglyia which shows similarities to some species in the genus Aedes) by the possession of 1 or more of the following characters: mesepisternum with 1 or more upper setae present; acrostichal setae present; anterior dorsocentral setae present (setae anterior to prescutellar space); and alula of wing with scales forming a single row along the margin.

There is a resemblance of the species of Heizmannia (Mattinglyia), including discrepans and tripunctata, in the adult habitus and female genitalia to species in the subgenus Diceromyia Theobald of Aedes, especially franciscoi Mattingly and whartoni Mattingly (descriptions of Diceromyia are given by Reinert 1970). These 2 species have the number of scutal setae much reduced, supra-alar and prescutellar space covered with long broad dark scales, large patches of pleural broad pale scales and alula with 2 rows of broad scales; but upon closer examination a number of important features of this group, as well as all Diceromyia, conform to the genus Aedes and differ sharply from the Heizmannia. These features are: prosternum bare; mesepisternum with both upper and lower setae; no silvery scales present, though scales may be snowy-white and broad; eyes contiguous; and many species with pale scaled bands on tarsi.

A number of African species in the subgenus Stegomyia superficially resemble Heizmannia by the presence of patches of broad silvery scales, dark integument and scales on the prosternum but such species are easily distinguished by the presence of anterior dorsocentral setae, tarsi with white bands and maxillary palpi of females with apex white scaled.

The Heizmannia, which are confined to the Oriental Region, display a very close similarity in adult habitus to the new world genus Haemagogus including the presence of broad silvery scales on the prosternum and the absence of upper mesepisternal setae. The female genitalia of these 2 genera also show similarities but differ in the development of the insula and the upper vaginal sclerite. In Heizmannia the insula is long, tongue-like with 2-6 tiny tuberculi on apical 0.25 (some species with small thin setae attached to tuberculi) and the upper vaginal sclerite is well developed and heavily pigmented while in Haemagogus the insula is short, lip-like with 3-6 well developed setae and the upper vaginal sclerite is absent. These differences in the female genitalia are of the same order as those existing between subgenera of Aedes. Differences exist in the male genitalia and immatures of Heizmannia and Haemagogus but not to a greater magnitude than those existing between subgenera of Aedes. Habitats of immature stages (plant-containers) of these 2 genera are also similar. Since many similarities exist between Heizmannia and Haemagogus it is imperative that when a complete revision of the latter genus is made a careful comparison should be made of it with Heizmannia.

The nomenclature and chaetotaxy used for the females and female genitalia follow Knight (1970), Knight and Laffoon (1970a, 1970b, 1971) and Laffoon and Knight (1971), except for additional terminology of the female genitalia which was used by Reinert (1973).

Heizmannia (Mattinglyia) discrepans (Edwards), New CombinationHaemagogus discrepans Edwards 1922a, Indian J. med. Res. 10: 29 (♀);

Edwards 1922b, Indian J. med. Res. 10: 450; Barraud 1934, Fauna Brit. India, Diptera 5: 309 (♀).

Aedes discrepans (Edwards), Mattingly 1957, Cul. Mosq. Indomalayan Area 2: 5, 20; Stone et al. 1959, Thomas Say Found. 6: 211; Mattingly 1970, Contr. Am. ent. Inst. 5: 46.

FEMALE (Fig. 1). Head. Antenna dark brown, pedicel dark brown with a few short brown hairs mesally, flagellomere 1 with a few small brown scales; clypeus dark brown, bare; maxillary palpus short, covered with broad, blackish-brown scales, approximately 0.11 length of proboscis; proboscis long, slender, covered with broad, blackish-brown scales, approximately equal in length to abdomen and distinctly longer than femur I; eyes well separated in front; vertex and lateral surfaces covered with broad, overlapping, decumbent, blackish-brown scales except for a dorsal, anteromedian, diamond-shaped patch of broad silvery scales which extends 0.50 posteriorly and anteriorly between eyes to base of antennal pedicel, similar scales forming a large patch on lateral surface next to eye margin at level of antepnotum; occiput with a number of short, blackish-brown, erect, forked scales; several dark ocular setae, median 2 on each side long, remainder moderately long; interocular setae absent. Thorax. Scutal integument dark reddish-brown colored; scutum covered with moderately broad, slightly curved, dark reddish-brown scales, posterior portion of supra-alar area covered with broad, long, overlapping, dark reddish-brown scales; scutellum with a patch of broad, overlapping, blackish-brown scales on lateral lobe, median lobe covered with broad, overlapping scales, silvery scales forming a large basal patch with apical ones blackish-brown; scutal setae confined to the following areas: 2 long dark median anterior promontory, scutal fossal (5 long anterior and 3 long lateral), supra-alar area with a closely packed patch of 10-12 short dark setae at posterior margin of paratergite, 1 long dark one anterior to and 1 similar one near middle of paratergite, 13-14 long dark setae along lateral margin of area from base of wing posteriorly, 1 long dark postalar callar seta and scutellar (5 long and 5 short dark median, 3 long and 3-4 short dark lateral); mesopostnotum dark reddish-brown, bare; pleural integument dark reddish-brown; antepnota large, moderately separated and covered with broad, overlapping scales which are silvery on most of area with blackish-brown ones on posterior surface, 7 long dark setae; postpnotum with 4 long dark setae; propleuron covered with broad, overlapping, silvery scales, 3 long setae, 1 dark and 2 pale; prosternum completely covered with broad, overlapping, silvery scales; subspiracular area with a row of 5-6 broad, overlapping silvery scales; postspiracular area with broad, overlapping, silvery scales on posterior portion, 2 long dark setae; paratergite large, covered with broad, overlapping, silvery scales; mesepisternum with most of area covered with broad, overlapping, silvery scales, 1 long, dark, lower, posterior seta; prealar knob with 5 short dark setae; mesepimeron with a large patch of broad, overlapping silvery scales covering most of upper and anterior areas, a patch of 2-3 short, fine, dark setae on upper area posterior to scale patch and 1 long, dark, lower seta; other pleural areas bare. Legs. Coxae I-III each with long and short setae, dark on I and II, pale on III, I-III each with entire anterior surface covered with broad, overlapping, silvery scales, I with scales also extending over lateral surface; trochanters I-III each with several short setae, I with

small, broad scales, silvery ones on posterior surface and remainder brown, II-III each with small, broad, silvery scales; femora I-II completely covered with broad, dark brown scales, III covered with broad, dark brown scales with broad, snowy-white scales on basal 0.52 of anterior surface and similar scales forming a broad posteroventral stripe on basal 0.41; tibiae I-III and tarsi I-III each covered with broad, dark brown scales; posttarsi I-III each with 2 ungues, I and II, each with ungues large, equal, each with a tooth, III with ungues small, equal, each simple. Wing. Dorsal and ventral veins covered with blackish-brown scales; alula with moderately broad, dark brown scales forming 2 rows, 1 row of decumbent scales parallel to margin and other row on fringe; upper calypter with several dark hairs. Halter. Pedicel pale; capitellum covered with broad, overlapping, blackish-brown scales. Abdomen. Terga I-VII each covered with broad, blackish-brown scales and with a large laterobasal patch of broad silvery scales on II-VII, laterobasal patch of silvery scales extends onto dorsal surface of VI and VII forming a narrow basal band, V with 7-8 scattered silvery scales dorsally near base but not forming a band, laterotergite of I covered with broad silvery scales; sterna each covered with broad blackish-brown scales with a narrow basal band of broad silvery scales; terga and sterna with a few short, dark setae along posterior margins, setae longer and more numerous on I, VI-VII. Genitalia (Fig. 2). Tergum VIII large, apex broadly rounded, base with a broadly rounded median indentation, apical 0.60 covered with broad dark scales, 11 long stout and several moderately long and short setae on apical 0.17, index* 0.62; sternum VIII large, apex with a small lobe on each side of midline and a large one laterally, base with a small median indentation, numerous broad dark scales and short and moderately long setae on apical 0.80, setae more numerous apically and medially and scales more numerous laterally, index 0.65; tergum IX heavily pigmented, apex bilobed with 1-3 setae on each lobe, index 1.03; insula tongue-like, moderately pigmented, covered with minute setae and with 2 tiny tuberculi on apical 0.25; lower and upper vaginal lips narrow, heavily pigmented, covered with minute setae; upper vaginal sclerite large, heavily pigmented; postgenital lobe moderately long, flattened apically, 14 setae on each side of midline, covered with minute setae, dorsal PGL index 1.15, ventral PGL index 2.00; cercus moderately long and broad, apex blunt, dorsal surface with 8 long stout setae on apical portion and numerous short setae scattered over remainder of area, 12-14 short setae on apical portion of ventral surface, entire dorsal and ventral surfaces covered with minute setae, index 2.00, cercus/dorsal PGL index 2.90; 3 heavily pigmented, spherical seminal capsules, 1 large and 2 slightly smaller ones, base of spermathecal duct heavily pigmented.

MALE, PUPA, LARVA and EGG. Not known.

TYPE-DATA. The following information is recorded on the labels attached to the pin on which the adult is mounted: Type ♀; E.322; Haemagogus dis-crepans, F.W. Edwards det., 1921; C.M. Bureau, India, Locality, Mus. No. 1275; India, Capt. P.J. Barraud, B.M. 1924-233. The type data given by Edwards (1922a: 292) in the original description of the species is as follows: S.W. India, Pudupadi, xi. 1915, caught in jungle, Khazan Chand collector, type ♀ (unique) in Central Malaria Bureau, Kasauli. Barraud (1934: 309), however, lists the following for the type (which differs in the date and location of the type): Pudupadi, Malabar Coast, x. 1915, Khazan Chand collector, type ♀ in British Museum. I believe that the female specimen marked type ♀ and located

* For definitions of indices used in the female genitalia description see Reinert 1973.

in the British Museum (Natural History) is the holotype for discrepans and that it was originally deposited in the collection of the Central Malaria Bureau by Edwards but later transferred to the British Museum as stated by Barraud. Since no date appears on the holotype specimen, the difference in the collection date, reported by Barraud, could possibly be a typographical error.

The condition of the holotype as of 1 December 1972 is as follows: proboscis missing, all except basal 2 segments of maxillary palpi missing, right tarsus II missing tarsomeres 4-5, pleural area of thorax and paratergite (one side) somewhat rubbed, scutum somewhat rubbed near middle, minuten pin extending through lateral surfaces of thorax, otherwise the specimen is in good condition.

DISTRIBUTION. INDIA, Malabar Coast, Pudupadi; Bombay Deccan, Nagargali; N. Kanara, Yellapur (Barraud 1934: 310).

BIOLOGY. Edwards (1922a: 292) records the holotype collected in the jungle while Barraud (1934: 309, 310) records the habitat as bamboos and states the species is probably confined to heavily forested localities. He also lists the females as day-flying and speculates that they probably suck human blood.

TAXONOMIC DISCUSSION. Edwards (1922a: 292) in his original description of discrepans stated that it was evidently very closely allied to Dendromyia achaetae Leicester and also Stegomyia tripunctata Theobald. He later (1922b: 449) stated that the absence of setae on the mesopostnotum of discrepans and tripunctata prevented their inclusion in the genus Heizmannia and therefore provisionally placed these 2 species along with achaetae in the genus Haemagogus. Mattingly (1957: 5, 20) provisionally transferred achaetae to the genus Heizmannia and tripunctata and discrepans to the genus Aedes. He stated that the latter 2 species were rather less like Heizmannia but that they were intermediate between achaetae and some species of Aedes. Lien (1968: 128) described a new genus, Mattinglyia, for his new species, catesi, from Taiwan and also transferred achaetae to this new genus. Mattingly (1970: 1, 43) downgraded Mattinglyia to subgeneric rank in Heizmannia and included achaetae, catesi and thelmae, a new species he described from Thailand. He again (1970: 46) mentions the similarity of discrepans and tripunctata to members of the subgenus Mattinglyia but retains these 2 species in Aedes awaiting the discovery of early stages and males.

Edwards (1922a: 291) in the original description of discrepans incorrectly reported that the anteprenotum was completely covered with flat silvery scales when in fact only the anterior and lateral surfaces are covered with broad silvery scales and those on the posterior portion are broad and blackish-brown. The present description of the maxillary palpus and proboscis are taken from the original description since these structures are now missing from the holotype.

Both discrepans and tripunctata fit well within the subgenus Mattinglyia of Heizmannia in respect to the female habitus and genitalia and are most closely related to achaetae. These 2 species are easily distinguished from other members of the subgenus (achaetae, catesi and thelmae) by the absence of scales on the postpronotum and discrepans also by the presence of both silvery and dark scales on the anteprenotum.

Heizmannia (Mattinglyia) tripunctata (Theobald), New Combination

Stegomyia tripunctata Theobald 1908, Rec. Indian Mus. 2: 288 (♀); Theobald 1910. Monogr. Cul. 5: 182 (♀); Brunetti 1912, Rec. Indian Mus. 4: 450; Brunetti 1920, Rec. Indian Mus. 17: 130; Senior-White 1923, Cat. Indian Insects 2: 72.

Haemagogus tripunctatus (Theobald), Edwards 1922b, Indian J. med. Res. 10: 450; Barraud 1934, Fauna Brit. India, Diptera 5: 310 (♀).

Aedes tripunctata (Theobald), Mattingly 1957, Cul. Mosq. Indomalayan Area 2: 5; Stone et al. 1959, Thomas Say Found. 6: 211.

Aedes tripunctatus (Theobald), Mattingly 1957, Cul. Mosq. Indomalayan Area 2: 20; Mattingly 1970, Contr. Am. ent. Inst. 5: 46.

FEMALE. Head. Antenna dark brown, pedicel black with a few short, black hairs mesally, flagellomere 1 with basal area pale; clypeus dark brown, bare; maxillary palpus short, covered with broad, dark brown scales; proboscis long, slender, covered with dark brown scales; eyes well separated in front; vertex and lateral surfaces covered with broad, overlapping, decumbent, blackish brown scales except for a dorsal anteromedian patch of broad, silvery scales which extends between eyes to base of antennal pedicel, similar scales forming a patch on lower lateral surface next to eye margin and extending posteriorly; occiput with a number of short, dark, erect, forked scales; 2 long dark ocular setae; 2 long dark interocular setae. Thorax. Scutal integument black colored; scutum covered with narrow, slightly curved, reddish-brown scales; scutellum with a patch of broad, overlapping, reddish-brown scales on all lobes; 1 cotype with some pale scales on median lobe; scutal setae confined to the following areas: 2 dark median anterior promontory, a few dark anterior and lateral scutal fossal, numerous dark supra-alar and long dark scutellar; mesopostnotum black, bare; pleural integument black; antepronota large, moderately separated, covered with broad, overlapping silvery scales, 6-7 long dark setae; postpronotum with 3-4 long dark setae; propleuron covered with broad, overlapping silvery scales, 2-3 long setae; postspiracular area with 2 dark setae; paratergite large, covered with broad, overlapping silvery scales; mesepisternum with most of area covered with broad, overlapping, silvery scales, 1-2 long, dark, lower, posterior setae; prealar knob with several dark setae; mesepimeron with a large patch of broad, overlapping, silvery scales, a patch of 2-3 short, fine, dark setae on upper area posterior to scale patch and 1 long lower seta. Legs. Coxae I-III each with a large patch of broad, overlapping, silvery scales; femora I and II each covered with broad, dark brown scales with white scales on posterior at base, III with anterior surface covered with broad, white scales except apical portion which is dark brown scaled, posterior surface with broad, dark brown scales except for a ventral white scaled stripe basally, dorsal surface dark brown scaled; tibiae I-III and tarsi I-III each covered with broad, dark brown scales; posttarsi I-III each with 2 ungues, all simple. Wing. Dorsal and ventral veins covered with dark brown scales, plume scales broad. Abdomen. Terga I-VII each covered with broad, blackish scales and with a large latero-basal patch of broad, silvery scales on II-VII, basal patch of silvery scales extends onto dorsal surface of VI and VII forming a narrow basal band (Theobald 1908: 288 mistakenly reported bands on terga V and VI), terga with short pale setae, mostly along posterior margins. Genitalia. Tergum VIII partially retracted into segment VII; cerci flattened apically.

MALE, PUPA, LARVA and EGG. Not known.

TYPE-DATA. Two cotype females each with the following information on the labels: Lushai Hills, Assam, E.C. Macleod collector; Stegomyia tripunctata, type ♀, F.V.T.; ⁷⁴³⁹/₁₅. One cotype female is in good condition and the second cotype female is in poor condition. Both cotypes are deposited in the Indian Museum, Calcutta, India. Theobald (1910: 183) lists the collection date of the type as 6-vi-04.

BIOLOGY. Barraud (1934: 309) states the females are day-flying, probably suck human blood and appear to be confined to heavily forested localities.

DISTRIBUTION. Known only from the type locality in India.

TAXONOMIC DISCUSSION. The above description is based on the original one by Theobald (1908: 288) and notes on the types made by Dr. John E. Scanlon. Heizmannia tripunctata appears to be very similar in habitus and biology to discrepans from which it can be distinguished by: posttarsi I-III each with simple ungues, plume scales of wing broad and femur III with anterior surface white scaled nearly to apex. Unfortunately no information is available on the presence of broad silvery scales on the prosternum and no specimens were available for examination by me; however, the other characters mentioned in the description agree well with other members of the subgenus Mattinglyia of Heizmannia and do not fit any of the subgenera of Aedes. Additional information about this species is included in the discussion section of discrepans and the introductory remarks of this paper.

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Fig.1

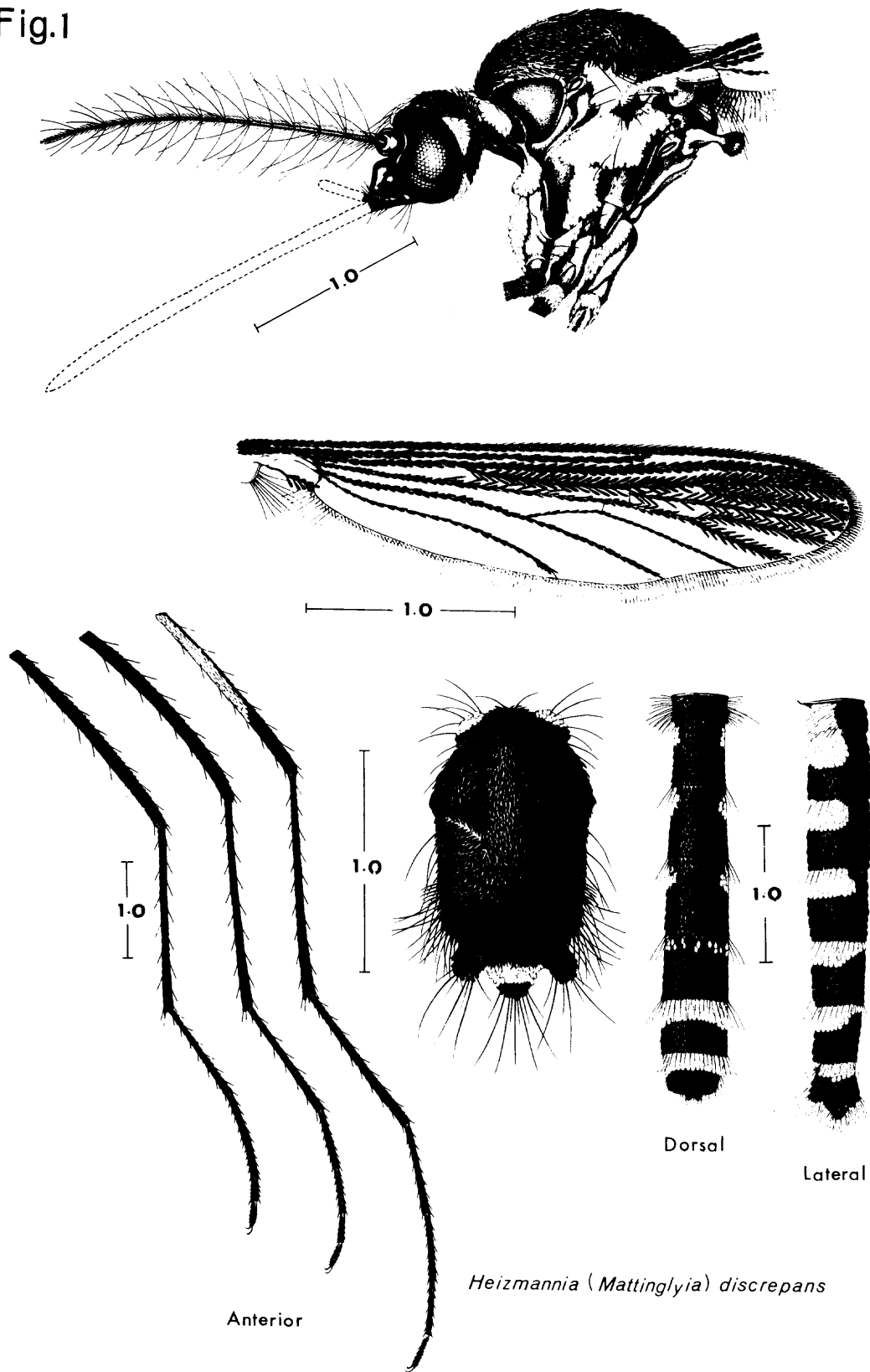
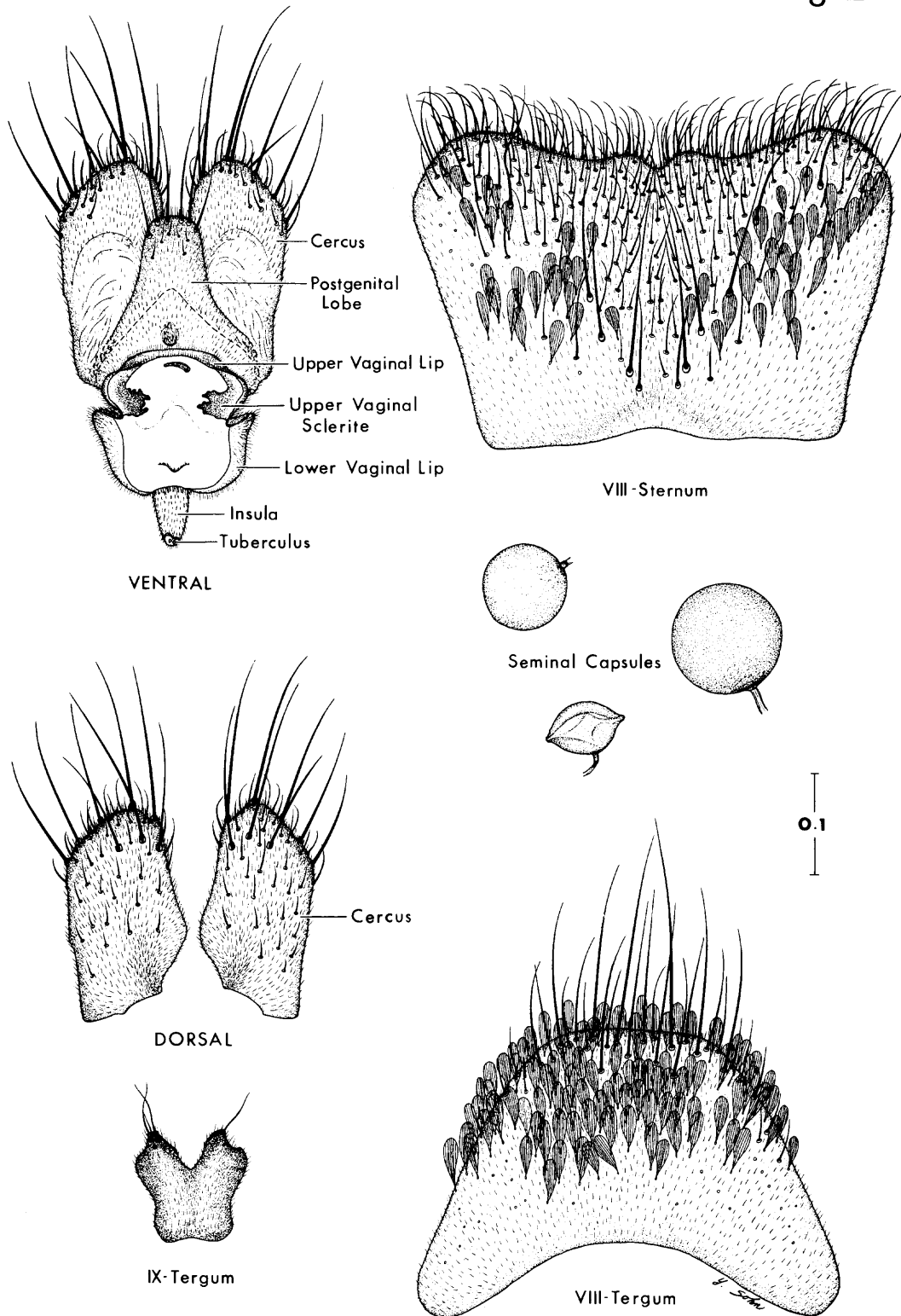


Fig. 1. Heizmannia (Mattinglyia) discrepans holotype female: adult morphology.

Fig. 2



Heizmannia (Mattinglyia) discrepans

Fig. 2 Heizmannia (Mattinglyia) discrepans holotype female: genitalia.