

A NEW SPECIES OF *HEIZMANNIA* FROM SRI LANKA (DIPTERA: CULICIDAE)

FELIX P. AMERASINGHE

*Department of Zoology, University of Peradeniya,
Peradeniya, Sri Lanka*

ABSTRACT. *Heizmannia (Heizmannia) carteri* n. sp. from Sri Lanka is described and illustrated based on characters of the adult female. This species is compared with, and separated from, all other described members of the genus from South and Southeast Asia.

INTRODUCTION

Only one species of the genus *Heizmannia*, i.e., *H. (Heizmannia) greenii* Theobald, has hitherto been reported to occur on the island of Sri Lanka (5° 10' N 79° 82' E). Major life stages of this species were recently re-described from the original and subsequently collected material from Sri Lanka (Amerasinghe 1989). Collections made by this author in various regions of the island between 1980 and 1990 contained specimens of a *Heizmannia* that were markedly different from *H. greenii*. Although only females have been collected, they are sufficiently different from other described members of the genus in South and Southeast Asia to warrant recognition as a distinct species. The description of this new species is presented in this paper.

MATERIALS AND METHODS

Morphological terminology follows Harbach and Knight (1980). Illustrations were prepared from specimens collected at the type locality of the new species.

TAXONOMIC TREATMENT

Heizmannia (Heizmannia) carteri, new species

Female (Figs. 1, 2). **Head** (Fig. 1A): Eyes well separated; clypeus bare; vertex with broad, flat, dark scales and a patch of broad white scales overhanging interocular space; broad, flat, white scales extending down side

to postgena; prominent setae along ocular and interocular lines; postgenal setae present; proboscis dark, with 5,6 labial basal setae; length forefemur/proboscis 0.97-1.0, mean 0.98 (based on sample of 7 females); palpus dark, length palpus/proboscis 0.11-0.14, mean 0.13; antennal pedicel fringed with minute narrow scales, flagellomere 1 with pale scales along inner surface. **Thorax** (Fig. 1A,B): Scutum with dense covering of broad, flat, overhanging dark scales with metallic bronze to purple and green reflections; acrostichal, dorsocentral, and prescutellar setae absent, scutal fossal setae present along anterior margin; scutellum dark at base, mid- and lateral lobes variably pale-scaled (some specimens entirely pale, others almost completely dark), midlobe with 5 stout setae and lateral lobes with 2,3 stout setae; antepronotum with mesal and anterolateral setae, largely to entirely pale-scaled with anteromesal borders always pale-scaled; postpronotum covered with broad pale scales which sometimes extend to anterior margin of scutum; proepimeron bare; proepisternum and postprocoxal membrane white-scaled; postspiracular area, upper half of subspiracular area, posterior half and upper anterior region of mesokatepisternum, mesanepimeron, and paratergite covered with broad white scales; prealar knob with few broad white scales; antealar margin pale-scaled; proepisternum with 3,4 setae; mesokatepisternum with one long and one short seta on lower posterior border; mesanepimeron with single very long seta; prealar knob with 9,10 setae; mesokatepimeron, meso-

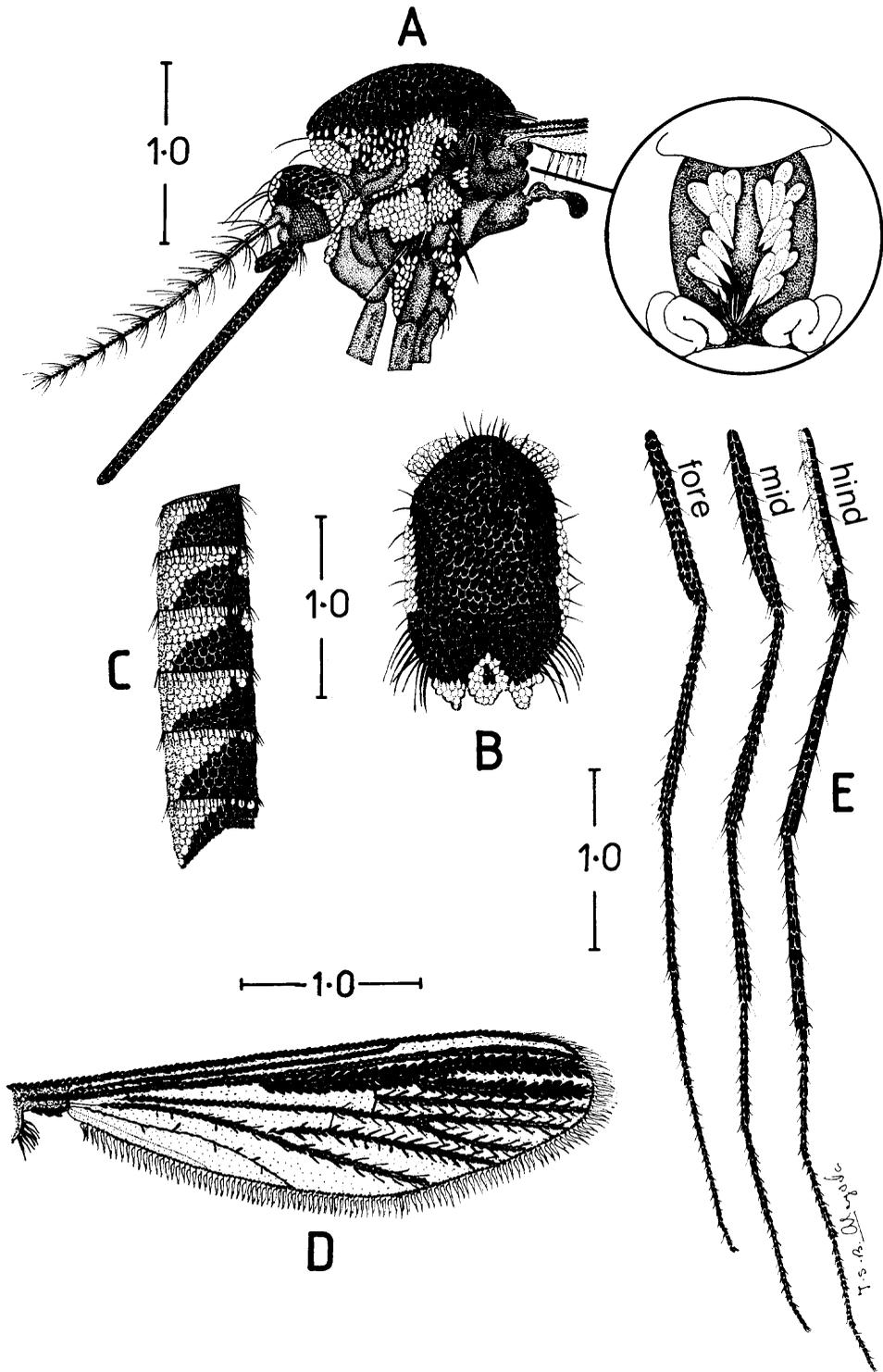


Fig. 1. *Heizmannia (Heizmannia) carteri* n. sp., female. A, Lateral view of head and thorax (inset shows double row of pale scales on mesopostnotum); B, dorsal view of mesonotum; C, lateral view of abdominal segments I-VI; D, dorsal view of wing; E, anterior surface of fore-, mid-, and hindlegs. Scale bars in mm.

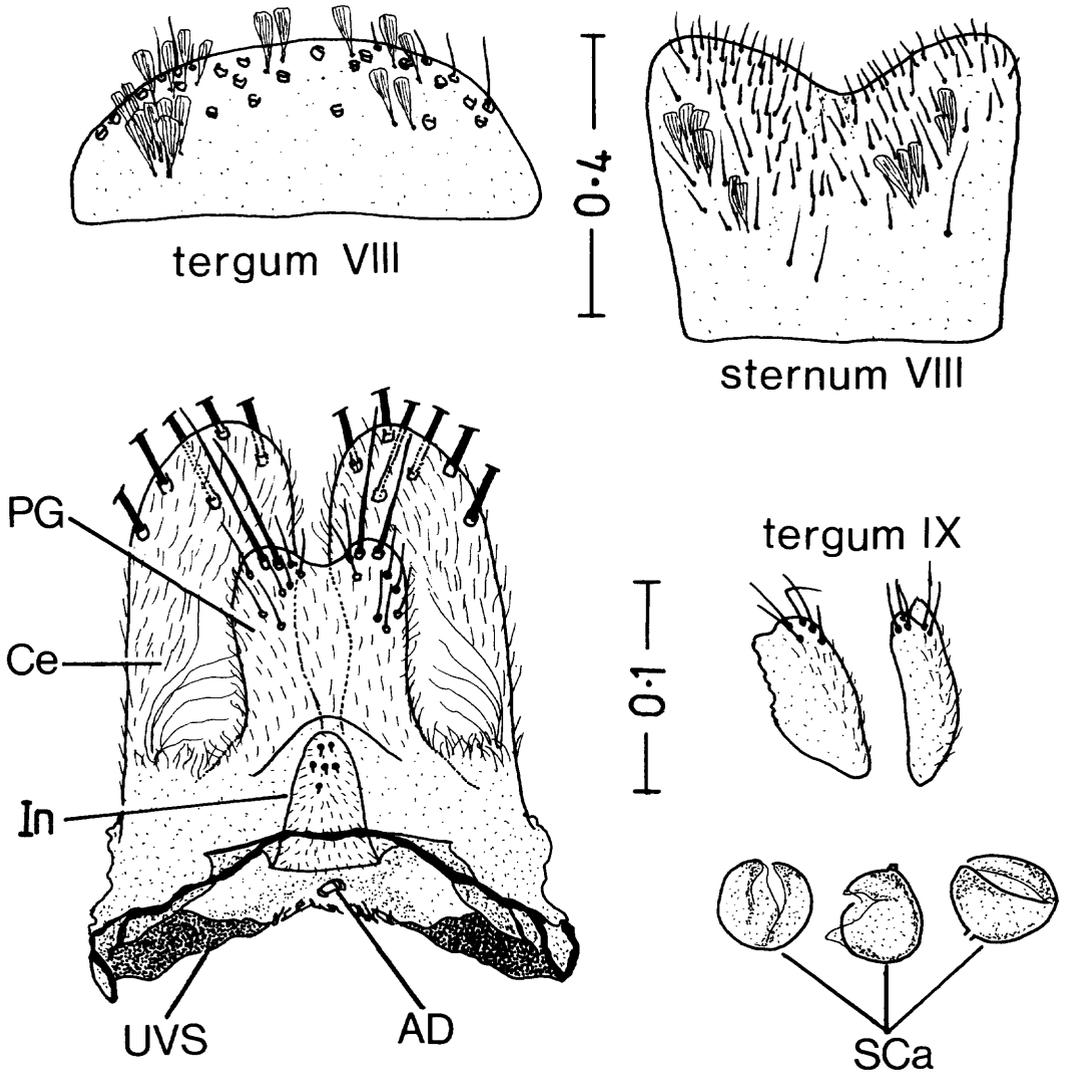


Fig. 2. *Heizmannia (Heizmannia) carteri* n. sp., female genitalia. AD = accessory gland duct; Ce = cercus; In = insula; PG = postgenital lobe; SCa = spermathecal capsule; UVS = upper vaginal sclerite. Scale bars in mm.

meron, metepisternum, and metapostnotum bare; mesopostnotum (Fig. 1A) with patch of small setae and prominent double row of broad pale scales along its length. *Wing* (Fig. 1D): Upper calypter fringed with setae; alula with patch of small dark scales; plume scales moderately broad; length cell R_2 /vein R_{2+3} = 3.2–5.8, mean 4.7; length cell M_1 /vein M_{1+2} = 1.9–3.0, mean 2.5. *Halter*: Capitellum dark-scaled. *Legs* (Fig. 1E): Fore-, mid-, and hind-

coxae pale-scaled; fore- and midfemora dark on anterior surface, pale-scaled along length of posterior surface; hindfemur pale-scaled along 0.8 of anterior and entire length of posterior surface; all tibiae and tarsi dark; fore-, mid-, and hindlegs with both ungues simple. *Abdomen* (Fig. 1C): Tergum I dark on dorsum and white-scaled on lateral borders; terga II–VII with basolateral triangular white markings which sometimes extend toward

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dorsum and form narrow basal white bands on terga VI, VII; tergum VIII dark, partially retracted; sterna II, III entirely pale-scaled, sterna IV–VII with broad basal white bands. **Genitalia** (Fig. 2): Cerci broad; postgenital lobe with a distinct emargination at apex, with one or 2 pairs of very long setae and 7 or 8 pairs of shorter setae on each side; tergum IX represented by 2 separate sclerites, each with 4, 5 apical setae; insula spiculose.

Male, pupa, and larva. Unknown.

Type data. Holotype female (ref. no. 6B/1) and one paratype female (ref. no. 8B/5) with dissected genitalia mounted on microscope slides. SRI LANKA. *Central Province*, Udawattakele Forest, collector F.P. Amerasinghe, diurnal human bait catch, 22 December 1980. Deposited in the National Museum of Natural History (NMNH), Smithsonian Institution, Washington, DC.

Other material examined. SRI LANKA. *Central Province*, Udawattakele Forest, one female (ref. no. UK001) with genitalia on microscope slide, collector N.B. Munasingha, diurnal human bait catch, 20 March 1984; *Sabaragamuwa Province*, Sinharaja Forest, 2 females (ref. nos. S2/5, S2/6) with genitalia on microscope slides, collector V.L. Kulasekera, diurnal human bait catch, 30 June 1984; *Eastern Province*, Dehiattakandiya, 2 females (ref. no. BKY002 dated 6 April 1984, and ref. no. B185[M] dated 11 May 1984) with genitalia on microscope slides, collectors F.P. Amerasinghe and N.B. Munasingha, diurnal human bait catch. Specimen nos. S2/6 and BKY002 are deposited at the NMNH, Smithsonian Institution, Washington, DC; nos. UK001, S2/5, and B185[M] presently in the Department of Zoology, University of Peradeniya, Sri Lanka, but will be deposited in the NMNH, Smithsonian Institution, Washington, DC.

Bionomics. All females were collected biting humans during the daytime in primary wet-zone forest in the southwest, secondary wet-zone forest in the central hills, and secondary dry-zone forests in the east of the island. Thus, the species appears to be widely distributed within Sri Lanka, though the few specimens obtained over a decade of col-

lecting suggest that it is rare in all these habitats. Nothing is known of the natural hosts or immature habitats of this species.

Systematics. Despite the fact that only females have been collected to date, they are sufficiently distinct from all other known *Heizmannia* to warrant description as a distinct species. The species clearly belongs to the subgenus *Heizmannia*, which is characterized by the presence of closely approximated antepnota, setae on the mesopostnotum, and tergum IX of the female genitalia represented as two separate sclerites. *Heizmannia carteri* shares with many other members of the genus the presence of pale scales on both the antepnotum and postpronotum. However, *H. carteri* is unique among members of the genus in possessing a clearly demarcated double row of pale mesopostnotal scales. This, together with a distinctly emarginate apex of the postgenital lobe, is diagnostic of the species.

Heizmannia complex (Theobald) is the only other known member of the genus to regularly possess broad pale scales on the mesopostnotum. However, these are attached near the basal setae and do not extend in a double row towards the anterior part of the mesopostnotum as in *H. carteri*. Some specimens of *H. aureochaeta* (Leicester), as well as the only known specimen (the holotype male) of *H. scanloni* Mattingly, have been reported to possess one or two mesopostnotal scales (Mattingly 1970). Harrison and Bickley (1990) have reported the presence of these scales on *H. taiwanensis* Lien. Material examined by me at the NMNH and the British Museum (Natural History) (BMNH) showed that occasional specimens of the above species (except *H. scanloni*), as well as those of *H. chengi* Lien and *H. greenii* (Theobald), possessed one to three mesopostnotal scales. The mesopostnotal scalation of these species was quite distinct, in terms of scale number and arrangement, from the double row characteristic of *H. carteri*. It is clear that the occurrence of mesopostnotal scales is not a stable character in the above species, unlike *H. carteri* where the character has been present in every specimen examined so far. Females

of all these species (except *Hz. scanloni*) also differ from *Hz. carteri* in having a convex apex to the postgenital lobe. The only known, badly damaged specimen of *Heizmannia scanloni* has a single pale linear scale on the mesopostnotum, quite distinct in shape from the broadly rounded scales of *Hz. carteri*. Other differences include: cell R_2 /vein R_{2+3} ratio which is 2.0 in *Hz. scanloni* and 3.2–5.8 in *Hz. carteri*; plume scales on the wing which are narrow to extremely narrow in *Hz. scanloni* and broad in *Hz. carteri*; and the hindfemora which are dark-scaled in *Hz. scanloni* and mostly pale-scaled anteriorly and entirely pale-scaled posteriorly in *Hz. carteri*. These differences, as well as distributional criteria (*Hz. scanloni* is known only from Thailand), make it highly unlikely that the species described herein as *Hz. carteri* represents the undescribed female of *Hz. scanloni*. All other species of *Heizmannia* lack mesopostnotal scales and are thus easily distinguished from *Hz. carteri*.

Several species of *Heizmannia* have the postgenital lobe with an emarginate apex as in *Hz. carteri*, including *Hz. communis* (Leicester), *Hz. covelli* Barraud, *Hz. macdonaldi* Mattingly, *Hz. achaetae* (Leicester), *Hz. catesi* (Lien), and *Hz. thelmae* Mattingly. However, none of these species have mesopostnotal scales and are thus clearly distinguishable from *Hz. carteri*. Additional differences are as follows: *Hz. communis* and *Hz. covelli* have dark scales on the postpronotum (pale in *Hz. carteri*), while *Hz. achaetae*, *Hz. catesi*, and *Hz. thelmae* lack mesopostnotal setae, have well separated anteprenotal lobes, and, except for *Hz. thelmae*, have tergum IX represented by a single sclerite (mesopostnotal setae present, anteprenotal lobes closely approximated and tergum IX represented by two sclerites in *Hz. carteri*). The structure of the female postgenital lobe is not described or illustrated in the original or subsequent descriptions of *Hz. chandi* Edwards (Edwards 1922, Barraud 1934), *Hz. viridis* Barraud (Barraud 1929, 1934), and *Hz. kana* Tanaka, Mizusawa and Saugstad (Tanaka et al. 1979). However, all three species can be separated from *Hz. carteri* by the presence of

very narrow plume scales on the wing and the absence of the double row of mesopostnotal scales (plume scales broad and mesopostnotal scales present in *Hz. carteri*). *Heizmannia proxima* Mattingly, known only from the male, has pale postpronotal scales as in *Hz. carteri* but lacks scales on the mesopostnotum. All other species of *Heizmannia* (except *Hz. scanloni*, which is known only from the male) have a convex or flat apical margin on the postgenital lobe and are thus clearly distinct from *Hz. carteri*.

Heizmannia greenii is the only other species of the genus known to occur on Sri Lanka. Most females of *Hz. greenii* lack mesopostnotal scales (occasional females possess only one or two such scales), and all lack an emarginate apex on the postgenital lobe. Thus, they are easily distinguished from *Hz. carteri*. In addition, *Hz. greenii* has a ventral pale spot at the base of the proboscis (absent in *Hz. carteri*), wings with extremely narrow plume scales, and a cell R_2 /vein R_{2+3} ratio of 2.0–3.0 (broad plume scales and R_2/R_{2+3} ratio 3.2–5.8 in *Hz. carteri*).

Etymology. This species is named after Henry F. Carter in honor of his contributions to malariology and medical entomology in Sri Lanka.

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