

**A REVISION OF THE SHORE FLY GENUS *ELEPHANTINOSOMA*
BECKER (DIPTERA: EPHYDRIDAE)**

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Abstract.—The shore fly genus *Elephantinosoma* Becker is revised and now includes the type species, *E. chnumi* Becker, and a new species, *E. cogani*, from Nigeria. The genus is Afrotropical and Mediterranean in distribution and is apparently related to *Allotrichoma*, sensu lato, and *Hecamede*, although a sister-group relationship with either has not been established. The main characters for distinguishing between species are those of the male terminalia, of which figures are provided.

The genus *Elephantinosoma* Becker (1903) was proposed to accommodate *E. chnumi* and *E. perspiciendum*, two new species that Becker described in the same paper. The specimens Becker studied came from the Isle of Elephantine, an island in the Nile River, and the island's name, evidently, is the basis for the generic name, not the size or shape of the flies. Indeed, the small size of these shore flies, with body lengths of less than three mm, and their shape, which is typically fly-like, does not allude to an elephant-like body.

When Becker described the genus, and in his later treatments of the genus (1922, 1926), he did not designate a type species, and his characterization of the genus was inaccurate for some of the characters he used. Cresson (1946) subsequently designated *E. chnumi* as the type species for the genus and earlier (1929: 176) had transferred *perspiciendum* from *Elephantinosoma* to *Allotrichoma* Becker. Unfortunately, the basis for Cresson's transfer was a misidentification of specimens he was studying from the type locality in Egypt. Later, Cresson (1946: 249-250) discovered his error, transferred *per-*

spiciendum back to *Elephantinosoma*, and described his misidentified specimens as a new species, *Allotrichoma aegyptium*.

The back and forth placement of *perspiciendum* did not abate with Cresson, however. The distinguished English dipterist, J.E. Collin (1949: 204) noted certain anomalies in the characterization of *Elephantinosoma* and was certain that the two originally included species belonging to "... two quite distinct genera" Consequently he followed Cresson's earlier precedent in transferring *perspiciendum* back to *Allotrichoma* and retaining *E. chnumi* as the only included species in *Elephantinosoma*. Collin's placement of *perspiciendum* in *Allotrichoma* was tentative, however, and he further suggested that this species and a new one he described, *A. agens*, were possibly related to *Pseudohecamede* Hendel, a genus known only from the Western Hemisphere. Not having adequate material then available to him for further study of these genera, he left the matter partially unresolved. Some years later, Soika (1956) proposed the subgenus *Eremotrichoma* for *A. perspiciendum*, its type species, *A. agens* Collin, and *A. sim-*

plicior Collin, and that subgenus was recently revised (Mathis, 1986a).

In recent catalogues of the Afrotropical and Palearctic regions, *Elephantinosoma* has either included *chnumi* and *perspicendum* (Cogan, 1980) or just *chnumi* (Cogan, 1984), with *perspicendum* in *Allotrichoma*.

The purpose of this paper is to resolve better some of the remaining problems. The genus is recharacterized, *E. chnumi* is re-described, and a new species is described from Nigeria. The monophyly of *Elephantinosoma* within the tribe Atissini is also discussed briefly.

The methods used generally in this study were explained previously by Mathis (1985, 1986a, 1986b). The descriptive terminology, with the exceptions noted in the above-cited papers, follows that published in the recent *Manual of Nearctic Diptera, Vol. 1* (McAlpine, 1981).

Two venational ratios are used commonly in the descriptions and are defined here for the convenience of the user (all ratios are averages of three specimens).

1. Costal vein ratio: the straight line distance between the apices of R_{2+3} and R_{4+5} /distance between the apices of R_1 and R_{2+3} .

2. M vein ratio: the straight line distance along M basad of crossvein dm-cu/distance apicad of crossvein dm-cu.

Descriptions are composite. For the most part, information given in the generic description is not repeated in the species description.

Genus *Elephantinosoma* Becker

Elephantinosoma Becker, 1903: 179 [type species: *Elephantinosoma chnumi* Becker, by designation of Cresson, 1946: 249]; 1926: 94–95 [rev.].—Cresson, 1946: 248–249 [review].—Collin, 1949: 203–206 [disc.].—Cogan, 1980: 657 [Afrotropical cat.]; 1984: 131 [Palearctic cat.].

Diagnosis.—Small to moderately small shore flies, length 1.80 to 2.65 mm.

Head: Wider than high; frons entirely and

mostly densely microtomentose, with mesofrons undifferentiated except for colorational differences; ocellar setae inserted slightly in front of anterior ocellus; pseudopostocellar setae moderately well developed, about $\frac{1}{2}$ to $\frac{2}{3}$ length of ocellar setae; only reclinate fronto-orbital seta present, no proclinate setae, although sometimes with a minute setula; both inner and outer vertical bristles present; ocelli arranged to form isosceles triangle, with distance between posterior pair slightly greater than between anterior ocellus and either posterior ocellus. Antenna dark colored, black, generally within shallow facial groove; arisal length subequal to antennal length and bearing 5–6 dorsal rays, with basal 3–4 rays longer than apical 2–3; 2nd antennal segment with short, proclinate dorsal seta. Eye subround to slightly ovate, bare of setulae. Face between antennal grooves carinate, but not with tuberculate prominence below level of antennal grooves, otherwise face in profile more or less vertical; oral margin broad, wider than narrowest distance between eyes, ventral margin more or less flat, not emarginate; facial setae weakly developed, usually only 1 seta inserted near parafacial; gena moderately high, about $\frac{1}{2}$ eye height and bearing 1 genal seta; labella broad, fleshy, shorter than mediproboscis; maxillary palpus dark, mostly blackish.

Thorax: Mesonotum usually light tan to faintly golden, pleura more gray to whitish gray, usually with broad stripe through venter of notopleuron; chaetotaxy generally weakly developed, setulae much reduced and sparse, arranged in setal tracks as follows: acrostichal setulae minute, generally inconspicuous, in 2–4 rows, setulae of median rows slightly better developed, lateral rows attenuated anteriorly; prescutellar acrostichal setae well developed, subequal in length to posteriormost dorsocentral bristles, distance between less than that between either seta and posteriormost dorsocentral seta; dorsocentral track terminated posteriorly with 1 larger seta; intra-alar setulae irregu-

larly seriated; 1 postpronotal seta; presutural seta reduced or lacking; 1 postalar seta; 2 scutellar bristles and with sparse, scattered setulae on scutellar disc; 2 notopleural setae, insertion of posterior seta elevated above level of anterior one; 2 anepisternal bristles along posterior margin and several small, pale setulae on dorsal $\frac{1}{3}$; katapisternal seta lacking.

Wing: membrane coloration milky white; veins behind costa pale, whitish yellow; vein R_{2+3} extended beyond level of crossvein dm-cu, 3rd costal section about $\frac{1}{2}$ that of 2nd section; alular marginal setulae short, length less than $\frac{1}{2}$ alular height.

Legs: not bearing prominent setae or with distinctive conformation; femora mostly gray, microtomentose, tibiae grayish yellow to yellow, tarsi yellow, apical tarsomere darker, browner.

Abdomen: Fifth tergum of male visible dorsally, as long as 3rd, not telescoped within 4th, and lacking dorsal apodemes that project into 4th but with a distinct oval area toward posteroventral margin (function unknown); 5th sternum poorly sclerotized, U-shaped or as 2 rod-shaped sternites. Male terminalia as follows: cerci fused ventrolaterally with epandrium; surstyli apparently lacking; aedeagus long and narrow in lateral view, slightly enlarged apically; gonite roughly triangular in shape, sheathing base of aedeagus; hypandrium a long narrow process, slightly longer than aedeagus, that lies between the arms of 5th sternum.

Distribution.—Old World. Southern Palaearctic (Mediterranean: Egypt, Israel to Morocco), and Afrotropical (Niger, Nigeria, and Sudan). Cresson (1948: 26) reported a damaged female from India (Punjab). We have examined this specimen and can report that it is an undetermined species of *Allotrichoma* (*Eremotrichoma*).

Natural history.—The few specimens that we have collected of this genus were taken from an exposed, bare shore next to a slightly brackish aquatic environment. The specimens of *E. cogani* were collected on a nar-

row sandy beach having patches of *Typha* in places and bounded inland by *Salvadora* scrub. The shore was littered with mammal and fish bones and carrion, including a very ripe dead horse, and had a waveline of drowned tree locusts (*Anacridium* sp.) and *Typha* flotsam. Dead chironomids from vast swarms of *Tanytarsus spadiceonotatus* Freeman blanketed the shore in places. On account of large populations of herons and wading birds, the inshore waters were rich in nutrients from bird lime. The site had a considerable range and quantity of decaying organic matter!

Discussion.—The monophyly of *Elephantinosoma* is indicated by the following apomorphies (The outgroups are *Allotrichoma*, sensu lato, and *Hecamede* of the tribe Atissini):

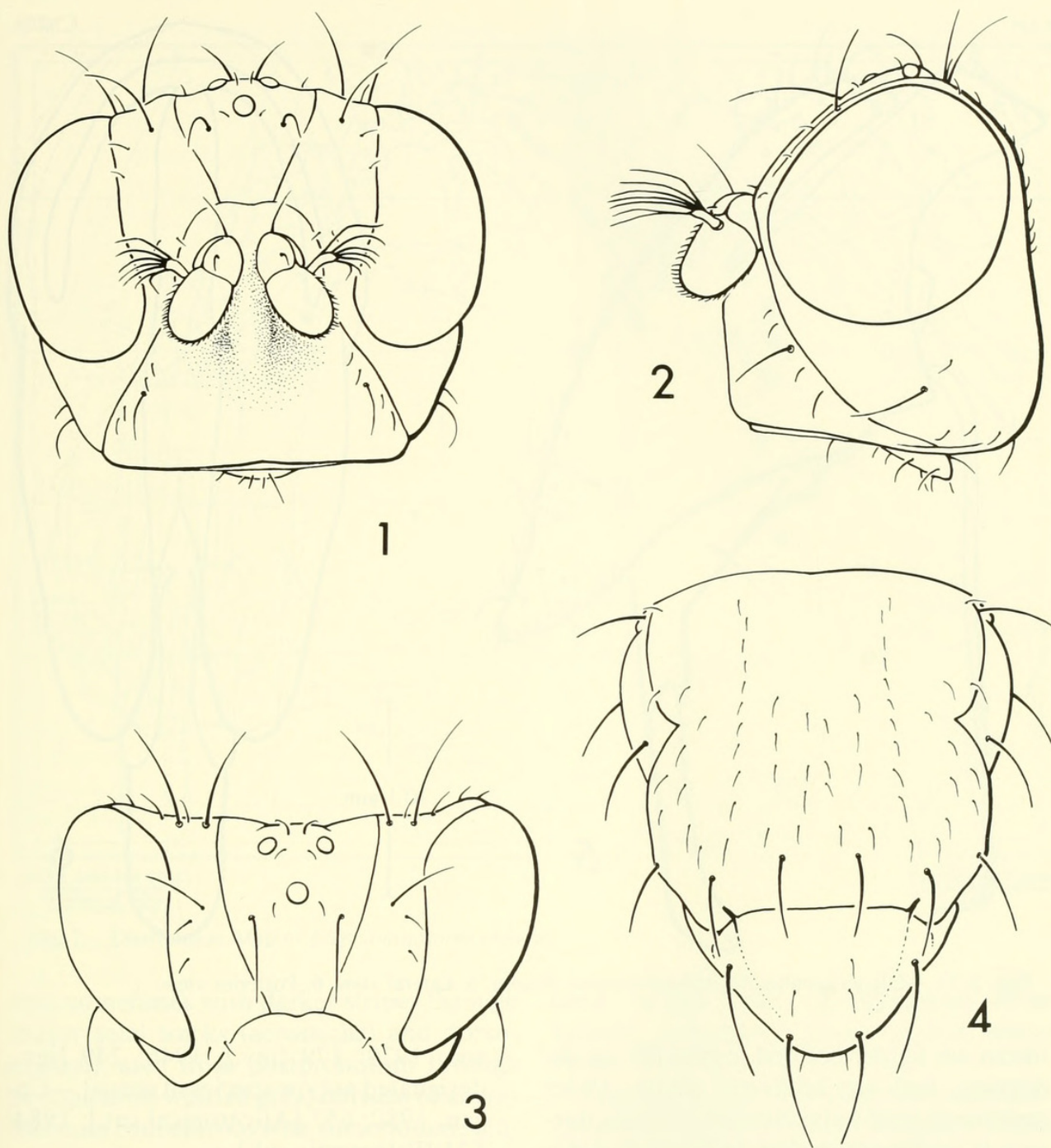
1. One reclinate fronto-orbital seta and no proclinate setae. Usually there is at least one proclinate fronto-orbital seta in members of the tribe Atissini, and its absence in *Elephantinosoma* is considered to be a derived state.

2. Katapisternal seta lacking. Typically the katapisternal seta is present and conspicuous. There is no evidence, in a reduced state or otherwise, of this seta in *Elephantinosoma*, and thus this state is considered to be apomorphous.

3. Facial setae weakly developed, usually only one seta inserted near parafacial. Most atissine taxa have two to three well-developed facial setae. The reduced number of these setae, as in *Elephantinosoma*, is considered an apomorphy.

4. Presutural seta reduced or lacking. The loss of this seta has occurred more than once in the tribe Atissini, each apparently independently. This character by itself, for this reason, is not strong evidence for the monophyly of *Elephantinosoma*. As it corroborates the other characters presented here, however, we consider it to be a derived character.

5. Reduced size and number of mesonotal setae. Like character four, this character oc-



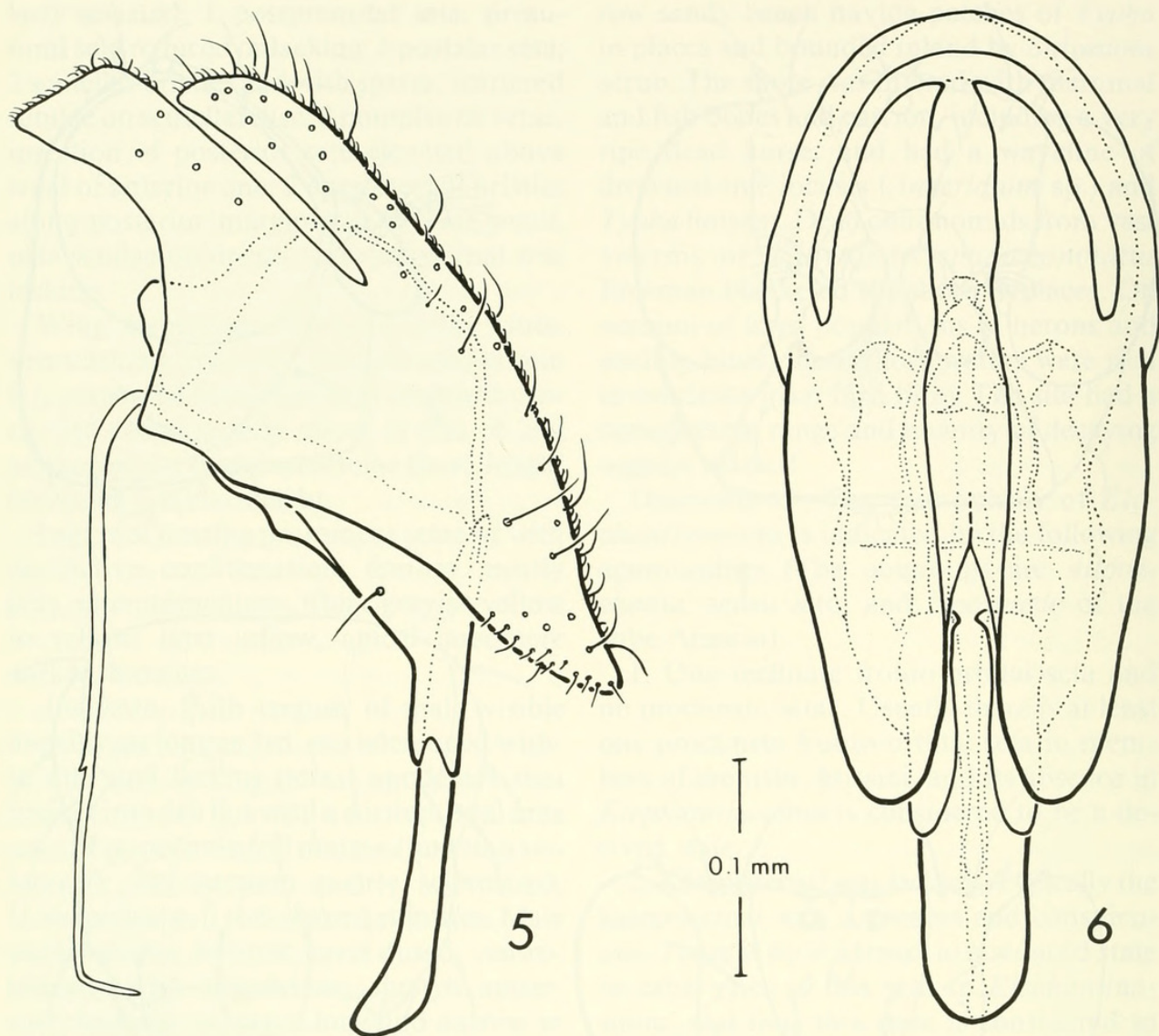
Figs. 1–4. *Elephantinosoma chnumi*. 1, Head, anterior view. 2, Same, lateral view. 3, Same, dorsal view. 4, Thorax, dorsal view.

curs elsewhere in Atissini, but in taxa that are not closely related to *Elephantinosoma*. Thus, we consider its occurrence in this genus to be an apomorphy and to be convergent with the other atissine taxa.

A sister group for *Elephantinosoma* has not been specifically identified, and we are deferring detailed discussion of this matter

until a more definitive classification of the tribe has been presented (Mathis, in preparation). For this study it is sufficient to know that the genus is related to *Allotrichoma*, sensu lato, and *Hecamede*.

There is considerable intraspecific variation in color that seems to be related in part to the age of specimens. Younger spec-



Figs. 5, 6. Male terminalia of *Elephantinosoma chnumi*. 5, Lateral view. 6, Posterior view.

imens are lighter colored, especially on the dorsum, and are relatively intact. Older specimens tend to be tattered, and the dorsum is uniformly darker and with a duller sheen.

As there are only two species presently known in this genus, we have not provided a key. The diagnoses and figures for the two should suffice for their identification.

***Elephantinosoma chnumi* Becker**

Figs. 1–7

Elephantinosoma chnumi Becker, 1903: 180.—Becker, 1922: 72 [rev.]; 1926: 95 [review; figs. of thorax and head].—Cres-

son, 1929: 179 [rev.]; 1946: 249 [rev., designated as type species of genus].—Cogan, 1980: 657 [Afrotropical cat.]; 1984: 131 [Palearctic cat.].

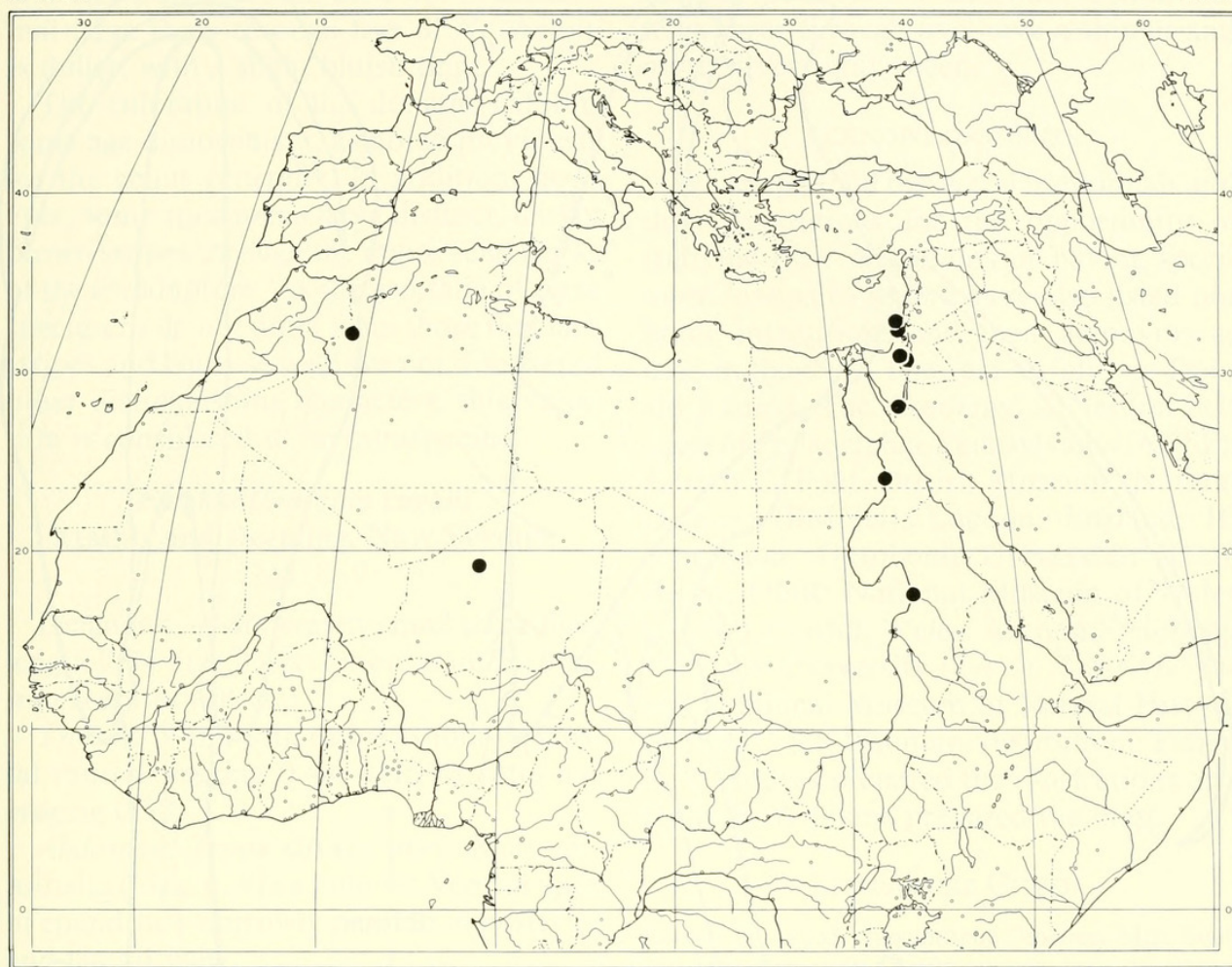
Diagnosis.—Small to moderately small shore flies, length 1.8 to 2.65 mm.

Head (Figs. 1–3): Frons mostly light tan to brown, sometimes with fronto-orbits grayish to whitish gray. Antenna blackish; arista with 4–5 dorsal rays. Face mostly white to silvery white; dorsal facial carina concolorous with frons or slightly more golden. Gena concolorous with face.

Thorax (Fig. 4): Mesonotum mostly concolorous with frons to dorsum or notopleu-

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Fig. 7. Distribution Map of *Elephantinosoma chnumi*.

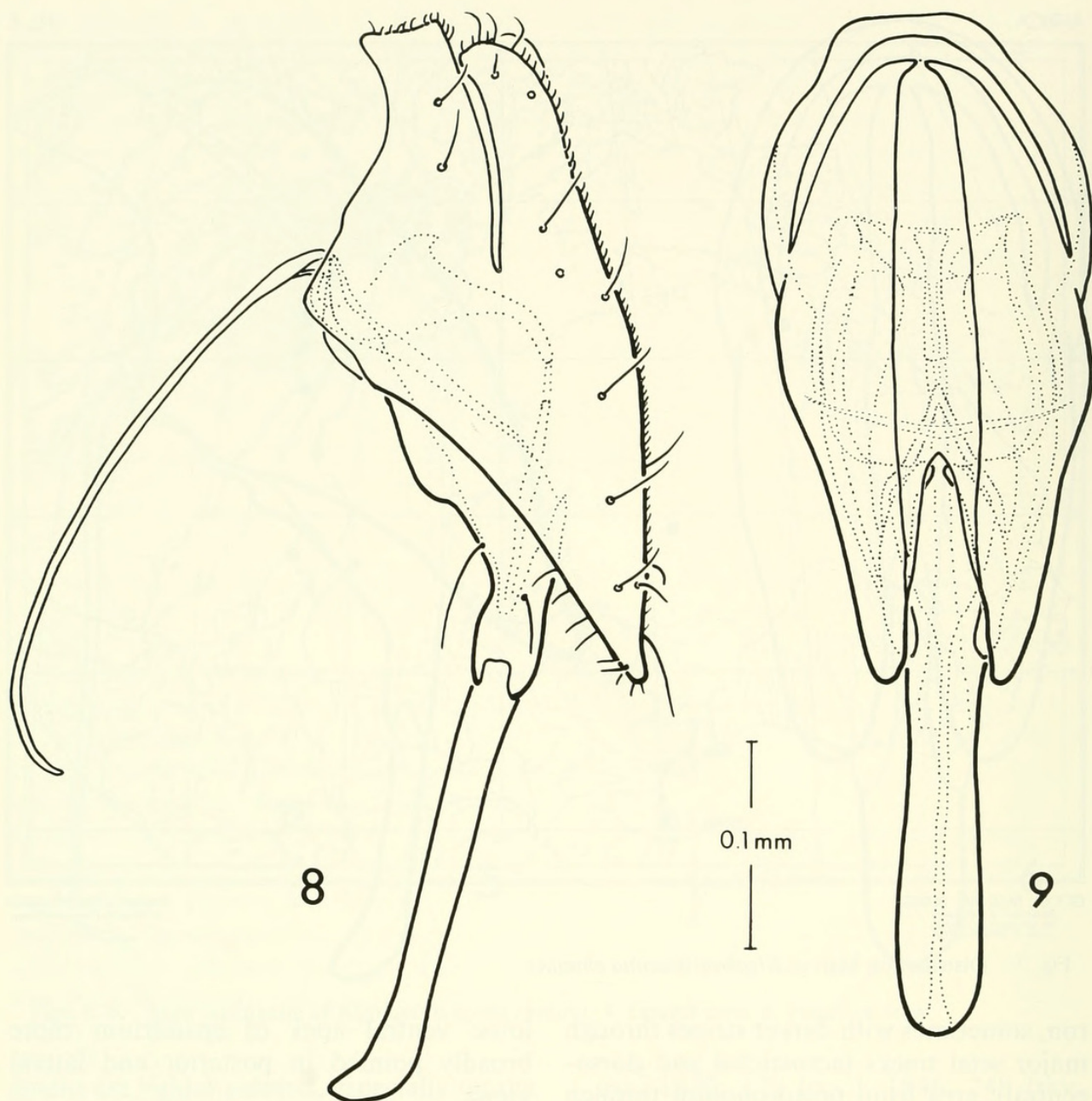
ron, sometimes with darker stripes through major setal tracks (acrostichal and dorso-central); area from postpronotum through notopleuron whitish gray; dorsum of anepisternum concolorous with mesonotum, otherwise pleura uniformly whitish gray. Wing with ratios as follows: costal ratio averaging 0.41; vein M ratio averaging 0.43. Legs with femora mostly whitish gray, concolorous with pleura, tibiae slightly lighter, and tarsi yellowish except for apical 1–3 (some specimens with all tarsomeres except for basotarsomere dark colored).

Abdomen: Dorsum of 1st and 2nd terga lightly tannish, remaining terga light tannish gray to silvery gray depending on angle of view. Male terminalia (Figs. 5, 6) as fol-

lows: ventral apex of epandrium more broadly pointed in posterior and lateral views.

Type material.—The lectotype male of *E. chnumi* Becker is labeled “Assuan I 44556 ♂ [handwritten]/Lectotypus [red; black submargin].” The lectotype is double mounted, is in fair condition (right antenna is missing), and is in the Humboldt Universität collection. Although this specimen is labeled as the lectotype, we are not aware of its designation earlier.

Other specimens examined.—**EGYPT.** Aswan (2 ♀; ANSP, paralectotypes). Sinai: Ofira (sewage), 22 Mar–21 May 1981, A. Freidberg, W. N. Mathis (2 ♂, 5 ♀; TAU, USNM). **ISRAEL.** Bet Zayada, NE shore



Figs. 8, 9. Male terminalia of *Elephantinosoma cogani*. 8, Lateral view. 9, Posterior view.

of Lake Kinneret, 5 Aug 1986, W. N. Mathis (5 ♂, 9 ♀; USNM); Ma'agan Michael, 29 Oct 1980, A. Valdenberg (1 ♀; TAU); Mash'abbé Sade (2 km W), 13 Aug 1986, W. N. Mathis (2 ♂; USNM); Nahal Iddan, 22 Mar 1980, W. N. Mathis and A. Freidberg (1 ♀; USNM); Ne'ot Ha'Kikar, 21 Mar 1980, W. N. Mathis and A. Freidberg (1 ♀; USNM); Tel Aviv, 16 Sep 1977, A. Freidberg (1 ♂, 1 ♀; TAU). **MOROCCO.** nr. Figuig, Defilia, 5–20 Apr 1966, A. M. Hutson (4 ♂, 4 ♀; BMNH). **NI-**

GER. Air Massif, Wadi Iberkom, 18°55'N 8°40'E, 23 Aug 1983, P. C. Matteson (1 ♂; NMW). **SUDAN.** Atbara, 3 May 1914, Ebner (1 ♂; ANSP).

Distribution (Fig. 7).—Israel, Egypt, Morocco, Niger, and Sudan.

Remarks.—This species is very similar to *N. cogani* and is distinguished from the latter by the shape of the male terminalia, especially the more broadly rounded apices of the epandrium as seen in posterior and lat-

eral views. In addition, the color of abdominal terga three through five of *N. chnumi* is duller, with a slight bluish tinge.

The coloration of the dorsum exhibits some age dimorphism, as noted previously for the genus generally. In addition, however, some specimens have distinct, darker brown stripes through the major setal tracks of the mesonotum. As the genitalia of these specimens do not differ from those that lack stripes and because we have not discovered other distinguishing characters, this variation is considered to be intraspecific.

Elephantinosoma cogani

Mathis and Deeming, NEW SPECIES

Figs. 8, 9

Diagnosis.—Moderately small shore flies, length 2.24 mm. Description as in *E. chnumi* except as follows:

Thorax: Wing with ratios as follows: costal ratio averaging 0.44; vein M ratio averaging 0.38.

Abdomen: Terga silvery gray. Male terminalia (Figs. 8, 9) as follows: Ventral apex of epandrium narrowly pointed in posterior and lateral view.

Type material.—The holotype male is labeled "N. NIGERIA: Shore of Lake Chad at Malamfatori, 4–12. iv. 1967. J. C. Deeming./*Elephantinosoma* sp. n. nr. *chnumi* Becker 2 ♂ (apex scutellum w. 3–4 fine pale hairs beneath; tergites silvery grey. det. J. C. Deeming 1984/NMWZ. 1981-001." The holotype is double mounted (glued to a paper point), is in good condition, and is in the National Museum of Wales. A male paratype has the same locality data as the holotype but was collected on 13 Apr 1967 (USNM).

Etymology.—It is a pleasure to name this species after Brian H. Cogan, who has made numerous contributions to our knowledge of Diptera, the family Ephydriidae in particular.

Remarks.—This species is distinguished mostly by the shape of the epandrium, especially the ventral margin, which is more

sharply pointed. In addition, abdominal terga three through five have a shinier and more silvery gray sheen.

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