

**DESCRIPTION OF THE FEMALE, PUPA AND PHALLOSOME OF
CULEX (CULICIOMYIA) CAMBOURNACI (DIPTERA: CULICIDAE)
AND REDESCRIPTION OF THE FOURTH-INSTAR LARVA AND
MALE¹**

HELENA DA C. RAMOS², H. RIBEIRO³ AND R. A. CAPELA⁴

ABSTRACT. The hitherto unknown pupa and male phallosome of *Culex (Culiciomyia) cambournaci* Hamon and Gândara are described on the basis of material collected at 14 different localities of São Tomé island. Identification keys for distinguishing the 10 now known pupae of *Culiciomyia* in the Afrotropical Region are provided.

INTRODUCTION

Culex (Culiciomyia) cambournaci was described in 1955 by Hamon and Gândara on the basis of a sole damaged male caught indoors on the coast of the island of São Tomé. The described larva was tentatively attributed to *Culex cambournaci* in the absence of associated adults.

The following redescriptions of the male and larva and first descriptions of the female, pupa and phallosome are based on the examination of 98 females, 25 males, 202 larvae and 157 pupae collected by the third author during an expedition to the Island of São Tomé in June 1984 and, later, also by the first authors during malaria work carried out on the island from 11 April to 29 May 1986.

Culex cambournaci immatures were found in 14 different localities on the island of São Tomé: Água Malanza, Angra Toldo, Boavista, Conde, Ilhéu das Rolas, Ió Grande, Lagoa Amélia, Paga Fogo, Praia Faleiras, Ribeira Afonso, Ribeira Malanza, Santa Catar-

ina, São João dos Angolares and Trindade. Breeding places included holes in several kinds of trees, such as *Atrocarpus intergrofolia* Thum., *Cocus nucifera* L., *Bambusa vulgaris* Schrad and *Atrocarpus incisa* Thumb., axils of *Colocasia* sp., bored bamboos, broken coconuts, a bucket, domestic utensils, a boat and a canoe containing rainwater, and also in small rainpools. All this material is deposited at the Discipline of Medical Entomology of the "Instituto de Higiene e Medicina Tropical."

With the description of this species, it is apparent that the taxonomic structure of this highly heterogenous subgenus is in need of a thorough revision, which is intended to be carried out by the first writer in the near future.

Culex (Culiciomyia) cambournaci Hamon and Gândara, 1955

Type locality: São Tomé.

Type depository: ORSTOM, Bondy, FRANCE.

Female. Head: A narrow rim of white, broad and flat scales continuously bordering eyes in front, widened behind in triangle; remaining decumbent scales of head all narrow; erect scales brown, slender, numerous, with tips rather broad (in furcula). Palpus and proboscis dark, palpus about one-sixth as long as proboscis; torus brown, without scales. **Thorax:** Integument light brown, but scutum clothed with brown-bronze narrow scales. Scutellum with strongly developed setae and

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² Centro de Zoologia, Instituto de Investigação Científica Tropical, Junqueira, 14—1300 Lisboa, Portugal.

³ Disciplina de Entomologia Médica, Instituto de Higiene e Medicina Tropical, Lisboa, Portugal.

⁴ Departamento de Zoologia, Faculdade de Ciências, Universidade de Lisboa, Campo Grande, Lisboa, Portugal.

some narrow scales. Acrostichal setae moderately developed; dorsocentral setae relatively abundant and well developed. Mesokatepisternum light, almost devoid of scales (a very few near upper tip); one lower mesepimeral seta; vertical row of setae toward posterior edge of mesokatepisternum continued forward into prealar area; antepronotum and postpronotum without scales; 3,4 setae along posterior margin of postpronotum and well developed setae along upper margin of antepronotum. *Abdomen*: All dark above and on lateral margins; venter mostly pale. *Legs*: Mainly dark, only indefinitely pale beneath on femora. Front and middle claws subequal, longer one with a strong denticle. *Wing*: Dark, forks II and IV long, and about same length. Halter with yellow base (scabellum) and brown expanded distal part (capitellum).

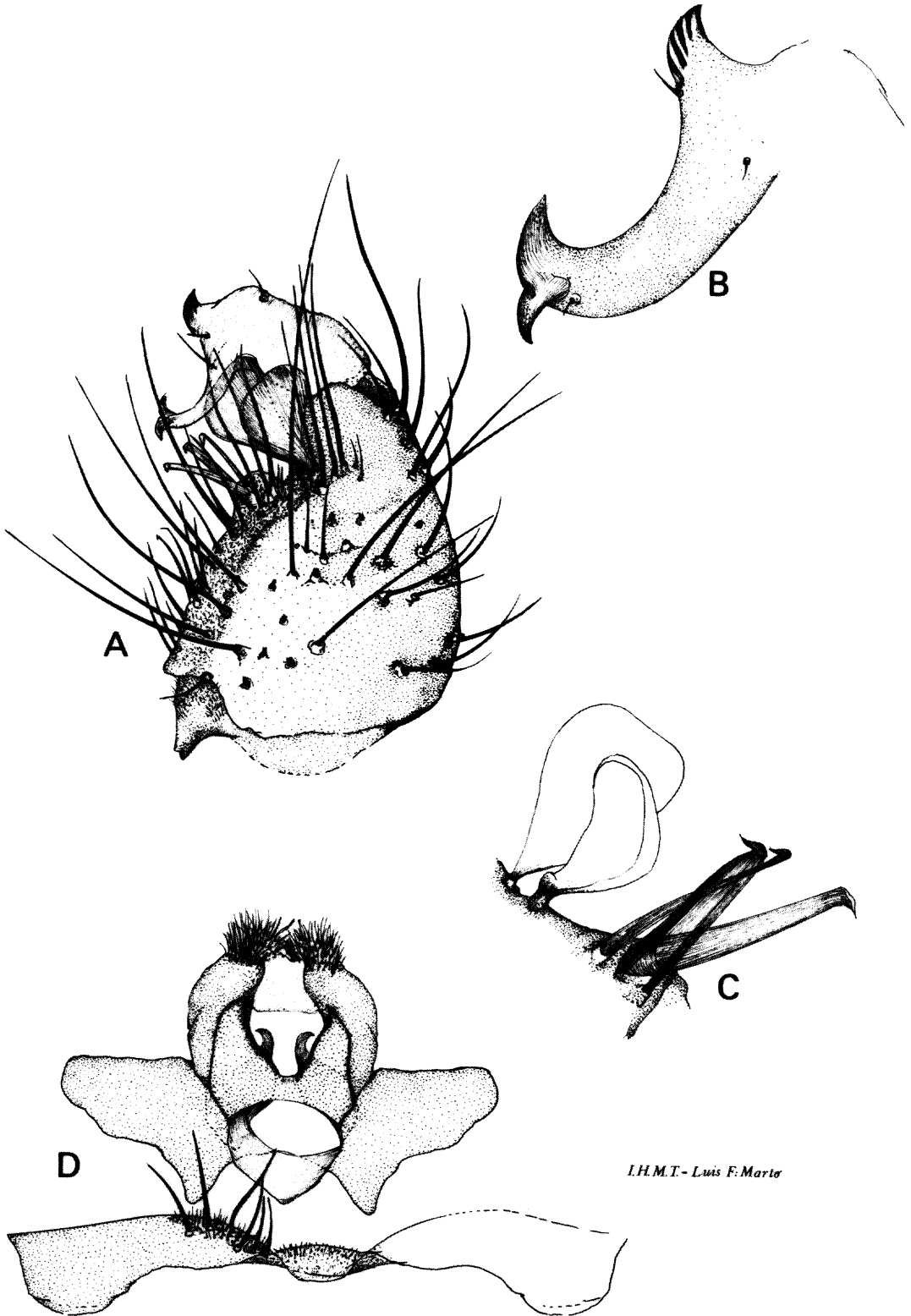
Male. Essentially as in female. Palpus very short, only one-seventh length of proboscis, without scales; proboscis with an apparent median joint and a poorly developed median ventral tuft.

Male genitalia (Fig. 1). *Segment IX*: Tergal lobe relatively small, with a row of 5 or 6 setae. *Gonocoxite* (Fig. 1A): With broadly convex tergomesal and lateral tergal margins; tergomesal margin with prominent rows of numerous strong setae, extending from near base to proximal portion of subapical lobe. *Subapical lobe* (Fig. 1C): Relatively broad, with clearly separate proximal and distal divisions. Proximal division with one stout, strongly chitinized blade with curved tip coalesced with another seta; one more slender seta, also with curved tip; one strong and single seta. Distal division with 2 well developed leaflets; sternoapical spiculose lobe small, with several short setae forming a tuft at base. *Gonostylus*: Outer subapical margin with a strong crest (Fig. 1B); one dorsal and one ventral tiny seta present; apical claw very strong; apex of gonostylus curved upward into a strong spur (Fig. 1B). *Phallosome*: Lateral plate without small denticles along margins, only a strong spinelike basal denticle present (Fig. 1D). *Paraproct*: Without basal arm and with broadly expanded apical portion; outer-

most spines of crest longer and stouter than the others.

Larva. General morphology and chaetotaxy of the fourth-instar larva as illustrated in Fig. 2. *Head* (Fig. 2A): Antenna normal, not infuscate, strong and densely spiculate, and seta 1-A placed at about middle of shaft. Seta 1-C filamentous, sometimes lightly spiculose and length considerably more than half distance between bases of pair. Seta 4-C with 4 or 5 pectinate branches; 5-C with 7 branches; 6-C with 5 or 6 pectinate branches; and 7-C with 8 branches. *Thorax*: Integument glabrous (spiculation not developed); seta 3-P with 3-6 branches, weaker and shorter than 1,2-P, these 2 subequal in length; seta 2-P single or double, 1-P with 4-6 branches; 4-P triple; 5,6-P single; 7-P with 3 or 4 branches; 8-P short and fine, with about 8 branches; 14-P single. *Abdomen*: Spiculation not developed; seta 6-I double; 7-I triple; 6-II-VI double, sometimes triple; 1-III-VI strong, subequal and spiniform; 1-VII very strong and very long. Comb scales small, about 26-30 in number, aggregated into a rectangular patch, all with even fringe of fine spicules laterally and apically. *Segment X* (Fig. 2F): Saddle complete, slightly pigmented, caudal margin near bases of setae 2,3-X weakly spiculate; seta 1-X double, 1.5 as long as saddle; 2-X with 6,7 branches; 3-X single and simple; 4-X with 4 pairs of setae, each 4 or 5-branched, all inserted within grid, sometimes one more seta inserted outside grid; anal papillae sausage-shaped, about 4 times as long as saddle. *Siphon*: Moderately short, index variable, about 3.0; pecten of 4-6 spines with one or 2 distinct basal denticles; 4 pairs of large subventral setae, though the more apical ones are smaller, each with about 3 or 4 subplumose branches; single pairs of shorter lateral and subdorsal setae, each with 3,4 branches.

Pupa. Pupal chaetotaxy as illustrated in Fig. 3. *Cephalothorax* (Fig. 3B): Seta 5-CT remarkably long, double. Trumpet (Fig. 3B): Short and relatively broad, without tracheoid area at base. Trumpet index, mean 3.5; pinna ratio, mean 0.25; meatus ratio, mean 0.70. Seta 10-CT with 6-9 branches; 11-CT always



I.H.M.T. - Luis F. Marín

Fig. 1. *Culex (Culicomyia) cambournaci*. A, gonocoxopodite (lateral view); B, gonostylus; C, setae on subapical lobe of gonocoxite; D, lateral plate of aedeagus, paraprocts and tergum IX lobes.

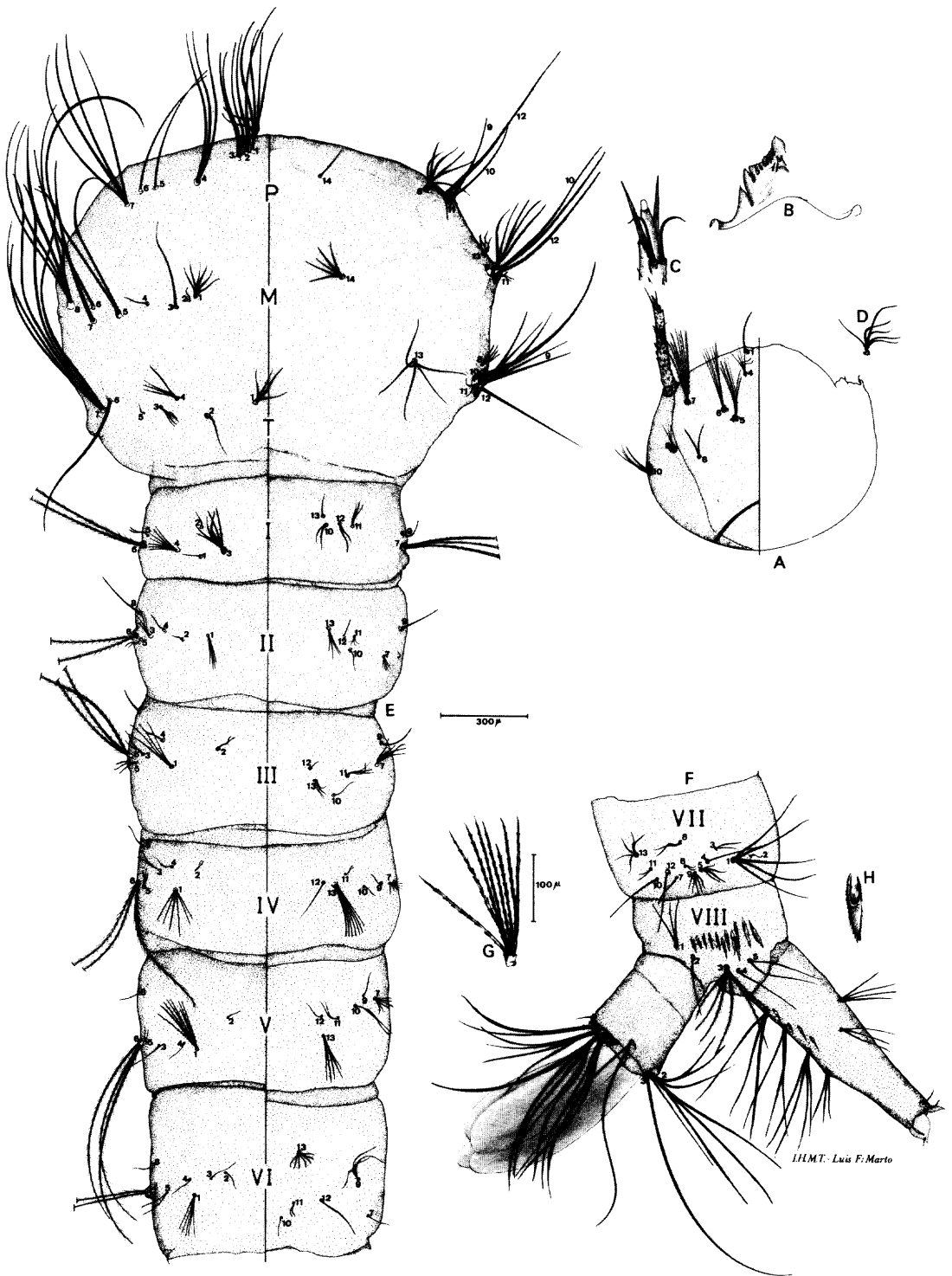
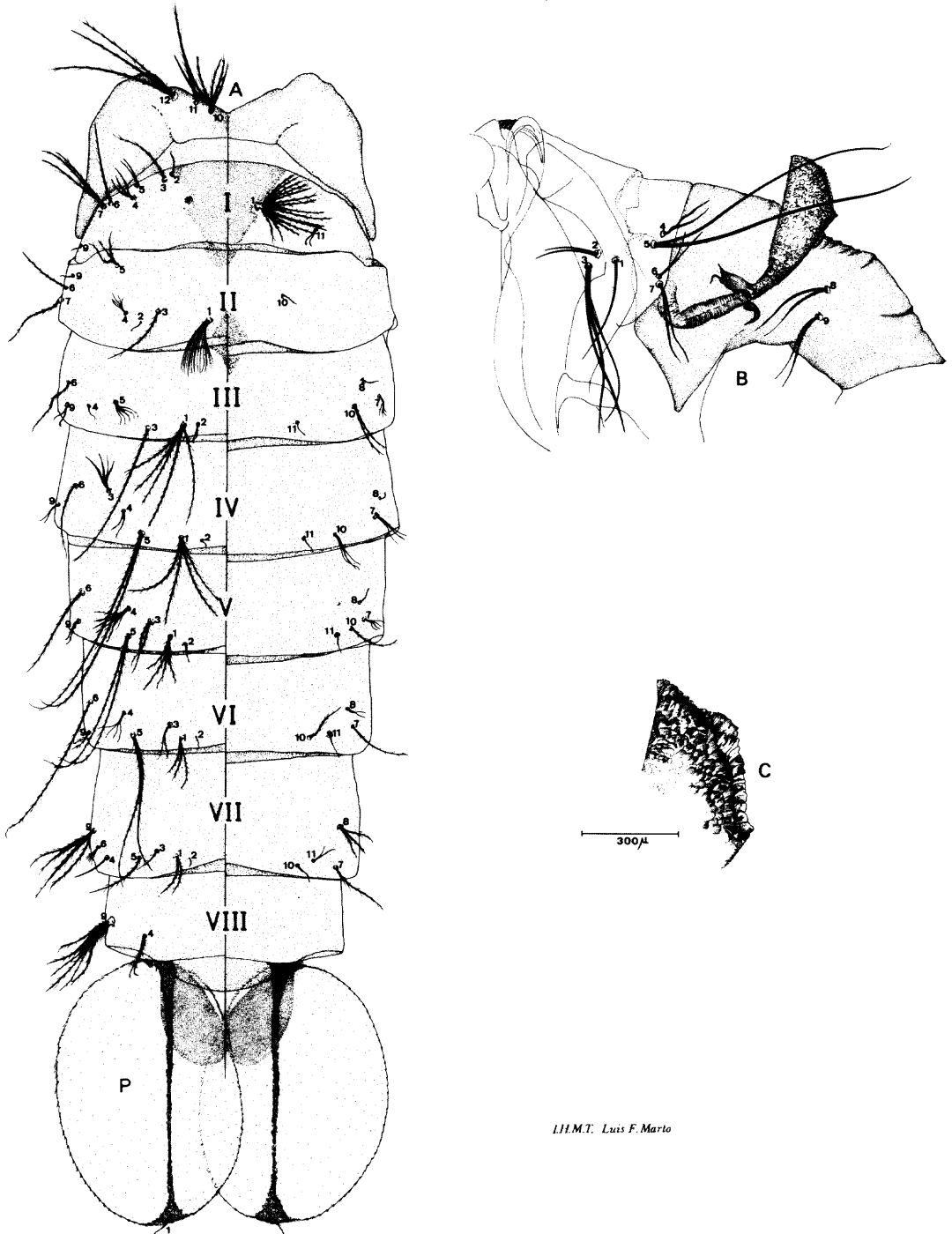


Fig. 2. *Culex (Culiciomyia) cambournaci*. A, Head; B, mental plate; C, apex of antenna; D, seta 4-C; E, thorax and abdomen; F, abdominal segments VIII, X and siphon; G, setae 1-V; H, comb scales.



I.H.M.T. Luis F. Mario

Fig. 3. *Culex (Culiciomyia) cambournaci*. A, Metanotum, abdomen and paddles; B, cephalothorax and trumpet; C, pinna.

single and stronger than the other 2 remaining setae and 12-CT with 3,4 branches. *Abdomen*: Setae 3-II,III single; 1-II multiple, brush-like; 1-III 5 or 6-branched; 1-IV, 4 or 5-branched; 1-V,VII 2 or 3-branched; 5-IV,V,VI long, double, about 2 times as long as following segment. *Paddle* (Fig. 3A): Relatively broad, pale whitish; midrib strongly marked; with a smooth distal edge; 1-P minute; sometimes a very small accessory seta (2-P) present; an indistinctly or only very slightly notched paddle.

DIFFERENTIAL DIAGNOSIS

With the description of the pupa of *Culex* (*Culiciomyia*) *cambournaci*, there are now 10 pupae of *Culiciomyia* known in the Afrotropical Region (Edwards 1941, Peters 1955, van Someren 1956, Vattier and Hamon 1962). In the identification key that follows, an attempt is made to separate the pupae of these species.

**KEY TO THE PUPAE OF
CULICIOMYIA OF THE
AFROTROPICAL REGION**

- 1. At least seta 5-CT long, about twice or more length of other cephalothoracic setae; trumpet short and broad, without tracheoid area 2
- None of the cephalothoracic setae obviously longer than the others; trumpet long and narrow, with an evident tracheoid area 5
- 2(1). Seta 1-CT about as long as 5-CT, obviously longer than other cephalothoracic setae . . . *harleyi*
- Seta 1-CT obviously shorter than 5-CT, about as long as other cephalothoracic setae 3
- 3(2). Paddle without a distinct notch at tip or only very slightly notched *cambournaci*
- Paddle distinctly notched at tip 4
- 4(3). Paddle with a small seta 2-P *furlongi*

- Paddle without seta 2-P *cinereus nebulosus*
- 5(1). Paddle with seta 2-P 6
- Paddle without seta 2-P 8
- 6(5). Trumpet darker on basal half; seta 2-P about same length as seta 1-P, both minute . . . *cinerellus*
- Trumpet homogeneous in color, without distinct dark and pale zones; seta 1-P distinctly longer than seta 2-P 7
- 7(6). Trumpet dark; seta 1-P short and seta 2-P minute *semibruneus*
- Trumpet pale; seta 1-P long, seta 2-P short *liberiensis*
- 8(5). Trumpet slightly angulate (Madagascar) . *pendani*
- Trumpet not angulate 9
- 9(8). Seta 9-VIII with about 3 simple branches . *gilliesi*
- Seta 9-VIII with about 6 plumose branches *macfieii*

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