

## NOTES ON THE GENUS *CYAMOPS* MELANDER (DIPTERA: PERISCCELIDIDAE), INCLUDING DESCRIPTION OF TEN NEW SPECIES

ALESSANDRA R. P. BAPTISTA AND WAYNE N. MATHIS

Department of Entomology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560-0169, U.S.A. (e-mail: baptista@nmnh.si.edu and mathis.wayne@nmnh.si.edu)

---

**Abstract.**—The species of *Cyamops* Melander are reviewed for five regional faunas, including the description of 10 new species as follows: *C. funkae* (Guyana), *C. nigeriensis* (Nigeria), *C. freidbergi* (Madagascar), *C. micronesicus* (Yap), *C. fiji* (Fiji), *C. samoensis* (American Samoa), *C. femoratus* (Philippine Islands), *C. laos* (Laos), *C. banvaneue* (Laos), *C. kaplanae* (Thailand). *Cyamops pectinatus* Khoo is reported from Tasmania. Regional keys are provided for the New World, Afrotropical, Australasian/Oceanian, and Oriental faunas.

**Key Words:** Diptera, Periscelididae, *Cyamops*, New World, Afrotropical, Australasian/Oceanian, Oriental, Palearctic

---

The genus *Cyamops* Melander includes 14 valid species: three in the Nearctic Region, five in the Neotropical Region (Baptista and Mathis 1994, 1996), and six in the Australasian Region (Khoo 1985). Since revising the New World species of *Cyamops* (Baptista and Mathis 1994), we (Baptista and Mathis 1996) have described one additional species, *C. sabroskyi*, from specimens collected in Rio de Janeiro, Brazil. When we published our revision of New World species, several new species from localities elsewhere in the world were then known to us, and some of these species had previously been reported (Hennig 1969, Sabrosky 1980). The purpose of this paper is to describe most of the new species and update the existent keys to facilitate identification of all known species of *Cyamops*. The new species that we studied and that are not described in this paper are represented by poorly preserved specimens, frequently a single male.

**Methods.**—The descriptive terminology, with the exceptions noted in Baptista and Mathis (1994), is that published in the Manual of Nearctic Diptera (McAlpine 1981). As we recently published a complete description for the genus *Cyamops*, the generic characters are not repeated here. The format for species' description likewise adheres to Baptista and Mathis (1994), with the following modifications:

**Facial shape:** In addition to being sexually dimorphic, two basic facial shapes occur among males of *Cyamops*: 1. Face constricted medially by the anteroventral margin of the eyes, expanding into a triangular region ventrally below the level of the pseudovibrissae and bearing a median ridge that was called the "facial carina" in our first paper. The corresponding female face is trapezoidal below the level of the pseudovibrissa, with a central, large, more elevated area. 2. Face not constricted medially, without a median ridge. The corresponding fe-



male face is equally large but has no central, elevated area. These shapes will be cited simply as "face of male narrowed" or "not narrowed."

The structure we called the "hypandrial projection" in our revision will not be used in species descriptions herein, as this structure is apparently unique to the following Neotropical species: *C. halteratus* Sabrosky, *C. nebulosus* Melander, *C. buenorum* Baptista and Mathis, and *C. fasciatus* Baptista and Mathis. This structure is mentioned in the revised key, however, as it distinguishes the Neotropical species just noted.

The "Key for the Australasian and Oceanian species of *Cyamops*" was generated using DELTA (Dallwitz et al. 1998). The character states for the Australian species, described by Khoo (1985) and Hennig (1969), were taken from their publications.

Species represented by poorly preserved specimens are noted and are included in an appropriate regional key. Our purpose in providing information on undescribed species is to call attention to character variation and distributional data for future studies on *Cyamops*.

Although most specimens for this study are in the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM), we also studied numerous specimens that were borrowed from and will be deposited in the Bernice P. Bishop Museum (BPBM).

#### NEOTROPICAL REGION

The new species treated in this section all key to *C. americanus* Baptista and Mathis in our "Key to the New World species of *Cyamops* Melander" (Baptista and Mathis 1994) and form a species group that is characterized by the following combination of characters: face of male constricted medially; crossvein bm-cu present, separating cell bm from cell dc. To help identify the new American species discovered since our revision, we have furnished a revised key to the New World species. Species of the

genus *Cyamops* that have large geographic distributions, however, demonstrate some variation in the extent of microtomentum and coloration of the legs and wings. Thus, study of characters of the male terminalia is still advisable to determine a species' identity accurately.

#### KEY TO NEW WORLD SPECIES OF *CYAMOPS*

1. Anepisternum bare along posterior margin . . . 2
  - Anepisternum setose along posterior margin, usually bearing 1 seta and a few setulae . . . 6
2. Only apical scutellar seta present (United States) . . . . . *C. imitatus* Sturtevant
  - Apical and basal scutellar setae present . . . 3
3. Wing hyaline (Canada, United States) . . . . .
  - . . . . . *C. halteratus* Sabrosky
  - Wing at least partially infusate . . . . . 4
4. Vein  $R_{2+3}$  sinuous; mid- and hindtibiae mostly yellow; scutellar disc slightly convex (eastern Canada and United States) . . . . .
  - . . . . . *C. nebulosus* Melander
  - Vein  $R_{2+3}$  straight or nearly so; mid- and hindtibiae lightly infusate to brown; scutellar disc flat . . . . . 5
5. Male right surstylus as narrow as left; hypandrial projection large and exposed; 7th and 8th sternites reduced (Brazil) . . . . .
  - . . . . . *C. fasciatus* Baptista and Mathis
  - Male right surstylus much broader than left; hypandrial projection of normal length, not large, usually hidden beneath right surstylus; 7th and 8th sternites well developed, fused to 5th sternite (Mexico) . . . . .
    - . . . . . *C. buenorum* Baptista and Mathis
6. Face of ♂ and ♀ angulate in profile, sloped anteroventrally from base of antenna to vibrissal angle; facial carina lacking in ♂; ♂ frons entirely depressed below insertion of fronto-orbital setae; eye densely microsetulose (Colombia) . . . . .
  - . . . . . *C. colombianus* Baptista and Mathis
  - Face of ♂ shallowly and vertically arched, never angulate; facial carina present in ♂; ♂ frons depressed only medially; eye microsetulae sparse, difficult to discern . . . . . 7
7. Wing cell  $R_{4+5}$  usually completely infusate, dividing subapical white spot (pale specimens with only traces of brown on the veins around cell  $R_{4+5}$ ); mid- and hindfemora mostly yellow . . . . . 8
  - Wing cell  $R_{4+5}$  with a conspicuous, undivided subapical white spot; mid- and hindfemora mostly dark . . . . . 11
8. Basal rays of arista not bifurcate; middle portion of hindtibia darkened; postpronotum shiny to subshiny, microtomentose . . . . . 9



- Basal 3–4 rays of arista bifurcate; hindtibia completely yellow; postpronotum shiny, lacking microtomentum (Costa Rica, Mexico) . . . . . *C. americanus* Baptista and Mathis
- 9. Forefemur brownish dorsally; vertex with a large, shiny spot; surstylus as in Fig. 1 (Guyana) . . . . . *C. funkae*, new species
- Forefemur mostly yellow dorsally; vertex entirely subshiny microtomentose or with a tiny shiny spot adjacent to posterior ocellus; surstylus otherwise . . . . . 10
- 10. Hindfemur infusate on apical 1/6; surstyli very elongate, apical portion concealed below 6th–7th sternite; right surstylus boot-shaped; produced portion of male face 3/4 width of 1st flagellomere . . . . . *C. sp. 1*
- Hindfemur infusate on apical 1/3; surstyli not elongate, apex of right surstylus only partially concealed below 6th–7th sternite; right surstylus as in Fig. 7; male face only slightly produced, produced portion of face 1/4 width of 1st flagellomere . . . . . *C. sp. 2*
- 11. Right surstylus with apical margin deeply concave in middle, having a hook-shaped appearance; aedeagal apodeme length equal to length of combined 6th and pregenital tergites (Baptista and Mathis 1996:246, Fig. 1) (Brazil) . . . . . *C. sabroskyi* Baptista and Mathis
- Right surstylus with apical margin convoluted, irregular (Baptista and Mathis 1994:24, Fig. 58); aedeagal apodeme very large, length equal to combined length of 5th, 6th, and pregenital tergites (Brazil, Costa Rica, Peru) . . . . . *C. neotropicus* Hennig

**Cyamops funkae Baptista and Mathis,  
new species**  
(Figs. 1–4, 32)

Baptista and Mathis 1996: 247 [misidentified as *C. americanus* Baptista and Mathis].

**Description.**—Adult ♂ length 2.5–2.6 mm; wing length 2.1–2.4 mm; wing width 0.8 mm. Adult ♀ length 3.0 mm; wing length 3.5 mm; wing width 1.0 mm.

**Head:** Ocellar tubercle polished; vertex with a large shiny spot; remaining frons subshiny, microtomentose, velvet at deepest portion; antenna mostly yellow, infusate at dorsal margin; facial region intensely whitish microtomentose, brownish dorsally; palpus and labellum mostly white; face in profile sloped ventrally from base of antenna to vibrissal angle, then slightly receded to oral margin, produced portion of face same

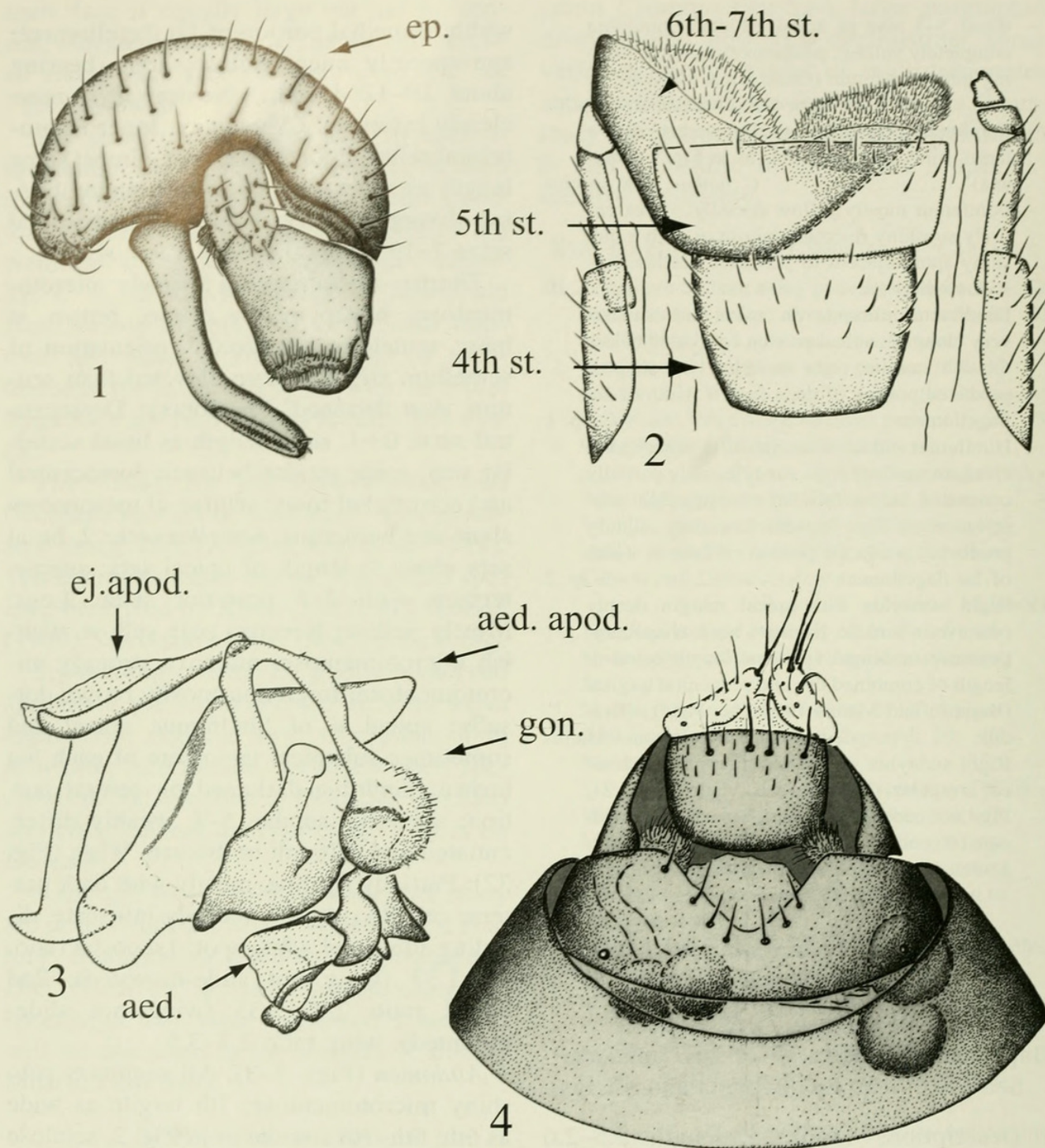
width as medial portion of 1st flagellomere; eye sparsely microsetulose; arista bearing about 10–12 dorsal, 3 ventral rays, none clearly bifurcate. Chaetotaxy: Inner fronto-orbital setae slightly divergent, almost same length as outer vertical seta; pseudovibrissae divergent, curved dorsally; peristomal setae 7–10, intercalated by a few setulae.

**Thorax:** Postpronotum sparsely microtomentose; halter mostly white, brown at base; scutellum trapezoidal, orientation of scutellum slightly more elevated than scutum, disc flattened. Chaetotaxy: Dorsocentral setae 0+1, same length as basal scutellar seta; some setulae between dorsocentral and acrostichal rows; setulae of mesonotum short and numerous; scutellar setae 2, basal seta about 2/3 length of apical seta; anepisternum with 2–3 posterior setae. Legs: Mostly yellow; forecoxa pale yellow, whitish microtomentose; midcoxa strongly microtomentose; forefemur mostly brown dorsally; apical 1/4 of hindfemur, apical and sometimes subapical tarsomere of each leg brown; hindtibia darkened on central portion; spinelike setulae 5–7, weakly differentiated and difficult to discern. Wing (Fig. 32): Partially hyaline, mostly with dark pattern; cell R<sub>4+5</sub> usually entirely infusate, dividing subapical white spot; 1st costal ratio: 1.2–1.37 (wing not slide-mounted); 2nd costal ratio 2.97–3.33 (wing not slide-mounted); wing ratio 2.7–3.5.

**Abdomen** (Figs. 1–3): All segments subshiny microtomentose; 7th tergite as wide as 6th; 6th–7th sternite as in Fig. 2, setulose along posterior portion. Terminalia (Figs. 1, 3): Left surstylus long, slightly inclinate at apical 2/3, posteroapical portion apparently excavated, although without a true concavity; right surstylus shorter and broader than left; ejaculatory apodeme (Fig. 3) small, almost equal to length of 5th tergite (a little longer than combined 6th and pregenital tergites), in lateral view hatchet shaped, extended process parallel sided, in dorsal view somewhat triangular in shape.

**Female:** **Head:** First flagellomere with dorsal half and apex brown; mesofacialia





Figs. 1-4. *Cyamops funkae*. 1, Epandrium, cerci, and surstyli, ventral view. 2, Male abdominal segments 4-7, ventral view. 3, Internal male terminalia, lateral view. 4, Female abdomen, segments 6-9, ventral view. Abbreviations: aed. = aedeagus; aed. apod. = aedeagal apodeme; ej. apod. = ejaculatory apodeme; ep. = epandrium; gon. = gonite; st. = sternite.

dark brown, shiny medially; gena light brown to brown in ground color; palpus brown; produced portion of face longer than 1st flagellomere medially; arista bearing 14 dorsal rays.

*Thorax:* Dorsocentral setulae typically

more developed than in males. Legs with base of forecoxa sometimes mostly black.

*Abdomen* (Fig. 4): Width of 7th tergite about  $\frac{1}{3}$  that of 6th tergite; 8th sternite apparently fused to 7th sternite, as in Fig. 4, not completely conspicuous, represented by



a pair of lateral setulose lobes and a central membranous lobe; 4 spermathecae, rounded, 1 pair slightly smaller than others.

Type material.—The holotype ♂ is labeled "GUYANA. CEIBA (ca.40 km S Georgetown) 06°29.9'N, 58°13.1'W[,] 21 April 1995[,] Wayne N. Mathis/USNM ENT 00134287 [plastic bar code label]/HOLOTYPE ♂ *Cyamops funkae* Baptista & W.N.Mathis USNM [red; species name, gender symbol, and "Baptista &" handwritten]. The holotype is double mounted (minuten in a block of plastic), is in excellent condition, and is deposited in the USNM. Paratypes are as follows: Same label data as the holotype (2 ♂; USNM; 1 ♂ with abdomen dissected, structures in an attached microvial); same label data as the holotype but with the following changes in dates: 13 Apr 1994 (1 ♀ USNM; abdomen dissected, structures in an attached microvial); 28 Aug 1997 (3 ♂; 1 ♀; USNM).

Distribution.—*Cyamops funkae* is known only from the type locality, CEIBA (06°29.9'N, 58°13.1'W), in Guyana.

Etymology.—The species epithet, *funkae*, is a patronym to honor, recognize, and express appreciation to Dr. Vicki A. Funk, Director of the Biodiversity of the Guianas Program, who supported and encouraged our field work in Guyana.

Remarks.—In our last paper on *Cyamops* (Baptista and Mathis 1996), we misidentified *C. funkae* as *C. americanus* and reported Guyana as a new locality for the latter species. The two species are very similar, and care must be taken to distinguish between them. Although the dorsal arisal branches of *C. funkae* are not bifurcate, which seems to be a consistent character, we relied on the structures of the male terminalia to distinguish this species.

The female of *C. funkae* can easily be distinguished from that of *C. americanus* by the shape of the 8th sternite, which is apparently reduced to a pair of lateral setose lobes and a well-defined median lobe. Females of *C. americanus* have lateral plates without setulae and a membranous median

lobe that is less conspicuous. The 7th tergite of the female abdomen is very narrow in *C. americanus*, approximately ¼ the width of the preceding tergite, and the spermathecae are elongate, not rounded as in this species. The shape of the 6th-7th sternite and of the surstyli is unique to this species.

#### *Cyamops* sp. 1

(Figs. 5–6)

A specimen from Trinidad, representing an undescribed species, can be distinguished from other Neotropical species of *Cyamops* by the characters given in the key. Although we are not naming this species here because the only available specimen is in poor condition, we are providing an illustration of the male terminalia (Figs. 5–6). This species is similar to *C. sp. 2* (see below) but can be distinguished from it by the characters given in the key. The shape of the right surstylus is boot-shaped and that of the 6th–7th sternite is quite distinctive and apparently unique among species of the genus.

Material examined.—The specimen is labeled "Trinidad 20 Jun [date handwritten] WI/Aug. Busck Collector" (1 ♂; USNM).

#### *Cyamops* sp. 2

(Fig. 7)

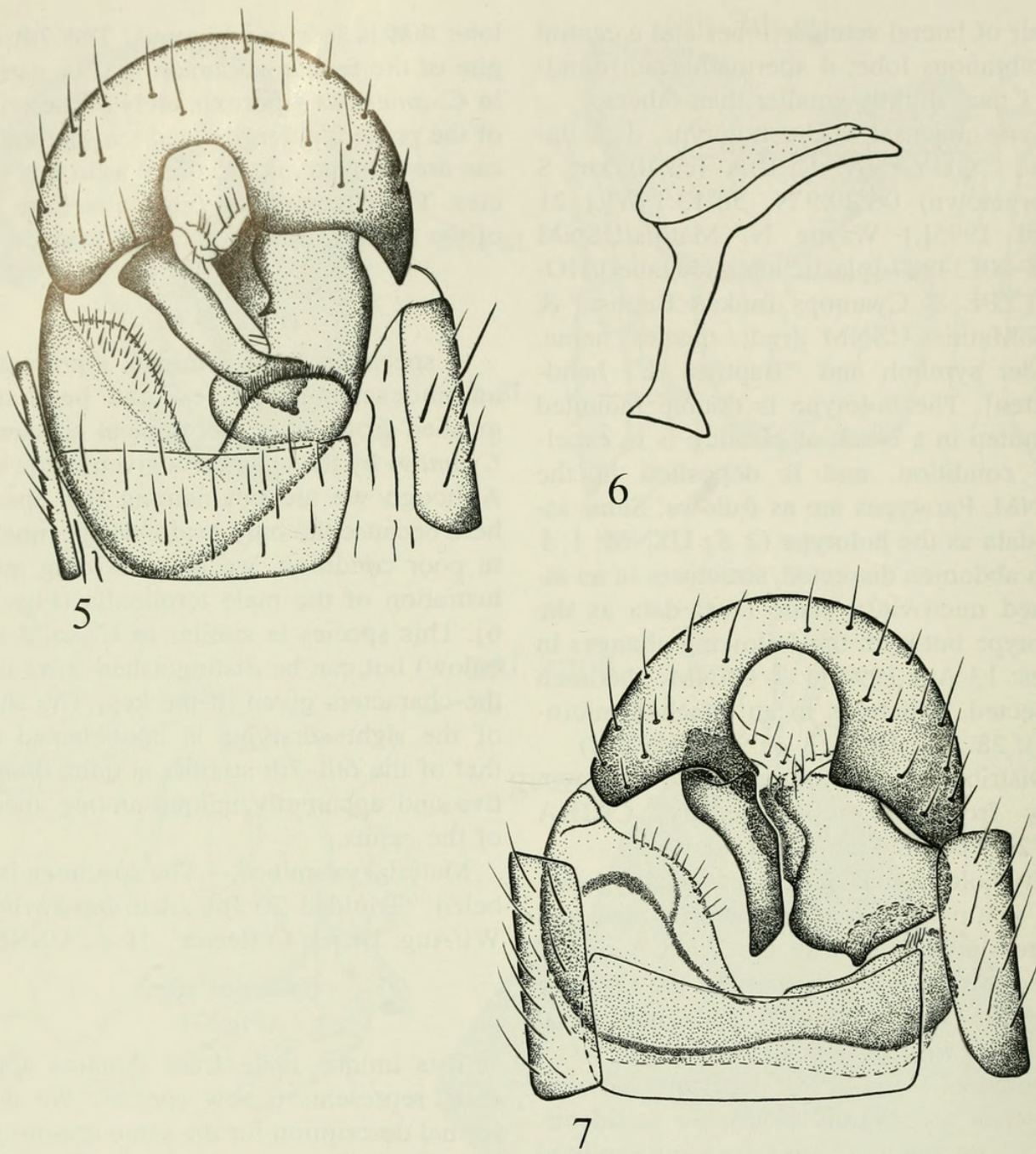
This unique male from Panama apparently represents a new species. We defer formal description for the same reasons just noted (see *Cyamops* sp. 1). An illustration of the male terminalia is provided, however (Fig. 7). This species is most similar to *C. sp. 1*, described above, but can be easily distinguished from that species by the characters given in the key. The shape of the right surstylus and of the 6th-7th sternite is unique for this species.

Material examined.—The specimen is labeled "LaJollaPan[ama] 29 IV 1952 [29 Apr 1952]/FSBlanton Collector" (1 ♂; USNM).

#### AFROTROPICAL REGION

Until now, no species had been described from this region, although Sabrosky (1980)





Figs. 5-7. *Cyamops* sp. 1 (Trinidad). 5, Segments 5-7, epandrium, cerci, and surstyli, ventral view. 6, Ejaculatory apodeme, lateral view. *Cyamops* sp. 2 (Panama). 7, Segments 5-7, epandrium, cerci, and surstyli, ventral view.

listed a “sp.” from Nigeria and Khoo (1985) mentioned an “undescribed species” from Africa.

Both of the Afrotropical species described below are characterized by the following combination of characters: Face of male constricted medially; crossvein bm-cu present, separating cell bm from cell dc; anepisternum not setulose posteriorly.

KEY TO AFROTROPICAL SPECIES OF *CYAMOPS*

- 1. Scutellar setae 1 pair; dorsocentral setae 0 + 2; hindfemur mostly yellow, infuscate apically; wing mostly brown with 2 conspicuous white spots along anterior margin and 2 white spots along posterior margin; right surstylus subrectangular, not claw shaped in appearance (Nigeria) . . . . . *C. nigeriensis*, new species
- Scutellar setae 2 pairs; dorsocentral seta 0 + 1; hindfemur brown on apical ¾; wing hyaline;



right surstylus with apical margin deeply concave in middle, claw shaped in appearance (Madagascar) . . . . . *C. freidbergi*, new species

***Cyamops nigeriensis* Baptista and Mathis, new species**  
(Figs. 8–10, 33)

**Description.**—Adult ♂ length 1.6–2.0 mm; wing length 1.6–1.7; wing width 0.5–0.6 mm. Adult ♀ length 1.8–2.0 mm; wing length 1.9 mm; wing width 0.6–0.7 mm.

**Head:** Vertex shiny, ocellar tubercle and surrounding area almost polished; depressed region of frons deep black; antenna yellow, some specimens with dorsal margin slightly infuscate; facial region mostly yellow, sparsely microtomentose medially; labellum and palpus pale yellow; face shallowly and vertically arched, not angulate, slightly produced, produced portion about  $\frac{3}{4}$  width of 1st flagellomere. Chaetotaxy: Inner fronto-orbital setae nearly parallel to slightly divergent,  $\frac{1}{2}$ – $\frac{3}{4}$  length of outer vertical seta; arista bearing 9–10 dorsal, 3 ventral rays, 6–7 basal rays clearly bifurcate; pseudovibrissae slightly converging, oriented dorsally; peristomal setae 3–4, some setulae intercalated between them.

**Thorax:** Halter mostly white; scutellum more or less trapezoidal, apex rounded, orientation of scutellum slightly more elevated than scutum, disk slightly convex; postpronotum narrow and shiny; anepisternum shiny; anepimeron polished. Chaetotaxy: Dorsocentral setae 0 + 2, posterior seta subequal in length to scutellar seta, anterior dorsocentral seta slightly shorter and thinner; mesonotal setulae very thin and sparse; scutellar seta 1. Legs mostly yellow; mid- and hindfemora infuscate, becoming darker brown apically; apical tarsomere of each leg brown; spinelike setulae not differentiated. Wing (Fig. 33): Mostly with dark pattern; cell  $R_1$  mostly hyaline; cell  $R_{2+3}$  with a basal and subapical oblique spot; cell  $R_{4+5}$  completely brown; cell M with a medioblique spot; posterior margin of wing with 2 well-defined, hyaline spots (some specimens with an additional hyaline spot at anal

angle); vein  $R_{2+3}$  strongly sinuous about midlength; 1st costal ratio: 1.3–2.22 (slide-mounted wing 1.42); 2nd costal ratio 3.84–5.0 (slide-mounted wing 5.0); wing ratio 2.42–2.57 (slide-mounted wing 2.5).

**Abdomen** (Figs. 8–9): Abdominal segments subshiny; 6th–7th sternite as in Fig. 8. Male terminalia (Figs. 8–9): Right surstylus large, slightly longer than wide, almost same length as left; left surstylus narrow, gradually tapered to point, internal margin slightly sinuous, approximately boot-shaped; ejaculatory apodeme subequal in length to 5th tergite, in lateral view hatchet shaped, extended process parallel sided, in dorsal view somewhat tear drop in shape.

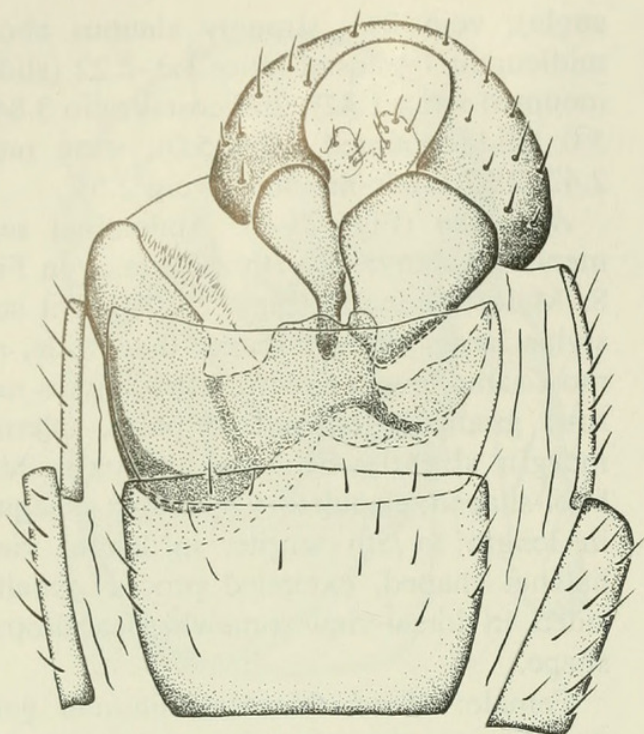
**Female:** **Head:** Mesofacialia and gena dark brown, strongly microtomentose, medial portion of face and clypeus shiny; palpus brown; antenna dorsally infuscate; face in profile sloped anteroventrally from base of antenna to vibrissal angle, thereafter slightly receded to oral margin.

**Thorax:** Setae and setulae of mesonotum typically better developed and longer than in male. Legs with foretarsi brown; apical  $\frac{1}{4}$ – $\frac{1}{2}$  of midfemur brown; apical  $\frac{1}{4}$ – $\frac{1}{2}$  of hindfemur brown.

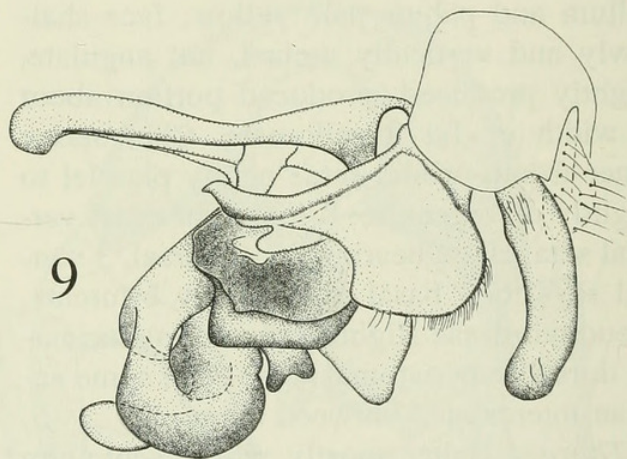
**Abdomen** (Fig. 10): 7th tergite and sternite forming a complete ring as in American species, widened ventrally with posterior margin slightly pointed, very thin dorsally, not well delimited and concealed beneath 6th tergite; 2 spermathecae, apical portion of spermathecal duct apparently unsclerotized.

**Type material.**—The holotype ♂ is labeled “Nigeria Badeggi Rice Res. Sta., NW state 12-22-68 [22 Dec 1968]/J.T. Medler Collector/HOLOTYPE ♂ *Cyamops nigeriensis* Baptista & W.N. Mathis [red; species name, gender symbol, and “Baptista &” handwritten].” The holotype is double mounted (glued to a point), is in relatively good condition (setae of face and thorax half broken, following tarsi missing; fore right, mid right, hind left), and is deposited in the USNM. Paratypes are as follows:

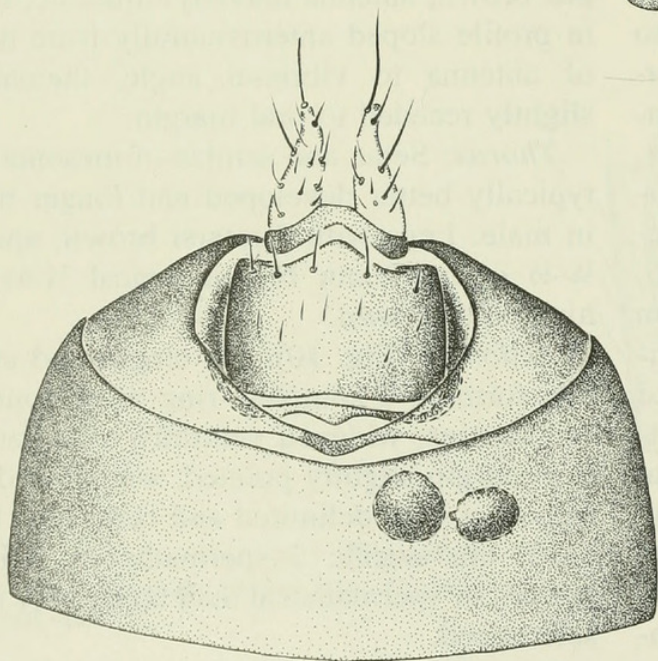




8



9



10

Figs. 8-10. *Cyamops nigeriensis*. 8, Segments 4-7, epandrium, cerci, and surstyli, ventral view. 9, Epandrium, internal male terminalia, lateral view. 10, Female abdomen, segments 5-9, dorsal view.

Same locality label as the holotype (4 ♂, 8 ♀; none in good condition; 1 ♂, 1 ♀ with abdomen dissected, structures in an attached microvial; USNM).

Other material examined.—Nigeria. Zaria, Samaru, 23 Jun 1966, J. C. Deeming (2 ♀; USNM).

Distribution.—*Cyamops nigeriensis* is known only from Nigeria.

Etymology.—The species epithet, *nigeriensis*, refers to the country where the type locality is located.

Remarks.—A character that distinguishes this species from *C. freidbergi*, the presence



of a single pair of scutellar setae, also occurs in *C. imitatus* Sturtevant (North America). The narrowed postpronotum is apparently unique to *C. nigeriensis*.

***Cyamops freidbergi* Baptista and Mathis,  
new species  
(Figs. 11–13)**

**Description.**—Holotype ♂ length 1.9 mm; wing length 1.74; wing width 3.2 mm.

**Head:** Vertex almost completely polished; ocellar tubercle shiny; depressed region of frons deep black; antenna yellow, pedicel infusate dorsally; facial region yellow, sparsely microtomentose medially; palpus and labellum pale yellow; face shallowly and vertically arched, not angulate, only slightly produced, produced portion almost width of 1st flagellomere. Chaetotaxy: Inner fronto-orbital setae nearly parallel to slightly divergent, about half length of outer vertical seta; arista bearing 10 dorsal, 3 ventral rays, 6 dorsobasal rays clearly bifurcate; pseudovibrissae slightly convergent, oriented dorsally; peristomal setae 9, with longest seta about half length of pseudovibrissal seta.

**Thorax:** Halter pale yellow; scutellum trapezoidal, orientation of scutellum slightly more elevated than scutum, disk flat; postpronotum shiny, slightly microtomentose. Chaetotaxy: Dorsocentral setae 0+1; mesonotal setulae very thin and sparse, mostly restricted to dorsocentral and acrostichal rows; scutellar setae 2, basal pair about ½ length of apical seta. Legs mostly yellow; hindfemur brown on apical ⅔; apical and subapical tarsomere of each leg brown; spinelike setulae weakly differentiated, brown, 5. Wing: Hyaline, central portion very slightly infusate with brown; 1st costal ratio 1.2 (slide-mounted wing); 2nd costal ratio 3.75 (slide-mounted wing); wing ratio 4.16 (slide-mounted wing).

**Abdomen** (Figs. 11–13): 6th tergite as large as 7th tergite dorsally. Male terminalia (Figs. 11, 13): Right surstylus short, almost as long as wide, about a half length of left surstylus, apical margin deeply concave in

middle, hook-shaped in appearance; left surstylus narrow, gradually tapered to point, margins slightly sinuous, basally slightly expanded to left; ejaculatory apodeme in lateral view hatchet shaped, extended process parallel sided, in dorsal view somewhat tear drop in shape.

**Female:** Unknown.

**Type material.**—The holotype ♂ is labeled “MADAGASCAR NW[,] NosyBe, Forest SE[,] Lakobe Res[,] 5.IV.1991 [5 Apr 1991] A. FREIDBERG & FINI KAPLAN/PERISCELIDIDAE *Cyamops* sp. D.K. McAlpine det. 1991 [handwritten except for “D. McAlpine Det.”]/Dissected by A.Baptista 97 [black border]/HOLOTYPE ♂ *Cyamops freidbergi* Baptista & W.N.Mathis [red; species name, gender symbol, and “Baptista &” handwritten].” The holotype is double mounted (minuten in a block of plastic), is in relatively good condition (abdomen removed, dissected, structures in an attached microvial), and is deposited in the USNM.

**Distribution.**—This species is known thus far only from the type locality on Madagascar.

**Etymology.**—The species epithet, *freidbergi*, is a genitive patronym to honor and recognize Dr. Amnon Freidberg, who collected this species and many other interesting acalyptrate Diptera on Madagascar.

**Remarks.**—The presence of a single dorsocentral seta, a character that distinguished this species from *C. nigeriensis*, also occurs in New World species of *Cyamops*. The shape of the male surstylus (Fig. 11) distinguishes this species from other congeners.

**AUSTRALASIAN/OCEANIAN REGION**

The Australasian/Oceanian fauna demonstrates variation in characters that are constant in American and Afrotropical species, i.e., sexual dimorphism in the shape of the face (absent in *C. micronesicus* and an undescribed species from Ponape) and presence of crossvein bm-cu. All species, however, have two dorsocentral setae, and the anepisternum lacks setae along the posterior margin.



# KEY TO AUSTRALIAN/OCEANIAN SPECIES OF *CYAMOPS*

1. Basal arista rays not bifurcate . . . . . 2
- Basal arista rays bifurcate . . . . . 5
2. Mesofacialia bearing a ridge (male) or a wide elevated portion (female); face of male narrow, constricted medially; 1st costal ratio 2.3 or greater (Fiji) . . . . . *C. fiji*, new species
- Mesofacialia flat throughout; face of male wide, not constricted medially; 1st costal ratio 1.0–1.8 . . . . . 3
3. Pseudovibrissa aligned with other peristomal setae; basal scutellar seta about  $\frac{1}{2}$  length of apical seta . . . . . 4
- Pseudovibrissa placed externally to the row of peristomal setae; basal scutellar seta about  $\frac{3}{4}$  or more length of apical seta (Micronesia) . . . . . “Ponape” species complex
4. Mesofacial plate without setae; tibia and tarsus of foreleg mostly brown to dark-brown; ocellar tubercle shiny; vertex shiny (Yap) . . . . . *C. micronesicus*, new species
- Mesofacial plate setose between upper peristomal setae; tibia and tarsus of foreleg mostly yellow; ocellar tubercle dull microtomentose; vertex dull microtomentose (Ponape) . . . . . *C. sp.* 3
5. 1st costal ratio 1.0–1.8 . . . . . 6
- 1st costal ratio 2.3 or more . . . . . 10
6. Comb on ventral margin of midcoxa absent . . . . . 7
- Comb on ventral margin of midcoxa present (Australia) . . . . . *C. pectinatus* Khoo
7. Peristomal setae on mesofacial plate (Australia) . . . . . *C. claudiensis* Khoo
- Peristomal setae on genal suture . . . . . 8
8. Basal scutellar seta about  $\frac{3}{4}$  or more length of apical seta; tibia and tarsus of foreleg mostly yellow to yellowish brown . . . . . 9
- Basal scutellar seta at most  $\frac{1}{2}$  length of apical seta; tibia and tarsus of foreleg mostly brown to dark-brown (New Guinea) . . . . . *C. papuensis*, new species
9. Wing hyaline (Australia) . . . . . *C. truncatus* Khoo
- Wing with a conspicuous brown pattern (Australia) . . . . . *C. dayi* Khoo
10. 5th sternite of male abdomen entire . . . . . 11
- 5th sternite of male abdomen divided medially (American Samoa) . . . . . *C. samoensis*, new species
11. Legs mostly yellowish; midfemur yellow; wing hyaline (Australia) . . . . . *C. australicus* Hennig
- Legs mostly yellowish brown to black; midfemur brown apically; wing with a conspicuous brown pattern (Australia) . . . . . *C. delta* Khoo

# *Cyamops micronesicus* Baptista and Mathis, new species

(Figs. 14–16)

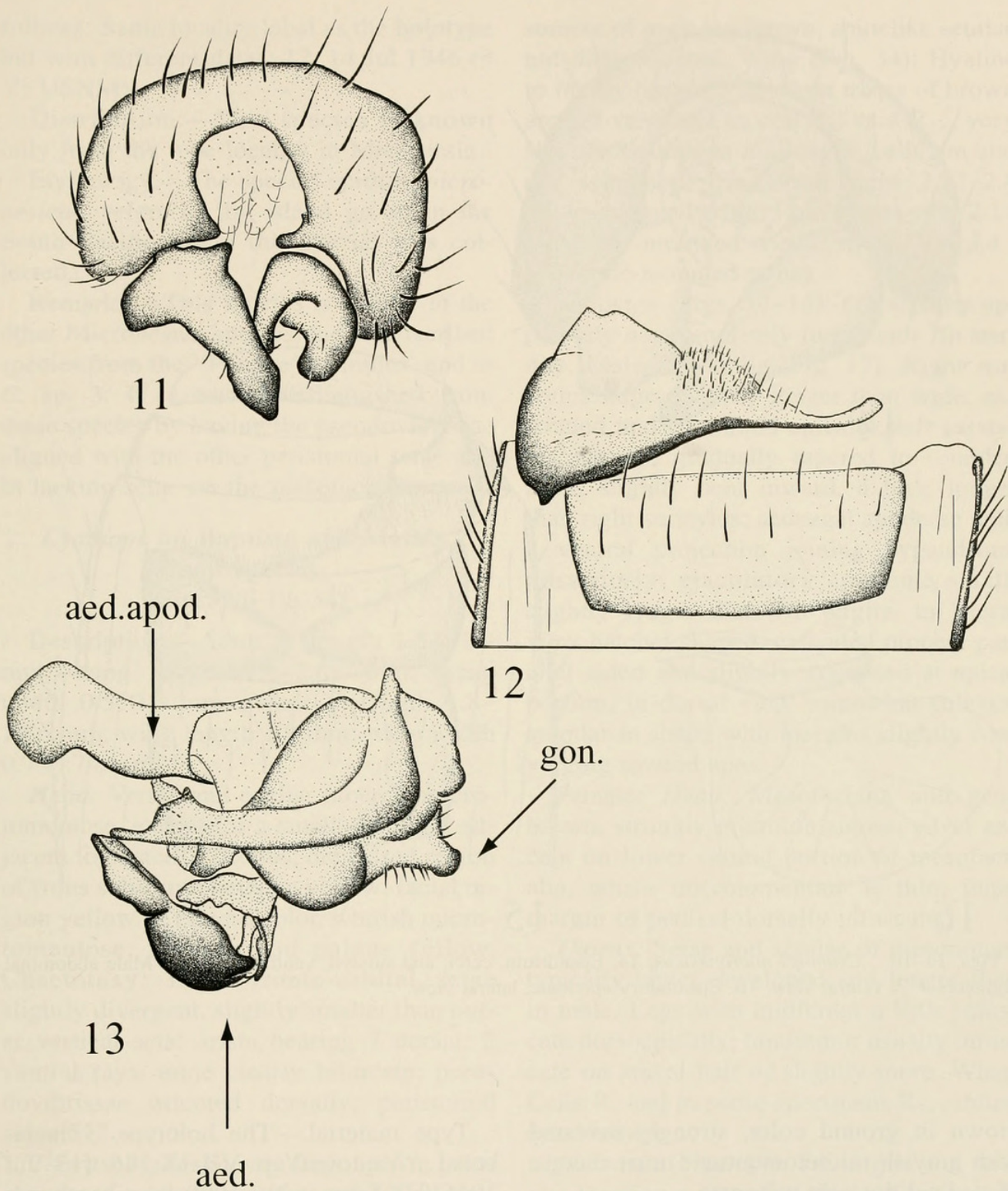
**Description.**—Adult ♂ length 2.0 mm; wing length 1.8 mm; wing width 0.6 mm. Adult ♀ length 1.8–2.07 mm; wing length 1.97–2 mm; wing width 0.67–0.72 mm.

**Head:** Vertex and ocellar tubercle bright shiny, depressed region of frons subshiny; antenna yellow; facial region yellow in ground color, gray microtomentose; clypeus and palpus yellow; face shallowly and vertically arched, not angulate, nor constricted medially. Chaetotaxy: Inner fronto-orbital setae nearly parallel to slightly divergent, slightly smaller than outer vertical seta; arista bearing 9–10 dorsal, 3 ventral rays, none clearly bifurcate; pseudovibrissae slightly divergent, pointing dorsally; peristomal setae 6–7.

**Thorax:** Halter mostly pale yellow; scutellum trapezoidal, orientation of scutellum very slightly more elevated than scutum, disk slightly convex; postpronotum and upper margin of notopleuron shiny. Chaetotaxy: Dorsocentral setae 0+2, posterior seta subequal in length to apical scutellar seta but thinner, anterior dorsocentral seta slightly shorter and thinner; mesonotal setulae very thin and sparse; scutellar setae 2, basal seta about  $\frac{3}{4}$  of apical seta. Legs mostly yellow (foretibia and foretarsi of holotype missing); apical  $\frac{1}{4}$ – $\frac{1}{3}$  of hindfemur, apical and subapical tarsomere of each leg brown; spinelike setulae not differentiated. Wing: Partially hyaline; cell  $R_{4+5}$  mostly brown, subdividing subapical spot; cell M and somewhat cell  $CuA_1$  mostly lightly infuscate to hyaline; vein  $R_{2+3}$  only slightly sinuous at midlength; cells bm and dm confluent; 1st costal ratio 1.15–1.4 (slide-mounted wing); 2nd costal ratio 2.2–3.8 (slide-mounted wing); wing ratio 2.88–2.96 (slide-mounted wing).

**Abdomen** (Figs. 14–16): 6th tergite subequal in width to 7th tergite. Male terminalia (Figs. 14–15): Left surstylus narrow, gradually tapered to a point, about 1.5 times





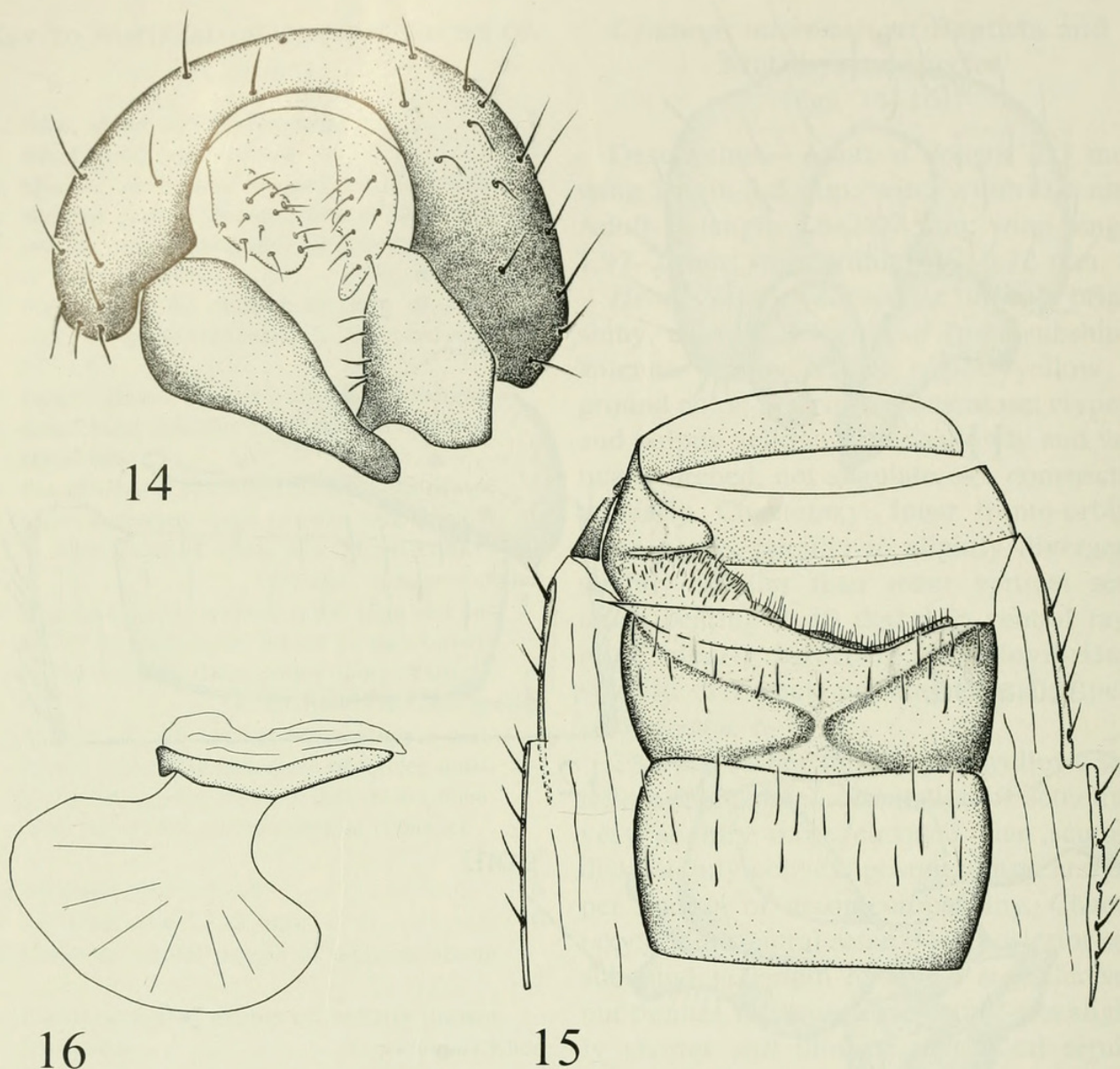
Figs. 11-13. *Cyamops freidbergi*. 11, Epandrium, cerci, and surstyli, ventral view. 12, Male abdominal segments 5-7, ventral view. 13, Internal male terminalia, lateral view. Abbreviations: aed. = aedeagus; aed. apod. = aedeagal apodeme; gon. = gonite; st. = sternite.

longer than right; right surstylus slightly longer than wide, anterior margin slightly receded, forming a nipplelike projection on inner corner; ejaculatory apodeme in dorsal

view as long as 6th tergite, with extended process greatly expanded toward apex, fan-like (Fig. 16).

Female: *Head*: Mesofacialia and gena





Figs. 14-16. *Cyamops micronesicus*. 14, Epandrium, cerci, and surstyli, ventral view. 15, Male abdominal segments 4-7, ventral view. 16, Ejaculatory apodeme, lateral view.

brown in ground color, strongly invested with grayish microtomentum; inner margin of pedicel dorsally infusate.

**Thorax:** Setae and setulae of mesonotum typically better developed and longer than in male; postpronotum almost lacking microtomentum; tibia and tarsus of foreleg brown to dark brown. Wing: pattern generally darker than in male.

**Abdomen:** 7th tergite and sternite forming a complete ring, wide ventrally, dorsally about half that of 6th tergite; 2 subequal spermathecae.

**Type material.**—The holotype ♂ is labeled "YaptownYap VII-13 -46 [13 Jul 1946]/HKTownes No 1090 [number handwritten]/HOLOTYPE *Cyamops micronesicus* Baptista & W.N.Mathis USNM [red; species name, gender symbol, and "Baptista &" handwritten]." The holotype is double mounted (glued to a point on ventral, right side), is in fair condition (foretibiae and tarsi missing, left wing detached and slide-mounted; abdomen removed, dissected, structures in an attached microvial), and is deposited in the USNM. Paratypes are as



follows: Same locality label as the holotype but with different dates: 12, 14 Jul 1946 (3 ♀; USNM).

**Distribution.**—This species is known only from the type locality in Micronesia.

**Etymology.**—The species epithet, *micronesicus*, refers to the island group in the South Pacific where this species was collected.

**Remarks.**—This species is similar to the other Micronesian species, the underscribed species from the “Ponape” complex, and to *C. sp. 3*. It is easily distinguished from these species by having the pseudovibrissae aligned with the other peristomal setae and in lacking setae on the mesofacialia.

***Cyamops fiji* Baptista and Mathis,  
new species**

(Figs. 17–19, 34)

**Description.**—Adult ♂ length 1.54–1.7 mm; wing length 1.6–1.68 mm; wing width 0.5–0.6 mm. Adult ♀ length 1.8–1.86 mm; wing length 1.9 mm; wing width 0.7–0.74 mm.

**Head:** Vertex and ocellar tubercle microtomentose, except for a small shiny dot adjacent to posterior ocellus; depressed region of frons subshiny; antenna yellow; facial region yellow in ground color, whitish microtomentose; clypeus and palpus yellow. Chaetotaxy: Inner fronto-orbital setae slightly divergent, slightly smaller than outer vertical seta; arista bearing 7 dorsal, 3 ventral rays, none clearly bifurcate; pseudovibrissae oriented dorsally; peristomal setae 5–7.

**Thorax:** Halter mostly dark brown; postpronotum microtomentose, subshiny; scutellum trapezoidal, orientation of scutellum very slightly more elevated than scutum, disk slightly convex. Chaetotaxy: Dorso-central setae 0+1 (some specimens with an elongate but thin setula anterior of dorso-central seta); mesonotal setulae well developed; scutellar setae 2. Legs mostly yellow; forefemur a little infusate dorsally, mostly on apical portion; apical  $\frac{1}{3}$ – $\frac{1}{2}$  of hindfemur brown; apical and sometimes subapical tar-

somere of each leg brown; spinelike setulae not differentiated. Wing (Fig. 34): Hyaline to faintly brown with slight traces of brown around veins and in cell  $R_1$ ; vein  $R_{2+3}$  very slightly sinuous at midlength; cells *bm* and *dm* separated; 1st costal ratio 2.35–2.8 (slide-mounted wing); 2nd costal ratio 2.1–2.5 (slide-mounted wing); wing ratio 2.4–3.2 (slide-mounted wing).

**Abdomen** (Figs. 17–18): 6th sternite apparently not completely fused with 7th sternite. Male terminalia (Fig. 17): Right surstylus large, slightly longer than wide, expanded and convoluted apically; left surstylus narrow, gradually tapered to rounded apex, slightly bent inward, a little longer than right surstylus; aedeagal apodeme with a ventral projection joining hypandrium posteriorly; ejaculatory apodeme small, slightly longer than 7th tergite, in lateral view hatchet shaped, extended process parallel sided and slightly expanded at apical portion, in dorsal view somewhat subrectangular in shape with margins slightly converging toward apex.

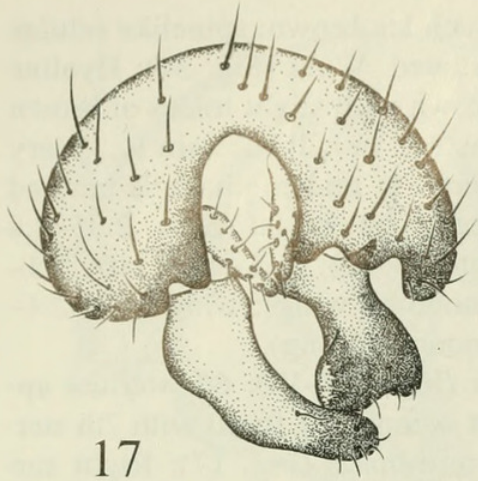
**Female:** **Head:** Mesofacialia and gena brown, strongly microtomentose, silver except on lower central portion of mesofacialia, where microtomentum is thin; inner margin of pedicel dorsally infusate.

**Thorax:** Setae and setulae of mesonotum typically better developed and longer than in male. Legs with midfemur a little infusate dorsoapically; hindfemur usually infusate on apical half or slightly more. Wing: Cells  $R_1$  and in some specimens  $R_{2+3}$  infusate, brown.

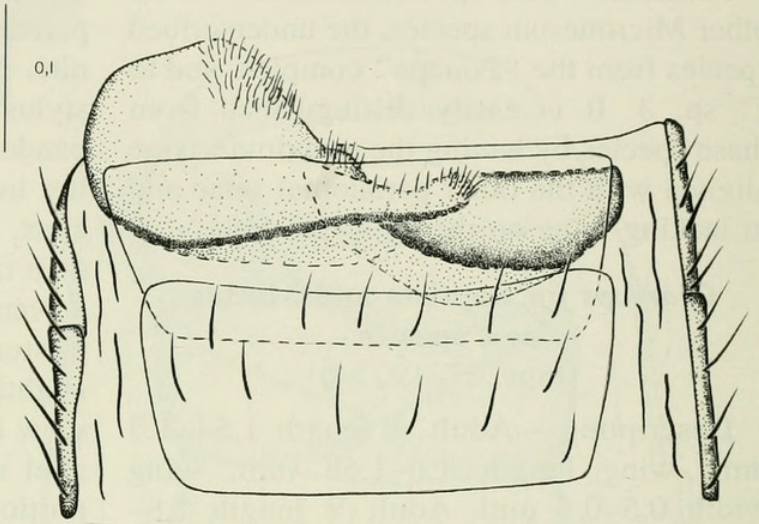
**Abdomen** (Figs. 19): 7th tergite and sternite forming a complete ring, wide ventrally, dorsally about  $\frac{3}{4}$  of 6th tergite; 3 subequal spermathecae (Fig. 19); sclerotized portion of spermathecal duct about same length as spermatheca.

**Type material.**—The holotype ♂ is labeled “FIJI: Viti Levu I: Lami, 0–200 m, III.1981/N.L.H. Krauss, Coll. BISHOP Museum Acc. #1981.131/HOLOTYPE ♂ *Cyamops fiji* Baptista & W.N.Mathis [red; species name, gender symbol, and “Baptista

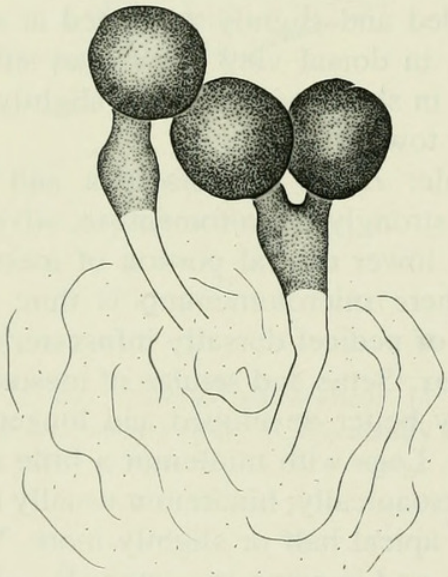




17



18



19

Figs. 17-19. *Cyamops fiji*. 17, Epandrium, cerci, and surstyli, ventral view. 18, Male abdominal segments 4-7, ventral view. 19, Spermathecae, ventral view.

&” handwritten].” The holotype is double mounted (glued to a point on the right side), is in relatively good condition (mesonotal setae broken), and is deposited in the BPBM. Paratypes are as follows: Same label data as the holotype (17 ♂, 18 ♀; BPBM, USNM).

**Etymology.**—The species epithet, *fiji*, is

the name of the country where the type locality is located and is a noun in apposition.

**Remarks.**—This species has the 6th and 7th sternites incompletely fused, a character shared with *C. samoensis*. Both species, however, can be easily distinguished by the characters in the key. The shape of the right surstylus is unique to *C. fiji*.



***Cyamops papuensis* Baptista and  
Mathis, new species**

(Fig. 20)

**Description.**—Adult ♂ length 1.7–1.8 mm; wing length 1.6 mm; wing width 1.6–2 mm. Adult ♀ length 1.8–2.0 mm; wing length 1.8–2.0 mm; wing width 2.5 mm.

**Head:** Ocellar tubercle polished; shiny spot on vertex large and distinct, extended from ocellus  $\frac{2}{3}$  distance to eye margin; depressed region of frons deep, velvet; pedicel on upper half, 1st flagellomere yellow, infusate dorsally; facial region yellow in ground color, strongly microtomentose; labellum and palpus pale yellow; face produced and slightly angulate. Chaetotaxy: Inner fronto-orbital setae slightly divergent, slightly smaller than outer vertical seta; arista bearing 9 dorsal, 3 ventral rays, 6 basal rays bifurcate; pseudovibrissae oriented dorsally; peristomal setae 7.

**Thorax:** Halter brown; scutellum trapezoidal, orientation of scutellum moderately more elevated than scutum, disk a little convex; postpronotum polished. Chaetotaxy: Dorsocentral setae 0+2, posterior seta slightly longer than anterior seta; mesonotal setulae moderately well-developed; scutellar setae 2, basal seta  $\frac{1}{3}$  length of apical seta. Legs mostly yellow; femora brown infusate at apical  $\frac{1}{2}$ – $\frac{2}{3}$  tibiae very slightly infusate; apical and subapical tarsomere of each leg brown; spinelike setulae about 6, weakly differentiated. Wing: Hyaline, slightly fuscous; cells bm and dm separated; 1st costal ratio 1.28–1.5 (slide-mounted wing); 2nd costal ratio 3.5–4.0 (slide-mounted wing); wing ratio 0.8–1.0 (slide-mounted wing).

**Abdomen** (Fig. 20): 6th tergite about same width as dorsal portion of 7th tergite, both sclerites almost without setae; 4th and 5th sternites with well-developed lateral setae and a row of setae along posterior margin, 5th sternite slightly reduced in length, posterior margin somewhat receded. Male terminalia: right surstylus almost globular,

posteromedial margin deeply excavated, forming a fingerlike projection on left portion of surstylus, left surstylus at least 4× longer than wide.

**Female:** **Head:** Mesofacialia and gena brown, strongly microtomentose, silver except on facial carina where microtomentum is thin; 1st flagellomere infusate dorsally.

**Thorax:** Legs with femora mostly brown.

**Abdomen:** 7th tergite and sternite separate; 7th tergite about  $\frac{3}{4}$  length of 6th tergite; 2 subequal, spherical spermathecae; sclerotized portion of spermathecal duct about  $\frac{1}{5}$  length of spermatheca.

**Type material.**—The holotype ♂ is labeled “NEW GUINEA: NE Morobe District Mindik, 1,200–1,600 m, IX.1968 [Sep 1968]/N.L.H. Krauss Collector BISHOP MUSEUM/HOLOTYPE ♂ *Cyamops papuensis* Baptista & W.N. Mathis [red; species name, gender symbol, and “Baptista &” handwritten].” The holotype is double mounted (glued to a paper point), is in good condition (right wing missing), and is deposited in the BPBM. Paratypes are as follows: NEW GUINEA. NE. Morobe District, Mt. Kaindi (N Peak; 2,350 m), 1–14 Sep 1966 (1 ♂; USNM).

**Other material examined.**—Papua New Guinea. NE. Wau, Hospital Creek (1,200 m; Malaise trap), 6 Apr 1965, J. Sedlasec (1 ♀; BPBM); Amok (165 m), 6 Jan 1960, T. C. Maa (1 ♀; BPBM). SE. Western District. Oriomo River (3 ♂; light trap), 4 Aug 1964, H. Clissold (1 ♂; BPBM).

**Etymology.**—The species epithet, *papuensis*, refers to Papua New Guinea, the country where the type locality is located.

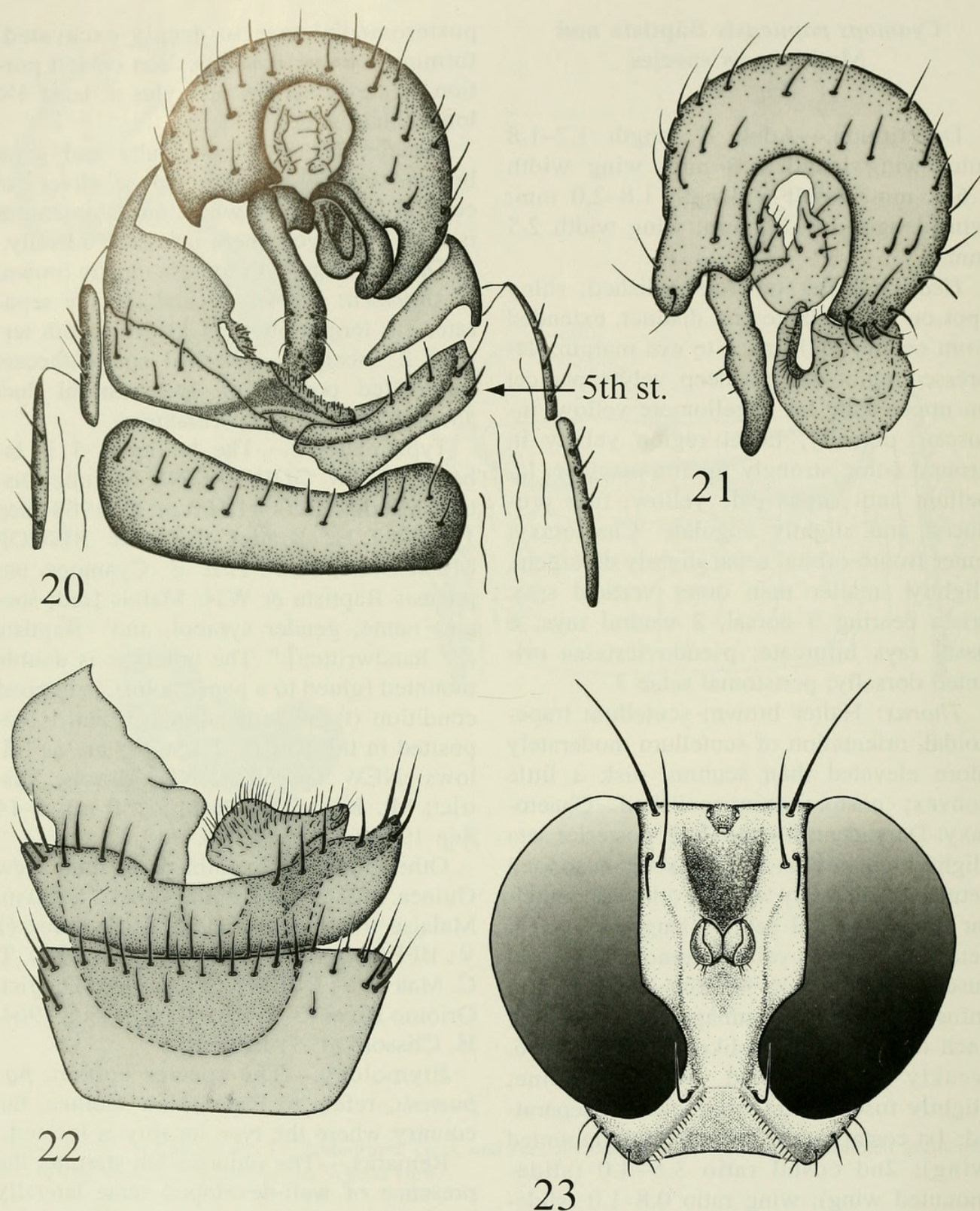
**Remarks.**—The reduced 5th sternite, the presence of well-developed setae laterally on the 4th and 5th sternites, and the shape of the 6th–7th sternites and surstylus distinguish this species.

***Cyamops samoensis* Baptista and  
Mathis, new species**

(Figs. 21–22)

**Description.**—Holotype ♂ length 1.8 mm; wing length 1.7 mm; wing width 0.6 mm.





Figs. 20-23. *Cyamops papuensis*. 20, Segments 4-7, epandrium, cerci, and surstyli, ventral view. *Cyamops sampensis*. 21, Epandrium, cerci, and surstyli, ventral view. 22, 4th-7th sternites, ventral view. *Cyamops* sp. ("Ponape" species complex). 23, Head, anterior view. Abbreviations: st. = sternite.

**Head:** Ocellar tubercle microtomentose; a shiny spot on vertex large and distinct, extended from ocellus  $\frac{2}{3}$  distance to eye margin; depressed region of frons deep vel-

vet; pedicel brown, 1st flagellomere yellow; facial region yellow in ground color, strongly microtomentose; labellum and palpus yellow; face slightly produced, constricted



medially. Chaetotaxy: Inner fronto-orbital setae slightly divergent, slightly smaller than outer vertical seta; fronto-orbits with setulae that run beyond limits of silver-microtomentose portion; arista bearing 9 dorsal, 3 ventral rays, 6 basal rays bifurcate; pseudovibrissae parallel, oriented dorsally; peristomal setae 7.

*Thorax*: Halter mostly white, dark brown at base; scutellum trapezoidal, orientation of scutellum moderately more elevated than scutum, disk flat; postpronotum microtomentose. Chaetotaxy: Dorsocentral setae 0+2, posterior seta slightly longer than anterior seta; mesonotal setulae moderately well developed; scutellar setae 2, basal seta  $\frac{3}{4}$  of apical seta. Legs mostly yellow; hind-femur apically weakly infusate; apical and subapical tarsomere of each leg brown; spinelike setulae about 6, weakly differentiated. Wing: Hyaline to faintly brownish infusate; cells bm and dm separated; 1st costal ratio 3.0; 2nd costal ratio 2.4, wing ratio 2.8.

*Abdomen* (Figs. 21–22): 6th tergite about same width as 7th tergite, both tergites almost without setae (in a dry specimen, only 6 abdominal segments are seen); 5th sternite asymmetrical, divided in 2 parts; 6th sternite apparently incompletely fused with 7th sternite. Male terminalia: Right surstylus large, slightly longer than wide, complicated in shape, convoluted; left surstylus narrow, a little enlarged posteriorly, twice length of right surstylus; ejaculatory apodeme triangular when viewed dorsally, posterior process in lateral view parallel-sided, not longer than body of apodeme.

*Type material*.—The holotype ♂ is labeled “Amer[ican]. Samoa Tutuila Is. Leone Area/July 27-Aug 5 MR Wheeler 1962 [date handwritten]/HOLOTYPE ♂ *Cyamops samoensis* Baptista & W.N. Mathis USNM [red; species name, gender symbol, and “Baptista &” handwritten].” The holotype is in good condition (glued to a point; abdomen removed and in an attached microvial) and is deposited in the USNM. Paratype is as follows: SAMOA. Tulia, Na-

val station, 24 Aug 1940, Sand Zimmerman (1 ♂; BPBM).

*Etymology*.—The species epithet, *samoensis*, refers to the country where the type locality is located.

*Remarks*.—The shape of the medially divided, symmetrical 5th sternite and of the right surstylus are typical for this species. The separated 6th and 7th sternites is a character shared with *C. fiji*. Males of *C. femoratus* also have the 5th sternite divided medially.

#### *Cyamops pectinatus* Khoo

*Cyamops pectinatus* Khoo 1985: 528–530.—Khoo and Sabrosky 1989: 551 [Australasian/Oceanian catalog].

*Specimens examined*.—AUSTRALIA. Tasmania: Stoneyford Creek (N of Lagoons), 11 Nov 1979, H. B. Williams (1 ♂; USNM).

*Distribution*.—North Queensland to the southern coast of New South Wales and inland to Narrabri and the Australian Capital Territory (Khoo 1985). Tasmania is a new state record for this species.

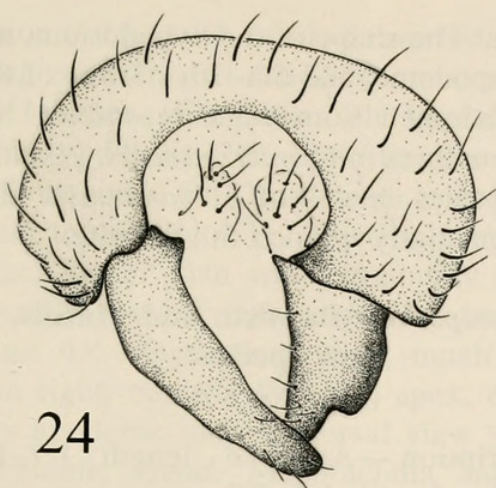
#### “Ponape” species complex (Fig. 23)

Seven specimens from Ponape, all in poor condition, share a distinctive character: Pseudovibrissae are placed external to the row of peristomal setae (Fig. 23). In addition, these species can be easily distinguished from other species from Ponape by the absence of mesofacial setae. The male, like *C. sp. 3*, has a wide face. Having peristomal setae that are modified differently in the male and the female, along with differences in the coloration of the legs and wings, lead us to suspect that the male and female might belong to different species. Because the wings of available specimens are in poor condition, it was impossible to determine whether crossvein bm-cu is present or not. Some of the specimens we examined came from different localities and we are unsure of the number of species rep-

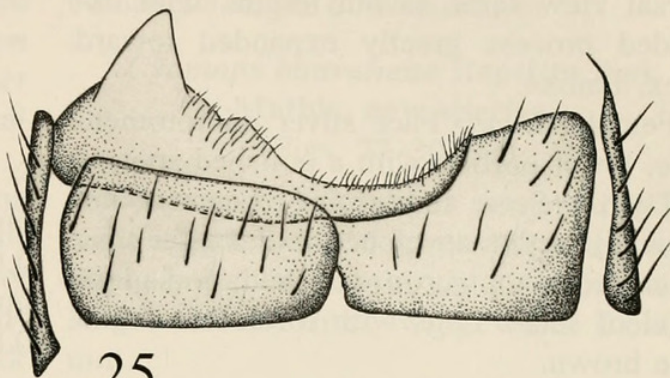




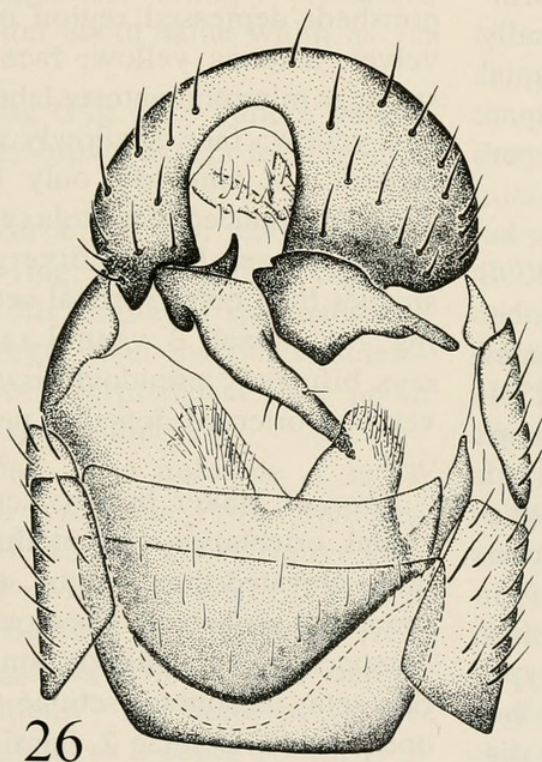




24



25



26

Figs. 24–26. *Cyamops femoratus*. 24, Epandrium, cerci, and surstyli, ventral view. 25, Male 5th–7th sternites, ventral view. *Cyamops laos*. 26, Segments 4–7, epandrium, cerci, and surstyli, ventral view.

mere of each leg brown; spinelike setulae about 4, basalmost seta long, forefemur bearing an additional long seta basally. Wing (Fig. 35): Mostly hyaline; cells  $R_1$  and  $R_{2+3}$  mostly hyaline; posterior margin and apex of cell  $R_{2+3}$  dark; posterior portion of cell M and cell  $CuA_1$  with hyaline area (pale specimens with wing mostly hyaline and pattern rather faint); vein  $R_{2+3}$  sinuous,

narrowing cell  $R_{2+3}$  at midlength; cells bm and dm only partially separated; 1st costal ratio 1.3–1.5 (slide-mounted wing); 2nd costal ratio 4.3–4.8 (slide-mounted wing); wing ratio 2.8–3.6 (slide-mounted wing).

**Abdomen** (Figs. 24–25): 5th sternite divided in middle, slightly asymmetrical; 6th tergite almost same width as 7th tergite; 6th–7th sternites simple, reduced in com-



parison to other species. Male terminalia (Fig. 24): Right surstylus large, slightly longer than wide; left surstylus much longer than wide, slightly tapered to point; aedeagal apodeme joined to hypandrium posteriorly; length of ejaculatory apodeme in dorsal view same as 6th tergite, with extended process greatly expanded toward apex, fanlike.

Female: *Head*: Face silver microtomentose, lower portion with a polished spot.

*Thorax*: Setae and setulae of mesonotum typically better developed and longer than in male; notopleuron polished dorsad of level of setae. Legs with forefemur infusate brown.

*Abdomen*: 7th tergite and sternite forming a complete ring, wide ventrally, dorsally about half width of 6th tergite; 2 subequal spermathecae; sclerotized portion of spermathecal duct subequal to length of spermatheca.

Type material.—The holotype ♂ is labeled "P[hilippine]. I[lands]., NEGROS OR. L. Balinsasayao 6-X-1959 [number "6" handwritten over the top of a printed number] /C.M. Yashimoto Collector BISHOP MUSEUM/HOLOTYPE ♂ *Cyamops femoratus* Baptista & W.N. Mathis [red; species name, gender symbol, and "Baptista &" handwritten]." The specimen is double mounted (glued to a paper point), is in good condition (left vertical seta missing), and is deposited in the BPBM. Paratypes are as follows: Same label data as the holotype (one ♀ with abdomen and wing dissected and in an attached microvial) but with different dates as follows: 6 Oct 1959 (2 ♂, 4 ♀; BPBM, USNM); 1–7 Oct 1959 (3 ♂, 4 ♀; BPBM).

Etymology.—The species epithet, *femoratus*, refers to the characteristic seta on the forefemur.

Remarks.—The presence of a basoven-tral seta on the male forefemur is an autapomorphy for this species. The wing pattern of *C. femoratus* resembles that of *C. ban-vaneue*, and a sinuous vein  $R_{2+3}$  is shared with *C. laos* and *C. nebulosus* from North

America. The shape of the hypandrium, aedeagal apodeme, and 6th–7th sternite of the male abdomen somewhat resembles the same structures in *C. micronesicus*. Like the latter species, males of *C. samoensis* also have a medially divided 5th sternite.

***Cyamops laos* Baptista and Mathis,  
new species  
(Fig. 26, 36)**

Description.—Adult ♂ length 1.7–1.9 mm; wing length 1.9–2.0 mm; wing width 0.64–0.66 mm. Adult ♀ length 2.2–2.6 mm; wing length 2.5–2.8 mm; wing width 0.86–0.9 mm.

*Head*: Ocellar tubercle and vertex almost polished; depressed region of frons deep, velvet; antenna yellow; face pale yellow, strongly microtomentose; labellum and palpus yellow; face shallowly and vertically arched, not angulate, only lower portion slightly produced. Chaetotaxy: Inner fronto-orbital setae slightly divergent, slightly smaller than outer vertical seta; arista bearing 7–8 dorsal, 3 ventral rays, 6–7 basal rays bifurcate; pseudovibrissae slightly divergent, oriented dorsally; peristomal setae 6–8.

*Thorax*: Halter brown; scutellum trapezoidal, orientation of scutellum moderately more elevated than scutum, disk flat; postpronotum polished. Chaetotaxy: Posterior dorsocentral seta slightly longer than anterior seta; mesonotal setulae weakly developed; scutellar setae 2, basal seta  $\frac{2}{3}$  length of apical seta. Legs mostly yellow, only hindfemur brown at apical  $\frac{1}{6}$ ; apical and subapical tarsomere of each leg brown; spinelike setulae about 8, weakly differentiated. Wing (Fig. 36) mostly slightly infusate; cell  $R_1$  mostly hyaline; cell  $R_{2+3}$  mostly infusate with subapical white spot; posterior portion of cell M and somewhat of cell  $CuA_1$  with hyaline area (wing only slightly infusate around veins in some specimens); vein  $R_{2+3}$  sinuous, narrowing cell  $R_{2+3}$  at midlength; 1st costal ratio: 1.37–1.61 (slide-mounted wing), 1st costal



ratio: 3.25–4.14 (slide-mounted wing), wing ratio 2.9–3.1 (slide-mounted wing).

*Abdomen* (Fig. 26): 6th tergite about same width as 7th, both tergites almost without setae; 6th–7th sternite as in Fig. 26. Male terminalia (Fig. 26): Right surstylus large, longer than wide, gradually tapered laterally toward right side; left surstylus about 4× longer than wide, much longer than right, narrowed toward apex; ejaculatory apodeme short in dorsal view  $\frac{2}{3}$  as

Female: *Head*: Mesofacialia and gena dark brown, strongly microtomentose, silver except for facial carina which is shiny and almost polished on posterior half; pedicel mostly brown; palpus brown to dark brown; face angulate, strongly produced, produced portion about same width as 1st flagellomere.

*Thorax*: Wing (Fig. 36): Pattern darker; cell  $R_{2+3}$  mostly brown except for a hyaline median spot.

*Abdomen*: 7th tergite and sternite forming a complete ring, wide ventrally, dorsally ranging  $\frac{2}{3}$  of 6th tergite; 2 spermathecae, one slightly larger than the other; sclerotized portion of spermathecal duct about half length of spermatheca.

Type material.—The holotype ♂ is labeled "LAOS: Vientiane Prov. Ban Van Eue 15.IX.1967 [15 Sep 1967]/Native Collector BISHOP [Museum]/HOLOTYPE ♂ *Cyamops laos* Baptista & W.N. Mathis [red; species name, gender symbol, and "Baptista &" handwritten]." The holotype is double mounted (glued to a paper point), is in fair condition (facial setae, right 1st flagellomere, thoracic setae, right hindleg missing), and is deposited in the BPBM. Paratypes are as follows: Same locality label as the holotype, but with different dates as follows: 15 May 1966 (2 ♀; BPBM), 8 Aug 1966 (1 ♀; BPBM), 15 Aug 1966 (2 ♀; BPBM), 15 May 1967 (1 ♂, 1 ♀; BPBM, USNM), 30 Jun 1967 (2 ♂, 1 ♀; BPBM, USNM), 15, 30 Aug 1967 (1 ♀; BPBM), 15 Sep 1967 (1 ♂, 1 ♀; BPBM). One ♂ paratype has been dissected (the structures are in an attached microvial).

*Etymology*.—The species epithet, *laos*, refers to the country of the type locality and is a noun in apposition.

*Remarks*.—This species is similar to *C. banvaneue* but can be easily distinguished by the characters cited in the key (also see comments under *C. banvaneue*).

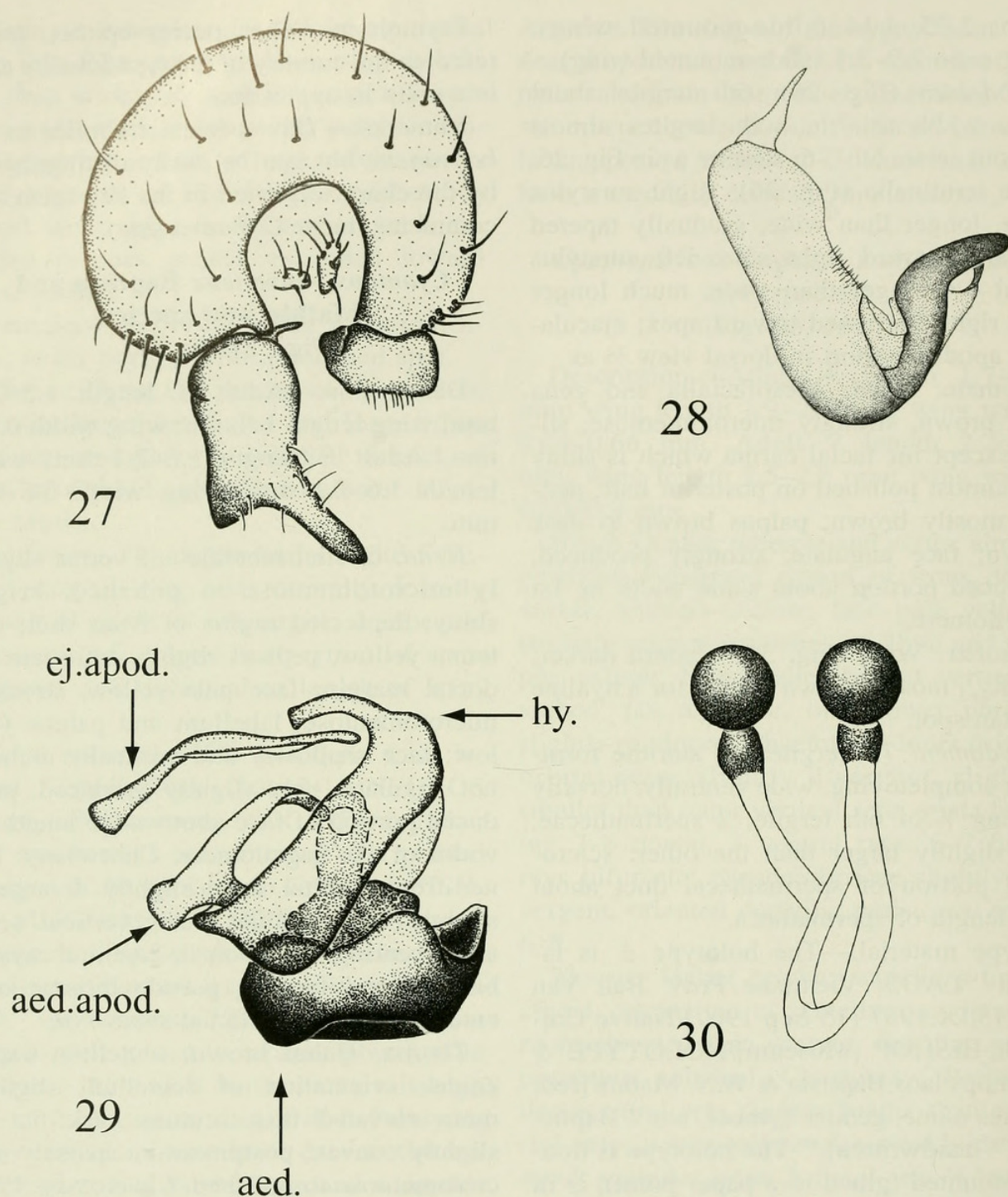
***Cyamops banvaneue* Baptista and  
Mathis, new species**  
(Figs. 27–30, 37)

*Description*.—Adult ♂ length 1.5–2.5 mm; wing length 1.6 mm; wing width 0.56 mm. Adult ♀ length 1.8–2.1 mm; wing length 1.6–2.1 mm; wing width 0.6–0.7 mm.

*Head*: Ocellar tubercle and vertex slightly microtomentose to polished, bright shiny; depressed region of frons dull; antenna yellow, pedicel slightly infusate on dorsal margin; face pale yellow, strongly microtomentose; labellum and palpus yellow; face shallowly and vertically arched, not angulate, only slightly produced, produced portion of face about same length as width of 1st flagellomere. Chaetotaxy: Inner fronto-orbital setae slightly divergent, slightly smaller than outer vertical seta; arista bearing 9–10 dorsal, 2 ventral rays, 6 basal rays bifurcate; pseudovibrissae oriented dorsally; peristomal setae 7–9.

*Thorax*: Halter brown; scutellum trapezoidal, orientation of scutellum slightly more elevated than scutum, disk flat to slightly convex; postpronotum sparsely microtomentose to polished. Chaetotaxy: Posterior dorsocentral seta slightly longer than anterior seta; scutellar setae 2, basal seta  $\frac{2}{3}$ – $\frac{3}{4}$  length of apical seta. Legs mostly yellow, only hindfemur brown at apical half; apical and subapical tarsomere of each leg brown; forefemur slightly infusate dorsally; spine-like setulae slightly differentiated, 2–3, black. Wing (Fig. 37): Mostly infusate; cells  $R_1$  completely and  $R_{2+3}$  mostly hyaline; posterior margin and apex of cell  $R_{2+3}$  dark, posterior portion of cell M and somewhat cell  $CuA_1$  with hyaline areas; cells bm and dm separated; 1st costal ratio 1.2–1.3





Figs. 27–30. *Cyamops banvaneue*. 27, Epandrium, cerci, and surstyli, ventral view. 28, Male 6th–7th sternites, ventral view. 29, Internal male terminalia, lateral view. 30, Spermathecae, ventral view. Abbreviations: aed. = aedeagus; aed. apod. = aedeagal apodeme; ej. apod. = ejaculatory apodeme; hy. = hypandrium.

(slide-mounted wing); 2nd costal ratio 3.7–3.8 (slide-mounted wing); wing ratio 2.3–2.8 (slide-mounted wing).

**Abdomen** (Figs. 27–29): 6th tergite about same width as 7th tergite, both tergites almost without setae; 6th–7th sternite as in Fig. 28. **Male terminalia** (Figs. 27, 29):

Right surstylus large, slightly wider than long, subrectangular; left surstylus slightly longer than wide, with a fingerlike process on apicomeseal inner corner about  $\frac{2}{3}$  of length of surstylus; aedeagal apodeme joined to hypandrium posteriorly; ejaculatory apodeme short in dorsal view at most



$\frac{1}{3}$  as long as 7th tergite, extended process thin, with margins subparallel, in dorsal view subrectangular in shape.

**Female: Head:** Mesofacialia and gena dark brown, strongly microtomentose, silver except for facial carina which is shiny and almost polished on posterior  $\frac{2}{3}$ ; pedicel mostly brown; palpus brown to dark brown; femora dark except for yellow basal ring.

**Thorax: Wing:** Pattern darker, cell  $R_{2+3}$  mostly brown except for a hyaline median spot.

**Abdomen (Fig. 30):** 7th tergite and sternite forming a complete ring, wide ventrally, dorsally ranging  $\frac{2}{3}$  of 6th tergite; 2 spherical subequal spermathecae (Fig. 30); length of sclerotized portion of spermathecal duct about  $\frac{1}{2}$  diameter spermatheca.

**Type material.**—The holotype ♂ is labeled "LAOS: Vientiane Prov. Ban Van Eue 30.VI.1967 [30 Jun 1967] /Native collector BISHOP [Museum] /HOLOTYPE ♂ *Cyamops banvaneue* Baptista & W.N. Mathis [red; species name, gender symbol, and "Baptista &" handwritten]." The holotype is double mounted (glued to a paper point), is in fair condition (setae of head broken, both 1st flagellomeres and many thoracic setae missing), and is deposited in the BPBM. Paratypes are as follows: Same locality data as the holotype except for dates, which are as follows: 15–31 May 1965 (1 ♀; BPBM); 15 May 1966 (1 ♀; BPBM); 15 Aug 1966 (1 ♀; BPBM); 30 Jun 1967 (1 ♂; BPBM); 15 Aug 1967 (2 ♀; BPBM, USNM); 15 Sep 1967 (1 ♀; BPBM). One ♂ has been dissected (the structures are in an attached microvial).

**Etymology.**—The species epithet, *banvaneue*, refers to the type locality in Laos and is a noun in apposition.

**Remarks.**—This species is sympatric with *C. laos* but the two species are easily distinguished by the wing patterns. The wing of *C. banvaneue* has cell  $R_{2+3}$  mostly hyaline with only the apical third dark, whereas in *C. laos* this cell is mostly dark with a subapical hyaline spot. A second difference is the shape of vein  $R_{2+3}$ , which is

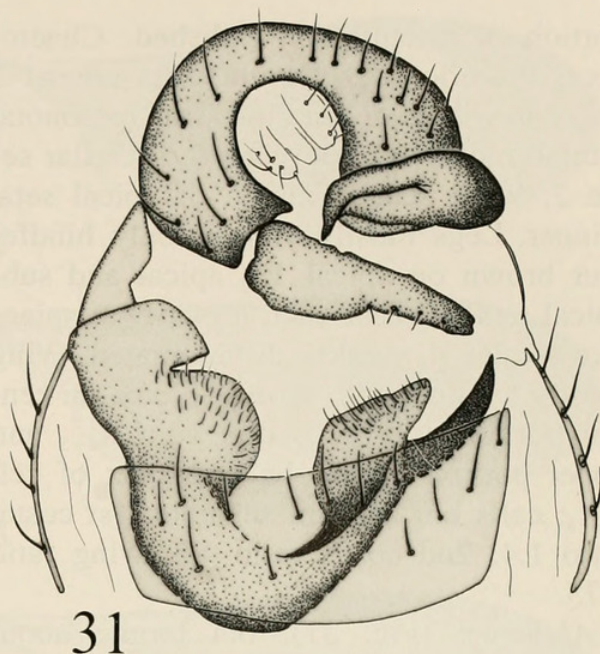


Fig. 31. *Cyamops kaplanae*. 20, Segments 5–7, epandrium, cerci, and surstyli, ventral view.

straight in *C. banvaneue* and sinuous in *C. laos*.

***Cyamops kaplanae* Baptista and Mathis,  
new species  
(Fig. 31)**

**Description.**—Adult ♂ length 2.1 mm; wing length 1.86 mm; wing width 0.6 mm. Adult ♀ length 2.1 mm; wing length 2.2 mm; wing width 0.8 mm.

**Head:** Ocellar tubercle and vertex mostly polished; depressed region of frons deep black; antenna yellow, slightly infusate on dorsal margin; face pale yellow, strongly microtomentose; labellum and palpus yellow; face in profile angulate, sloped anter-oventrally from base of antenna to vibrissal angle, thereafter slightly receded to oral margin, produced portion about  $\frac{3}{4}$  width of 1st flagellomere. Chaetotaxy: Inner fronto-orbital setae slightly divergent, about half length of outer vertical seta; arista bearing 10 dorsal, 3 ventral rays, 7 basalmost rays bifurcate; pseudovibrissae slightly divergent and curved dorsally; peristomal setae 7.

**Thorax:** Halter mostly brown, base pale yellow; scutellum trapezoidal, orientation of scutellum moderately more elevated than scutum, disk flat; postpronotum and central



portion of anepimeron polished. Chaetotaxy: Posterior dorsocentral seta almost 3 times longer than anterior seta; mesonotal setulae moderately developed; scutellar setae 2, basal seta  $\frac{1}{3}$  length of apical seta, thinner. Legs mostly yellow, only hindfemur brown on apical  $\frac{1}{5}$ ; apical and subapical tarsomere of each leg brown; spine-like setulae 4, weakly differentiated. Wing mostly hyaline, with brownish area on central portion over cells dm, vein  $R_{4+5}$  and upper portion of cell br, and apex of cell  $R_{2+3}$ ; cells bm and dm separate; 1st costal ratio 1.4; 2nd costal ratio 4.5; wing ratio 2.75.

**Abdomen** (Fig. 31): 6th tergite about same width as 7th tergite, both tergites almost without setae; 6th–7th sternite with posterior process as in Fig. 31. Male terminalia (Fig. 31): Right surstylus large, subrectangular, complex in shape; left surstylus slender, length about  $2\times$  that of right surstylus; ejaculatory apodeme short, as long as 5th tergite dorsally, extended process thin and short, with margins subparallel.

**Female: Head:** Antenna dark, median portion of 1st flagellomere microtomentose, with silver dust; produced portion of face larger than width of 1st flagellomere; mesofacialia and gena dark brown, strongly microtomentose, central portion shiny; palpus brown to dark brown; femora dark except for yellow basal portion.

**Thorax:** Wing: Hyaline

**Abdomen** (abdomen not dissected): 7th tergite and sternite separate.

**Type material.**—The holotype ♂ is labeled “THAILAND: S. KhaoSokNatPar. Rt. 401, 22.X.1993 [22 Oct 1993], F. KAPLAN & A. FREIDBERG/Dissected by A. Baptista97 [type written]/HOLOTYPE ♂ *Cyamos kaplanae* Baptista & W.N. Mathis USNM [red; species name, gender symbol, and “Baptista &” handwritten].” The holotype is double mounted (glued to a paper triangle), is in excellent condition (abdomen removed and dissected, structure in an attached microvial), and is deposited in the

USNM. The paratype ♀ bears the same locality data as the holotype (1 ♀; USNM).

**Etymology.**—The species epithet, *kaplanae*, is a genitive patronym to recognize the collecting efforts of Ms. Fini Kaplan, who collected the type series of this species and many other specimens of interesting acalyptrate Diptera.

**Remarks.**—The 7th tergite and sternite of the female abdomen are separate. Having a suture between the 7th tergite and the 6th–8th sternites is apparently a plesiomorphic feature. Female specimens from the Australasian Region also have the tergite and sternite of the 7th segment separate.

#### PALEARCTIC REGION

No species of *Cyamops* has been described from this zoogeographic region.

#### *Cyamops* sp. 4

One specimen from Japan (Kyushu Bep-pa, 21 Jun 1952, P. W. Oman; USNM) has the following combination of characters: Face constricted medially; lacking mesofacial setae; pseudovibrissae aligned with peristomal setae; dorsocentral setae 2.

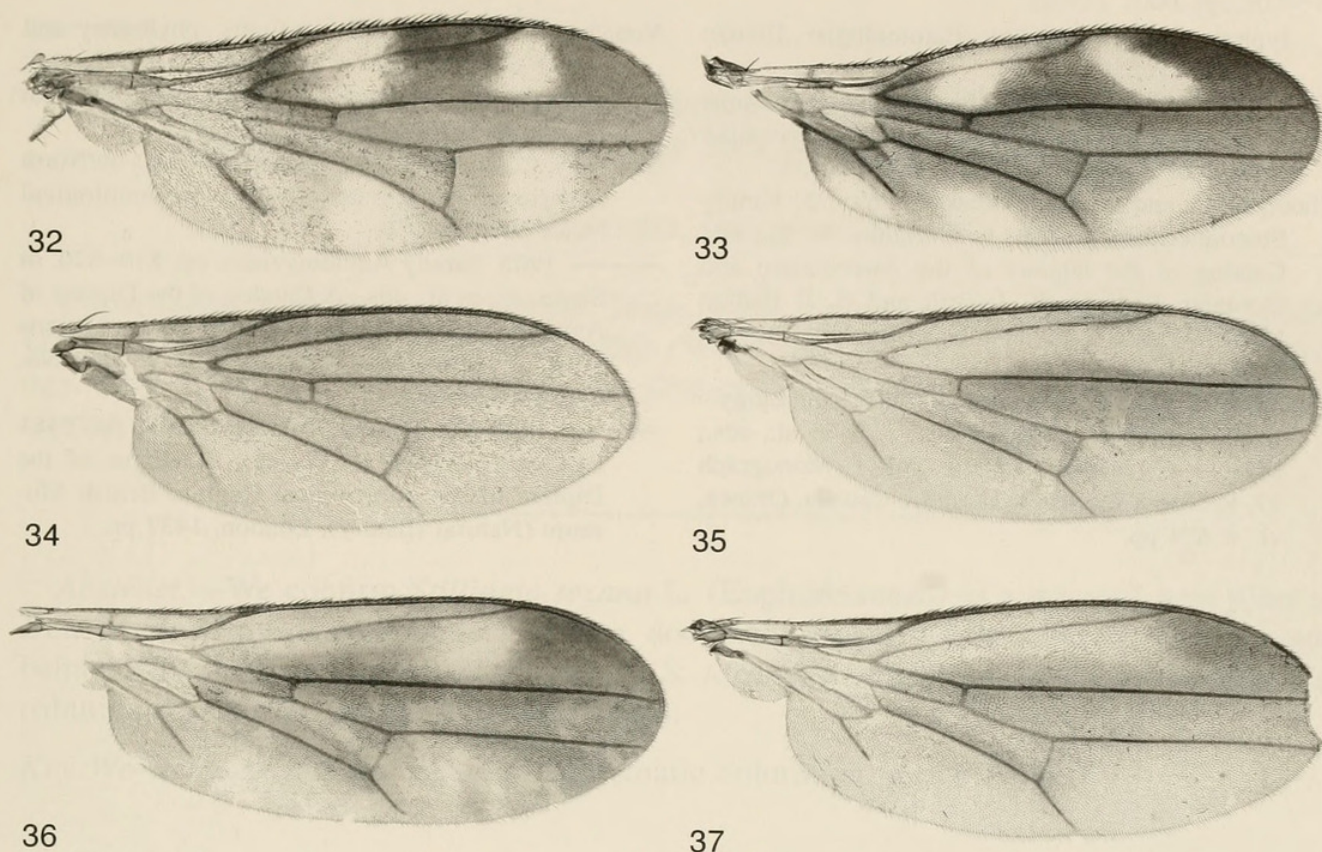
The only available specimen is in poor condition, and we defer describing this species until better preserved specimens become available.

#### PHYLOGENETIC CONSIDERATIONS

At the time of our revision we followed D. McAlpine (1989) and classified *Cyamops* in the family Periscelididae. Roháček (1998) has questioned the placement of *Stenomicra* and *Cyamops* (“Stenomicridae”) with the other Periscelididae as unnatural, based on the “different types of male postabdomen and hypopygium” for each group. Moreover, he tentatively included the anthomyzid genus *Echidnocephalodes* Sabrosky in Periscelididae.

We agree with Roháček that the supporting evidence for the monophyly of Periscelididae is weak and needs further investigation. That both groups have different types of postabdomens, however, does not





Figs. 32–37. Wings. 32, *Cyamops funkae*. 33, *C. nigeriensis*. 34, *C. fiji*. 35, *C. femoratus*. 36, *C. laos*. 37, *C. banvaneue*.

preclude the hypothesis of monophyly. The “naturalness” of a group does not rely wholly on characters of the male terminalia or on any one character suite in particular. Our study of structures of the male terminalia of many Periscelididae reveals that these features are often so highly modified and derived that they obscure hypotheses of primary homology.

The caplike pedicel also occurs in the family Neurochaetidae, and it is possible that Periscelididae and Neurochaetidae are sister groups or one family.

#### ACKNOWLEDGMENTS

This research was partially supported by a PEET grant from the National Science Foundation (PEET 952-1773). We thank Amnon Freidberg, Marion Kotrba, and Stephen D. Gaimari for reviewing a draft of this paper. We are also grateful to the Smithsonian Institution’s Biodiversity of the Guianas Program (publication 26; Vicki A. Funk, Director; Carol Kelloff, Coordi-

nator) for supporting field work in Guyana. To Neal L. Evenhuis (BPBM) who loaned specimens, we express our sincere thanks. George L. Venable expertly produced the plate of wing illustrations. We are also grateful to Amnon Freidberg for the generous donation of specimens that he and Fini Kaplan collected on Madagascar and in Thailand.

#### LITERATURE CITED

- Baptista, A. R. and W. N. Mathis. 1994. A revision of New World *Cyamops* Melander (Diptera, Periscelididae). *Smithsonian Contributions to Zoology* 563: 1–28.
- . 1996. A new species of *Cyamops* Melander (Diptera: Periscelididae) from Brazil, with distributional notes on another species. *Proceedings of the Entomological Society of Washington* 98: 245–248.
- Dallwitz, M. J., T. A. Paine, and E. J. Zurcher. 1993. *User’s Guide to the DELTA System: a General System for Processing Taxonomic Descriptions*. 4th ed., 136 pp.
- Hennig, W. 1969. *Neue Gattungen und Arten der Aca-*



- lypterae. The Canadian Entomologist 101(6): 589-633.
- Khoo, K. C. 1985. The Australian species of *Cyamops* Melander (Diptera: Perisclididae). Australian Journal of Zoology 32(1984) (2): 527-536.
- Khoo, K. C. and C. W. Sabrosky. 1989. 75. Family Stenomicridae, p. 551. In Evenhuis, N. L., ed., Catalog of the Diptera of the Australasian and Oceanian Regions. E. J. Brill and B. P. Bishop Museum special publication, Honolulu, 86: 1-1155 pp.
- McAlpine, J. F. 1981. Morphology and terminology - adults, pp. 9-63. In McAlpine, J. F., et al., eds., Manual of Nearctic Diptera. Vol. 1. Monograph 27, Research Branch Agriculture Canada, Ottawa, vi. + 674 pp.
- Roháček, J. 1998. Taxonomic limits, phylogeny and higher classification of Anthomyzidae (Diptera), with species regard to fossil record. European Journal of Entomology 95: 141-177.
- Sabrosky, C. W. 1958. New species and notes on North American acalyptrate Diptera. Entomological News 69: 169-176.
- . 1965. Family Anthomyzidae, pp. 819-820. In Stone, A., et al., eds., A Catalog of the Diptera of America North of Mexico. United States. Department of Agriculture, Agriculture Handbook No. 276, iv + 1696 pp.
- . 1980. 66. Family Aulacigastridae, pp. 648-649. In Crosskey, R. W., ed., Catalogue of the Diptera of the Afrotropical Region. British Museum (Natural History), London, 1437 pp.





Rung, Alessandra and Mathis, Wayne N. 2000. "Notes on the genus *Cyamops* Melander (Diptera: Periscelididae), including description of ten new species." *Proceedings of the Entomological Society of Washington* 102, 481–506.

**View This Item Online:** <https://www.biodiversitylibrary.org/item/54765>

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/54806>

#### **Holding Institution**

Smithsonian Libraries and Archives

#### **Sponsored by**

Smithsonian

#### **Copyright & Reuse**

Copyright Status: In copyright. Digitized with the permission of the rights holder.

Rights Holder: Entomological Society of Washington

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://biodiversitylibrary.org/permissions>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.