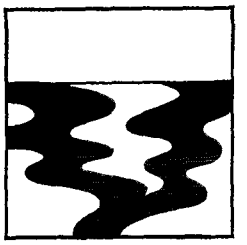

The Leptophlebiidae : Atalophlebiinae of New Caledonia (Ephemeroptera)

Part VI. — Systematics

William L. PETERS (1), Janice G. PETERS (1)
and George F. EDMUNDS, Jr. (2)

ABSTRACT

The sixth in a series on the Leptophlebiidae (Ephemeroptera) of New Caledonia, this paper treats one new genus Tenagophila *and two new species,* T. brinoni *and* T. paitae. *Both are described from reared adults and nymphs.*

KEYWORDS: Ephemeroptera — Taxonomy — New Caledonia — Freshwaters.

RÉSUMÉ

LES LEPTOPHLEBIIDAE : ATALOPHLEBIINAE DE NOUVELLE-CALÉDONIE (ÉPHÉMÉROPTÈRES).
SIXIÈME PARTIE : TAXINOMIE.

Sixième d'une série sur des Leptophlebiidae (Ephemeroptera) de Nouvelle-Calédonie, ce travail traite du genre nouveau Tenagophila, *et deux espèces nouvelles,* T. brinoni *et* T. paitae. *Les deux espèces ont été décrites à partir des stades larvaires et adultes.*

MOTS CLÉS : Ephemeroptera — Taxinomie — Nouvelle-Calédonie — Eaux douces.

INTRODUCTION

This paper is the sixth in a series on the systematics, phylogeny, biogeography and ecology of the Leptophlebiidae of New Caledonia. Part I of this series lists all localities (PETERS *et al.*, 1978). Other works on systematics are PETERS and PETERS (1980, 1981a, 1981b) and PETERS *et al.* (1990). In this paper, body length is measured from the anterior margin of the prothorax to the posterior margin of tergum 10. As always, the phrase "mature nymph" refers to nymphs with developed wing pads. Type material originally deposited at UU has been transferred to FAMU, and type material intended for UU has been incorporated with that of FAMU in this and subsequent papers.

(1) *Center for Studies in Entomology, Florida A&M University, Tallahassee, Florida 32307-4100, USA.*
(2) *Department of Biology, University of Utah, Salt Lake City, Utah 84112, USA.*

In this paper, we describe one genus *Tenagophila*. The genus is distinct from other New Caledonian Leptophlebiidae, and nymphs display some convergence with members of the Ephemerelloidea. Field work for this study was supported by the National Geographic Society, Washington, D.C. Some laboratory research was supported by a research program (FLAX 79009) of the Scientific and Educational Administration/ Cooperative State Research Service, United States Department of Agriculture.

***Tenagophila*, new genus** (Fig. 1-40)

New genus B of Peters. LANDA *et al.*, 1980 : Fig. 10, 45, Tables 1-13.

IMAGO. Length of male : body 4.2-4.6 mm, fore wings 5.2-5.7 mm. Length of female : body 3.6-5.7 mm, fore wings 2.8-7.0 mm. Eyes of male separated on meson of head by a length equal to maximum width of a lateral ocellus, dorsally upper portion circular-shaped, lower portion of eyes 3/4 length of upper portion (Fig. 15-16); eyes of female separated on meson of head by a distance 4 × maximum width of an eye. Pronotum with posterolateral, broad-based, acute projections extended laterally toward anterior margin of anteronotal protuberance of mesonotum. Wings (Fig. 6-8) : maximum width of fore wings 1/3 maximum length; vein Rs of fore wings forked >1/5 to <1/4 distance from base to margin; vein MA forked about 1/2 distance from base to margin, fork symmetrical, distal portion of vein MA a little sagged posteriorly; vein MP_2 attached at base to veins MP_1 and CuA with a cross vein (Fig. 6), attachment of vein MP_2 to MP_1 a little greater than 1/3 of distance from base to margin, base of vein MP_2 about equidistant from veins MP_1 and CuA ; vein ICu_1 attached to veins CuA and CuP with a cross vein, remainder of Cu-A area as in Fig. 6; cross veins few. Costal projection of hind wings rounded, located a little more than 1/2 distance from base, curved over (Fig. 7-8); apex of wings blunt to broadly rounded (Fig. 7-8); cross veins few. Legs : ratios of segments in male fore legs, 0.52-0.57 : 1.00 (2.10-2.24 mm) : 0.04-0.05 : 0.33-0.35 : 0.28-0.33 : 0.19-0.22 : 0.05-0.08. Claws of a pair dissimilar, one apically hooked (Fig. 17), other obtuse, pad-like. Male genitalia (Fig. 9-14) : segment 2 of forceps a little longer than segment 3, segment 2 of forceps 1/7 length of segment 1, apex of segment 3 blunt, forceps strongly bowed, base of forceps broad, its inner margin forms an angular bend near middle of forceps; length of styliger plate along median line 1/2 maximum width, apex of styliger plate shallowly cleft or with irregular margins as in Fig. 9, 11, 14; penes fused except at apex, penes triangular in shape, tubular, lateral margins rolled dorsally (Fig. 9-14). Ninth sternum of female entire apically (Fig. 26); margin of 7th sternum smooth, rounded (Fig. 24-25). Terminal filament a little longer than cerci.

MATURE NYMPH. Head hypognathous. Antennae 1-1/2 to 2 × maximum length of head. Mouthparts (Fig. 31-38) : dorsal hair on labrum as in Fig. 32; anterosubmedian areas of hair ventrally; anteromedian emargination with 5 to 6 truncated denticles (Fig. 31). Clypeus as in Fig. 32. Left mandible as in Fig. 34. Lingua of hypopharynx with small lateral processes, triangular shaped as in Fig. 37; paired, submedian row of long hair on internal dorsal surface, fine hair apically; superlingua as in Fig. 37, with row of hair along anterior margin, lateral margins not well developed. Maxillary palpi reduced as in Fig. 35-36; segment 2 of maxillary palpi a little longer to a little less than 2 × length of segment 1; segment 3 of palpi 3/4 length of segment 2, triangular; a V-shaped ridge near the ventral, inner anterolateral margin of maxillae; hair on maxillae as in Fig. 35. Labium as in Fig. 38; segment 2 of palpi equal to a little longer than length of segment 1; segment 3 of palpi a little less than 2/3 length of segment 2, triangular; paraglossae on same plane as glossae. Short, fine hair over entire body. Well developed, paired submedian protuberances on pronotum, smaller protuberances present or absent on mesonotum and occiput of head (Fig. 39-40). Legs (Fig. 27-29) : maximum width of tibiae a little longer than maximum width of tarsi, tibiae in cross section circular; outer margin of femora indented near apex so tibiae can draw partially into femora (Fig. 27); apex of claws hooked and narrow, denticles on claws progressively larger apically (Fig. 28). Gills (Fig. 30) : gills on segments 2-7 alike; each gill with lamellae deeply forked, slender; main trunk of tracheae along median line of lamellae, main trunk branched at fork of lamellae, no tracheal branches, main trunk pigmented. Posterolateral spines on abdominal segments 8 and 9, those on 9 a little longer. Terminal filament a little longer than cerci.

ETYMOLOGY. tenagos, Gr., meaning shallows; philia, Gr., f., meaning love. Feminine.

TYPE SPECIES. *Tenagophila brinoni*, new species.

DISCUSSION. When slide mounted, the penes of male genitalia are distorted and somewhat folded over. The margins of the styliger plate are variable and the irregular margin (Fig. 9, 11) is not consistent within species. *Tenagophila* can be distinguished from all genera of the Leptophlebiidae by the following combination of characters. In the imagos : (1) the Cu-A area of the fore wings possesses 2 long intercal-

aries (Fig. 6); (2) hind wings are round with a curved over, concave costal projection (Fig. 7-8); (3) length of vein Sc of the hind wings is 3/4 maximum length of hind wings (Fig. 7-8); (4) penes of male genitalia are fused except at apex; penes are triangular-shaped, tubular, and lateral margins are rolled dorsally (Fig. 9-14); and (5) claws of a pair are dissimilar; one is apically hooked while the other is obtuse, pad-like (Fig. 17). In the nymph : (1) outer margin of mandibles is straight (Fig. 34); (2) segment 3 of labial palpi possesses only a few long hairs (Fig. 38); (3) glossae of labium are flat and tapered at apex (Fig. 38); (4) lingua of hypopharynx has small lateral processes (Fig. 37); and (5) abdominal gills occur on segments 2-7; each gill has only one portion of lamellae present; lamellae are deeply forked (Fig. 30).

Tenagophila is most closely related to an undescribed genus of the Leptophlebiidae from New Zealand represented by "*Zephlebia planulata*" Towns (Towns, personal communication). *Tenagophila* can be distinguished from "*Zephlebia planulata*" by the following combination of characters. In the imagos : (1) penes are triangular-shaped and tubular without visible hairs in the apical openings (Fig. 9-14), and (2) hind wings are rounded. In the nymph : (1) lingua and superlinguae of hypopharynx have small lateral processes (Fig. 37); (2) abdominal gills occur on segments 2-7; each gill has only one portion of lamellae present; lamellae are deeply forked (Fig. 30); (3) maxillary palpi are greatly reduced (Fig. 35-36); and (4) inner margin of segment 3 of labial palpi possesses only a few long hairs (Fig. 38). Within New Caledonia, the adult of *Tenagophila* resembles most closely that of *Ounia*. It can be distinguished from *Ounia* by the shape of the penes with lateral margins rolled dorsally (Fig. 8-14), the rounded hind wings (Fig. 7-8), and its smaller size. The nymph is distinct from all other genera in New Caledonia.

The internal anatomy of *Tenagophila* was described by LANDA *et al.* (1980) under the name "New genus B of Peters."

We describe herein 2 species of *Tenagophila*, *T. paitae* and *T. brinoni*. The nymphs are reared and the nymphs, male imagos, and female imagos are known for both species. We have other specimens from throughout New Caledonia that we cannot place to species. Some may represent undescribed species; others are immature nymphs or nymphs in poor condition. Additional localities represented are FNK35, FNK53, FNK57, FNK62, FNK77, FNK85, FNK94, FNK98, FNK105.

KEY TO THE SPECIES OF *TENAGOPHILA*, NEW GENUS

IMAGOS

1. Median, dark brown, V-shaped mark on terga 3-9 or 4-9; terga 6-9 with submedian dark marks (Fig. 18, 20) ..... *T. brinoni*

— No median marks on terga 3-5; terga 6-8 with dark brown pattern (Fig. 22) ..... *T. paitae*

MATURE NYMPHS

1. Tibiae with median dark band (Fig. 1-3); mesothorax light brown, abdominal color pattern as in Fig. 1-3, occipital area of approximately same color as prothorax ... *T. brinoni*

— Tibiae unicolorous, light brown to brown (Fig. 4-5); mesothorax dark brown, abdominal color pattern as in Fig. 4-5; occipital area white, contrasting with darker prothorax ..... *T. paitae*

In addition to the contrasting color patterns described in the keys, the condition of mesothoracic protuberances may help to distinguish the species. Acute mesothoracic protuberances often occur on *T. paitae* (Fig. 40) but not on *T. brinoni* (Fig. 39); however, this character is not consistent in *T. paitae* and is lost as the adult form develops in the last nymphal instar.

***Tenagophila brinoni*, new species** (Fig. 1-3, 6-11, 15-21, 27-39)

MALE IMAGO (in alcohol). Length : body 4.4-4.6 mm; fore wings 5.5-5.7 mm. Upper portion of eyes red-brown, lower portion black. Head brown, carinae darker. Antennae pale. Thorax : mesonotum, prothorax, sterna and pleura of mesothorax light brown to brown, carinae darker, sutures paler; metatergum washed with blackish-brown. Coxae brown, remainder of legs pale, except apex of femora brown, tarsal segments 2-5 and claws of prothoracic legs washed with light brown, tarsi and claws of mesothoracic and metathoracic legs washed with brown. Wings (Fig. 6-8) : longitudinal veins of fore and hind wings brown, veins faded in Cu-A area of fore wings, veins faded in hind wings; cross veins in fore and hind wings hyaline; membrane of fore and hind wings hyaline, except apical 1/3 of cells C and Sc of fore wings translucent white. Abdomen : anterior margin of segments 2-9 with transverse, blackish-brown band, terga 1 and 2 and 6-9 opaque, yellowish-brown, terga 1 and 2 heavily washed with blackish-brown, lateral areas paler; terga 3-5 translucent, pale brown, a median, dark brown, V-shaped mark on each tergum as in Fig. 18, 20; paired, darker

brown, anterosublateral maculae on each tergum; tergum 6-9 with paired, dark brown, anterosubmedian, irregular maculae (Fig. 18-21), maculae faded on terga 8 and 9; sterna 1 and 2 and 6-9 opaque, light brown, sterna 3-5 translucent, pale brown; sterna 1-9 with a darker brown color pattern as in Fig. 19, 21, ganglia brown; spiracles dark brown, tracheae hyaline. Genitalia (Fig. 9-11): brown, apical half of forceps paler. Caudal filaments pale, darker brown annulations at articulations.

FEMALE IMAGO (in alcohol). Length : body 5.7 mm; fore wings 7.0 mm. Eyes brownish-black. Head brown. Antennae pale. Color and marks of thorax as in male imago. Color and marks of legs as in male imago. Wings : longitudinal veins of fore and hind wings brown, veins faded in hind wings, cross veins of fore wings light brown, darker in cells C, Sc and R_1, cross veins of hind wings hyaline, membrane of fore and hind wings as in male imago. Abdomen : color and marks as in male imago, except segments 3-5 opaque, anterior band on each segment darker and more extensive than male imago, submedian lines and V-shaped marks on terga obscured due to darker anterior bands, anterosublateral maculae on terga 3-7 extend to posterolateral corner of each tergum. Caudal filaments pale, darker brown annulations at articulations.

MATURE NYMPH (in alcohol). Head : brown, dorsal area between eyes light brown. Thorax : light brown, carinae darker, sutures paler, tracheae generally darker than mesonotum (Fig. 1). Legs (Fig. 1-3, 27) : coxae brown, remainder of legs pale, except a large, darker brown mark near apex of femora, often with a darker brown, dorsal macula near middle of femora; a wide, median transverse darker brown, dorsal band on tibiae; tarsi and claws darker brown. Abdomen : color and marks as in male and female imagos, except anterosublateral maculae on terga faded, median V-shaped mark on terga faded, sternal color pattern faded. Gills (Fig. 30) : membrane gray; tracheae black, faded at apex of blade of lamellae. Caudal filaments pale, darker brown annulations at articulations.

SPECIMENS. Holotype male imago, No. N42; allotype female imago, No. N42; paratypes : 2 nymphs, No. N37; 82 nymphs, 2 males imagos, 5 males subimagos, 3 females subimagos, No. N42; 1 male imago, 17 nymphs, No. N43; 5 nymphs, No. FNK79; 1 nymph, No. FNK82; 4 nymphs, No. FNK95; 1 nymph, No. FNK121. All types are in alcohol. Association of the nymphs and adults is by rearing. All types are deposited in the following collections : holotype, allotype, 2 males paratypes, 3 males subimaginal paratypes, 1 female subimaginal paratype, and 72 nymphal paratypes at FAMU; 1 female subimaginal paratype, 1 male subimaginal paratype and 8 nymphal paratypes at BPBM and ORSTOM; 10 nymphal paratypes at CTFT and NMNH.

Additional material (FAMU) : 10 nymphs, No. N13; 1 nymph, No. N28; 7 nymphs, No. N35; 1 female subimago, No. N51; 1 male imago, 19 nymphs, No. N54; 1 nymph, No. FNK22; 6 nymphs, No. FNK59; 4 nymphs, No. FNK105.

Other material (at FAMU) appearing to belong to this species is shown in Fig. 3. The color pattern of legs and nymphal body is darker and more extensive than in type material of *T. brinoni*. The single male imago and reared female subimago have color marks on abdominal terga 5-7 a little more extensive than those illustrated in Fig. 18-21. Localities are : 17 nymphs, 1 female subimago, No. N13; 5 nymphs, No. N27; 6 nymphs, No. N53; 1 male imago, 2 nymphs, No. N55; 4 nymphs, No. FNK4; 1 nymph, No. FNK120. Four dark-bodied nymphs are also represented from No. FNK67 and FNK68.

ETYMOLOGY

Species is named for Mr. Marcel Brinon, Station Forestière, Castex.

DISCUSSION. The range of abdominal color is given in Fig. 18-21. The nymphal claw in Fig. 28 is typical, but specimens from N42 frequently have broken denticles (Fig. 29). *Tenagophila brinoni* can be distinguished from *T. paitae* by the following characters. In the imagos : (1) general color of the thorax is brown, (2) mesothoracic and metathoracic tarsi are washed with brown, and (3) a median, dark brown, V-shaped mark occurs on terga 3-5 as in Fig. 18, 20. In the nymph, (1) no acute protuberances occur on the mesonotum (Fig. 39), (2) a large, dark brown, dorsal macula occurs near apex of femora, and (3) a wide, median, transverse, dark brown, dorsal band occurs on tibiae.

BIOLOGY. *Tenagophila brinoni* occurs throughout New Caledonia. Nymphs were found in streams with water temperatures of 15.2 °C-24 °C at 76-122 m elevation. Most nymphs and all adults were collected in streams with water temperatures of about 19 °C.

Nymphs were found among submerged tree roots along the stream bank in fast to standing water. Nymphs emerged in early morning and subimagos molted to imagos at about 2200. No swarming was observed.

***Tenagophila paitae*, new species** (Fig. 4-5, 12-14, 22-26, 40)

MALE IMAGO (in alcohol). Length : body 4.2 mm; fore wings 5.2 mm. Upper portion of eyes red-brown,

lower portion black. Head dark brown, dorsal area between eyes paler. Antennae pale. Thorax : mesonotum brown to dark brown; prothorax, metathorax, sterna and pleura of mesothorax dark brown, washed with blackish-brown, carinae darker, sutures paler. Coxae dark brown, trochanters, femora and tibiae of all legs pale, except femora very lightly washed with light brown, apex of femora dark brown; tarsal segments brown basally fading to pale apically on meso- and metathoracic legs, apical tarsal segment brown; color faded on prothoracic tarsi; claws brown, prothoracic claws light brown. Wings : veins of fore and hind wings brown, veins faded in Cu-A area of fore wings, veins faded in hind wings; cross veins in fore and hind wings hyaline; membrane of fore and hind wings hyaline, except apical 1/3 of cells C and Sc of fore wings translucent white. Abdomen : anterior margin of segments 2-9 edged in dark brown, overlap between consecutive segments appearing darker; terga 1-2 and 6-9 opaque, heavily washed with dark brown, anterolateral areas and median line of terga 1-2 paler, submedian, darker brown, longitudinal lines as in Fig. 22; terga 6-9 with submedian paired darker brown longitudinal lines as in Fig. 22; terga 3-5 translucent, pale brown, with darker anterosublateral maculae on each tergum as in Fig. 23; sterna 1 and 2 and 6-9 opaque, heavily washed with dark brown, sterna 3-5 translucent, light brown, sterna 1-9 with a darker brown color pattern as in Fig. 23, ganglia dark brown; spiracles dark brown (more apparent on terga 3-5), tracheae hyaline. Genitalia (Fig. 12-14) : dark brown, apical half of forceps paler. Caudal filaments pale, narrow dark brown annulations at articulations.

FEMALE IMAGO (in alcohol). Length : body 3.6 mm; fore wings 4.8 mm. Eyes black. Head dark brown. Antennae pale. Color and marks of thorax as in male imago, a little darker in intensity of color. Legs as in male imago except markings darker. Wings : longitudinal veins of fore and hind wings brown, veins faded in hind wings, cross veins of fore wings light brown, darker in cells C, Sc and R_1, cross veins of hind wings hyaline, membrane of fore and hind wings as in male imago. Abdomen (Fig. 24) : color and marks as in male imago, base color of terga yellowish-brown, marks generally darker than in male imago, anterior border of abdominal segments broader, anterosublateral maculae on terga 3-5 larger, fused by a thin anterior line. Caudal filaments as in male imago.

MATURE NYMPH (in alcohol). Head : dark brown, dorsal area between eyes paler, almost white. Thorax : dark brown, carinae darker, sutures paler; paired, submedian protuberances on mesonotum often present. Legs : coxae darker brown, remainder of legs pale, except apex of femora dark brown, tibiae and tarsi sometimes pale brown. Abdomen : color and marks as in male and female imagos (Fig. 4-5). Gills : membrane gray; tracheae black, faded along blade of lamellae. Caudal filaments light brown.

SPECIMENS. Holotype male imago, No. N35; allotype female imago, No. N35; paratypes : 4 nymphs, No. N15; 22 nymphs, 1 male imago, No. N35; 13 nymphs, 1 male imago, 1 female imago, 2 females subimagos, No. N54. All types are in alcohol. Association of the nymph and adults is by rearing. All types are deposited in the following collections : holotype, allotype, 15 nymphal paratypes, 2 males paratypes, 1 female paratype and 2 females subimaginal paratypes at FAMU; 5 nymphal paratypes at BPBM, ORSTOM, CTFT, and NMNH.

Additional material (FAMU) : Other material was collected from localities No. N21 (1 nymph), No. N37 (10 nymphs), No. N42 (male subimago reared, 23 nymphs), No. N53 (11 nymphs), No. FNK79 (1 nymph), and No. FNK37 (1 nymph). The dark brown color of terga 6-10 may be posteriorly faded beginning on tergum 7 or 8 (Fig. 5). The lighter pattern of the terga approaches that of *T. brinoni*, but nymphs can be distinguished from *T. brinoni* by characters given below.

ETYMOLOGY. Species is named for Païta, a city near the type locality.

DISCUSSION. *Tenagophila paitae* can be distinguished from *T. brinoni* by the following characters. In the imagos : (1) general color of the thorax is dark brown, (2) abdominal terga 6-10 are heavily washed with dark brown (Fig. 22), and (3) no median marks occur on abdominal terga 3-5 (Fig. 22). In the nymph, (1) tibiae are unicolorous, pale brown to light brown; (2) the occipital area is white in marked contrast to the darker brown of the thorax; (3) color pattern of body is as shown in Fig. 4-5; and (4) acute protuberances may be present on the mesonotum (Fig. 40).

BIOLOGY. Nymphs of type material of *T. paitae* were collected in a tributary of the Rivière Karionan between 10 September and 14 November; water temperatures were 18.3 °C to 20.5 °C. Nymphs were found among partially submerged vegetation along the stream banks in slow or standing water and emerged to subimagos in early morning. A few subimagos were collected at light trap; swarming was not observed.

Manuscrit accepté par le Comité de rédaction le 29 juillet 1995

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APPENDIX

Illustrations were prepared from the following localities : Fig. 1 (N43), Fig. 3 (N13), Fig. 5 (N37), Fig. 12-13, 22-23 (N54); all other figures of *T. paitae* (N35), of *T. brinoni* (N42).

APPENDIX

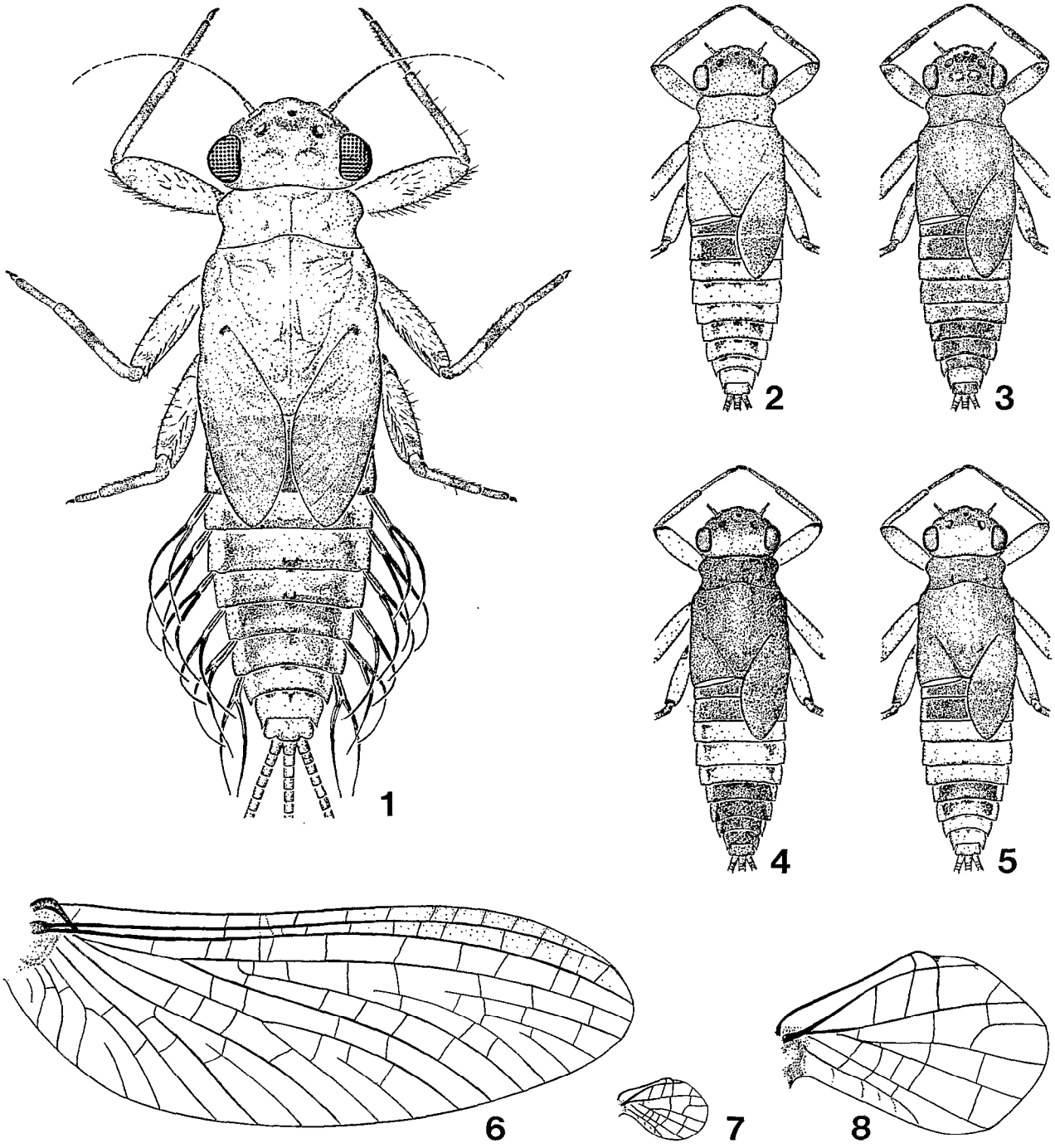

FIG. 1. — *Tenagophila brinoni*, mature female nymph. FIG. 2-5, body and forelegs of *Tenagophila* female nymphs : 2, *T. brinoni*; 3, *T. brinoni*? (dark form); 4-5, *T. paitae*. FIG. 6-8, *T. brinoni*, wings of male imago (6, fore wing; 7, hind wing; 8, hind wing enlarged).

FIG. 1. — Tenagophila brinoni, *nymphe femelle mature. FIG. 2-5, corps et pattes antérieures de nymphes femelles du genre* Tenagophila *: 2,* T. brinoni ; *3.* T. brinoni ? *(forme sombre); 4-5,* T. Paitae. *FIG. 6-8, ailes de* T. brinoni *adulte (6, aile antérieure; 7, aile postérieure; 8, agrandissement de l'aile postérieure).*

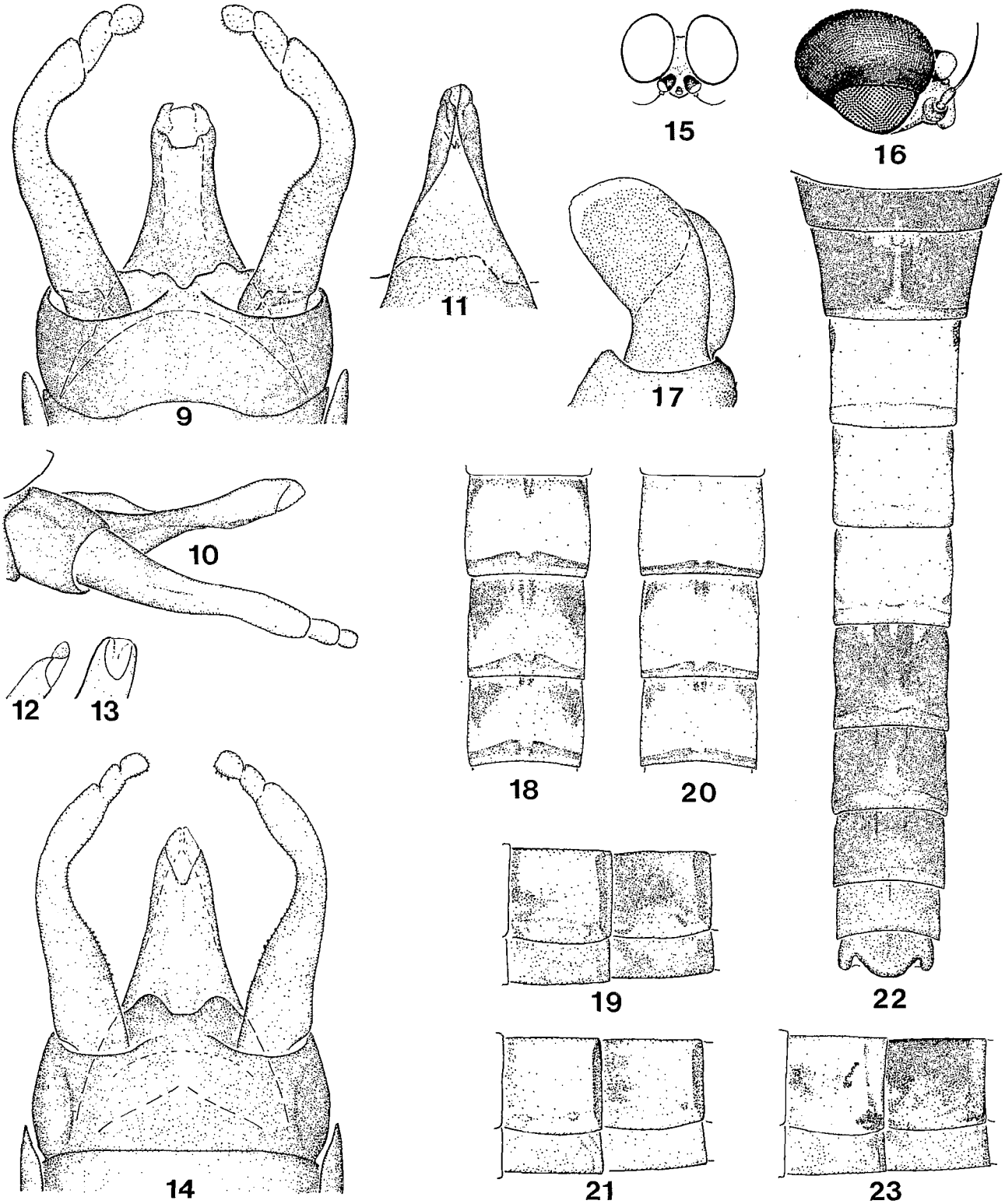

FIG. 9-23. — *Tenagophila* male imago : 9-11, 15-21, *T. brinoni*; 12-14, 22-23, *T. paitae*. FIG. 9-14, genitalia (9,14, ventral; 10, lateral; 11, dorsal view of penes; 12-13, subdistal views of apex of penes drawn from free-floating specimen). FIG. 15-16, eyes (15, dorsal; 16, lateral). FIG. 18-23, abdominal segments (19, 21, 23, lateral view of segments 5-6; 18, 20, terga 5-7; 22, terga 1-10). Tenagophila *adulte male : 9-11, 15-21,* T. brinoni; *12-14, 22-23,* T. paitae. *FIG. 9-14, genitalia (9, 14, vue ventrale; 10, latérale; 11, vue dorsale du gonostylus; 12-13, vues subterminales de l'apex du gonostyle d'un specimen d'eau libre). FIG. 15-16, yeux (15, vue dorsale; 16, latérale). FIG. 18-23, segments abdominaux (19, 21, 23, vue latérale des segments 5-6; 18, 20, tergites 5-7; 22, tergites 1-10).*

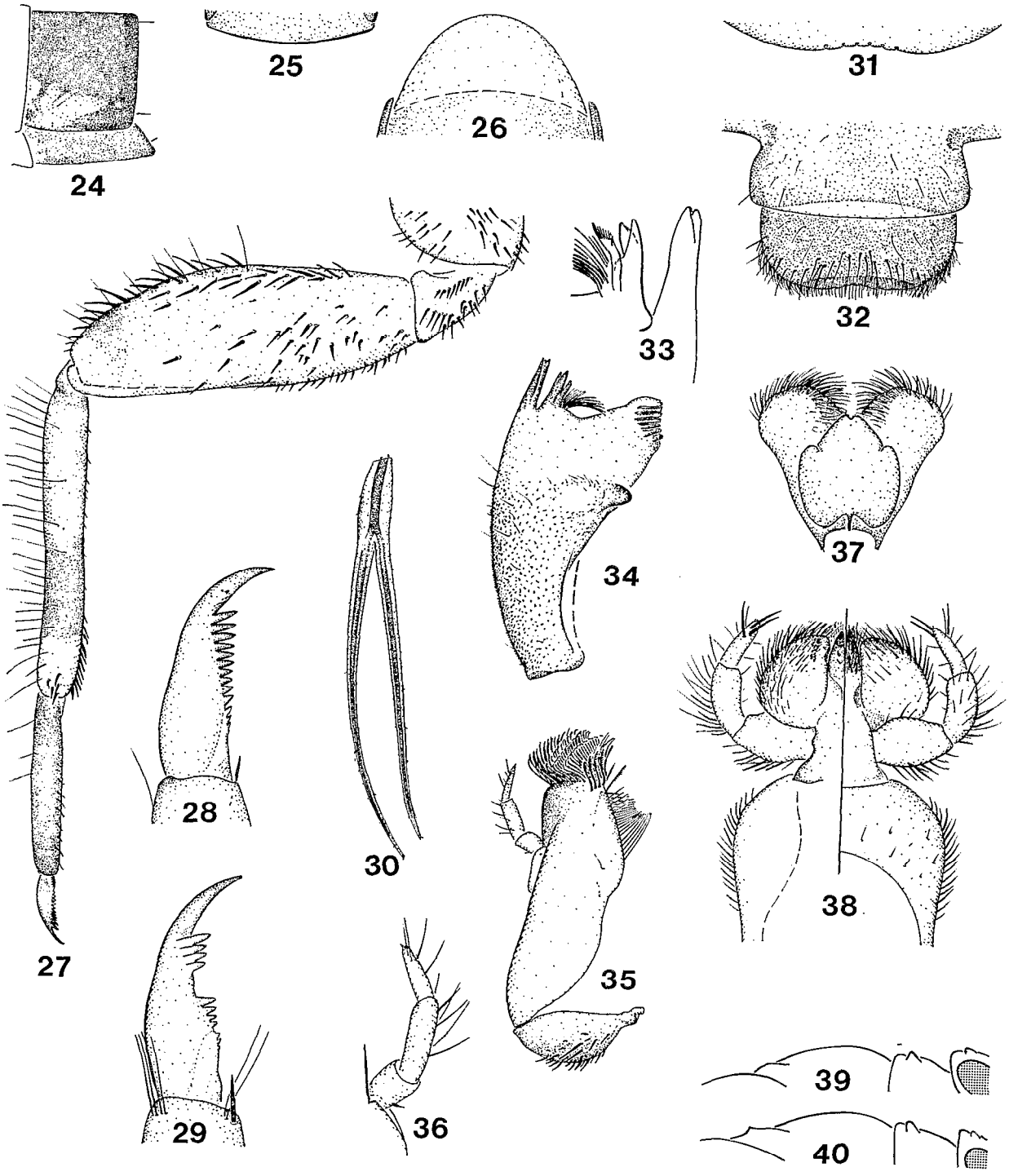

FIG. 24-26. — *Tenagophila paitae* female imago : 24, lateral view of abdominal segment 7; 25, posterior margin of sternum 7; 26, sternum 9.

Tenagophila paitae, *adulte femelle : 24, vue latérale du segment abdominal 7; 25, bord postérieur du sternum 7; 26, sternum 9.*

FIG. 27-40. — *Tenagophila* mature nymph : 27-39, *T. brinoni*; 40, *T. paitae*. FIG. 27, fore leg. FIG. 28-29, fore claw. FIG. 30, abdominal gill 4. FIG. 31-38, mouthparts (31, anterior margin of labrum enlarged; 32, clypeus and labrum; 33, detail of right incisors of mandible and prosthecal base; 34, left mandible; 35-36, right maxilla, ventral view, with dorsal detail of palp; 37, hypopharynx; 38, labium drawn with venter on right, dorsum on left). FIG. 39-40, lateral outline of pro- and mesothorax.

Tenagophila, *nymphe mature : 27-39*, T. brinoni; *40*, T. paitae. *FIG. 27, patte antérieure. FIG. 28-29, griffe antérieure. FIG. 30, branchie abdominale 4. FIG. 31-38, parties buccales (31, agrandissement de la bordure antérieure du labre; 32, clypeus et labre; 33, détails de la mandibule droite; 34, mandibule gauche; 35-36, vue ventrale du maxillaire droit, détail dorsal du palpe; 37, hypopharynx; 38, partie ventrale du labrium à droite et dorsale à gauche). FIG. 39-40, contour du pro- et du mésothorax.*