PAN-PACIFIC ENTOMOLOGIST
75(2): 61–67, (1999)

CAENIS CHAMIE, A NEW SPECIES FROM COLOMBIA (EPHEMEROPTERA: CAENIDAE)

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Abstract.—The alate stages, nymph and egg of *Caenis chamie* (Ephemeroptera: Caenidae), NEW SPECIES, are described and illustrated on the basis of reared material from Colombia. A discussion of its relationships with other South American species of *Caenis* is included.

KeyWords.—Insecta, Ephemeroptera, Caenidae, winged stages, nymph, egg, *Caenis chamie*, South America, Colombia.

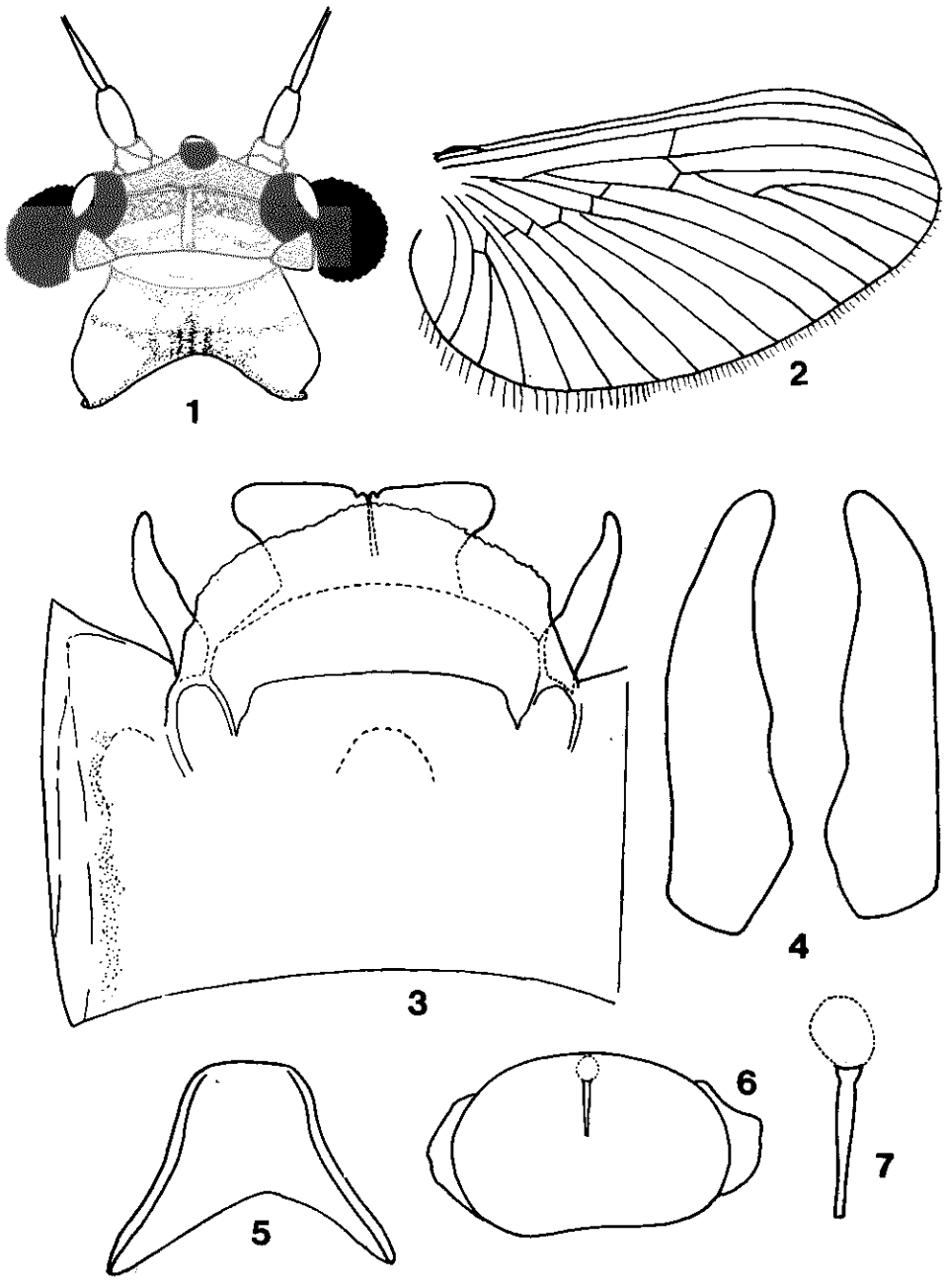
The family Caenidae (Ephemeroptera) in South America is poorly known, with 25 recorded species in four genera (*Brachycercus* Curtis 1834; *Brasilocaenis* Puthz 1975, *Caenis* Stephens 1835 and *Cercobrachys* Soldán 1986). The genus *Caenis* is the most diverse with 17 species (Navás 1915, 1929a, 1920b, 1922, 1930; Froehlich 1969; Malzacher 1986, 1990; Pereira & Da Silva 1990; Da Silva 1993): 4 species are known from Argentina (*C. albata* Navás, *C. argentina* Navás, *C. ludicra* Navás and *C. nemoralis* Navás), 8 from Brazil (*C. candelata* Malzacher, *C. cigana* Pereira & Da Silva, 1990; *C. cuniana* Froehlich, *C. fittkaui* Malzacher, *C. pfulgfelderi* Malzacher, *C. quatipuruica* Malzacher, *C. reissi* Malzacher, and *C. sigillata* Malzacher), 2 from Chile (*C. axillata* Navás and *C. nigella* Navás), and 2 from Paraguay (*C. burmeisteri* Malzacher and *C. pseudamica* Malzacher). Berthélemy (1965) reported material from Chile, deposited in the Museum of Natural History in Paris, labelled by Navás as type of *C. chilensis*. However, *C. chilensis* is a manuscript name and is therefore a *nomen nudum*.

During a general study of mayflies of southeast Colombia (Mosquera 1995), specimens of an undescribed species of *Caenis* were collected. Based on laboratory reared material herein describe all stages of the new species.

The types of the new species are deposited in the following intitutions: Museo de Entomología, Universidad del Valle, Cali, Colombia (MEUV) and the senior author's collection in the Departmento de Biología Animal y Ecología (Zoología), Universidad de Granada, Spain (JAC).

CAENIS CHAMIE ALBA-TERCEDOR & MOSQUERA, NEW SPECIES

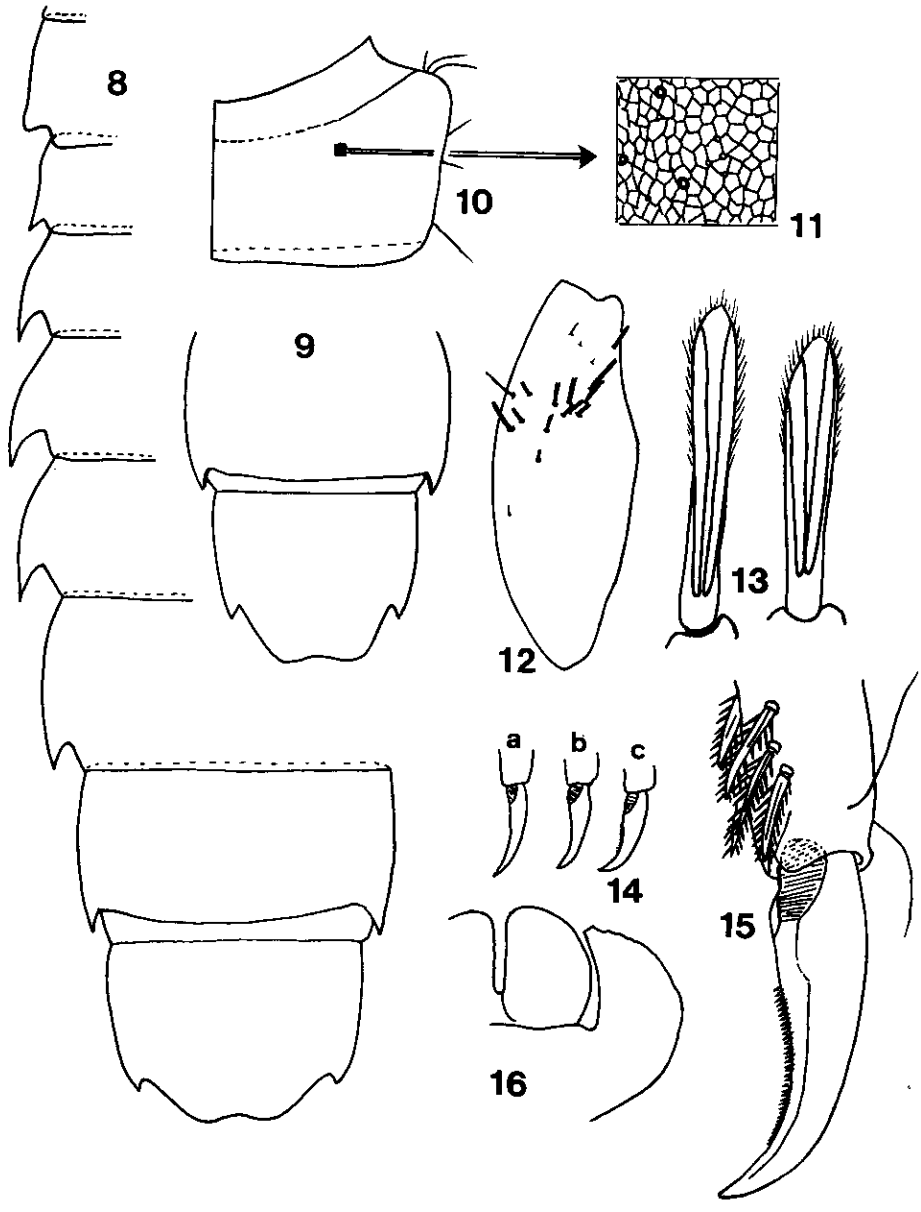
Types.—Holotype, male imago (genitalia and left wing on slide # 300); data: COLOMBIA. *VALLE DEL CAUCA*: Acueducto de Pavas, 1200 m. a.s.l., 76°33′ W, 3°40′ N, September 1994. S. Mosquera leg.; deposited MEUV. Paratypes: 1 male imago (genitalia mounted for SEM), 4 male subimagos, 5 females, 5 nymphs, 5 exuviae skins (one on slide no. 301) and eggs on slide no. 302, all from the same locality and date as the holotype; deposited in MEUV (except slides 301 and 302 deposited in JAC).



Figs. 1–7. Male imago (1–5): head and pronotum (1); wing (2); genitalia (3); forceps (4); and prosternum (5). Egg ×400 (6) and detail of micropyle, in light microscope ×1000 (7).

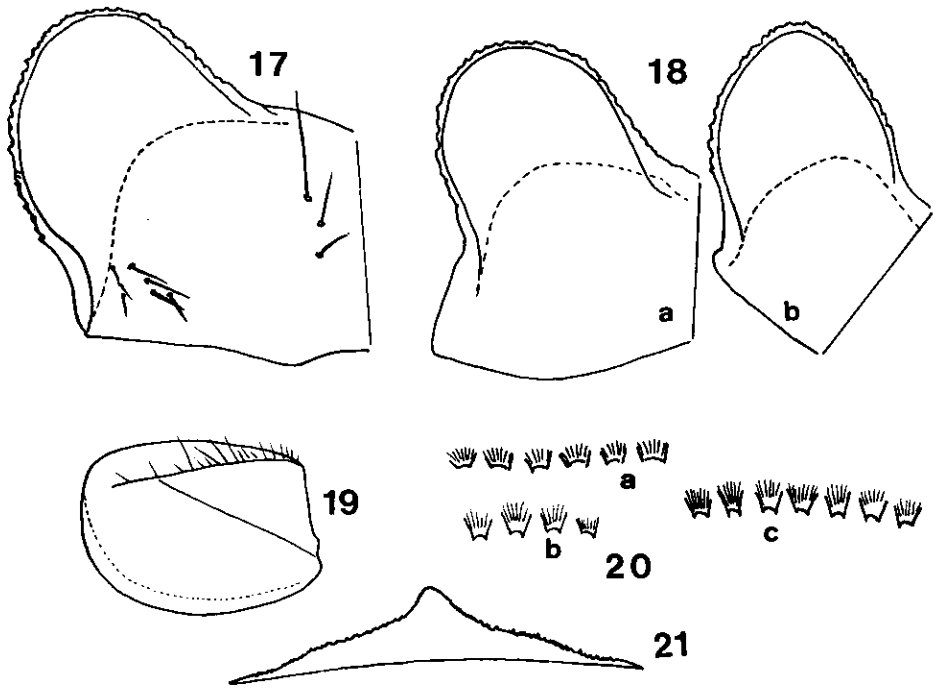
Etymology.—The new species is named after the "chamies" an ethnic group that in the past inhabited the Cauca Valley.

Male imago. (in alcohol).—Length body: 2.9–3.7 mm, wings: 2.3–2.9 mm. *Head*: (Fig. 1): middle longitudinal white line from occiput to frontal suture; dark band between lateral ocelli; antennae



Figs. 8–15. *Caenis chamie* sp.n. nymph: ventral view of female (8) and male abdominal sternites (9); pronotum (10) and detail of the surface ornamentation ×400 (11); fore femur (12) and bristles in the row on the distal third (13); claws (14) (a: anterior, b: middle, c: posterior); details of distal part of posterior tibia and claw (15); labial glossa and paraglossa (16).

yellow-white, pedicel length approximately twice that of scape; flagellum basally slightly enlarged; yellow, progressively paler apically. *Thorax*: light brown pattern of pronotum as in Fig. 1; prosternum shaped as in Fig. 5; meso- and metanotum yellow with dark sutures; wings hyaline, costal, subcostal cells and veins C, Sc and R_1 shaded with light purple-grey; forefemora brown, with dark longitudinal margins; tibiae and tarsi white; femur:tibia ratio = 0.54–0.61, fore tarsal formula $1<5<4\simeq3<2$. *Abdomen*: no projection on second abdominal tergum; posterior 2/3 of each tergum with grey-brown



Figs. 17–20. *Caenis chamie* sp.n. nymph: lamellar apophysis of middle (17) and hind coxae (18: a and b correspond to the right and left side); 2nd gill (19); submarginal row of scales on 2nd gill ×400 (20) (a: distal zone, b: middle zone, c: distal zone); dorsal projection on the 2nd abdominal tergite (21).

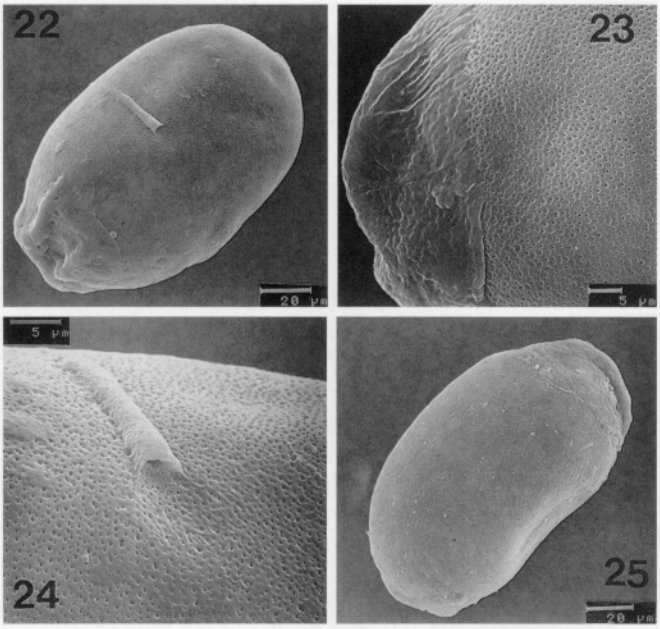
pigmentation, terga 1–2 pigmented only in distal third; longitudinal black stripe ventrally at junction of sterna and pleura. *Genitalia* (Figs. 3–4, 27–29): Penes anvil shaped, distal margin straight, with rounded and well-developed lateral lobes, and with central longitudinal incision (Fig. 3). Forceps (Fig. 4) with blunt tips, densely covered with short setae (Figs. 28 and 29). Anterior apophysis of the transversal sclerite of styliger (after Malzacher 1991) pointed (Fig. 3).

Subimago male. (in alcohol).—Similar to male in color and pattern except obscured by subimaginal cuticle.

Female. (in alcohol).—Length body: 3.5–3.7 mm, wings: 3.6–3.8 mm.; general color yellow-brown with pattern similar to that of male.

Egg.—(Figs. 6–7, and 22–26). Length: 159.5–176.2 μm. ($\bar{x}$ = 166, n = 20); width: 83.3–100 μm ($\bar{x}$ = 92.5, n = 20). Egg bean shaped (Figs. 6 and 25). Two epithema (polar caps) present. Micropyle long, with opening preceded by depression. Chorionic surface with small pores.

Nymph. (in alcohol).—Length body: 3.0–3.5 mm. (male), 4.3–5.3 (female). *Head*: transverse dark band between eyes; pedicel length twice that is scape, 4–7 bifid setae ½ pedicel length; segment 3 of maxillary palpi subequal in length segment 2, or slightly longer; glossae broad, longer than paraglossae (Fig. 16). *Thorax*: Pronotum as in Fig. 10, dorsal surface with reticulate ornamentation (Fig. 11) (similar ornamentation on vertex and metanotum); forefemora with irregular row of long bifid bristles (Fig. 12); bristles distally pinnate (Fig. 13); lateral flanges of coxae as in Figs. 17 and 18; claws of fore and middle legs long and slender, without denticles (Fig. 14a, 14b); hind claws more curved with row of small denticles (Figs. 14c and 15); distal inner margin of hind tarsi with two rows of strong and pinnate bristles (Fig. 15), bristles absent on forelegs, sparse and arranged in one row on middle legs. *Abdomen*: dorsal projection on tergum 2 as in Fig. 21; postero lateral projections of abdominal segments as in Fig. 8; abdominal sternite 9 slightly emarginate, sexually dimorphic (compare Figs. 8 and 9); lateral margins of terga 4–8 with long setae; posterior margins of terga 7–8 with long setae;



Figs. 22–25. SEM of the egg of *Caenis chamie* sp.n.: general view of egg (22, 25); polar cap edge (23); micropyle showing the oval chorionic zone before the opening (24).

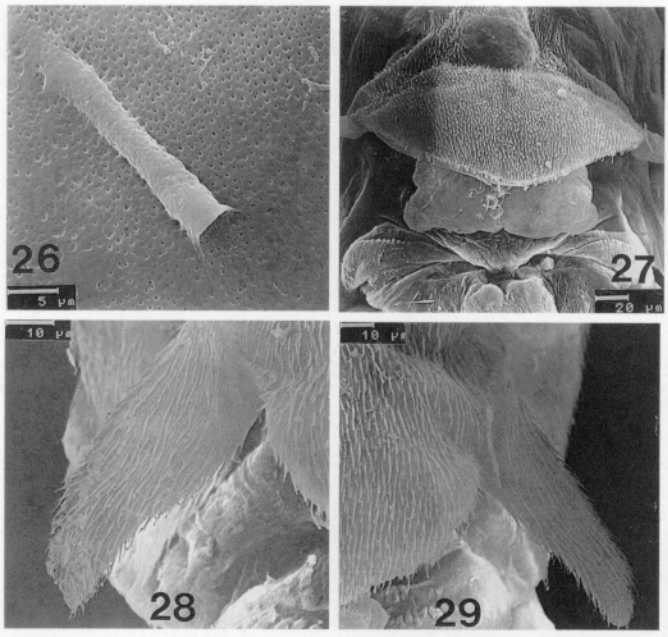
posterior margin of tergum 9 without setae but with small, somewhat rounded, denticles. Gill 2 as in Fig. 19, with setae only on mesal fork of triangular ridge; submaginal row of scales simple (Fig. 20).

Discussion.—There is some variability in the shape of the male genitaliaforceps. Thus, in one specimen the left forceps appear as normal (Fig. 29), but the right forceps is broader (Fig. 28).

Of the 17 named species of *Caenis* from South America, seven were identified and inadequately described by Navás. Material of four species (*C. argentina, C. axillata, C. ludicra* and *C. nemoralis*) are deposited in Argentina (Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires, and Museo de la Plata) (Dominguez 1989), and Spain (Museo de Zoología de Barcelona) (Alba-Tercedor & Peters 1985). Recently, the senior author has examined the material deposited in Spain. The only existing specimen of *C. axillata* is extremely damaged, lacking the wings, legs, and most of the abdomen, and thus is impossible to redescribe. Malzacher (*in litt*.—29.06.1997) has been studying the type material of *C. argentina* and *C. ludicra* and he is preparing a redescription of them.

Malzacher (1986) divided the South American species of *Caenis* into two groups: the *C. fittkaui*—group (with long sclerotised and pointed forceps) and the *C. reissi*—group (with short, apically rounded forceps). The new species belongs to the *C. reissi*—group. This group includes other 7 known species (*C. argentina, C. cigana, C. ludicra, C. pfulgfelderi, C. quatipurunica, C. reissi* and *C. sigillata*).

Diagnosis.—The winged stage of *C. chamie* sp.n. can be distinguished from *C. argentina* because in *C. argentina* the area between the subcosta and radius veins is conspicuously shaded dark brown, as was drawn by Navás (1915: fig. 4). *Caenis chamie* is close to *C. pflugfelderi*; however it can easily be distin-



Figs. 26–29. SEM of *Caenis chamie* sp.n.: micropylar rib (26); male genitalia (27) (note that penes were somewhat retracted after the deshydration process); detail and variability of forceps in a single specimen (28, 29).

guished by the straight hind margin of penes, pointed and not inwardly curved apophysis of the styliger sclerite, and broader prosternite. The chorionic surface of egg has pores (similar to *C. reissi*, compare Figs. 23, 24 and 25 with Malzacher 1986: figs. 3 and 4) but not honeycombed as in *C. pflugfelderi*. The nymph is similar to that of *C. pflugfelderi*. Both species share middle and hind claws without denticles, but the new species can be easily distinguished by the emargination of the hind margin of sternum 9.

Acknowledgment

We are indebted to: Peter Malzacher from Ludwigsburg (Germany) for confirmating the new species, useful comments and additional data on Navás's species; William and Janice Peters from Florida A&M University, Tallahassee, Florida (U.S.A.) for their valuable suggestions advise, comments, and editorial work; Eduardo Dominguez from Tucumán (Argentina) and Mike Hubbard from Tallahassee (U.S.A.) for bibliographic help. Support to the senior author to travel to Colombia (Centro de Investigación y Control de Contaminantes Ambientales de la Universidad del Valle, Cali) was provided by the Institute of Environmental Engineering-Bioengineering (Laussane, Switzerland). Page charges partially offset by a grant from the C. P. Alexander fund.

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Received 16 Oct 1997; Accepted 7 Dec 1998.