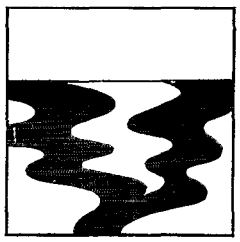


Cheleocloeon, *a new genus of Baetidae (Ephemeroptera) from West Africa*

Jean WUILLOT (1) and M. T. GILLIES (2)

ABSTRACT

A description is given of the adult and nymph of Cheleocloeon *a new genus of mayflies (Baetidae) from Guinea. The genus is regarded as a sister group of the South African mayfly,* Demoulinia. *Two species are known, both of them found in the slack water on the edge of forested streams.*

KEYWORDS : Mayflies — Descriptions — New species — Adults — Nymphs — Taxonomy.

RÉSUMÉ

CHELEOCLOEON, UN GENRE NOUVEAU DE BAETIDAE (EPH.) POUR L'AFRIQUE DE L'OUEST

L'adulte et la larve d'un nouveau genre d'éphémère (Baetidae) sont décrits. Ce genre est un groupe-frère de l'éphémère sud-africaine, Demoulinia. *Deux espèces sont connues, provenant toutes deux de Guinée. Elles se rencontrent dans les zones de courant calme, près des rives des ruisseaux forestiers.*

MOTS CLÉS : Éphémères — Description — Taxonomie — Espèce nouvelle — Adulte — Larve.

INTRODUCTION

In discussing the origins of the Afrotropical Baetidae, GILLIES (1990) pointed out that the fauna was dominated by genera with, in the adult, single marginal intercalaries in the fore wing and, in the nymph, a tuft of setae on the right mandible at the base of the prostheca. Yet another new genus of this group has recently come to light in the course of a study of the baetid fauna of rivers in the forest belt in Guinea. The adults of two closely related species were obtained by rearing. Unlike the adults, the nymphs are highly distinctive. They are described here as members of the new genus *Cheleocloeon*. Types of the new species are deposited in the Muséum national d'histoire naturelle de Paris.

DESCRIPTION

Cheleocloeon gen. nov.

Adult : Small species. Fore wing with single marginal intercalaries; hind wing absent. ♂ forceps with 3 segments, terminal segment elongated.

Nymph : Both mandibles with setal tuft at base of prosthecae. Labial palp with apical medial process of second segment unusually and strongly produced and pointed; base of glossa not expanded at base,

(1) *Orstom, Muséum national d'histoire naturelle, 43 rue Cuvier, 75231 Paris, France.*
(2) *Whilfeld, Hamsey, Lewes, Sussex BN8 5TD, England.*

about equal in width to paraglossa. Maxillary palp with 2 segments, long, extending well beyond galea lacinia. Legs fine, tarsal claws long with minute teeth at base. Gills present on 7 segments, lamella I paddle-shaped, longer than all other gills. Cerci and terminal filament about equal in length.

Type species : C. yolandae Wuillot.

Etymology : From *chele*, latin, the claw of a scorpion or similar animal, in reference to the pincher-like appearance of the labial palps.

Cheleocloeon yolandae sp. nov., Wuillot

♂ *imago :* Turbinate eyes pale brown. Legs cream, fore leg with tibia 1.5-1.75 times as long as femur, fore tarsus as long as or longer than tibia. Fore wing hyaline (fig. 1), some specimens with a milky wash in the distal part of costal and subcostal areas; stigma with 3-7 crossveins. Hind wing absent. Abdominal terga uniformly brown to fawn, without characteristic markings. Forceps with 3 segments (fig. 2), the basal segment stout and partially fused with second segment, apical segment elongate.

♂ wing 3-4 mm; body (without cerci) 3-4 mm.

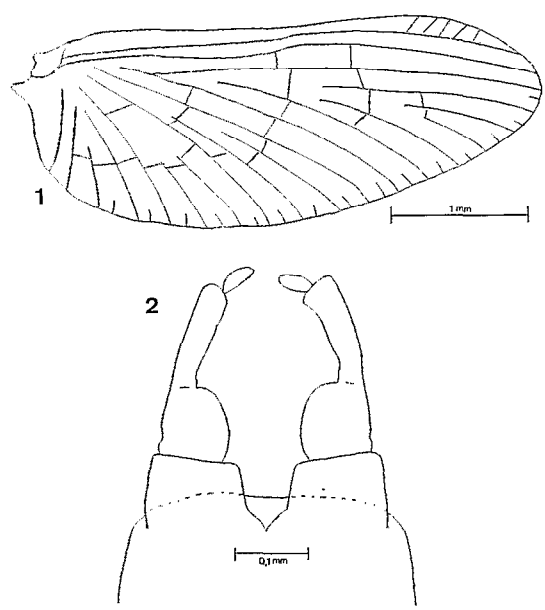


FIG. 1-2. — *Cheleocloeon yolandae* sp. nov. ♂ imago.
1 : fore wing. 2 : forceps.
Cheleocloeon yolandae *sp. nov. ♂ imago. 1 : aile I. 2 : genitalia.*

Nymph : Mouthparts (figs. 3-7) : dorsal surface of labrum with a line of short hairs internal to antero-lateral margin; canines of right mandible partially fused, prostheca with 3-4 subequal teeth at apex; on left, canines fused, prostheca scraper-like, with about 6 terminal teeth; apical medial process of second segment of labial palp marked off from the rest of the segment by a linear thickening of the integument. Margins of femora sparsely ornamented with spine-like setae (fig. 8). In mature nymph the main veins in the wing-bud are conspicuously pigmented. Abdominal terga extensively marked, the pigment most heavily developed on I, III, VI and IX (fig. 10). Gill lamellae on segments II-VII subequal, ovate; lamella I 1.5 times as long as rest of gills, broadly paddle-shaped in distal half (fig. 9). Terminal filament subequal to cerci, feathered to apex.

Material : Guinea : holotype ♂ imago with associated nymph skin on slide, R. Niandam, Sassambaya, 02.89; paratypes, same provenance, 3 ♂♂, 02.88, 02.92, 21 nymphs 03.88, 02.92; 1 ♀ subimago with nymph skin fragments on slide, R. Diani, near Nzebela, 31.01.88; 4 nymphs, same provenance. Mali : R. Bakoye, Kokofata, 01.92.

Cheleocloeon carinatum sp. nov., Wuillot

♂ *imago :* Turbinate eyes cream. Legs cream, fore tibia 1.5-1.75 times as long as femur. Fore wing hyaline (fig. 11), marginal intercalaries incomplete in basal interspaces; stigma with 2 crossveins. Hind-wing absent. Abdominal terga uniformly brown to fawn, without characteristic markings. ♂ forceps (not figured) with 3 segments, the distal segment elongated.

♂ wing, 3-4 mm; body 3-4 mm.

Nymph : Mouthparts (figs. 12-16) : Labrum dorsally with marginal setae only; canines of both mandibles fused, right prostheca with a single tooth below sharply pointed apex, setal tuft at base of prosthecae present on both sides; maxillary palp with 2 segments, much longer than galea-lacinia; apical medial process of labial palp strongly produced and drawn out to a fine point. Legs fine (fig. 17), tarsal claws minutely toothed towards base. Gill lamellae (fig. 18) present on segments I-VII, that on I slightly longer than the rest, paddle-shaped in the outer one-third. Abdominal terga with blunt, median spurs on segments I to VI or VII (fig. 20); markings (fig. 19) maximal on terga III, VI and IX. Terminal filament subequal to cerci, feathered.

Material : Guinea : ♂ imago (damaged), R. Niandam, Sassambaya, 02.89; holotype nymph, same provenance, 03.88; 1 nymph, 02.87, 2 nymphs, 03.88, same provenance.

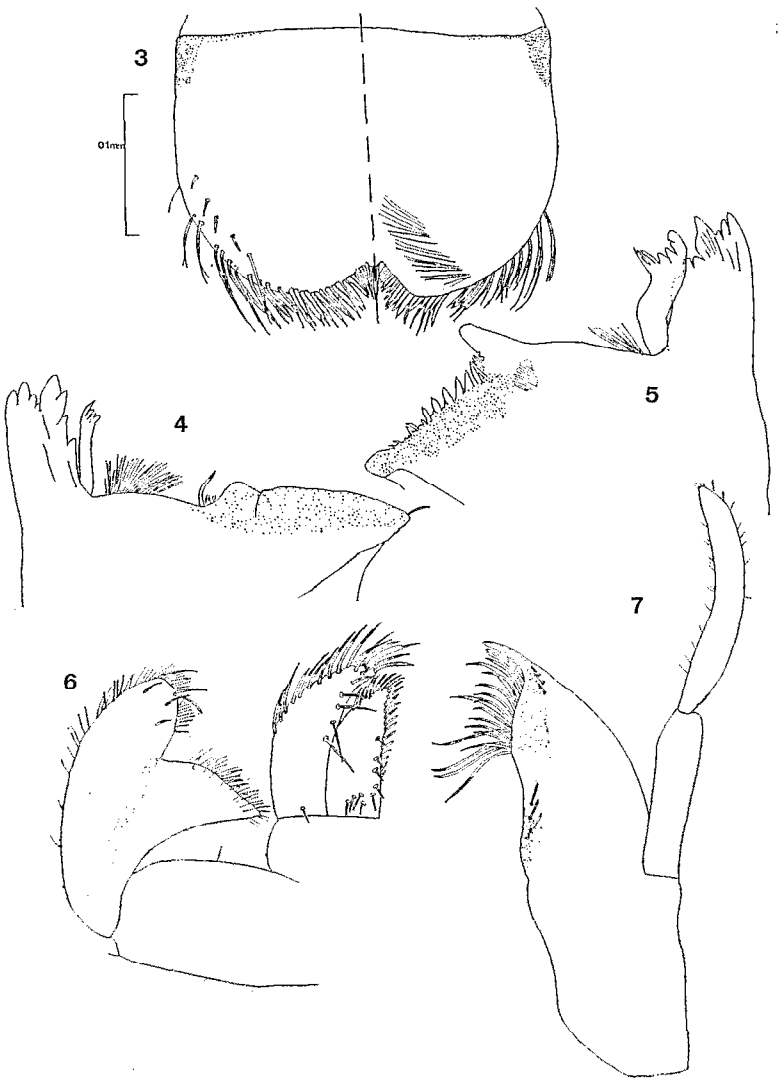


FIG. 3-7. — *Cheleocloeon yolandae* sp. nov. nymph, mouthparts. 3 : labrum (dorsal view on left, ventral on right). 4 : distal margin of right mandible. 5 : distal margin of left mandible. 6 : labium. 7 : maxilla.

Cheleocloeon yolandae *sp. nov. nymphe, pièces buccales. 3 : labrum (vue dorsale à gauche, vue ventrale à droite). 4 : marge distale de la mandibule droite. 5 : marge distale de la mandibule gauche. 6 : labium. 7 : maxille.*

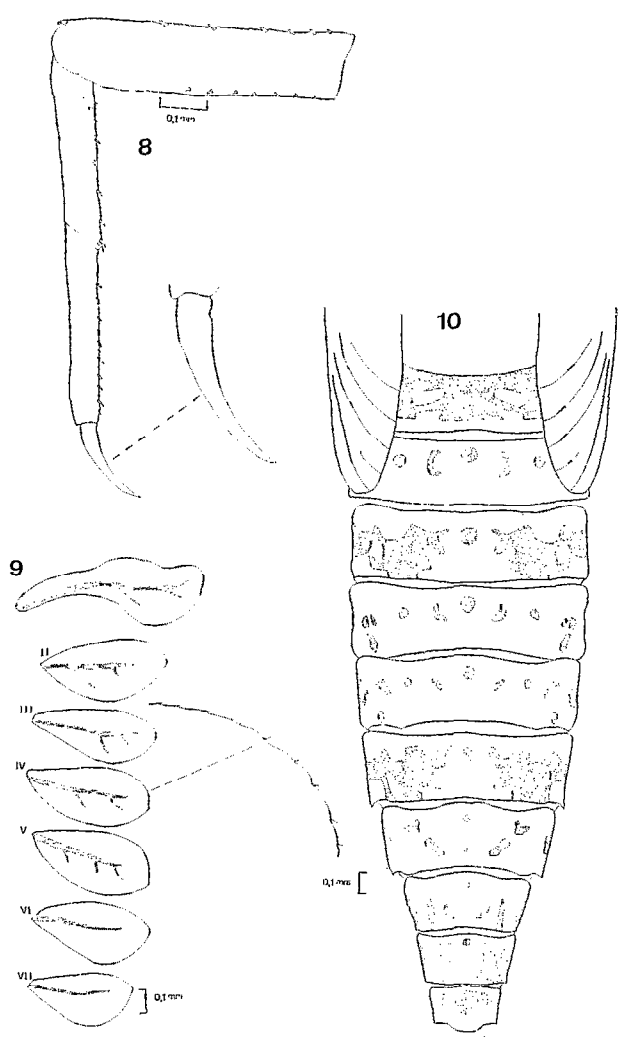
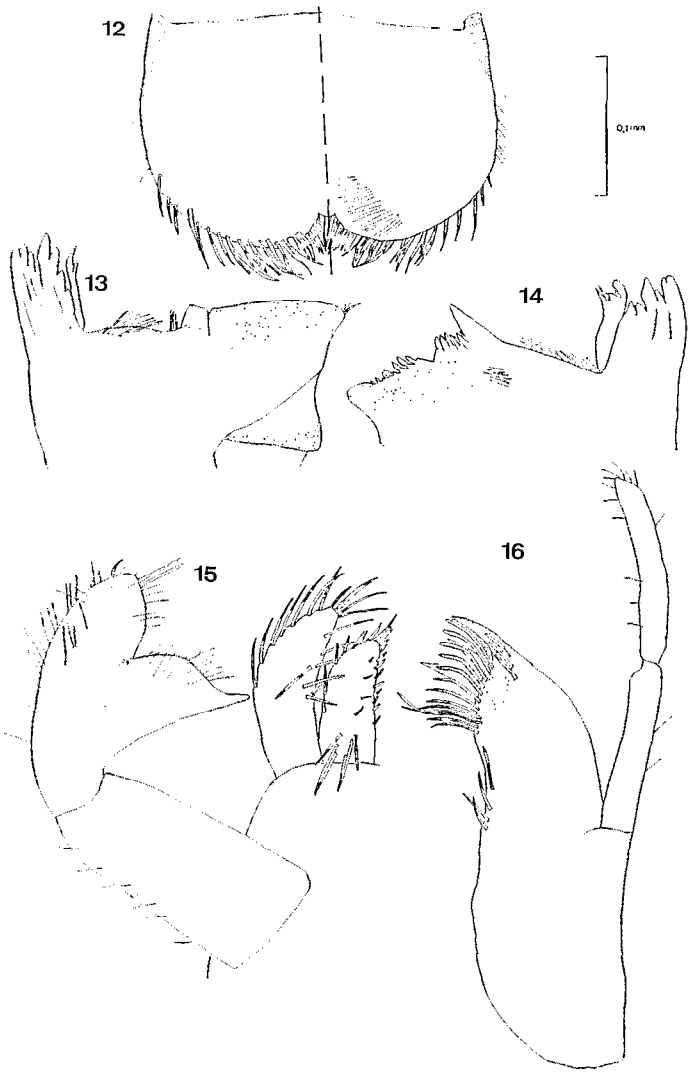


FIG. 8-10. — *Cheleocloeon yolandae* sp. nov. nymph. 8 : fore leg (with detail of leg). 9 : gill lamellae I-VII (with detail of distal anterior margin of gill IV). 10 : abdomen, dorsal view.

Cheleocloeon yolandae *sp. nov. nymphe. 8 : patte I (avec détail de la patte). 9 : trachéobranchies I-VII (avec détail de la marge antérieure de la trachéobranchie IV). 10 : abdomen, vue dorsale.*

FIG. 11. — *Cheleocloeon carinatum* sp. nov. ♂ imago.
11 : fore wing.
Cheleocloeon carinatum *sp. nov.* ♂ *imago. 11 : aile I.*



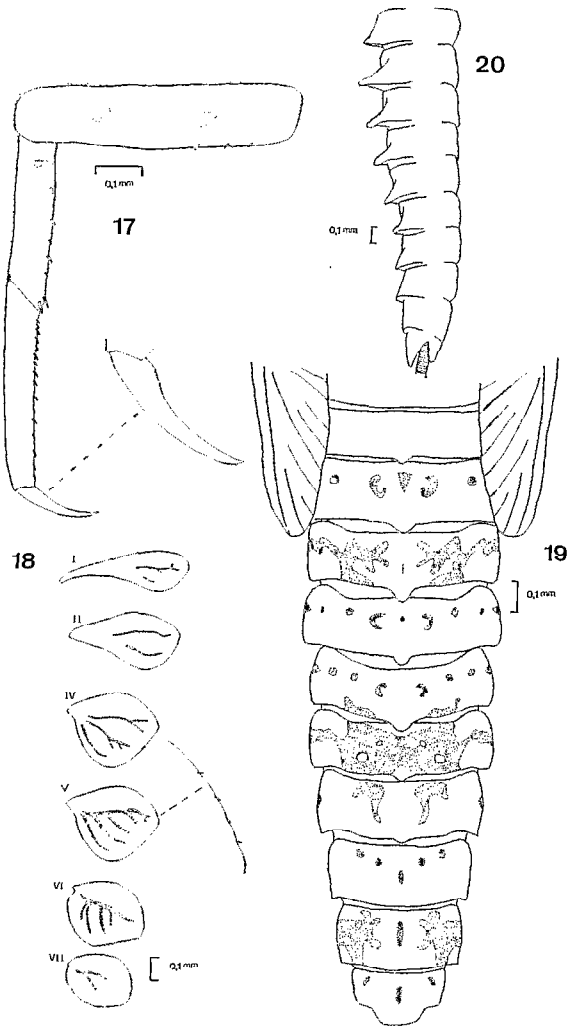


FIG. 17-20. — *Cheleocloeon carinatum* sp. nov. nymph.
17 : fore leg (with detail of claw). 18 : Gill lamellae I, II, IV-VII, (with detail of distal anterior margin of gill V). 19 : abdomen, dorsal view. 20 : abdomen in lateral view (pigmentation not represented).
Cheleocloeon carinatum *sp. nov. nymphe. 17 : patte I. 18 : trachéobranchies I, II, IV-VII, (avec détail de la marge distaleantérieure de la branchie V). 19 : abdomen, vue dorsale. 20 : vue latérale d'abdomen (la pigmentation n'est pas représentée).*

FIG. 12-16. — *Cheleocloeon carinatum* sp. nov. nymph, mouthparts. 12 : labrum (dorsal view on left, ventral on right). 13 : distal margin of right mandible. 14 : distal margin of left mandible. 15 : labium. 16 : maxilla.
Cheleocloeon carinatum *sp. nov. nymphe, pièces buccales. 12 : labrum (vue dorsale à gauche, vue ventrale à droite). 13 : marge distale de mandibule droite. 14 : marge distale de mandibule gauche. 15 : labium. 16 : maxille.*

AFFINITIES

The adult of *C. carinatum* differs from that of *C. yolandae* in the absence of marginal intercalaries in the basal interspaces of the fore wing. The nymph differs by the presence of median, tergal spurs on the abdomen, the tergal markings and the shorter lamella of gill I.

A highly characteristic feature of *Cheleocloeon* is the exceptional length of the first gill lamella. In practically all known genera of Baetidae this lamella is either subequal to those of the other gills, much smaller or sometimes absent altogether. In *C. yolandae* not only is it the longest of the gills but broadens out into a paddle-shaped organ in the distal half. In this it differs from *C. carinatum*, in which the elongation is less and the lamella lacks the distal broadening. The two species also differ in the tergal pattern and the absence in *C. yolandae* of the median tergal spurs characteristic of *C. carinatum*.

In living nymphs, while at rest, the first gill is held above the body like a banner and actively vibrated. In contrast, the remaining gills are held passively, close to the abdomen.

DISCUSSION

Cheleocloeon would seem to be a sister group of the South African mayfly *Demoulinia crassi* (Demoulin). It shares with this genus loss of the hind wing in the adult and the long, fine tarsal claws with minute denticles. *Cheleocloeon* has the antero-medial process of the second segment of the labial palp drawn out to a point. We have re-examined specimens of *Demoulinia* and find that this process is drawn out into a fine recurved point. This apotypic character is not apparent in the original figure of Crass (1947), and the palp is redrawn here (fig. 21). On the other hand, the forceps of the ♂ are most unusual, the apical segment arising from the inner aspect of the apex of the 2nd segment. In *Cheleocloeon* the forceps are normal for the group. The canines of the mandibles in

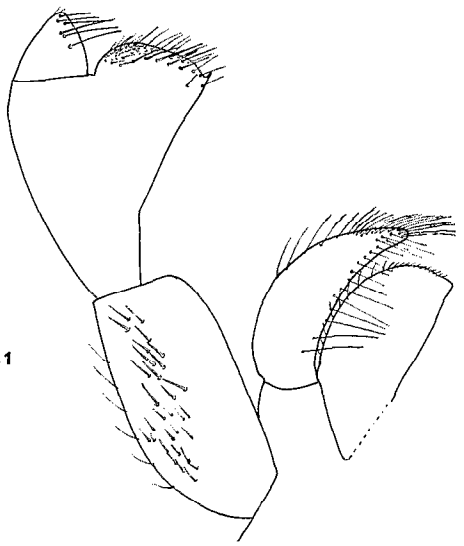


Fig. 21. — *Demoulinia crassi* (Demoulin). 21 : labial palp.
Demoulinia crassi *(Demoulin). 21 : palpe labiale.*

Demoulinia are divided, while those of *Cheleocloeon*, being fused on both sides, presumably represent the more derived character state.

A number of baetid mayflies have become adapted to the slowmoving water on the margins of rivers, for example *Potamocloeon* Gillies and the two genera discussed here. They are characterised by long fine claws, apparently as an adaptation to silted substrates. Similar claws are seen in the North American mayfly, *Apobaetis* Day, a species known to frequent artificial irrigation channels, Edmunds *et al.* (1976). Since this genus is not at all closely related to these African forms, it is evident that what we see is yet another example of parallel evolution in the Baetidae.

Acknowledgements

We are indebted to Dr. J.-M. Elouard for providing facilities for us to work in Guinea. We would like to thank Mr. M. Traoré for technical assistance.

Manuscrit accepté par le Comité de rédaction le 26 décembre 1993

REFERENCES

Crass (R. S.), 1947. — The May-flies (Ephemeroptera) of Natal and the Eastern Cape. *Annals Natal Museum*, 11 : 37-110.

Edmunds (G. F.), Jr., Jensen (S. L.), Berner (L.), 1976. — *The Mayflies of North and Central America.* Minneapolis, University of Minnesota Press, 330 p.

Gillies (M. T.), 1990. — A revision of the African species of *Centroptilum* Eaton (Baetidae, Ephemeroptera). *Aquatic Insects*, 12 : 97-128.