

A new genus of Caenidae (Ephemeroptera) from East Africa

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Introduction

Four genera of caenid mayflies are known from Africa at the present time (Thew, 1960). We give an account here of a fifth genus, which is remarkable not only for the highly developed eyes of the male but also for the diurnal emergence of the adults. Two species are described, both collected in Tanzania. The types have been deposited in the British Museum (Natural History).

CAENOPSELLA gen. nov.

Oculi in male very large, lateral diameter equal to about three-quarters of the distance between the eyes; pedicel of antennae short. Prosternum very narrow, fore coxae almost contiguous. Fore tibia less than 1.5 times femur, fore tarsal claws similar. Forceps limb terminating in a fine bristle of variable length; penes divided apically. Mandibles of nymph with a few marginal hairs; 1st gill 2-segmented, gill-cover rounded, lacking triangular crest but with a few stout chaetae dorsally and a marginal fringe.

Type species *C. meridies* nov.

Caenopsella meridies sp. nov.

Material

Holotype male imago. TANZANIA: Lake Kalimawe, South Pare District (38° 10' E, 4° 20' S), 450 m, 22.ix.61. Paratypes. Same provenance, 1 female imago, 42 male imagines, 2 nymphs, 2 nymph shucks, ix.61, x.61, ii.62.

Description

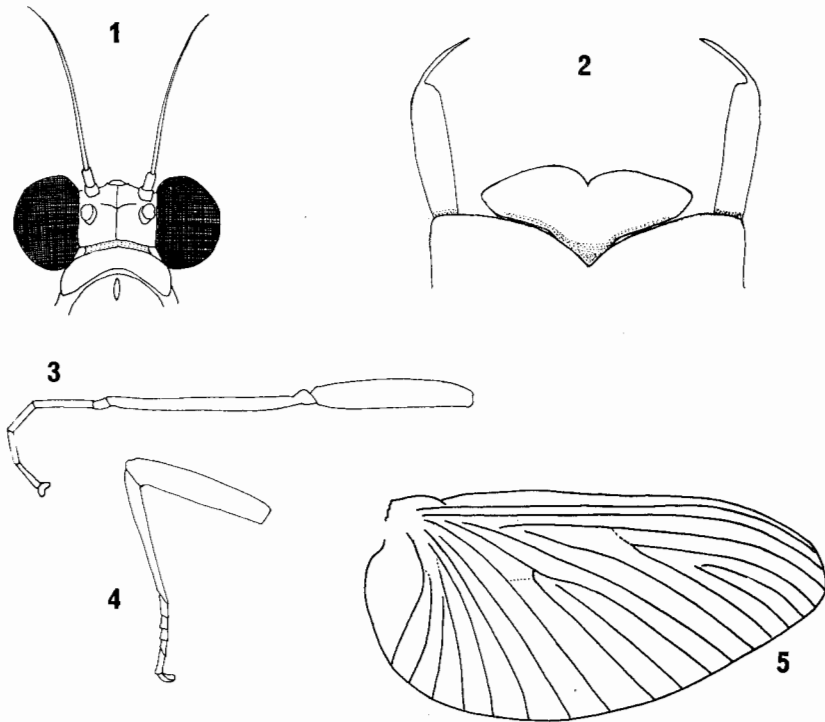
Male imago (in life). Figs. 1-5. A minute, black and white insect. Oculi dark reddish brown, head and thorax shining black, antennal scape and pedicel black, filament white; abdomen mainly pure white, distal three-quarters of 9th and all of 10th terga black; legs and tails white. Wings hyaline except for a faint milky sheen in costal and subcostal areas, cross-veins almost entirely absent. Forceps white, clothed in minute hair-like setae and terminating in a long, stout bristle, forceps base notched, penes dark around apical margin. Fore tibia 1.3 times femur.

Female imago (in life). Whole body dark brown, abdomen rather paler, tails white; postero-lateral margins of terga 5-8 with very small, fine projections; wing as in male; legs colourless except that all femora have a narrow, black streak at the apex on the upper surface.

Nymph. Body pale brown; mouthparts and gills as in figs. 6-13.

Dimensions

Male body 2.1 mm; wing 1.6-1.8 mm.



FIGS. 1-5. *Caenopsella meridies*. (1) Male head; (2) male terminalia; (3) and (4) male fore and hind legs; (5) wing.

***Caenopsella major* sp. nov.**

Material

Holotype male imago. TANZANIA: Lushoto, Western Usambara Mountains (38° 20' E, 4° 50' S), 1400 m, 28.x.61. Paratypes. TANZANIA: same provenance, 11 male imagines; Herkulu, Western Usambara Mountains (38° 30' E, 4° 50' S), 1550 m, 23.vi.62, 2 males; Lake Mgwaza, Mufindi, Southern Highlands (35° 20' E, 8° 30' S), c. 1600 m, 28.iii.63, 5 male imagines.

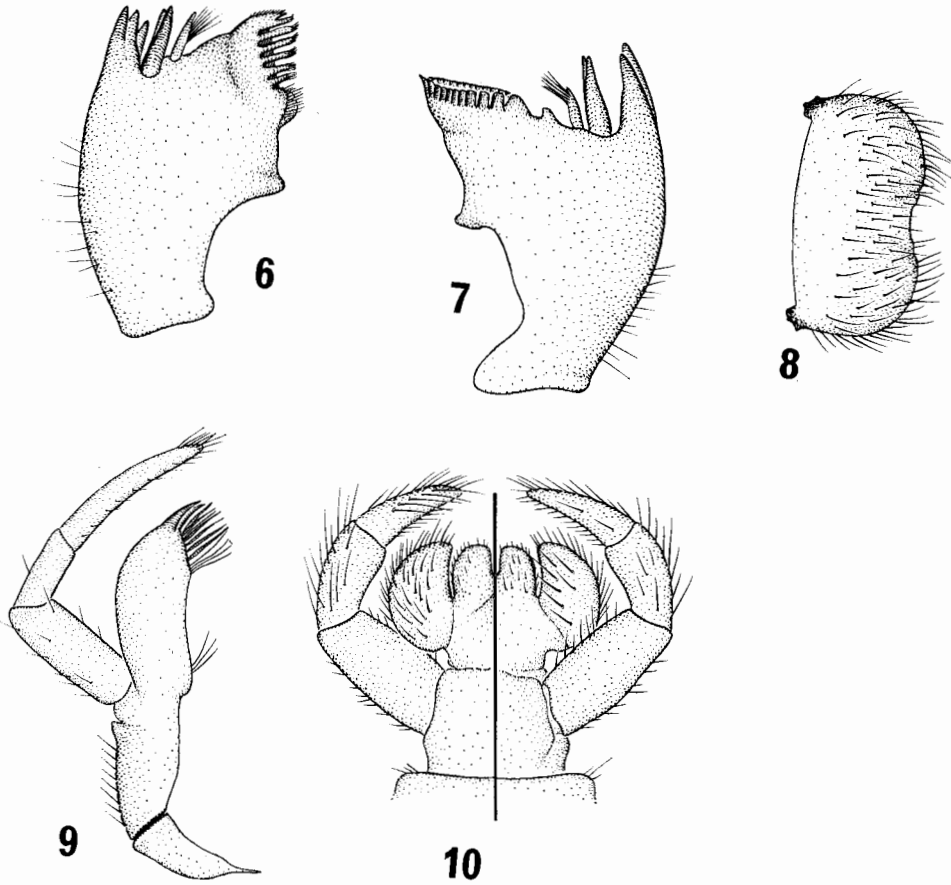
Description

Male imago (in spirit). Figs. 14-16. Head and thorax dark brown; abdomen rather paler brown, tails white. Fore femur and extreme base of tibia brown, rest of tibia and tarsus colourless; mid and hind femora and tibiae brown, tarsi colourless. Wings hyaline throughout, cross-veins normally developed. Forceps dark, abruptly broadened at base, terminating in 1 or 2 minute spine-like bristles. In preserved specimens the forceps project ventrally at a wide angle to the forceps base. Penes fused, divided apically and with a trumpet-shaped, central ring.

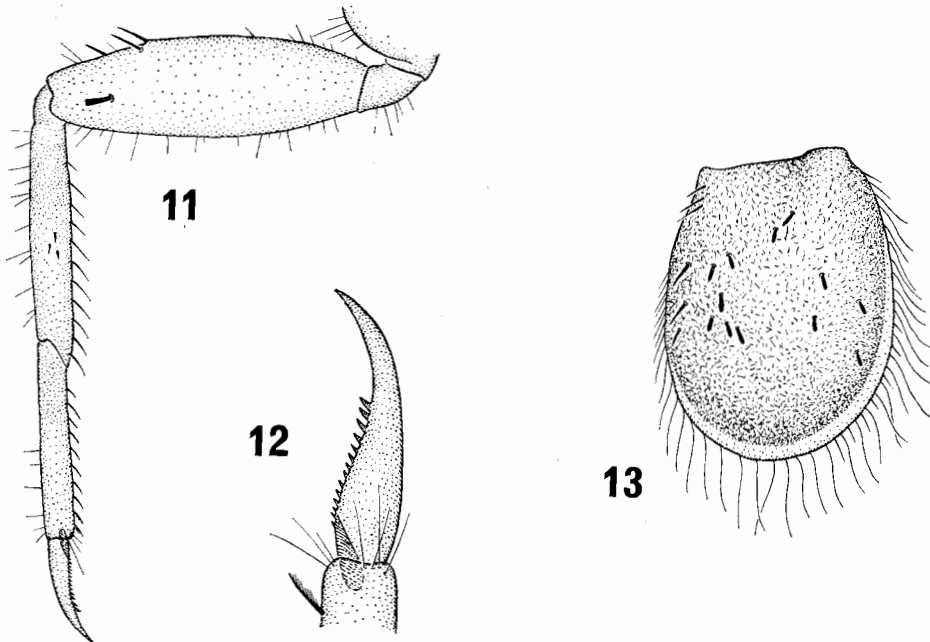
Dimensions

Body, 4-4.5 mm; wing, 3.5 mm.

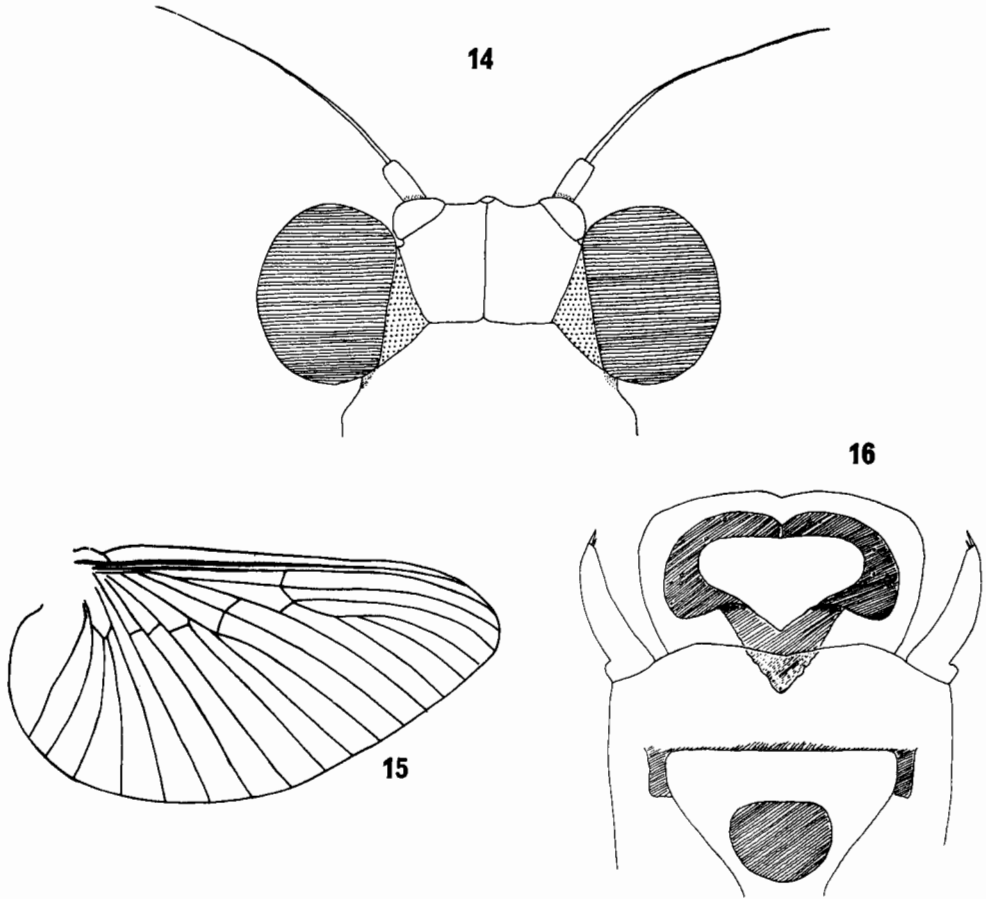
This species differs from *C. meridies* in its larger size, brown body, wing venation and male terminalia.



FIGS. 6-10. *Caenopsella meridies*, mouthparts of nymph. (6) and (7) Right and left mandibles; (8) labrum; (9) maxilla; (10) labium.



FIGS. 11-13. *Caenopsella meridies*. (11) and (12) Fore and hind legs of nymph; (13) lamella of second gill.



FIGS. 14-16. *Caenopsella major*. (14) Male head (semi-diagrammatic) from behind; (15) wing; (16), male terminalia.

Caenopsella differs from all other described Caenidae in the very large eyes of the male. The long terminal spine on the forceps limbs in *C. meridies* is quite unlike that of any other member of the family. However, in *C. major* this spine is very small and, except for the small subsidiary spine, resembles to a certain extent the terminal barb seen in *Caenodes* Ulmer. The gill-covers of the nymph are highly distinctive in lacking the triangular crest on the dorsal surface. In this it resembles the Australasian genus *Tasmanocaenis* Lestage, but differs in possessing a marginal fringe of hairs on the gill-covers and in the first gill being 2-segmented. The mature male nymph is instantly recognizable by the large oculi.

Lake Kalimawe is a small man-made lake fringed with papyrus, lying in the arid plain that separates the South Pare and West Usambara Mountains. We first came across *C. meridies* towards noon on a dazzlingly bright day in September. So minute were the insects and so unusual the time of day that at first we were slow to realize that they were mayflies and not some small dipteran. Subsequent visits in October, February and March confirmed both the abundance of the species and the regular presence of adults at this hour. On two

mornings I arrived at the lake by 0900 hours. No *Caenopsella* were seen until just before 1100 hours when a subimago emerged from its nymphal case on the surface of the water. On other days male spinners were dancing over the lake in the full glare of the sun from 1000–1230 hours, by which time the shade temperature was 30°–32°. In light winds they swarmed over the open water, but when the wind strengthened they took advantage of the shelter afforded by the papyrus. Male swarms were only ever seen at this hour, and it seems that the emergence period of the species is restricted to a time of day normally shunned by tropical mayflies.

The highland species, *C. major*, shows a similar if slightly later period of activity. Both in the Usambara Mountains and in the Southern Highlands males were caught at 1530–1600 hours, in one case dancing over a shady stream, in the other over an exposed lake at an air temperature of 23°.

It is tempting to correlate this diurnal activity with the greatly enlarged eyes in the males. However, many other Caenids swarm by day in temperate climates and in highland areas of East Africa, yet in these the eyes are as small as in crepuscular or nocturnal species. Verrier (1956) has pointed out how little the function of the different types of eyes in mayflies is understood at present, and it would clearly be rash to lay too much stress on this feature of anatomy, unusual though it may be in this family.

Summary

A new genus, *Caenopsella*, is described from Tanzania. One species, *C. meridies*, occurs in lowland plains and has the unusual habit of swarming in the middle of the day. A second species, *C. major*, is described from highland areas.

Acknowledgments

The author wishes to thank Dr. Steven L. Jensen for the drawings he made a good many years ago of the nymphal parts of *Caenopsella*.

References

- THEW, T. B. 1960. Revision of the genera of the family Caenidae (Ephemeroptera). *Trans. Am. ent. Soc.* **86** : 187–205.
- VERRIER, M.-L. 1956. *Biologie des Ephémères*. Libr. Armand Colin, Paris, 216 pp.