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MAYFLIES (EPHEMEROPTERA) COLLECTED BY J. OMER-COOPER IN THE EASTERN CAPE PROVINCE, SOUTH AFRICA, WITH A DESCRIPTION OF A NEW GENUS AND SPECIES (*NOTONURUS COOPERI*)

BY R. S. CRASS, B.Sc.

I AM indebted to Professor J. Omer-Cooper, of Rhodes University College, Grahamstown, for the opportunity to examine material collected by him from three localities in the Eastern Cape Province. This region presents features of special zoogeographical interest owing to its position as a meeting-ground for the fauna of Eastern Africa and that of the South-west Cape. No systematic work has, however, been done on the mayflies of the Eastern Cape, and records are the result of sporadic collecting only. The paucity of perennial streams over much of the area restricts aquatic life, but ranges such as the Hogsback and Katberg, which rise to an altitude of 6,000 feet, and lower hills like those on which lies the Pirie Forest provide exceptions. The abundant streams of these mountain areas have already been shown to possess a rich insect fauna, and an extensive field awaits future investigation. The mountainous country of East Griqualand and Pondoland, which extends to the Natal border, is transversed by many fine rivers whose fauna has scarcely been studied.

Eaton (1884) described one mayfly (*Adenophlebia auriculata*) from Grahamstown, Barnard (1932) added the record of a second species from the Eastern Cape, and Crass (1946) brought the total to twenty-two.

The material described below comprises ten species, nine of which are known, while the tenth is new and belongs to a new genus for which I propose the name *Notonurus*.

It is of interest to note the distribution, so far as it is known, of the twenty-three Eastern Cape mayflies: eight also occur in Natal, four are South-west Cape forms, ten are widespread species known to extend from the South-west Cape to Natal, and one is peculiar to the area under consideration.

BAETIDAE.

Cloëon aeneum Barnard.

Barnard, 1932 : 216, fig. 7.

Locality.—Kasouga River, February, 1944 (*J. Omer-Cooper*). One ♀ (identification not certain).

Previous Records.—South-west Cape—Groot Drakenstein (*A. C. Harrison*); Jonkershoek, Stellenbosch (*H. G. Wood*); Lilyfontein, Kamiesberg (*K. H. Barnard*); Eastern Cape—Grahamstown (*Albany Museum*); all *teste* Barnard.

Austrocloëon africanum (Esben-Petersen).

Esben-Petersen, 1913 : 184, fig. 8. Barnard, 1932 : 217, figs. 8 and 9. Crass, 1946 : 57.

Locality.—Hogsback, near Alice, Kingwilliamstown Division, February, 1944 (*J. Omer-Cooper*). One ♂.

Previous Records.—Zululand (*W. E. Jones*); Kimberley (*J. H. Power*); Grahamstown (*Miss Walton*); Pilgrims Rest, Transvaal (*Schunke*); Sabi, Transvaal (*J. C. Dendy*); Winkle Spruit, Natal (*Natal Museum*); Groot Drakenstein and Worcester (*A. C. Harrison*) and Ceres (*R. M. Lightfoot*) in the South-west Cape; all *teste* Barnard. Grahamstown (*J. Omer-Cooper*); Nelspoort and Cradock, in the Karroo (*R. S. Crass*); Curry's Post, Natal (*R. S. Crass*).

BRACHYCERCIDAE.

Austrocaenis capensis Barnard.

Barnard, 1932 : 227, figs. 17 and 18. Crass, 1946 : 93.

Locality.—Pirie Forest, February, 1944 (*J. Omer-Cooper*). One ♂, one ♀.

Previous Records.—Lakeside, Cape Peninsula (*K. H. Barnard*); Stellenbosch (*A. C. Harrison*); numerous other localities in the South-west Cape, *teste* Barnard; Kasouga River (*G. B. Hudson*), Grahamstown (*R. S. Crass*), Amatola Mts. (*R. S. Crass*), all in the Eastern Cape; streams throughout the Natal midlands, and in the Drakensberg foothills (*R. S. Crass*).

LEPTOPHLEBIIDAE.

Aprionyx natalica (Lestage).

Lestage, 1924 : 325. Barnard, 1932 : 240. Crass, 1946 : 96, fig. 34.

Localities.—Hogsback, near Alice, February, 1942, and Pirie Forest, February, 1944 (*J. Omer-Cooper*). Numerous ♂ and a few ♀.

Previous Records.—Kranskop, Natal (*K. H. Barnard*); Katberg and Hogsback (*Albany Museum*), *teste* Barnard; Curry's Post, Dargle and Inzinga districts, Natal (*R. S. Crass*).

Adenophlebia auriculata Eaton.

Eaton, 1884 : 112, pl. XIII, fig. 21. Barnard, 1932 : 242, fig. 30. Crass, 1946 : 100.

Locality.—Hogsback, near Alice, February, 1942 (*J. Omer-Cooper*). Two ♀.

Previous Records.—Grahamstown (*Albany Museum*), *teste* Eaton; Barberton, Transvaal (*South African Museum*); Natal (*S. G. Rich*), *teste* Barnard; Woest Hill, Grahamstown (*C. H. Crass*); Pirie Forest (*R. S. Crass*); Kokstad, East Griqualand (*R. S. Crass*); Basutoland, 10,000 feet (*K. M. Pennington*); Mont-aux-Sources summit, Natal (*R. F. Lawrence*); streams throughout the Natal midlands and Drakensberg foothills (*R. S. Crass*).

Adenophlebia sylvatica Crass.

Crass, 1946 : 102, figs. 35 and 36.

Locality.—Hogsback, near Alice, February, 1942 (*J. Omer-Cooper*). One ♂.

Previous Records.—Hogsback (*R. S. Crass*); Fenfield, Amatola Mts. (*A. Perks*); forest streams in Curry's Post and Karkloof districts, Natal (*R. S. Crass*).

Choroterpes nigrescens Barnard.

Barnard, 1932 : 248, figs. 38 and 39. Crass, 1946 : 108.

Locality.—Pirie Forest, February, 1944 (*J. Omer-Cooper*). One ♂.

Previous Records.—Groot Drakenstein (*A. C. Harrison*), Rawsonville (*A. C. Harrison*), Potteberg (*A. T. Packham*), all in South-west Cape, *teste* Barnard; Fenfield, Amatola Mts., Eastern Cape (*R. S. Crass*).

Euthraulius elegans Barnard.

Barnard, 1932 : 249, figs. 40 and 41. Crass, 1946 : 102.

Locality.—Pirie Forest, February, 1944 (*J. Omer-Cooper*). One ♂, four ♀.

Previous Records.—Groot Drakenstein (*A. C. Harrison*), Stellenbosch (*A. C. Harrison*), Hex River (*A. C. Harrison*), Cedarbergen (*K. H. Barnard*), all in South-west Cape, *teste* Barnard; Kokstad, East Griqualand (*R. S. Crass*); streams throughout the Natal midlands and Drakensberg foothills (*R. S. Crass*).

ECDYONURIDAE.

Afronurus peringueyi (Esben-Petersen).

Esben-Petersen, 1913 : 185, figs. 9–12. Barnard, 1932 : 255, figs. 45–47. Crass, 1946 : 109.

Locality.—Pirie Forest, February, 1944 (*J. Omer-Cooper*). Two ♂ (subimagos), four ♀ (subimagos, identification uncertain).

Previous Records.—Zululand (*W. E. Jones*), *teste* Esben-Petersen; Kunene River, Ovamboland (*K. H. Barnard*); Natal (*L. A. Day*), *teste* Barnard; Amatola Mts. and East Griqualand (*R. S. Crass*); streams throughout the Natal midlands and Drakensberg foothills (*R. S. Crass*).

Notonurus gen. n.

Imago.—Cross-veins numerous in both fore- and hind-wings. Hind-wing broadly ovate, MA forked. Hind tarsus of male less than the length of the tibia; first joint of hind tarsus of male equal to second joint; first joint fore tarsus shorter than second.

Forceps of male four-jointed, second joint longer than the others together. Penes united, flattened and expanded distally, with an apical incision; outer and inner lobes on each side distally, and a median ventral spiniferous projection.

Nymph.—Unknown.

Genotype.—*Notonurus cooperi* sp. n.

Remarks.—This genus is based on a single male imago, but the character of the genitalia appears to be sufficiently distinctive to justify generic separation.

The affinities of *Notonurus* would seem to lie rather with *Ecdyonurus* Eaton and *Heptagenia* Walsh, both Palaearctic and Nearctic genera, rather than with the Ethiopian *Afronurus* Lestage, from which it differs in the expanded form of the penes lobes and the presence of titillators, characters shared by the Northern genera. The ratio of the first two tarsal joints of the third hind-leg is similar to that of *Heptagenia*; otherwise the ratios of the leg joints are closer to those of *Ecdyonurus*, as defined in Ulmer's key to the ECDYONURIDAE (Ulmer, 1933 : 212).

Notonurus cooperi sp. n.

Imago.—In fore-wing cross-veins well marked, many thickened with pigment, giving a spotted effect. Sc and R_1 somewhat sinuous in pterostigmal area. In fore-leg ratio of the joints: femur 1, tibia 1.05, tarsus 1.3; tarsal joints: 1, 1.5, 1.5, 0.9, 0.6. In hind-leg: femur 1, tibia 0.8, tarsus 0.36; tarsal joints: 1, 1, 0.75, 0.6, 0.75.

Penes united, with a broad apical incision. On each side of this incision lie two chitinised lobes with a more membranous area between them. The margin of the inner lobes curves upwards to form a dorsal flange-like projection, while the outer lobes extend laterally in the horizontal plane. On each side of the incision, but slightly proximal to it, are two ventral serrate spines. On the ventral surface, near the base of the penes, is a bulbous projection ending in two submedian points, and bearing on each side two long outwardly directed spines. Genital styles four-jointed.

Head pale buff, with chestnut-brown mottling. Turbinate eyes piceous, ocelli white-tipped. Pro-, meso- and metathorax with chestnut-brown markings, and whitish interscleritic areas. Prothorax with a dark mediodorsal streak, a pale area on each side of it. Scutellum pale with dark edges. Ventral surface paler than dorsal.

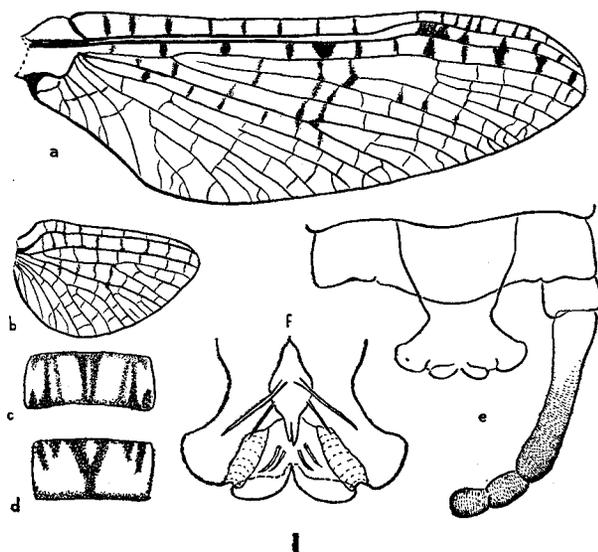


FIG. 1.—*Notonurus cooperi* gen. et sp. n.: a, b, fore-wing and hind-wing of imago; c, d, dorsal pattern of abdominal segments 3 and 7; e, forceps and penis, dorsal view with tenth tergite removed; f, ventral view of penes more highly magnified.

Abdomen with whitish ground-colour suffused castaneous, especially on posterior segments, and a well-marked pattern of deep warm brown on each segment, with a dark posterior border. Tergite 1 mostly dark, with paler dorsolateral areas. Segments 2–6 each with a median dark marking tapering posteriorly and divided by a narrow pale streak. On each side a double dark longitudinal marking and a dark lateral incomplete stripe. Segment 7 with a dark Y-shaped median mark, a small anterior marking on each side, and a longer lateral marking extending from the anterior edge. Segments 8–10 deeply suffused, 8 still showing indications of pattern, 9 and 10 almost uniform. Ventrally, anterior segments pale with lateral dark areas, posterior segments suffused. Genital styles suffused brownish. Cerci white, banded with dark brown. Legs whitish with dark areas; femora with dark areas proximally and distally, and dark stippling on anterior surface; tibiae

with two dark bands. Wings hyaline, with chestnut-brown blotches on many of the cross-veins. Neuration pale, the stronger veins slightly brownish.

Length: Body 9 mm., wing 10 mm., cerci 22 mm., fore leg 8.2 mm.

Holotype.—Male imago, Pirie Forest, February, 1944 (*J. Omer-Cooper*).

Remarks.—This interesting insect is a notable addition to the known mayflies of the Eastern Cape, and I have pleasure in naming it after its discoverer, Professor J. Omer-Cooper. It would be very desirable to find and correlate the nymph.

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BOOK NOTICE.

Simulidos del Nuevo Mundo. By Luis Vargas. Monografía I del Instituto de Salubridad y Enfermedades Tropicales. Mexico, D.F., 1945. Pp. 241, 10 pls.

This work is divided into two sections, the first and smaller of which deals with the bionomics of the insects, including their economic importance, morphology of the larvae and adults, life cycle, methods of rearing, and parasites and predators.

The second and larger section consists of a systematic survey which includes a catalogue of the subfamilies, tribes, genera, and of the New World species.

The species are also listed by countries, and there is a complete index of generic and specific names. An extensive bibliography completes the work.