AN ENTOMOBRYID COLLEMBOLAN (HEXAPODA: COLLEMBOLA) FROM THE LOWER PERMIAN OF SOUTHERN AFRICA

by

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ABSTRACT

Permobrya mirabilis gen. et sp. nov., recorded from carbonaceous shales of the Middle Ecca of southern Africa, is a rather large entomobryid collembolan. The specimen, preserved in lateral view, is complete except for the dentes and mucrones of the furcula and details of the claws which are not visible in the shale matrix. The species is surprisingly similar to Recent Collembola.

INTRODUCTION

Collembola are such fragile animals that they are rarely preserved as fossils, except in amber. *Rhyniella praecursor* Hirst and Mulik 1926 from the Middle Devonian Rhynie Cherts of Scotland is the only recorded Palaeozoic species that is almost certainly a collembolan. Tillyard (1928) was of the opinion that the species was a collomboloid hexapod but until the segmentation of the abdomen is known he refrained from placing the species definitely in the Collembola. From a study of additional specimens in which head, thorax and basal segments of the abdomen are preserved Scourfield (1940) concluded that *Rhyniella praecursor* was a true Collembolan that combined podurid and entomobryid characters.

An almost complete collembolan was discovered by the writer in carbonaceous shales of Middle Ecca age at Hammanskraal, near Pretoria, southern Africa. The specimen and counterpart were recovered from fragments of a slab of rock damaged in transit through the mails. This sample had been sent for detailed study of an insect nymph discovered by Dr. Éva Kovács-Endrödy during a study of the plant fossils in the shales.

The collembolan is clearly preserved in lateral view to show most of the diagnostic characters of the Entomobryidae: only the structure of the pronotum, details of the tarsal claw and the structure of the dentes and mucrones are unknown. The specimen combines characters of a number of Recent genera. There are no characters unique to the fossil species.

Order Collembola

Family Entomobryidae

*Permobrya* gen. nov.

*Permobrya mirabilis* sp. nov.

Figures 1–4

Type

HI 248 a, b, in Geological Survey, Pretoria.

Type locality

North-western corner of the farm Haakdoornfontein 119 JR, 7.25 km almost due south of Hammanskraal, near Pretoria, Africa, in carbonaceous shale of Middle Ecca age.

Description

Lateral view of whole animal. Length without furcula c. 4.5 mm. Outline of head, viewed from in front, vague. Antennae both preserved, inserted close together, one mostly overlying the head, the other fully exposed and distinct. Antennae 4-segmented, all...
segments long, increasing regularly in length, terminal segment slightly more than twice as long as first, distinctly wider than basal segments as preserved and annulated, with 7 or 8 annuli. Mesonotum distinctly sclerotised, lateral margin obscured by overlying antenna. Metanotum slightly shorter than mesonotum, lateral margin apparently convex. First two segments of abdomen very short, each about half as long as metanotum, and extending laterally only as far as metanotum. Segment 3 about as long as 1 and 2 combined, lateral margin ill-defined. Segment 4 large, as long as basal three segments combined, sclerotisation apparently extending to ventral margin of the body as preserved. Apical segment or segments about as long as high. Furcula distinct but only manubrium preserved: manubrium long and stout, almost as long as terminal segment of abdomen. Ventral tube distinct, about twice as long as wide. Two legs preserved, one apparently a hind leg, the other possibly a fore leg, with proportions differing in the two legs. Combined coxa plus trochanter of (fore?) leg about as long as femur. Tibiotarsus somewhat shorter and narrower than femur. From the irregular outline of the dorsal margin of the body it would appear that the body was covered with scales.

Note. It is surprising that this species of such great age should resemble Recent Collembola so closely.

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REFERENCES


(For overall size, see text page 141.)