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A Myriapod Identity for the Devonian “Scorpion” *Tiphoscorpio hueberi*

by

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Arthropod cuticle fragments, macerated by palaeobotanist Hueber from the Middle Devonian Onteora Formation of New York State, were described by KJELLESVIG-WAERING (1985) as a scorpion, *Tiphoscorpio hueberi*. This was believed by its describer to have been aquatic (scorpions were aquatic in Devonian times) and to have respired with an array of remarkably diverse plate-like gills. KJELLESVIG-WAERING described one tiny specimen, the holotype, as the carapace, and another as a supposed tarsus. Three types of “gill” were described: rounded, irregular and subrectangular (Fig. 1).

It seemed to us unlikely that these cuticle pieces, thick, ornamented, and with movable spines, could be gills, which are invariably thin-walled for gaseous diffusion, and hence normally poorly presented as fossils. Furthermore, the specimens seemed unlike any fossil scorpion known, yet the genus occupied a key position in the new phylogenetic scheme proposed by KJELLESVIG-WAERING (1985).

The specimens were studied during 1989, and we soon realized that while the holotype is certainly symmetrical, it is not a scorpion carapace, and the supposed tarsus does not belong to a scorpion at all. Most intriguing of all, however, the supposed gills appeared to be congeneric (at least) with the arthropleurid myriapod *Eoarthropleura devonica* described by STØRMER (1976) from Devonian of Germany. (Arthropleurids are reasonably well-known from the Carboniferous, during which time giant forms existed). A complete redescription of *Tiphoscorpio* is in preparation, and only preliminary findings are given here.

The supposed scorpion gill-covering plate (KJELLESVIG-WAERING 1985) is in reality a tergal plate of *Eoarthropleura* (Fig. 1, type 3). The “rounded gill” of *Tiphoscorpio* is really a sternal plate (Fig. 1, type 1; STØRMER 1976 called it labrum – but there are too many of them!). Differences in sizes of the rounded gills are presumably due to differences in sizes of segments and growth stages.

The morphology of the ventral surface of arthropleurids is not well known. A number of plates have been described by previous authors (e.g. ROLFE & INGHAM 1967): the rosette plate, B-plate, and K-plate. The rosette plate has raised, tuberculate areas for muscle attachments in the large arthropleurids. In *Eoarthropleura* it is smaller and less ornamented. The B-plate and K-plate have been recognized in *Eoarthropleura* and *Tiphoscorpio* (the “irregular and subrectangular gills” of KJELLESVIG-WAERING 1985, respectively). The B-plate is type 4, and the K-plate is type 2 in Figure 1. The rosette plate may be represented by one specimen in the *Tiphoscorpio* series (Fig. 1, type 5).

A particularly exciting discovery made a few years ago was that of the Gilboa fauna, dissolved using hydrofluoric acid from Middle Devonian shales of New York. Tiny arthropleurids (not yet

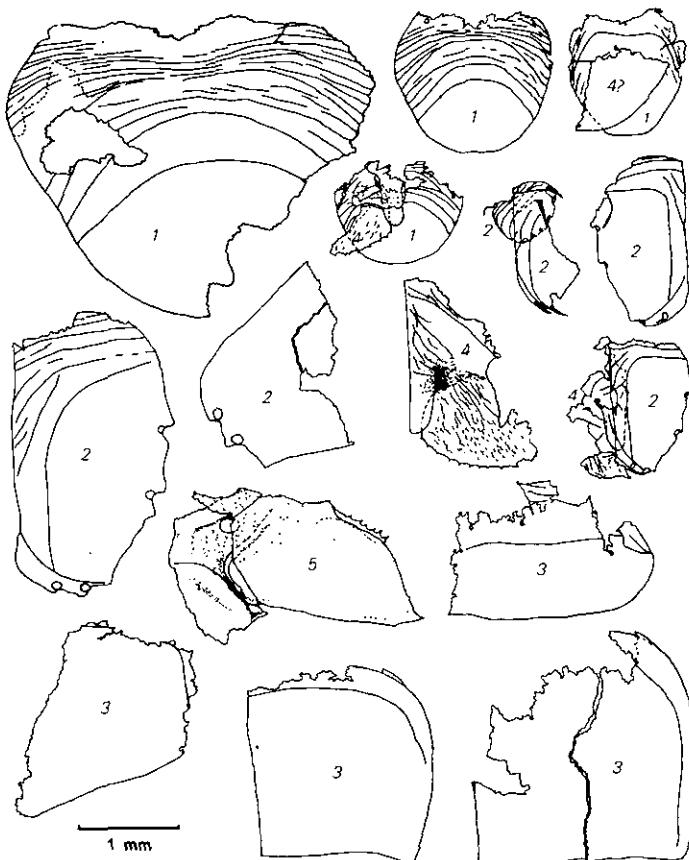


Fig. 1: Representative specimens of *Tiphoscorpio hueberi*; camera lucida drawings from the slide series. Numbers refer to types of plate: 1 = median sternal plate, 2 = K-plate, 3 = lateral tergal plates, 4 = B-plate, 5 = ? rosette plate.

published) were noticed; they are minute, but complete. A problem with large arthropleurids is in studying the complete animal, and a disadvantage of the minute forms is that they are very small and commonly preserved as a mush of overlapping tergites and sternal plates. *Tiphoscorpio* is intermediate in size, and could combine the right form of preservation with ease of study, to tell us a great deal more of the morphology of these bizarre Palaeozoic myriapods.

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