



Notostracan trackways and parataxonomy

Machalski, M. & Machalska, K. 1995. Arthropod trackways, '*Diplichnites*' triassicus (Linck 1943), from the Lower Triassic (Buntsandstein) fluvial deposits of the Holy Cross Mts, Central Poland. *Acta Geologica Polonica* 44 (for 1994), 3-4, 267-275, with 2 plates and 1 text-figure.

The arthropod legs, that left the trackways discovered by the authors in the early Triassic continental rocks, moved synchronously on both sides of the body with wave length of 5-7 pairs. The width of the walking apparatus was 7-11 millimeters. Such are the trackways produced by the Recent notostracan crustaceans. Only the tips of appendages were imprinted, as oval depressions, in the mudstone layer covered by the sandstone bed, on the lower surface of which the track is preserved. This, and the ruffling associated with groove marks, suggest that the surface of the mud was impregnated with a microbial mat and that the animals moved above a thin sand layer, deposited at the mud surface at the beginning of a high-energy sand sedimentation episode. The current was strong enough to force the notostracans to move down the stream, against their normal rheophilic behavior. When they moved obliquely to the current, the tracks tend to be disrupted into series laterally shifted to one another.

This is an interesting case history that can potentially be used to prove a stasis in the evolution of the notostracan behavior or, just opposite, to detect some anatomical and behavioral differences between the Triassic and Recent notostracans. In any case, the new evidence may help in taxonomic identification of the trackways producer. The authors point to Recent *Triops* as a close relative of the Triassic trace-marker.

One may then wonder why, if the producer has been identified with relatively high confidence, the fossil is not referred to just as a 'notostracan trackway' nor is the animal named in agreement with the spirit of zoological nomenclature. Instead, a pseudo-Linnean parataxonomy has been used. At the beginning of the paper the authors 'declare for a broad conception of [ichnotaxon] based on solely morphological criteria'. They choose the 'ichnological' parataxonomy. This makes all the apparently zoological taxonomy style, with lists of synonyms, and references to conspecificity biologically meaningless.

It would not make much sense to repeat here the arguments against parataxonomy (vividly discussed two decades ago, especially in connection with scolecodont and conodont apparatuses) that has resulted in its rejection by zoologists and paleontologists. No doubt that new and new 'ichnotaxa' will continue to be produced, despite all the flawed logic of this procedure. We should be aware, however, that the parataxonomic approach to trace fossils is in fact destructive to this very important area of paleobiological studies. Linnean names based on traces of animal activities are now allowed by the International Code of the Zoological Nomenclature. To be of value comparable with regular zoological taxa, they should be derived from the same basic assumptions. Taxonomic names do not refer to bones, shells, or tracks but to organisms which produced them. Taxonomy is expected to express evolutionary relationships among taxa, not just their morphologic similarities.

Any taxon based on a fossil is identified with a confidence proportional to information content in the fossil. Obviously, in many cases behavioral features may appear more specific than skeletal ones. Trace fossils may thus provide information very important taxonomically. There is no need, however, to create a separate parataxonomy for trace fossils, as it has already appeared impractical to use separate parataxonomies for different kinds of skeletal fossils (even if paleobotanists continue to do this). Whenever it is impossible to apply a formal zoological binomen, there is still a possibility of replacing it with a vernacular expression (for instance 'a notostracan trackway'). From some reason neither of these two possibilities appeals to the authors of the reviewed paper.