



## PALEOECOLOGY AND PALEOENVIRONMENT OF A PECULIAR MICROCONCHID TUBEWORM FROM THE DEVONIAN OF WYOMING, U.S.A.

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Microconchids are extinct tentaculitoid tubeworms, whose fossil record spans the Late Ordovician through the Middle Jurassic. Microconchids developed morphologies of various adaptive functions during their evolutionary history. Here, we present the new microconchid genus and species, *Aculeiconchus sandbergi* Zatoń et al. (2021), from the Devonian Maywood Formation of Cottonwood Canyon, Wyoming, USA. The Maywood Formation consists of estuarine channel deposits of shale, siltstone, and microconchid grainstone. Relative to any of the previously described species, *Aculeiconchus* developed unique hollow spines of various lengths on the underside of the tube. Similar tubular extensions are observed in fossil and modern cyclostome bryozoans, which use them for fixation to flexible substrates, such as algal thalli. The basal spines of *Aculeiconchus* likely played a similar role, and it is a previously undocumented adaptive strategy in microconchids. The *Aculeiconchus* microconchids most probably were attached to non-biomineralized algae that degraded quickly after death, leaving the microconchids scattered loosely within the sediment. The fossils represent at least parautochthonous assemblages, as they are well preserved, and the spines are often intact. The terrestrial spores recovered from the deposit belong to progymnosperm, lycopsid and primitive fern groups, which were major components of swamp plant communities. They suggest very close proximity of fresh water sources to the depositional paleoenvironment of the Maywood Formation. The highly abundant progymnosperm microspores of *Geminospora* and megaspores of *Biharisporites* and *Rhabdosporites* specifically suggests deposition in, or adjacent to, fluvio-lacustrine, lower floodplain, or paralic environments. The presence of the early to middle Givetian palynomorphs *Geminospora lemurata*, and scarce specimens of the middle to late Givetian *Samarisporites triangulatus*, allowed the microconchid-bearing deposits of the Maywood Formation to be precisely dated as middle Givetian. The deposits include fine granular and fibrous amorphous organic matter (AOM) with orange fluorescence, which has been linked with various terrestrial and algal aquatic sources. In addition, well-preserved terrestrial spores, and the presence of megaspores, tetrads, and pyrite all support a brackish, shallow-water depositional setting. The lack of other benthic fossils, and especially other encrusting organisms, clearly indicate that the *Aculeiconchus* microconchids were opportunistic taxa that colonized salinity-stressed estuarine channels. The tectonic quiescence during the Early to Middle Devonian indicates that channel incision was almost certainly driven by eustasy during lowstands of the epicontinental sea. Similar deposits found in channels formed over a span of 30 m.y. suggest that the opportunistic *Aculeiconchus sandbergi* repeatedly tracked marine incursions into these channels during this period.

### Referencias:

Zatoń, M., Hu, M., di Pasquo, M., y Myrow, P.M. (2021). Adaptive function and phylogenetic significance of novel skeletal features of a new Devonian microconchid tubeworm (Tentaculita) from Wyoming, USA. *Journal of Paleontology*, doi: 10.1017/jpa.2021.71s