

Deciphering the early evolution, diversification and ecology of Paleozoic jaw-bearing polychaete worms

Summary

Polychaete jaws (scolecodonts) are common Paleozoic microfossils, but their early record is poorly documented. The project seeks to fill this gap by studying new and existing material from Cambrian and Early Ordovician strata globally, to reveal the main evolutionary events, diversity turnovers, and paleoecological trends of jaw-bearing worms.

Research field:	Physical Sciences
Supervisor:	Olle Hints
Availability:	This position is available.
Offered by:	School of Science Department of Geology
Application deadline:	Applications are accepted between May 03, 2021 00:00 and May 31, 2021 23:59 (Europe/Zurich)

Description

Polychaete jaws (scolecodonts) are common microfossils through the Phanerozoic, representing a widespread and ecologically important group of marine invertebrates. Jawed polychaetes first appeared in the Cambrian, but until late Middle Ordovician, their taxonomy, evolution, diversification, paleoecology and paleogeographic distribution have remained virtually unknown.

The project seeks to fill this gap and find the answers to the following questions: (1) When the jawed polychaetes started to diversify and where this happened first? (2) What morphological and/or paleoecological innovations, or extrinsic factors supported the rapid diversification polychaetes in the Middle Ordovician? (3) If/how were the worms connected to ichnofabrics and ichnodiversity and could they have been supporting changes in biogeochemical cycling? (4) Are scolecodonts useful environmental and biostratigraphic indicators during the early Paleozoic?

TalTech Department of Geology holds some of the largest collections of Ordovician-Silurian acid-resistant microfossils – including scolecodonts – in the world. This material will be examined, and new sampling campaigns are planned to examine latest Cambrian and early Ordovician strata worldwide. Outcrops and drill cores from Estonia will also be utilized for integrated studies. The project will contribute to a better understanding of the evolution of biosphere and environments during the transition from Cambrian greenhouse world to Ordovician ice age.

The PhD student will be responsible for running lab analyses, conducting taxonomic work and analysing the data. The project involves writing and publishing at least 3 research papers in international journals and compiling a PhD thesis based on the papers. Additionally, the student will present the results at conferences, take part in PhD courses, and in teaching and supervising undergraduate students. Minimum net income € 1100 / month is assured (increase possible based on student's performance).

Applicants should fulfil the following requirements:

- education/background in geosciences or biology and previous experience with microfossils
- capable for routine micropaleontological work, including optical microscopy and laboratory extraction techniques
- fluent in English and willing to work in collaboration with other researchers
- MSc thesis must be provided together with other application documents

The following would be beneficial:

- good understanding of Paleozoic fossils, geology and stratigraphy worldwide
- skills with scanning electron microscopy and other analytical equipment used in geosciences
- experience in scientific writing, previous publications

- fieldwork experiences, understanding of sedimentology



To get more information or to apply online, visit <https://taltech.glowbase.com/positions/266> or scan the the code on the left with your smartphone.