

Ostracods in Ordovician–Silurian boundary section in Råssnäsudden, Sweden

Karin TRUUVER & Tõnu MEIDLA

The end-Ordovician Hirnantian glaciation is well known as one of the five major extinction events in Earth's history, a climate change which remarkably influenced marine life across the latitudes. We studied the response of ostracods to this change in Sweden where it was previously not documented in detail. Our investigation was based on materials from the Råssnäsudden locality (Östergötland) and the results were compared with those from the Borensult locality (MEIDLA 2007). A fraction of the rock of micro-palaeontological samples was also used for stable carbon isotopic analysis, to look for the positive shift in the carbon stable isotopic composition, a well-known feature of the Early Hirnantian interval. The Råssnäsudden section is the only Ordovician–Silurian boundary section in Sweden which is nowadays still available. It is a natural bank of the lake Vättern which mostly exposes folded Llandoveryan rocks which are thought to contain the Ordovician–Silurian transition beds in one of the lowermost blocks. A composite section was published by BERGSTRÖM & BERGSTRÖM (1996).

The basal beds of Råssnäsudden section consisting of red limestones contain a rich and diverse ostracod assemblage with dominating species of *Gryphiswaldensia plavinensis*, *Daleiella rotundata*, *Daleiella* sp. and *Rectella explanata*, which are all typical pre-Hirnantian species in eastern Baltic area (Estonia, Latvia and Lithuania). This part of the section was also formerly referred to as pre-Hirnantian. Carbon isotopic values in this part of the section are slowly rising, reaching up to 1.00‰.

The overlying succession of limestones, mudstones and aleuroliths which was formerly referred to as the Hirnantian contains widespread and abundant *Gryphiswaldensia plavinensis*, *Cryptophyllus gutta*, *Pullvillites laevis*, *Daleiella rotundata*, *Rectella explanata* and *Rectella romboformis*, the assemblage being similar to that in the previous unit. Carbon isotopic values in this part of the section range from -1.13 to 1.39‰, the latter being the maximum value of the whole section.

The continuation of the section, several large blocks of marly carbonates, revealed a different ostracod assemblage. The dominant species is *Microcheilinella mobile*, being accompanied with *Longiscula smithii*, *Microcheilinella rozhdestvenskaja* and others, all characteristic of basal Silurian strata in the eastern Baltic area. The carbon stable isotope values of the rocks are close to 0‰.

The Borenhult section, about 5 km east of the Råssnäsudden, reveals the *Harpabollia harparum* association which is interpreted as a cool-water immigrant assemblage in the Hirnantian of the eastern Baltic region (MEIDLA 2007). Our stable carbon isotope analysis of the Borenhult material resulted in higher $\delta^{13}\text{C}$ values, varying between 1.52 and 3.29‰. Although the blocks may not be in situ at Borenhult, it is still a sufficient approval of co-occurrence of the *Harpabollia harparum* association and elevated stable carbon isotopic values in the Ordovician-Silurian boundary beds in southern Sweden. Lack of both features in the Råssnäsudden section is likely referring to the absence of Hirnantian strata in this section. The Hirnantian interval could be folded out in the Råssnäsudden section, or may be lacking because of a gap in the succession. Our ostracod and stable isotope data suggest that stratigraphy of the Ordovician–Silurian boundary beds may need to be reconsidered in this area.

Acknowledgements

The author wishes to acknowledge project ETF 8049, supervisors Prof. Tõnu MEIDLA and senior-scientist Oive TINN.

References

- BERGSTRÖM, S.M. & BERGSTRÖM, J. (1996): The Ordovician-Silurian boundary successions in Ostergotland and Vastergotland, S Sweden. – GFF, 118: 25-42, Uppsala.
- MEIDLA, T. (2007): Ostracods from the Upper Ordovician Borenhult fauna, Sweden. – GFF, 129: 123-132, Uppsala.

Authors addresses:

Karin Truuver & Tõnu Meidla

Department of Geology, Institute of Ecology and Earth Sciences, University of Tartu, Ravila 14A, Tartu 50411, Estonia

karin.truuver@ut.ee