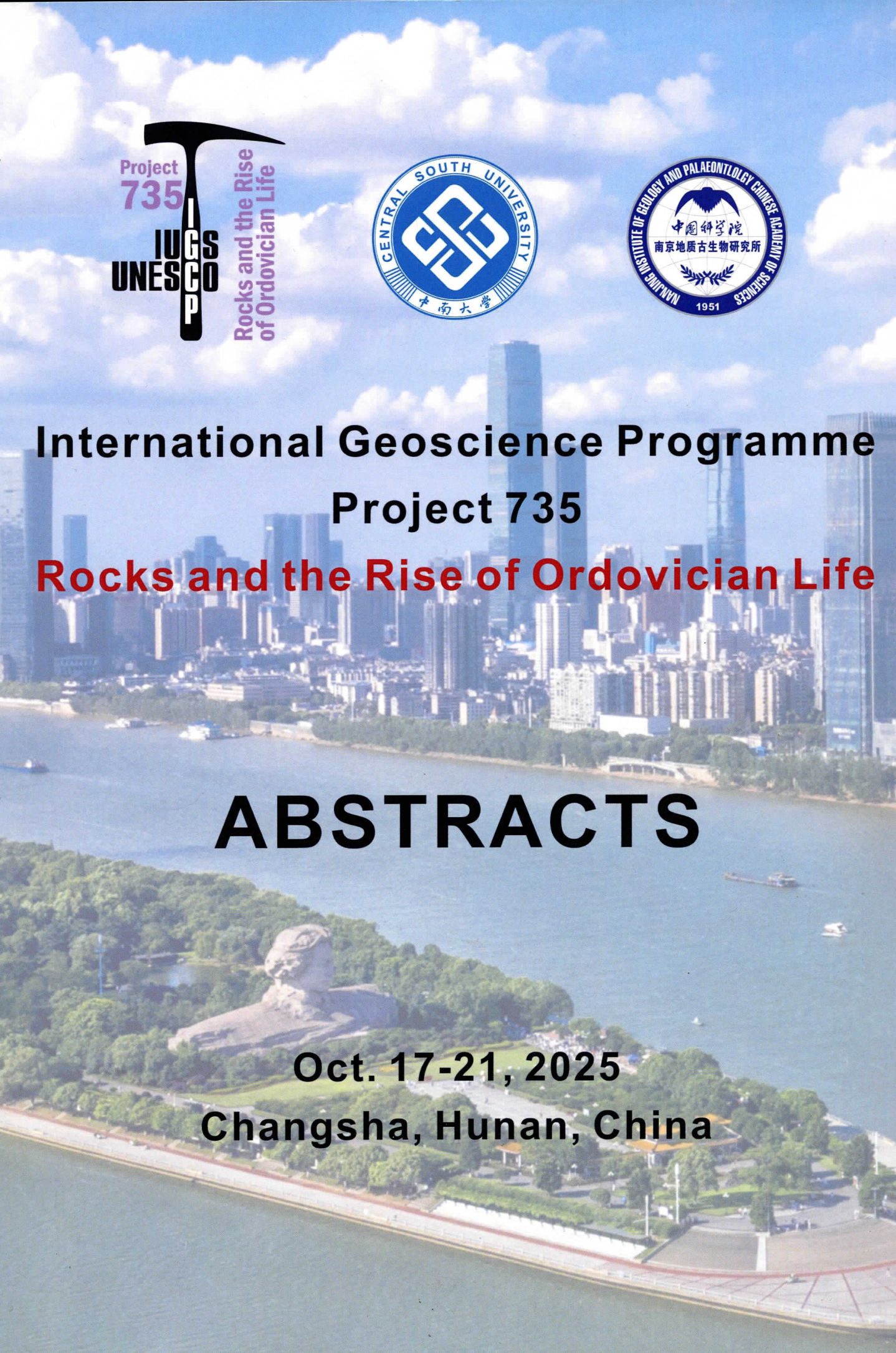

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ABSTRACTS

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Palaeoenvironment implications of a multi-proxy assessment of the Hirnantian–earliest Rhuddanian carbonates of Estonia (Baltica)

Ogechukwu Ann MOGHALU[1,*], Björn KRÖGER[2], Luis BUATOIS[3], Gabriela MÁNGANO[3], Petra TONAROVÁ[4], Olle HINTS[1] and Ursula TOOM[1]

[1] Department of Geology, Tallinn University of Technology, Tallinn, Estonia

[2] Finnish Museum of Natural History, University of Helsinki, Finland

[3] Department of Geological Sciences, University of Saskatchewan, Saskatoon, Canada

[4] Czech Geological Survey, Prague, Czech Republic

** corresponding author e-mail: ogechukwu.moghalu@taltech.ee*

The Ordovician-Silurian boundary marks a significant transition that was characterised by environmental changes that culminated in one of the biggest mass extinctions in Earth's history. Studies have been ongoing to understand the environmental conditions that prevailed during this time. A multi-proxy analysis of Hirnantian to earliest Rhuddanian carbonates from the Reinu quarry in Estonia was carried out, with the aim of reconstructing associated palaeoenvironmental conditions. Microfacies analysis revealed an abundance of whole and fragmented skeletal remains of shallow-marine organisms. Peloids are also abundant, suggesting a somewhat restricted environment. Rounded quartz grains were observed in the upper Hirnantian beds, indicating a contribution from the continent and subsequent reworking. Diagenesis is evident in the presence of blocky and bladed sparry calcite and peloidal cements, commonly associated with early marine burial. Dolomitisation is common in the Hirnantian beds, differentiating them from the Rhuddanian carbonates. Ichnological analysis revealed low to moderate trace fossil diversity, comprising nine ichnotaxa, including *Balanoglossites, Coprulus, Chondrites, Gordia*?, *Multina, Planolites, Paleophycus, Treptichnus,* and *Trypanites,* as well as escape traces. Ichnodiversity peaks towards the latest Hirnantian and falls in the Rhuddanian. Trace fossil abundance is highest in the Rhuddanian, where opportunistic ichnotaxa *Chondrites* and *Planolites* thrived, suggesting a stressed environment. The trace-maker community most probably included polychaete worms, which is inferred from the common occurrence of scolecodonts throughout the section. Preliminary microfossil data suggest that the high abundance of scolecodonts in the Rhuddanian beds correlates with the peak in trace fossil abundance. Chitinozoans are extremely rare in the section, showing the effect of mass extinction, as well as an unfavourable local environment. The results suggest that the palaeoenvironment was likely a restricted carbonate shelf where fauna adapted to changing environmental conditions.

KEY WORDS: palaeoenvironmental reconstruction, sedimentary petrography, ichnology, micropalaeontology, Ordovician-Silurian boundary