Three-dimensional methodology for photogrammetric reconstruction of ichnofossils

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Abstract:

Photogrammetry is a common method, which is used for 3D reconstruction purposes. It shows exceptional results in broad paleontology field (MALLISON & WINGS 2014), as well as in ichnological applications (REMODINO ET AL. 2010; FALKINGHAM ET AL. 2018). This study presents an experimental approach of the usage of photogrammetry in situ for reconstruction of large rock plates, covered with multiple ichnofossils. The studied material and locality is a Silurian limestone from Ohessaare cliffs, Saaremaa, Estonia, where rich bioturbations can be observed at a horizontal outcrop on the sea coast.

Photogrammetric survey was done by using a Canon 80D camera with 24 mm lens. Several GCPs were placed on each rock block and measured with RTK GNSS equipment. Reconstruction was done in Agisoft MetashapePro. Half of all GCPs were used for alignment corrections and another half for model clarification. As a result, orthomosaic and DEM were produced and exported to QGIS software for interpretation.

Reconstructed 3D models of rock plates show that *Rhizocorallium* from the Ohessarre coast has a thinner marginal tube and a burrow outline with the shape of a widely rounded curve and sprite organization more similar to Zoophycos. The outlined studies show prominent results of photogrammetry application in. The authors suggest the usage of this method for reconstruction of ichnofossils in situ.

Keywords: photogrammetry, ichnofossils, 3D reconstruction

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