

# Sea grasses/meadows in the Ordovician and Silurian of Estonia

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Seagrass/seaweed meadows represent over-looked diversity hotspots. They are the key contributors to the production and accumulation of organic matter, and thus a significant factor in controlling biodiversity and sedimentation in the shelf areas. These underwater meadows are made up of “grass-like” flowering plants (mostly angiosperms), which grow on the sandy-mud substrates and less often on the rocks. Recent sea grasses are spread from the tropics to the temperate latitudes in shallow-water coastal areas. This biotope plays an important role as a nursery for invertebrates and fish, a nutrition source, a living substrate for diverse epibionts and a stabilisation of the sediment.

But even less is known about how similar ecosystems functioned in the distant geological past, such as the Palaeozoic, when other organisms, often in association with algae, functioned as a foundation for the underwater meadows instead of angiosperms. Commonly, their role and significance in the fossil record have not yet been fully understood. Since seagrasses/seaweeds are not well predisposed for fossilisation, the primary aim of this project is to use a set of indirect markers/proxies (a combination of palaeontology and organic geochemistry) to be able to identify them in the fossil record.

We have selected six sites in central and northern Estonia: Aru Quarry, a deposit of kukersite near Püssi, Madise Escarpment, Ristna, Sutlema Quarry, and Kalana Quarry, ranging from the Darriwilian to upper Katian (Ordovician) and Llandovery (Silurian). Field investigations were carried out at these sites in an attempt to assess the benthic and nektonic assemblages and to collect samples with organic remains (hydrocarbons) for a geochemical study utilising chromatographic analysis to identify their source and interpret the depositional conditions.

The identified compounds were mainly biomarkers for cyanobacteria and microalgae in all samples (localities), but with varying admixtures of other sources. The analysed samples also indicate that the localities differed in the sedimentary environment, but an increased salinity can be supposed in most of them.

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