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Palynofacies analysis of Upper Silurian deposits from Sweden - Palaeoenvironmental implications

K.M Mehlqvist and V.V Vajda

Lund University, Department of Earth and ecosystem sciences, Lund, Sweden (kristina.mehlqvist@geol.lu.se)

A palynofacies analysis of drill core samples in Klinta 1 and Bjärsjölagård 2 wells intersecting the Upper Silurian Öved-Ramsåsa Group, Skåne, Sweden, reveals the presence of both terrestrial and marine microfossils. Well-preserved spore assemblages produced by early land plants are co-preserved with marine microfossils such as acritarchs and chitinozoans. The depositional environment through the main part of the investigated section is interpreted to be predominantly nearshore marine to lagoonal/intertidal based on the low, but persistent occurrence of acritarchs, together with the high relative abundance of spores. However, the palynofacies assemblages in a specific interval in Klinta 1 record an absence of spores and marine microfossils but instead a high abundance of plant debris, herein interpreted as non-marine deposition possibly in a high energy fluvial deposit. This is the first record of terrestrial depositional environments in the Upper Silurian of Scandinavia. This interval has no equivalent in the sediments of the Bjärsjölagård 2 drillcore, which were probably deposited somewhat further offshore. This is further corroborated by the high abundance of marine microfossils, e.g. chitinozoans, in the topmost part of Bjärsjölagård 2.

Previous studies on Silurian palynomorph assemblages from Sweden has revealed that the relative abundance of spores show an inverse relationship to marine organisms such as acritarchs and chitinozoans, i.e. where spores were abundant, acritarchs and chitinozoans were rare and vice versa. This is supported by the results of this study. Palynofacies analysis can greatly assist the interpretion of depositional environments. The spore-producing plants probably grew along distributary channels and their spores were dispersed by rivers and subsequently became concentrated in the nearshore to offshore environments of the inner shelf; higher relative abundances of spores vs marine microfossils signify closer proximity to land.