A freshwater assemblage from the Hirnantian of Saudi Arabia

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Abstract

A set of 11 samples from the Hirnantian of Saudi Arabia all of which contain the euglenid fossil, *Moyeria* Thusu, were examined for their organic-walled microfossil (OWM) content. Although these samples are dominated by sphaeromorph acritarchs of unknown phylogenetic and geographic provenance, they also contain members of both the Hydrodictyeaceae (*Proteolobus*, *Scenedesmus*) and the Zygnemataceae (*Gelastina*, *Lecaniella*, *Peltacystia*, *Zygnema*). The closest living members of all these green algae are restricted to fresh water settings. Their recovery here extends the geological record of first occurrences for several taxa, including members of the Zygnemataceae, the sister group to the embryophtyes. Cryptospores (*Quadrisporites*, *Velatitetras*, *Abiditusdyadus*, *Rimosotetras* and *Tetrahedraletes*) are common, but other than *Imperfectotriletes*, which are spores that were physically torn from permanent tetrads, there are no trilete spores recovered from these samples. The lack of trilete spores in this deposit is curious, especially given reports of their prior antiquity. The association of some envelope-enclosed tetrads and dyads with freshwater algae lends support of prior proposals that consider *Quadrisporites* and related forms to be classified with the chlorophycean green algae, not as cryptospores.

Keywords: cryptospores, NPP, Zygnema, origin of land plants, lacustrine deposits, freshwater, Hirnantian

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