

# Implications on Source Rock Accumulation from Ichnology in the Ordovician Yeoman Formation, Southeastern Saskatchewan

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## ABSTRACT

The Ordovician microfossil, *Gloeocapsomorpha prisca* Zalessky 1917 has produced valuable hydrocarbon source rocks (kukersites) from around the world. To date, no agreement has been made concerning the life habit of this organism, and the accumulation of beds rich in *G. prisca*. The more popular view is that *G. prisca* was a non-photosynthetic, prokaryotic, benthic algal mat; others believe it was a photosynthetic, eukaryotic, planktonic, possibly prokaryotic organism, which bloomed episodically throughout the Ordovician. Differing evidence and conclusions may be explained because evidence suggests that the alga was preserved at various stages in its lifecycle, i.e. it could be either planktonic or benthic. In an examination of the trace fossils of the Upper Ordovician Yeoman Formation of southeastern Saskatchewan, close relationships were observed between the dispersed organic matter or macerals (kerogen) and the biogenic sedimentary structures. The macerals in these sediments are dominantly composed of the algal microfossil, *G. prisca* alginite. Depending on whether *G. prisca* grew as algal laminae on the seafloor, or was accumulated from a planktonic bloom in the water column, they would have been consumed and processed differently by burrowing infauna. This is especially apparent when comparing how these macerals are distributed in filter- and deposit-feeding burrows. Fluctuations in the abundance of *G. prisca* are related to fluctuating feeding habits represented by the trace fossils. Based on the distribution of *G. prisca* alginite within the trace fossils of the Yeoman Formation, a planktonic nature for this microfossil better explains the accumulation of kukersite beds rich in *G. prisca* in southeastern Saskatchewan.