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Palaeoproterozoic microfossils from the Kondopoga Formation (Eastern Fennoscandian shield).

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Organic-walled microfossils (acritarchs) have been found in Palaeoproterozoic fine-grained siliciclastic rocks of the upper part of the Kondopoga Formation from Russian Karelia (Eastern Fennoscandian shield). They were isolated from the drill core samples by gentle acid maceration. These microfossils consist on a small population of simple unornamented sphaeromorphs 50 to 150 microns in diameter. The Kondopoga Formation is a ca. 500-m-thick unit that lies unconformably on basalts of the Suisari formation. A dolerite sill from the upper part of the Suisari formation yields a Sm–Nd age of 1980+/-27 Ma (Pukhtel et al., 1992). The Palaeoproterozoic sequence in Russian Karelia was deformed and underwent greenschist facies metamorphism during the 1.8-Ga Svecofennian orogeny. The Kondopoga formation is mainly composed of rhythmically bedded sandstones, siltstones and mudstones. The sandstones consist of volcanoclastic material derived from underlying volcanic rocks. Among the clasts are well sorted, poorly rounded particles of basalt and andesite in a feldspar-chlorite matrix. The siltstones consist of poorly rounded grains of feldspar and quartz cemented with chlorite. Chlorite and sericite are the main constituents of the mudstones, which contain around 1 wt.% C_{org} in the form of shungite. The rhythmic beds observed in the formation exhibit a sequence of sedimentary structures typical of turbidity current deposits. Small-scale slump structures and loading features are present. Some features suggest that the sediments were deposited from a multiple turbidity current pulse in a distal part of the basin. The presence of microfossils in $\sim$1.9 Ga carbonaceous shales

suggests that cells were able to synthesize wall biopolymers resistant to strong acids in the lab (HF 70%) (possibly strengthened by taphonomic processes), thus presumably to a range of physicochemical conditions by the middle paleoproterozoic, as extant walled organisms do today (Javaux, 2007). Further analyses will be carried out to determine the biological affinity (prokaryotic-possibly cyanobacterial- or protistan) of the microfossils. Studies of new drill cores recently collected through the ICDP FAR-DEEP project (Melezhik et al., 2005) will provide a refined geological framework and possibly better preserved microfossils.

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