

Graptolite-like fibril pattern in the fusellar tissue of Palaeozoic rhabdopleurid pterobranchs

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The fusellar tissue of Palaeozoic rhabdopleurid pterobranchs has been studied using the SEM techniques. The fibrillar material of Ordovician *Kystodendron* ex gr. *longicarpus* and *Rhabdopleurites primaevus* exhibits a distinct dimorphism, comprising: (1) thinner, wavy and anastomosing/branching fusellar fibrils proper, producing a tight three-dimensional meshwork; and (2) long, more or less straight and unbranched cortical fibrils, sometimes beaded, and arranged in parallel. These fibrils are similar to the fusellar and cortical fibrils of graptolites, respectively. Until now, dimorphic fibrils and their arrangement within fusellar tissue were regarded as unique characters of the Graptolithina. In general, the fibrillar material of these fossils is partially preserved in the form of flaky material (new term) composed of flakes (new term). Flakes are interpreted as flattened structures originating from the fusion of several neighbouring tightly packed fibrils. A Permian rhabdopleurid, referred to as *Diplohydra* sp., reveals a fabric and pattern of fusellar tissue similar to that of both Ordovician rhabdopleurids but devoid (?) of cortical fibrils. The results presented here question views that: (1) substantial differences in fabric and pattern of fusellar tissue exist between fossil pterobranchs and graptolites; and (2) the ultrastructure of pterobranch periderm has remained unchanged at least since the Ordovician. The Palaeozoic rhabdopleurids investigated are closer ultrastructurally to graptolites than to contemporary pterobranchs. The pterobranchs and the graptolites should be treated as members of one class - the Graptolithoidea.

Key words: Pterobranchs, rhabdopleurids, graptolites, ultrastructure, periderm, taxonomy, Ordovician, Permian.

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