

**PALEOECOLOGIC AND TAPHONOMIC CONSIDERATIONS OF A  
HEXACTINELLID SPONGE FAUNA FROM THE SEPTARIENTON  
(RUPELIUM, OLIGOCENE) OF BAD FREIENWALDE (NE-  
GERMANY) AND THE FIRST FOSSIL SPECIES OF ASCONEMA**

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Exceptionally well preserved hexactinellid sponges were found in the Septarienton (Rupelium, Oligocene) of a clay pit near Bad Freienwalde (NE Germany). The fauna is of moderate diversity, but with high individual numbers. It consists of Amphidiscophoran, as well as hexasterophoran species: *Asconema* n. sp. (Hexasterophora, Lyssacinosa), the so far first fossil representative of this genus, *Aphrocallistes* sp. (Hexasterophora, Hexactinosa) and *Hyalonema* sp. (Amphidiscophora). *Asconema* and *Aphrocallistes* show high plasticity in body form which seems to be linked with environmental parameters.

The three-dimensional, pyritic preservation suggests specific embedding and preservation conditions: First, the fast embedding is assumed to have been caused by mudflows; second, early diagenetic processes in the anoxic microenvironment are considered responsible for the pyritic preservation.

Sedimentological observations and the low diversity of the comparably small sponges indicate a slightly restricted, maybe temporarily dysoxic, environment. This was characterized by relatively low levels of sedimentation and turbulence, which is a precondition for the settlement and body-preservation of lyssacinosan hexactinellids. These environmental conditions were disturbed only by episodic mudflows.

The paleoenvironment of the sponges is reconstructed as a shallow shelf - possibly in the distal range of a delta. The occurrence of Hexactinellida in an environment shallower than it is usually the case has several reasons. First, relatively cool water offers good living conditions for hexactinellid sponges. Second, the soft sediment with only little substrate material (e.g. shells) offers good settling conditions for sponges adjusted to soft grounds. Third, the relatively low diversity of the sessile benthos caused only little ecological pressure for relatively slowly growing sponges.