

A BATHYAL-TYPE AGGLUTINATED FORAMINIFERA ASSOCIATION  
FROM A SANTONIAN HIPPURITID PATCHREEF-LAGOON  
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Single small Hippurites patchreef complexes occur together with associated reef environments in the Late Cretaceous Hochmoos Beds (Santonian; *Dicarinella asymmetrica* - zone) of the Gosau area (Salzkammergut, Austria). They usually contain typical shelf-sea benthic assemblages (calcareous algae, foraminifera, "micro"-gastropods; HÖFLING, 1985). The dark, silty, approximately 20 cm thick shales of the backreef lagoon of the Unterbrein patchreef complex (NE Rußbach) exhibit a peculiarity not usually found in the general palaeobathymetric situation: an abnormal fauna of arenaceous foraminifera with taxa which are known from flysch-type series of the Late Cretaceous and Palaeogene and from the bathyal of modern seas (e.g. HART, 1983).

Strongly represented are "simple", tubular morphotypes, especially *Bathysiphon* and *Reophax*. These are almost without exception agglutinated with idiomorphic pyrite crystals. Also present are *Dendrophrya*, *Ammodiscus* and *Glomospira*, some with pyrite-filled tests. They are associated with ataxophragmiids, nubeculariids, nodosariids, osangulariids and smooth-shelled ostracods which show no evidence of pyritization (post-mortem faunal mixture). The *Astrorhizidae*-*Hormosinidae* association of that type has been identified for the first time in an Alpine Late Cretaceous shallow marine depositional environment.

The high amount of pyrite indicates that a temporary anoxic situation with stagnant bottom water dominated in the lagoon. Special physico-chemical conditions (mainly linked to Eh/pH) were responsible for the subsequent biogeochemical reactions. These quite probably favoured the bacterially inflated formation of pyrite which collected in the mud of the lagoon floor.

The immigration of the bathyal-type agglutinants into this temporary, extreme biotope might possibly have been through the current transportation of small-sized specimens and/or intermediate stages of the foraminifera's life cycle (gamonts, schizonts) from the deeper regions of the sea. The high individual count suggests that the environment was particularly suitable for *Bathysiphon* and *Reophax*. According to MOORKENS (1976, 1984) modern tubular *Astrorhizidae* are also known to exist in H<sub>2</sub>S-rich clayey mud.

The shales which overlie the whole patchreef complex contain "normal" foraminiferal faunas in typical shelf-sea assemblages.

**References:**

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