

The first hexactinellid sponge skeleton from the Cretaceous of Austria (Schrambach Formation, Northern Calcareous Alps)

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The Early Cretaceous outcrops at Klausbachgraben yield abundant and diverse radiolarian and sponge-spicule microfauna. Macrofossils, represented mainly by ammonites and accompanying epifauna (bivalves, serpulids), have been collected and studied by A. Lukeneder, suggesting Late Hauterivian age. During 2016 field-season he found very unusual fossil – a large sponge skeleton encased in silicified calcareous wackestone. This unexpected finding actually represents the first hexactinellid sponge skeleton from the Cretaceous of Austria; its taxonomical, palaeoecological and palaeobathymetrical significance is therefore discussed herein.

The studied outcrops belong to a Lower Cretaceous (Berriasian-Aptian) pelagic to hemipelagic succession of the Bajuvaric Langbath Zone (Northern Calcareous Alps, Upper Austria). The studied sites are outcrops of the High Bajuvaric Unit west of the Lake Traunsee, in the northernmost part of the Northern Calcareous Alps.

The sediment encasing the studied sponge forms irregular calcareous nodule showing early diagenetic microcrystalline silicification. Sediment adhering to walls of the sponge is composed of abundant radiolarian tests, sponge spicules and fragments of sponge skeletons. All these siliceous bioclasts show traces of silica dissolution in places (corroded surface) but secondary silica deposition was documented too - both in the sponge wall (in the form of chalcedony quartz) and in the matrix (microcrystalline silica).

The sponge skeleton is irregularly spreading with peripherally branching and anatomising tubes. Skeletal canals are represented by closely spaced diaphragms perforating both skeletal surfaces. Canal openings of dermal and gastral surface are closely spaced, rounded, oval to polygonal in shape and arranged in seemingly regular honeycomb-like pattern. Cortical meshwork on dermal side is relatively dense with secondarily enlarged nodes in the centre of hexactinosidan spicules. The wall of the sponge is lacking any superficial network on both gastral and dermal surface of the skeleton. All above given characteristics are typical for genus *Aphrocallistes* Gray (class Hexactinellida Schmidt, order Hexactinosida Schrammen, family Aphrocallistidae Gray). More detail examination of studied material will allow comparison with other known *Aphrocallistes* representatives.

Hexactinellid sponges are important source of palaeobathymetrical and palaeoecological data. This is true especially for *Aphrocallistes alveolites* (Campanian-Maastrichtian of Germany and Poland), showing adaptations for both soft-bottom sediments and calm, non-disturbed (neritic) offshore shelf environments. Similar palaeoenvironmental conditions are also suggested for studied sequence, as also evidenced by (1) abundant radiolarians, (2) presence of other groups of siliceous sponges (represented by isolated spicules only) and (3) presence of ammonite shells with numerous epibionts (bivalves, serpulids), that took advantage of scarcely available hard-substrate.