Ber. Inst. Geol. Paläont. K.-F.-Univ. Graz	ISSN 1608-8166	Volume 7	Graz 2003

THE FIRST FOSSIL *ROSSELLA* (PORIFERA, HEXACTINELLIDA) FROM THE UPPER CRETACEOUS (CONIAC) OF BORNHOLM (DENMARK) AND PROBLEMS OF CLASSIFICATION WITHIN THE FOSSIL LYSSACINOSA

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The island of Bornholm in the Baltic Sea is a horst within the Fennoscandian Border Zone, which represents the marginal area between the stable Precambrian Baltic Shield and the subsiding late Palaeozoic-Mesozoic Danish subbasin. The northern part of Bornholm consists of Precabrian basement. The southern and western parts of the island consist of Palaeozoic and Mesozoic rocks in the form of down-faulted blocks.

The lyssacinosan Hexactinellida occur only at the type locality of the Arnager Limestone Formation (Coniac), which is exposed in a small stripe on the south coast immediately West of the town Arnager.

The mainly two-dimensionally preserved sponge fauna is comprised largely of lyssacinosan Hexactinellida, which consist predominantly of Rossellidae. The preservation of these non-rigid sponges is normally very poor, because of their soft skeleton of non-fused spicules. Without a rigid skeleton the sponge disintegrates as soon as the soft parts decay, therefore normally only isolated spicules can be found. The good preservation of these non-rigid and fragile Arnager sponges is the result of 1) a fast sediment covering and 2) a bacteria-induced pyritization of the spicules, which took place already during the decay of the just covered sponges.

The new *Rossella* has a cup-shaped form with a dense skeltal lattice formed by diactine bundles and hexactines. Round to oval wall openings are arranged in staggered rows. The diactine bundles are mainly parallel or diagonal to growth direction. Hypodermalia are paratropal and orthotropal pentactines, autodermalia are hexactines. The root tuft is long and moderately dense, with spicules on average 45 mm long. Basalia include 3- and 4-rayed orthotropal anchors. The new species is assigned to the genus *Rossella* Carter, 1872 because of its combination of skeletal characters: choanosomal diactine bundles and larger hexactines, protuding hypodermal paratropal and orthotropal pentactines, autodermal hexactines and diactines, and a large untwisted root tuft consisting of long anchoring spicules (orthotropal pentactines and perhaps paratropal pentactines and diactines).

The most important tool for the identification of recent lyssacinosan (and other) Hexactinellid species are the microscleres. This type of spicules, however, is normally not preserved in the fossil record, and in the unusual case of such preservation, the microscleres are found only isolated in the sediment. Due to the general absence of microscleres, the megascleres and the external habitus that are the most important criteria for classification of fossil sponges. Therefore, the comparison of the lyssacinosan sponges from the Arnager limestone with recent representatives by analysing the skeletal architecture is attempted. This includes the occurrence, distribution, sizes and pattern of the megascleres, particularly the choanosomalia, hypodermalia, lateralia and basalia. The assessment and analysis of their general form, fixation and external wall structures (internal/external openings, small elevations) are equally important. However, the two-dimensional preservation of the Arnager sponges and the pyritization of the spicules add to the difficulties of comparison and classification.