Rugose corals

BJÖRN NEUMAN and NILS-MARTIN HANKEN

Following the pioneer studies of Linnaeus (1745, 1758), rugose corals from Gotland have been described in numerous papers. In early studies species were characterized by external features alone (e.g. Hisinger 1831, 1837; Milne-Edwards & Haime 1851; Lindström 1865) or by external features combined with some internal characters based on one or two thin sections (e.g. Lindström 1870, 1882, 1896; Dybowski 1873; Lang & Smith 1927; Smith & Tremberth 1929). Wedekind (1927) attempted a monographic description of a substantial part of the rugose coral fauna of Gotland but he used an extremely narrow concept of species, in a number of which internal characters were not studied at all. A few recent papers on rugose corals also include material from Gotland (Weyer 1973, 1974; etc.).

Koch (1882) described in some detail the budding of corallites in colonial Rugosa from Gotland. First attempts at ontogenetic studies in solitary forms were published by Ryder (1926) and Vollbrecht (1928). Minato’s (1961) very interesting paper on some rugose corals from Gotland unfortunately lacked both locality and stratigraphical data. Neuman (1974) emphasised that during ontogeny, morphological features of solitary forms display a great variation in shape as well as construction. There is also some variation at the same ontogenetic stage between different specimens of a species. For a safe specific identification, study of serial sections, including both adult and pre-adult growth stages, is normally required.

At present the following groups of rugose corals from Gotland are being studied monographically: Acervularia by Hanken, and the genera Phaulactis, Araeopoma, Saucrophyllum, and Arachnophyllum by Neuman.

Because of the lack of modern monographic studies of the Gotland rugose fauna, it is not only difficult to identify, but in many cases also to define a species. Most of the specimens from Vat tenfallet were sectioned, and on average two to four dry peels produced from each sectioned coralite (in total approximately 800 peels). In addition, the calices of several specimens were carefully cleaned, with those in colonial forms being prepared by means of a new method elaborated by Hanken (ms. in preparation). The type specimens of species described by Lindström (1865, 1870, 1882, 1896), Ryder (1926), Wedekind (1927), and Vollbrecht (1928) were available for study and comparison. However, despite these factors some of the identifications remain uncertain and may be subject to change when monographic studies are completed.

The total number of specimens of rugose corals in the material from Vat tenfallet is 550, distributed among the following families: Streptelasmatidae
(260), Halliidae (99), Arachnophyllidae (37), Acervulariidae (9), Calostylidae (13), Spongophyllidae (5), Ptenophyllidae (8), Trysplasmatidae (57), Cystiphyllidae (34), and Goniophyllidae (4). In addition, there are 20 pre-adult streptelasmatids or halliids and 4 unidentified specimens. In this contribution Hanken is responsible for identification of colonial rugose corals (acervulariids and 5 colonies of *Tryplasma*) and Neuman for solitary corals (all other material).

For distribution in the Vattenfallet section see Fig. 25.

Annotated faunal list

Streptelasmatidae

Halliidae
*Holophragma calceoloides* Lindström, *Phaulactis cyathophylloides* Ryder, P. sp. a, P. sp. b.

*Phaulactis cyathophylloides* and P. sp. a. seem to be identical during the early growth stages of the corallite and juvenile specimens can therefore not be identified at species level.

Arachnophyllidae
*Entelophyllum visbyense* Wedekind, E. sp. a, *Kyphophyllum lindstroemi* Wedekind.

Acervulariidae
*Acervularia breviseptata* Weissermel, A. sp. a, A. sp. b.

Calostylidae
*Calostylis concavotabulata* Ma. Weyer (1973, Pls. 1–2) figured the ontogeny of the species based on material from Visby cementfabrik. The material from Vattenfallet seems to be conspecific.

Spongophyllidae
*Ketophyllum hoegbomi* Wedekind, K. sp. a (a single specimen).

Ptenophyllidae
*Spongophylloides* (*Actinocystis*) sp. a.
Tryplasmatidae

_Tryplasma glabra_ (Lindström), _T. hedstroemi_ Wedekind, _T._ sp. _a_, _T._ sp. _b_, _Palaeocyclus porpita_ (Linnaeus), _Rhabdocyclus_ sp. _a_ (one specimen), Tryplasmatidae n. gen., n. sp. (a single specimen). _Tryplasma hedstroemi_ and _T._ sp. _a_ are solitary whereas _T._ sp. _b_ is colonial.

Cystiphyllidae

_Hedstroemophyllum_ sp. _a_, _Araeopoma elongatum_ (Lindström).

**Taxonomic remarks**

As noted above, because of the present unsatisfactory knowledge of ontogeny in many species, including type species, a number of specific and generic taxa remain poorly defined. Many subjective synonyms have been established during this study. A preliminary partial synonym list is included here for some of the Vattenfallet species, based on examination of the type specimens.

*Rhegmatophyllum conulus* (Lindström, 1868)  
**Synonym:** _Rhegmatophyllum slitense_ Wedekind, 1927. For further information, see Weyer (1974:162–163).

_Crassilasma_ Ivanowsky, 1962  
The genus (type species: _C. simplex_) was defined by Ivanowsky (1962, 1963, 1965). _Crassilasma_ sp. _a_ shows the following features characteristic of the genus: Irregularly twisted septa, strongly dilated during early ontogeny; in later stages of ontogeny the dilatations of the major septa become reduced axially; tabulae rare and convex.

_Phaulactis cyathophylloides_ Ryder, 1926  
**Synonyms:** _Lycophyllum tabulatum_ Wedekind, 1927, _L. irregulare_ Wedekind, 1927, _L. torquatum_ Wedekind, 1927, _L._ sp. (Wedekind 1927, Pl. 5:12–13), _Lykocystiphyllum hoegklinti_ Wedekind, 1927, _L. oppositum_ Wedekind, 1927, _Aulacophyllum_ sp. (Wedekind 1927, Pl. 17:11–12), _Phaulactis irregularis_ (Wedekind) (in Minato 1961, Pls. 5–7, 17). A more detailed revision may reveal further synonyms. In _Phaulactis_ the internal morphology seems to vary widely within a species, probably as a response to various growth conditions. One or two transverse sections of each corallite examined by most previous authors did not reveal the range of intraspecific variation of morphological structures.

_Entelophyllum visbyense_ Wedekind, 1927  
**Synonym:** _E. anschuetzi_ Wedekind, 1927.
Kyphophyllum lindstroemii Wedekind, 1927

Acervularia sp. a
Probable synonym: Rhabdophyllum conglomeratum Wedekind, 1927.

Ketophyllum hoegbomi (Wedekind, 1927)

Tryplasma hedstroemi (Wedekind, 1927)
Synonyms: Pholidophyllum hedstroemi var. attenuata Wedekind, 1927, P. cylindricum Wedekind, 1927 (Pl. 3:5), P. intermedium Wedekind, 1927, P. intermedium var. articulatum Wedekind, 1927, P. tenue Wedekind, 1927 (Pl. 3:12), P. coniforme Wedekind, 1927 (Pl. 3:14), P. crassum Wedekind, 1927 (Pl. 3:15), Zelophyllum hoegklinti Wedekind, 1927 (Pl. 6:11–13). This species resembles Tryplasma loveni (Edwards and Haime) as defined by Hill (1936:206, Pl. 30:46–47) but has a much higher frequency of tabulae.

Hedstroemophyllum sp. a

Remarks

In terms of numerical abundance of rugose corals, Crassilasma sp. a (186 specimens), Dalmanophyllum dalmani (37) and Phaulactis cyathophyllioideos (28) comprise the main elements of the fauna. The greatest taxonomic diversity at Vattenfallet is in the upper part of the Upper Visby Marl, Höglklint a, and the base of Höglklint b. Hanken observed that five of the six colonies of Acervularia were worn prior to final deposition.

Details of the vertical range of various rugose coral species in the stratigraphical interval under consideration are poorly known. Phaulactis cyathophyllioideos, Dinophyllum involutum and Goniophyllum pyramidale also occur in the Lower Visby Marl, and the two latter species range farther into the underlying Arachnophyllum Beds. Rhegmaphyllum conulus and Acervularia
*brevisepatata* are common in the Slite Beds. The former species is here recorded for the first time from the Hökklint Limestone.

**REFERENCES**


