**Wienbergia**, new genus for *Barroisia faxensis* (Porifera: Demospongia) from the Middle Danian of Denmark

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In 1899 Ravn described the calcareous sponge *Barroisia faxensis* from the coral limestone of Fakse quarry (Middle Danian, Denmark). Ravn's material consisted of 7 specimens. The recent discovery of a well preserved specimen, and comparison with a related sponge having an aspicular skeleton composed of aragonite, made a reinterpretation necessary, especially as Ravn's species so far is the only known Tertiary Sphinctozoan. Reexamination made it clear that the Fakse material does not belong to the genus *Barroisia*, so a new genus is created for it herein.

**Wienbergia** n.g.
Type species. **Wienbergia faxensis** nomen subst. pro *Barroisia faxensis* Ravn, 1899.

Diagnosis: see diagnosis of *W. faxensis*.

Derivatio nominis: In honour of the late H. Wienberg Rasmussen.

**Wienbergia faxensis**
1899 *Barroisia faxensis* Ravn, p. 28, pl. 1, figs. 4–5.
1929 *Barroisia faxensis* Ravn, Voigt, p. 84.

The rare Middle Danian sponge, *Barroisia faxensis* Ravn, is redescribed under the new name *Wienbergia faxensis*. The new genus has characters which suggest that it should be placed in the order Sphinctozoida. This genus may represent a link between the Cretaceous genus *Barroisia* and the “living fossil” *Neocoelia crypta*.


**Diagnosis**

Sponge, simple in outline; cylindrical; chambers subglobose to discoidal; ambisiphonate. Larger specimens are usually bent as if restricted within a cavity. The more or less marked bulges are caused by irregularities in chamber thickness. There are no signs of branching.

The surface ornamentation consists of numerous fine pores which produce a fine reticulate pattern.

The skeleton is constructed of chambers that are supported by pillars orientated perpendicular to the walls. The walls of successive chambers are closely connected. There are no spicules.
Differential diagnosis

Wienbergia n.g. is different from the Cretaceous Barroisa by not possessing spicules in a systematic arrangement. Wienbergia n.g. differs from Neocoelia in being much larger, bending and presumably by not being branching.

Relationship

The relationship between Barroisia and related sphinctozoida has been examined by Reid (1968). He concluded that the genus Barroisia, which is restricted to the Cretaceous (England), and the closely related Tremacystia of same age, contain spicules in a systematic arrangement, and he redefined (Reid, 1968:9) these two genera on the basis of this arrangement.

In contrast, some other sphinctozoans do not possess spicules and, according to Reid (1968), this indicates that the group is polyphyletic.

Vacelet (1978) tried to solve this problem by erecting a new order, Sphaerocoelida for Cretaceous sponges having sphinctozoan structure and a skeleton of calcareous spicules, and placed this order within the Class Calcispongea. The Sphaerocoelida are thus regarded as homeomorphs of the Sphinctozoa, which Vacelet (1978) has shown to be an order of the class Demospongea.

Vacelet (1977) has described a living sphinctozoan from the Indian Ocean and New Caledonia. The skeleton of this form, Neocoelia crypta Vacelet, 1977, lacks spicules and is composed of aragonite. The living tissue lies inside the series of chambers. The histology, cytology and sexual reproduction are similar to those of the genus Ceratinomorpha in the class Demospongea (Vacelet, 1978:483).

Wienbergia faxensis shows a remarkable likeness to Neocoelia crypta in the skeletal structure, indicating close relationship.

Wienbergia n.g. is the only sphinctozoan so far known from the Tertiary and it is morphologically closely related to both Barroisia and to Neocoelia. This genus may thus represent a link between these two genera.

Spicules

Wienbergia faxensis contains no spicules and Ravn (1899:30) assumed that these had been dissolved like the rest of the skeleton. In one case (fig. 9–11) where the ubiquitous layer of cement is particularly thin and the chambers empty of sediment, the columns and the chamber wall can be seen clearly. However, close examination of these well-preserved parts has failed to reveal moulds of spicules, and it must therefore be assumed that there were none.

Ecology

Neocoelia crypta was found on the outer slope of coral reefs. The specimens occured preferentially in waterdepths of 15–38 m., within small cavities formed by accumulation of coral debris (Vacelet, 1978). A similar habitat, associated with microcavities in coral facies, is suggested for Wienbergia faxensis.

The environments in which the limestones were deposited have been subject to lively discussion. Asgaard (1968) gave a review of the different suggestions and, partly based on the probable presence of algal borings, suggested a water depth of 50–80 m.

Wienberg Rasmussen (1973) described a photophobic cavity-inhabiting fauna of Cyanthidium holopus growing mouth-downwards and concluded from this, and the presence of other light-shy faunal elements, that the coral limestone was formed within the photic zone.

If we may assume that the close phylogenetic relationship indicated by the morphology of
Wienbergia faxensis and Neocoelia crypta represents a basis for assuming a similarity of life habit, then the presence of *W. faxensis* at Faxe might be taken to indicate a water depth closer to 50 than 80 m.

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Dansk sammendrag


References


Figure 7–11. Sem-pictures of *Wienbergia faxensis* t.g. showing details of structure. P. C. Toft coll.

Fig. 7. Details of part of the structure showing chambers supported by pillars orientated perpendicular to the walls. ×15.

Fig. 8. Closeup of moulds after walls between two chambers showing the close connecting. ×110.

Fig. 9. Well-preserved part of the specimen showing a thin layer of ubiquitous cement. There are no sign of moulds after spicules. ×65.

Fig. 10. Closeup view of connection between two pillars. ×220.

Fig. 11. Internal view into the mould of one of the pillars. ×900.