An unexpected gastropod–A possible representative of the predominantly Mesozoic family Spinilomatidae (Mollusca: Caenogastropoda) found in the Middle Danian (Early Paleocene) coral…

Poster · December 2016

CITATIONS
0

READS
22

3 authors, including:

Kai Ingemann Schnetler
37 PUBLICATIONS **175** CITATIONS
SEE PROFILE

Jesper Milàn
Østsjællands Museum
127 PUBLICATIONS **1,085** CITATIONS
SEE PROFILE

AN UNEXPECTED GASTROPOD

- A POSSIBLE REPRESENTATIVE OF THE PREDOMINANTLY MESOZOIC FAMILY SPINILOMATIDAE (MOLLUSCA: CAENOGASTROPODA) FOUND IN THE MIDDLE DANIAN (EARLY PALEOCENE) CORAL LIMESTONE OF FAXE QUARRY, DENMARK

KAI INGEMANN SCHNETLER[1] & JESPER MILÀN[2,3]

[1]FUGLEBAKKEN 14, STEVNSTRUP, DK-8870 LANGÅ, DENMARK
[2]GEOMUSEUM FAXE/ØSTSJÆLLANDS MUSEUM, HØJERUP BYGADE 38, DK-4660 STORE HEDDINGE, DENMARK
[3]NATURAL HISTORY MUSEUM OF DENMARK, ØSTER VOLDGADE 5-7, DK-1350 COPENHAGEN K., DENMARK

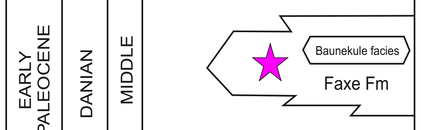
Abstract

The coral limestone of the Middle Danian (Early Paleocene) Faxe Formation in Faxe Quarry, Denmark has yielded a very diverse mollusc fauna, with more than 220 recorded species of gastropods alone (Ravn 1933, Lauridsen & Schnetler 2014). A new find is identified as a possible representative of the family Spinilomatidae. The specimen is preserved as an impression in the consolidated limestone, but by making a silicone mould of the impression a perfect cast of the specimen was retrieved enabling the identification. The family Spinilomatidae was until now known from the Mesozoic of Europe and India and from the Late Paleocene of California. This extends the biogeographical range of the family to Europe and highlights Faxe Quarry's importance as a locality for collecting and studying Early Paleocene fossils.

Faxe Quarry

The Middle Danian Faxe Formation, which is exposed in the Faxe Quarry, eastern Denmark, represents an extraordinary well-preserved deep water coral mound complex. The coral mound complex is dominated by three framebuilding azooxanthellate scleratinian coral species, of which *Dendrophyllia candelabrum* is by far the most common, followed by *Faksephyllia faxoensis* and a minor content of *Oculina becki*. The Faxe Formation is unique to the area and represents the oldest and best developed cold water coral mound complex of its kind with only a few limited patch reefs known from elsewhere in the Danish Basin (Lauridsen et al. 2012).

Coral limestone of the Faxe Formation dominated by *Dendrophylia candelabrum*

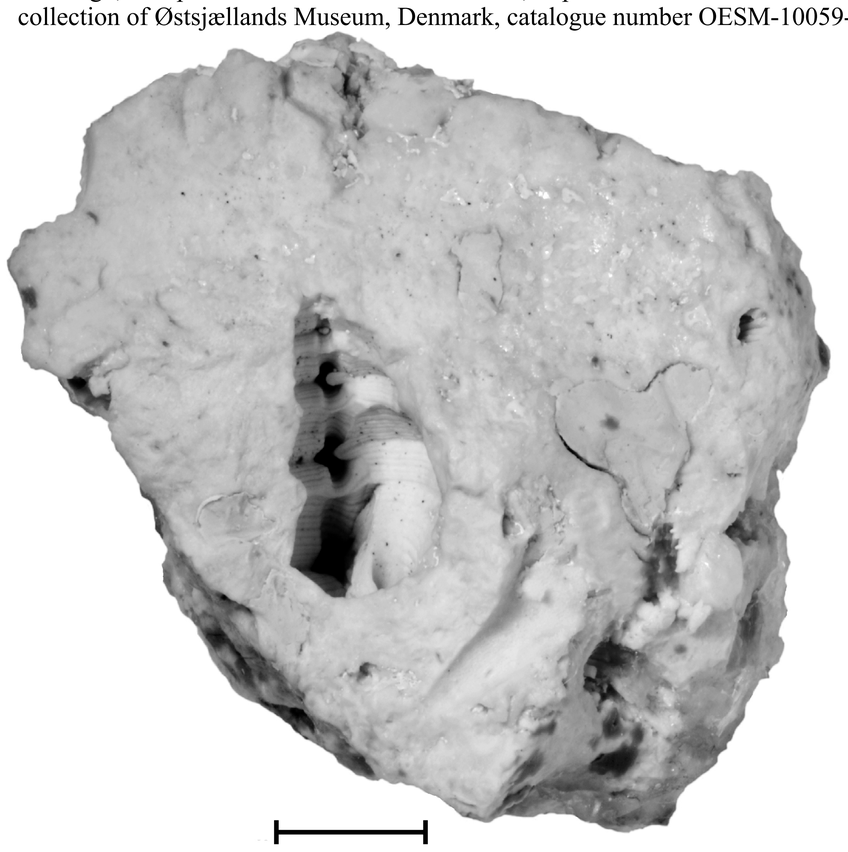


Chrono-stratigraphy			Lithostratigraphy
MIDDLE PALEOCENE	SELANDIAN		Lellinge Greensand Formation
EARLY PALEOCENE	DANIAN	UPPER	København Limestone Fm
		MIDDLE	Faxe Fm
		LOWER	Stevns Klint Fm
			Rødvig Fm: Cerithium Limestone Mb / Fiskeler Mb

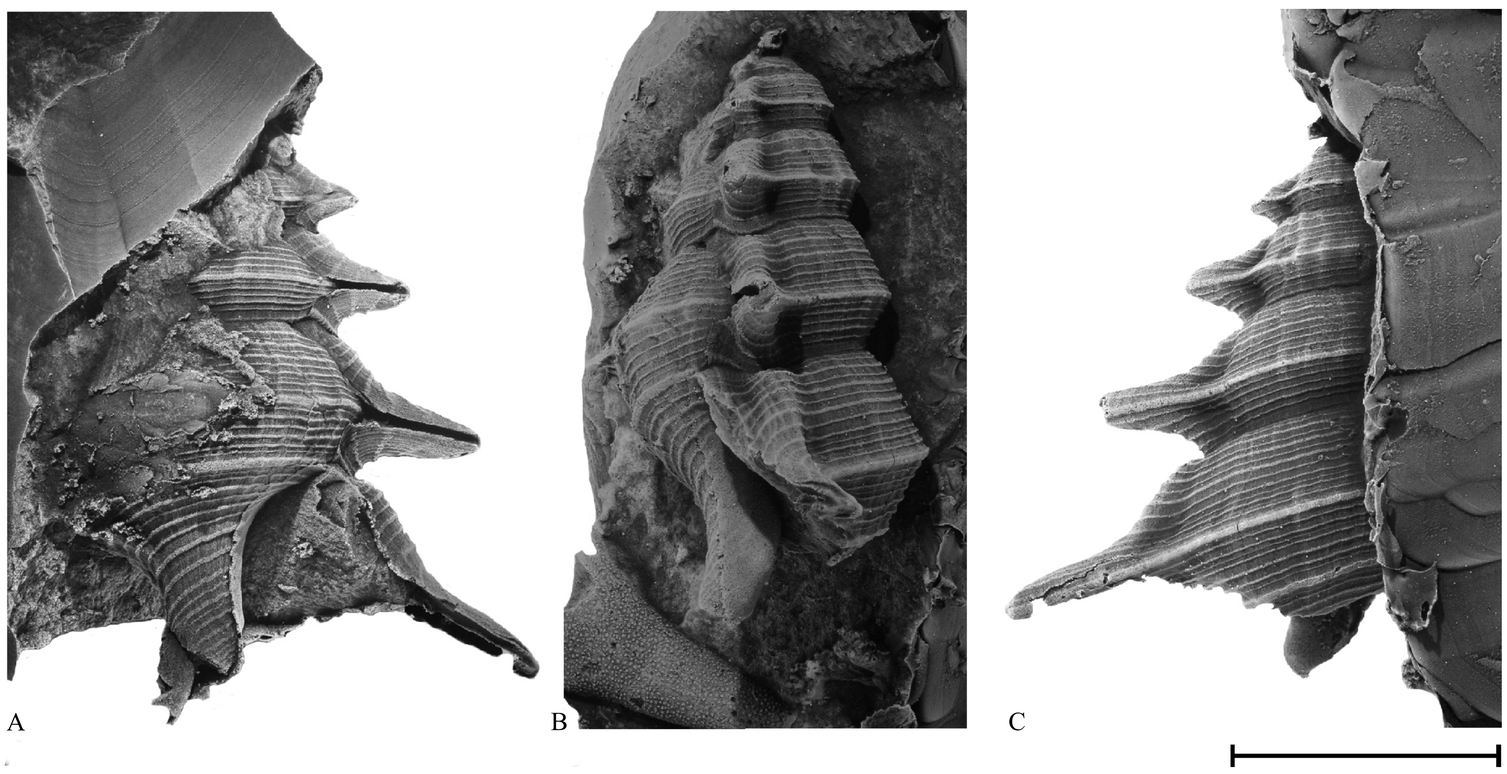
Scheme of the Lower and Middle Paleocene formations in Danmark. (Lauridsen et al. 2012).

The Specimen

The unique specimen described was found in Faxe Quarry in 1994 by the late Mrs. Alice Rasmussen (1932-2013) in an area of freshly quarried limestone. The specimen is preserved as an impression in consolidated coral limestone. The original aragonitic shell of the gastropod was dissolved after hardening of the sediment and a perfect cast of the shell morphology was obtained by making a silicone cast of the impression in a vacuum chamber. Although, the specimen was not collected in situ, impressions of scleratinian corals in the same slab could be identified as *Dendrophyllia candelabrum,* securing the provenience of the specimen. The specimen is now part of the collection of Østsjællands Museum, Denmark, catalogue number OESM-10059-21631.



The specimen as it was discovered preserved as an empty void in a piece of coral limestone. Scale bar equals 10 mm.



Silicone cast of the void, revealing the complete morphology of the gastropod. A: apertural view, B: lateral view, C: rear view. Scale bar equals 10 mm. Photos by Sten Lennart Jakobsen.

Discussion

The Faxe species is assigned to the family Spinilomatidae because of the presumed spines on both sides of the spire and the prevailing spiral ornament. As neither the protoconch, first intermediate whorl nor the anterior part of rostrum are preserved, the assignment to genus is somewhat uncertain. The species matches *Spiniloma* Gründel, Nützel and Schulbert, 2009 with regard to the presence of projecting spines on all teleoconch whorls, spines on the carina, one spine on the labrum and the general outline with prevailing spirals on the teleoconch whorls. The species differs from *Spiniloma* especially by having a wider aperture, a slightly concave columella and a curved and shorter rostrum.

The genus *Spinigeropsis* with type species *Spinigeropsis calafia* Squires and Saul, 2001 is described from the late Paleocene of southern California. *Spinigeropsis* differs from *Spiniloma* by having no digitations on uppermost spire, shorter digitations on middle part of spire, two rather than just a single digitation on left side of the body whorl, posteriorly directed digitations, and a bent and much shorter rostrum. The genus is by Wieneke (2015) assigned to the family Spinilomatidae. The Faxe species matches *Spinigeropsis* with regard to the rather short and bent rostrum, suggested axial ribs and the broader basis and rostrum, but differs by having spines on all teleoconch whorls and only one spine on the labrum.

Among the genera of Spinilomatidae the Faxe species matches *Spinigeropsis* and *Spiniloma* best. A larger material may result in an establishment of a new genus, but preliminary we prefer to assign it to the genus *Spiniloma*, as the species in general outline, spiral ornament and the arrangement of spines comes closest to this genus. As the assignment is somewhat uncertain, we suggest *Spiniloma* (s. lat.) for the species.

Conclusions

-The specimen from Faxe represents the first Cainozoic representative of the Mesozoic family Spinilomatidae, found outside North America, implying that the family also survived the K/Pg boundary in Europe.

-The genus *Spiniloma*, which previously was known exclusively from Jurassic and Cretaceous strata, seems to have survived into the Middle Danian.

-The coral mound complex of the Faxe Formation in Faxe Quarry was dominated by gastropod species with a preference for hard substrates, but soft substrate genera as *Spiniloma* were also present, but extremely rare.

Literature cited

Gründel, J., Nützel, A. and Schulbert, C. 2009: Toarctocera (Gastropoda, Aporrhaidae): A new genus from the Jurassic (Toarcian/Aalenian) of South Germany and the early evolutionary history of the family Aporrhaidae. Paläontologische Zeitschrift, 83(4): 533–543.
Lauridsen, B.W. and Schnetler, K.I. 2014: A catalogue of Danian gastropods from the Baunekule facies, Faxe Formation, Denmark. Geological Survey of Denmark and Greenland Bulletin 32, 117 pp.
Lauridsen, B.W., Bjerager, M. and Surlyk, F. 2012: The middle Danian Faxe Formation–new lithostratigraphic unit and a rare taphonomic window into the Danian of Denmark. Bulletin of the Geological Society of Denmark 60, 47–60.
Ravn, J.P.J., 1933: Études sur les pélécypodes et gastropodes du Calcaire de Faxe. Det Kongelige Danske Videnskabernes Selskabs Skrifter, naturvidenskabelig og mathematisk Afdeling, 9(2): 1–74.
Squires, R.L. and Saul, L.R. 2001: A new Genus of Aporrhaid Gastropod from Upper Paleocene Rocks in Southern California. The Veliger 44(3): 327–330.
Wieneke, U. 2015: Gastropoda Stromboidea. in Wieneke, U., Stoutjesdijk, H., Simonet, P. and Liverani, V. (eds), "Spinilomatidae" In: Gastropoda Stromboidea. modified: January 02, 2015, at 02:24 URL: http://www.stromboidea.de/?n=Species.Spinilomatidae (accessed: August 13, 2007, 16:13).

60th Annual Meeting of the Palaeontological Association, Lyon, 14 - 16th December 2016