

Ammonites in the NW Adda-1XA well

A contribution to The Jurassic Petroleum System in
the Danish Central Graben - The PETSYS Project

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Ammonite stratigraphy in the NW Adda-1Xa well

Finds of ammonites in a cored interval (depths: 2887–2851m / 9479'04" – 9354'01") in the NW Adda-1Xa well (Fig. 1) are studied with the purpose of adding biostratigraphic data to the succession previously dated mainly by palynostratigraphy.

Ammonites are relatively abundant in the c. 38 metre thick interval. 17 levels were sampled (Figs. 3–11, Table 1) and fragments were observed in additional two levels.

The interval covers the Jurassic–Cretaceous boundary. This interval is characterized by extreme provincialism, and it is commonly difficult, if not impossible, to correlate between areas. Accordingly separate zonations have been established in different areas and even separate stage names are used (Fig. 2). The ammonites recovered in the NW Adda-1Xa core belong to forms which are here related to the zonation used in eastern England (Casey 1973; Rawson 2006). Casey (1973) identified forms related to Greenland and Russia and therefore adopted the Boreal stage names Volgian and Ryazanian for the boundary interval, i.e. different from the usage in southern England where the stage names Portlandian and 'Purbeckian' has been locally developed and also different from the Tethyan stages names Tithonian and Berriasian.

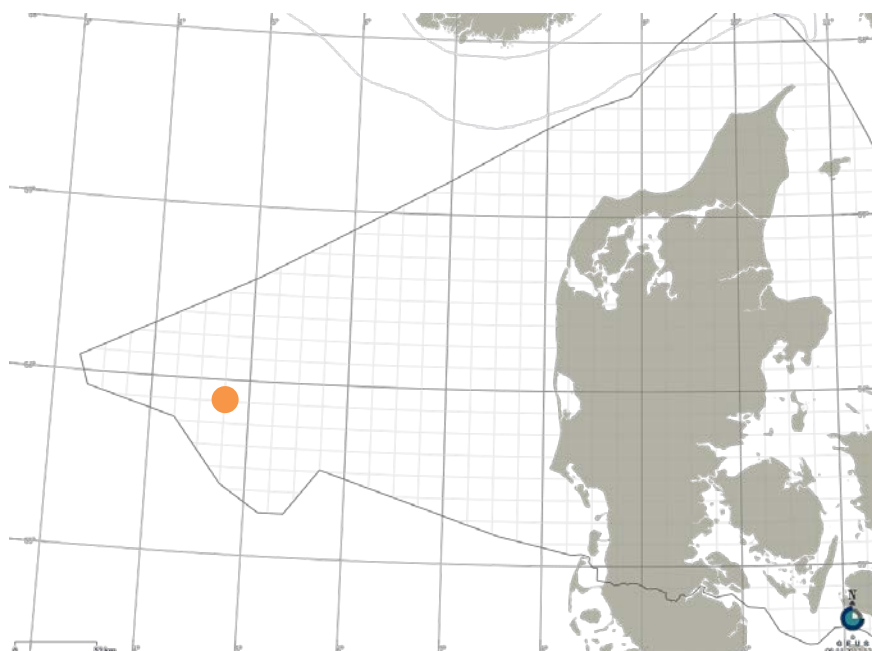


Figure 1. Position of NW Adda-1Xa.

The lowermost recovered ammonites (2286.6–2881.3 m) belong to the genus *Subcraspedites* which is restricted to the Upper Volgian. A few metre higher numerous specimens belonging to the genus *Praetollia*, and in particular the species *P. maynci* described from East Greenland (Spath 1952) dominate and indicate the Lower Ryazanian (2877–2871m). The uppermost ammonites may belong to *Surites* that is typical of the Upper Ryazanian (2858–2855m). Details in levels, identifications and the references to ammonite zones are listed in Table 1.

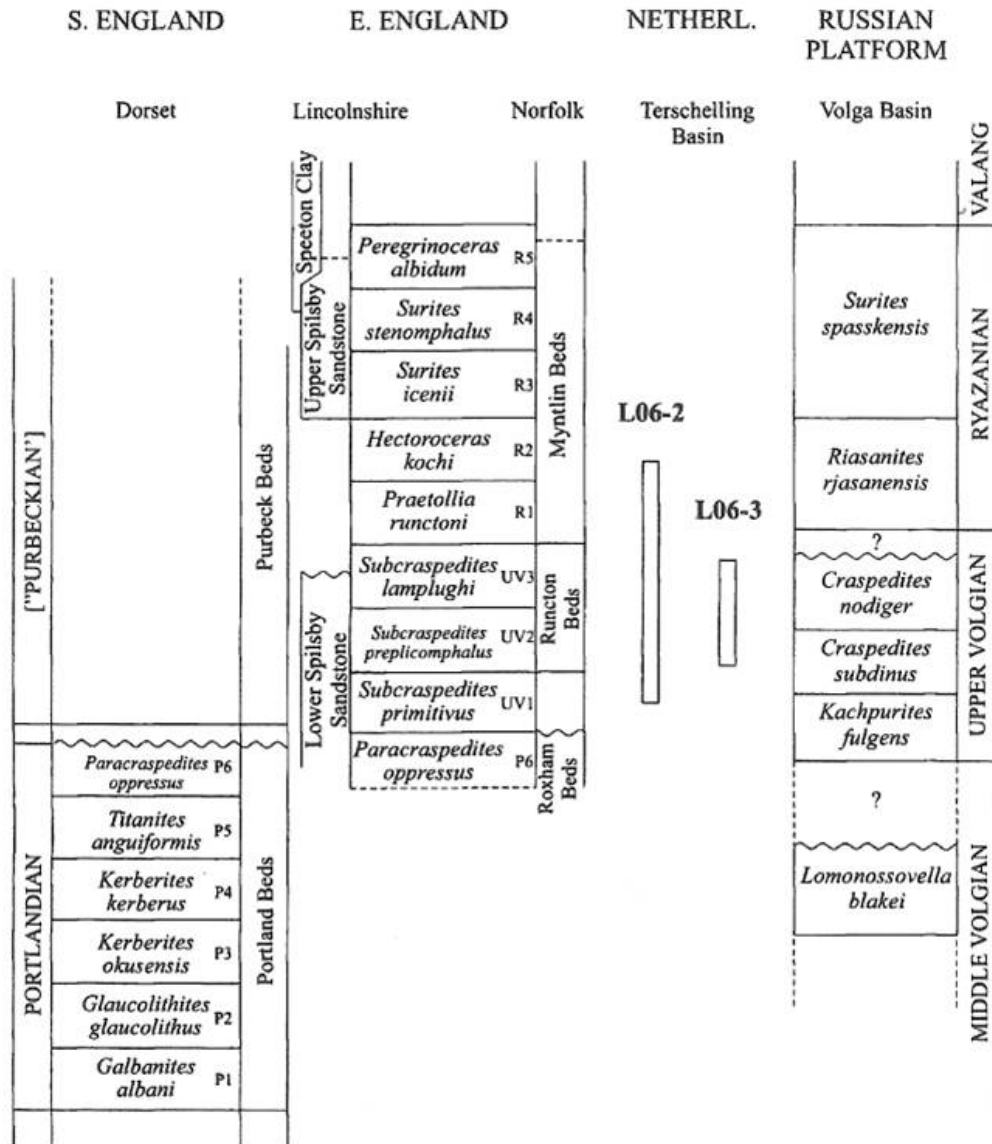


Figure 2. Boreal ammonite zonation. The studies interval correlates to similar ammonite bearing intervals in cores (L06-2 and L06-3) from Duchth sector in southern Central Graben (Abbink *et al* 2012)

GEUS sample no.	depth (in m.)	depth (in feet/inch)	Description	Chronostratigraphy
474017	2851.12	9354'01"	fragment, poorly preserved, not identified.	
474016	2855.33	9367'11"	imprint, fragmented, relatively thin low ribs dividing into two secondaries, ? <i>Surites</i>	? <i>Surites stenomphalus</i> Zone
474015	2858.62	9378'08"	fragment with relatively coarse, blunt ribs. Not identified (? <i>Surites</i>).	
474014	2871.32	9420'04"	poorly preserved specimen with fine delicate ribbing. <i>Praetollia</i> .	
474013	2873.25	9426'08"	two specimens, one small/medium sized with dense fine ribbing is a <i>P. maynci</i> . The other larger has more distant, blunt ribbing, also <i>P. maynci</i>	<i>P. runctoni</i> Zone
			two specimens and a fragment: one specimen is small to medium sized, relatively involute, relatively strong but fine and delicate primaries dividing midflank into (two) fine secondaries (not really exposed resembling <i>Praetollia maynci</i> . A second specimen of similar size is cut by the edge of the core piece, appears to be very involute and has very dense and very fine and delicate primaries each dividing high on flank/ventral shoulder into 3-4 extremely fine and delicate secondaries. There are not many candidates having such fine ribbing - it resembles but has less dense primary ribbing than <i>Peregrinoceras presullum</i> (see Saks et al 1975, pl. 29, fig. 1) or <i>P. subpresullum</i> (see Casey 1973, pl. 10, fig. 4) of the uppermost Ryazanian and various <i>Tollia</i> e.g. <i>T. maimetschensis</i> (see Saks et al 1975 pl. 21, fig. 2) and <i>T. subtilis</i> (see Zakharov et al. 1983 pl. 8 fig. 2) but they are all also to evolve, relatively. It is probably just an extremely finely ribbed variety of <i>P. maynci</i> . The third specimen/fragment is indeterminate	<i>Praetollia</i> indicate the <i>Praetollia maynci</i> Zone or the English equivalent <i>Praetollia runctoni</i> Zone (Note that Abbink et al 2012 revised the genus <i>Runctonia</i> Casey 1973 and now refer it to <i>Praetollia</i> .)
474012	2876.12	9436'01"	many specimens, slightly variable in ribbing but within the variation of <i>Praetollia maynci</i>	<i>P. runctoni</i> Zone
474011	2876.16	9436'03"	many specimens, slightly variable in ribbing but within the variation of <i>Praetollia maynci</i>	<i>P. runctoni</i> Zone
474010	2876.30	9436'08"	Involute/small umbilicus, dense fine delicate straight ribbing; <i>Praetollia maynci</i> Spath 1952.	<i>P. runctoni</i> Zone
				base Ryazanian; index of <i>P. maynci</i> Zone in Greenland, occurs in the <i>Praetollia runctoni</i> Zone in U.K.
474009	2877.20	9439'08"	medium to large, involute fine, sharp reticulate primaries, dividing high into fine sharp secondaries. <i>Praetollia maynci</i>	
474008	2881.30	9453'01"	small involute, ribbing weak (due to preservation?), but appears to be very dense and fine in inner whorls, and becoming relatively coarse in late stages. Perhaps <i>Subcraspedites</i> (<i>Swinertonia</i>) sp. as in Casey (1973, pl. 4 fig. 4)	? <i>S. primitivus</i> Zone, Upper Volgian
474007	2882.77	9457'11"	fragments, not identified	
474006	2883.56	9460'06"	very small fragment, not identified	
474005	2884.70	9464'03"	crushed small-medium sized, strong ribbing. Not identified	
474004	2884.76	9464'05"	crushed medium-sized specimens, one with relatively coarse, strong ribbing.	
474003	2885.03	9465'04"	fragments, not identified	
			two medium to large sized specimens, involute, relatively densely ribbed with primaries being strongest on the lower flank and fading towards midflank and the furcation level. <i>Subcraspedites</i> , comes close to <i>S. cf. claxbyensis</i> Casey (1973, pl. 3 fig. 1) but perhaps closer to <i>S. primitivus</i> as figured in Abbink et al. 2012, fig. 4B.	<i>S. preplicomphalus</i> - <i>S. primitivus</i> Zones, Upper Volgian
474002	2886.64	9470'07"		
474001	2889.30	9479'04"	small fragment of densely, finely ribbed small specimen. Not identified.	

Table 1. List of samples with depths, fossil content, descriptions and biostratigraphy



Fig. 3. *Subcraspedites* cf. *claxbyensis* or *primitivus* (# 474002, depth: 2886.64m / 9470'07").

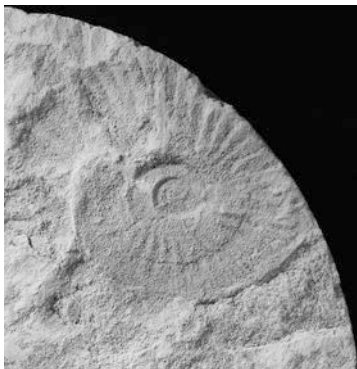


Fig. 4. *Subcraspedites* (*Swinbertonia*) sp. (#474008, depth: 2881.30m / 9453'01").

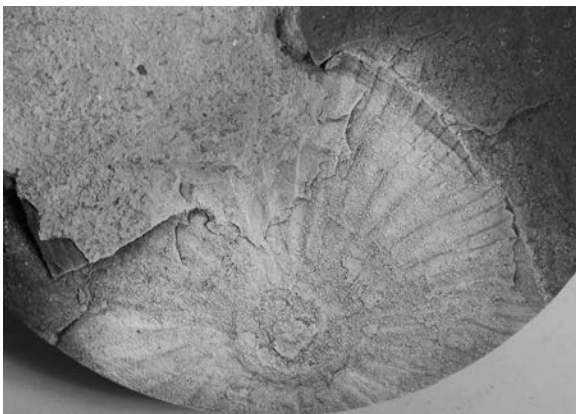


Fig. 5. *Praetollia maynci* (#474009, depth: 2877.20m / 9439'08").



Fig. 6. *Praetollia maynci*
(#474010, depth: 2876.30m
/ 9436'08").



Fig. 7. *Praetollia maynci*
(#474011, depth: 2876.16m
/ 9436'03"). More speci-
mens from same core piece
in Figs 8 and 9.



Fig. 8. *Praetollia maynci*. Another specimen from same core piece as Figs 7 and 9 (#474011, depth: 2876.16m / 9436'03").



Fig. 9 *Praetollia maynci*. Another specimen from same core piece as Figs 7 and 8 (#474011, depth: 2876.16m / 9436'03").



Fig. 10. *Praetollia cf. maynci* (#474012, depth: 2876.12m / 9436'01").



Fig. 11. *Praetollia maynci*
(#474013, depth: 2873.25m /
9426'08").

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