

## MICROPALAEONTOLOGY NOTEBOOK

**A new record of *Aratrocypris* Whatley *et al.*, 1985, Ostracoda, from the Lower Cretaceous of the North Sea: a range extension for the genus**

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**INTRODUCTION**

During analyses of ditch cuttings samples from wells 34/10-53A and 35/9-F-1H drilled by Statoil ASA in the North Viking Graben, North Sea, 16 specimens pertaining to *Aratrocypris* were found. One specimen was found at 1260 m (depth below KB) in 35/9-F-1H within an interval of Lower Paleocene claystones, and based on its white chalky preservation characteristics is considered reworked from Maastrichtian chalk. The remaining 15 specimens were found among ostracod-rich microfossil assemblages of Early Cretaceous age in a sample at 4190 m of 34/10-53A, and at 2166 m of 35/9-F-1H. Although these samples contain numerous ostracods, the occurrence at such a low stratigraphical level was unexpected since *Aratrocypris*, hitherto, has not been found older than Coniacian/Santonian. Their preservation condition as orange-stained opaque carapaces is the same as that of the remainder of the assemblage found at that level in the Lower Cretaceous. For this reason the possibility of it being caved from higher levels of the well is ruled out. The find, therefore, represents the earliest record of the genus, and is important also when considering its early zoogeographical distribution.

Ostracods occur in well 35/9-F-1H at two levels: Lower Paleocene and Lower Barremian–Lower Hauterivian. Each assemblage has a very different style of preservation which allows them to be easily separated. Ostracod assemblages of the younger level are white, translucent carapaces, a preservational style consistent with the abundant foraminifera found in the same sample. These foraminifera include many upper Maastrichtian index species, such as *Pseudotextularia elegans* (Rzehak, 1891) providing a firm age (King *et al.*, 1989) for this reworked chalk material. The specimen of *Aratrocypris* found at 1260 m also has a ‘chalky’ style of preservation and is clearly an element of the reworked Maastrichtian material. Despite its poor preservation it can be identified by the details of its outline, valve overlap and presence of a spine postero-ventrally (Text-fig. 1).

The ostracod assemblage found in the Lower Cretaceous sample at 2166 m has very different preservational characteristics. Specimens are typically deep orange, semi-transparent carapaces and no internal features are discernable. The single specimen of *Aratrocypris* found at this level (2166 m) is of similar condition. This, and the fact that no unequivocally caved material has been observed at this level, clearly indicates that the specimen is *in situ*. The associated ostracod assemblage comprises predominantly bairdiids, sighted *Eucytherura* spp., *Pontocyprilla* spp. and *Polycope* spp.. It forms an easily recognizable biofacies that also commonly includes agglutinated foraminifera, especially *Falsogaudryinella praemoesiana* Kaminski *et al.*, 1995 which is indicative of an Early Barremian–Hauterivian age (Kaminski *et al.*, 1995). The biofacies

inhabited ‘outer sublittoral–upper bathyal’ palaeodepths mainly in the Central North Sea and Viking Graben (King *et al.*, 1989). Upon examining the same biofacies and stratigraphical level of well 34/10-53A, additional specimens have been found which confirm the provenance and antiquity of the new *Aratrocypris* data.

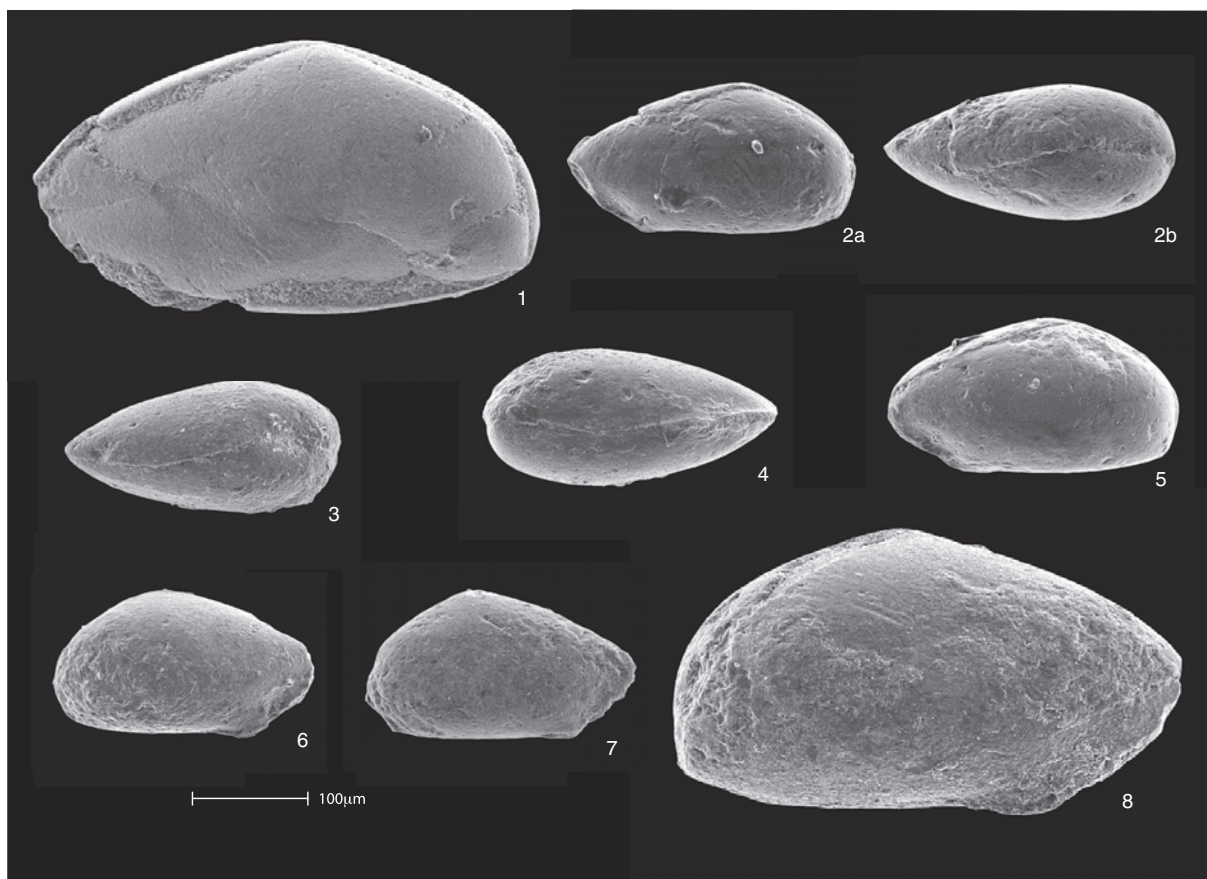
**The genus *Aratrocypris***

*Aratrocypris* is a very distinctive cyprid genus by virtue of its plough-like structure situated antero-ventrally. Seven species have been described from the Upper Cretaceous–Recent (Whatley *et al.*, 1985; 1989). The Cretaceous–Paleocene species lived in shelf environments, whereas younger species inhabit deep-water bathyal and abyssal environments (Whatley *et al.*, 1989).

Unfortunately, the ‘plough’ structure characteristic of *Aratrocypris*, is not well preserved in the new material. However, other features discussed by Whatley *et al.* (1989) as typical of the genus are easily discernable (Text-fig. 1). Identifiable features unique to *Aratrocypris* observable in the new Lower Cretaceous specimens are: (1) short hinge line situated very posteriorly and inclined at a steep angle, and parallel to anterior margin; (2) the smaller left valve is very strongly overlapped antero-dorsally by the right; (3) internal opening to the ‘plough’ at anterior extremity; and (4) antero-ventral incurvature and edge of the ‘plough’ ventrally is preserved. While the possibility that all the specimens are juvenile cannot be ruled out, the small size (length range 0.23–0.30 mm) is in keeping with the size trend: mean length increases from 0.39 mm to 0.72 mm over its Upper Cretaceous–Recent range (Whatley *et al.*, 1989).

Although very small and incompletely preserved, the overall carapace shape shows little variation and it is possible to make a judgement regarding the affinity of the Lower Cretaceous material with other species of *Aratrocypris*. Its outline with rounded posterior and postero-ventral angle is most similar to *A. cretacea* (Bonnema, 1941) described from the Coniacian–Santonian of the Upper Cretaceous of the Netherlands (Whatley *et al.*, 1985). On the basis of outline and overall shape an assignment to *A. cretacea* seems correct. If so then *A. cretacea* has changed very little in morphology over its considerable age range. Further comparisons must await the finding of additional Cretaceous material.

Although *Aratrocypris* is known world-wide, mainly from the bathyal environment, the previous record of *A. cretacea* in the Dutch Chalk indicates that an origin for the genus in the shelf seas of NW Europe is most likely. The new material reported here shows that *Aratrocypris* existed as early as Hauterivian/Barremian times in Europe, and occurred in shelf seas for a long time before its eventual migration into the deep sea during the early Paleogene.



**Text-fig. 1.** The specimens are housed in The Natural History Museum, London. **fig. 1.** *Aratrocypris cretacea* (Bonnema, 1941) from 1260 m (Lower Paleocene) of northern North Sea well 35/9-F-1H [NHMUK PM OS 19325], left lateral view of female carapace (reworked specimen of Late Maastrichtian age). **fig. 2.** *Aratrocypris ?cretacea* (Bonnema, 1941) from 2166 m (Lower Barremian–Lower Hauterivian) of northern North Sea well 35/9-F-1H; A-1 carapace [NHMUK PM OS 19326] – (a) left lateral view of carapace; (b) dorsal view. **figs 3–8.** *Aratrocypris ?cretacea* (Bonnema, 1941) from 4190 m (Lower Barremian–Lower Hauterivian) of northern North Sea well 34/10-53A: **3**, A-1 carapace [NHMUK PM OS 19327], dorsal view; **4**, A-1 carapace [NHMUK PM OS 19328], ventral view; **5**, A-1 carapace [NHMUK PM OS 19329], left lateral view; **6**, A-1 carapace [NHMUK PM OS 19330], right lateral view; **7**, A-1 carapace [NHMUK PM OS 19331], right lateral view; **8**, female carapace [NHMUK PM OS 19332], right lateral view.

## CONCLUSIONS

Several specimens from the Lower Barremian–Lower Hauterivian of wells 34/10-53A and 35/9-F-1H in the North Viking Graben, North Sea are shown to belong to the cyprid genus *Aratrocypris* Whatley *et al.*, 1985. Preservation characteristics indicate that specimens are *in situ* and not caved from younger strata. Hitherto, the earliest record of the genus was *A. cretacea* (Bonnema, 1941) from the Upper Cretaceous of The Netherlands. The new find indicates that the genus existed in shelf seas of NW Europe as early as the Lower Cretaceous.

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