

## OBSERVATIONS ON MIDDLE EOCENE MARINE DIATOMS FROM THE CENTRAL ARCTIC OCEAN

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Middle Eocene biosiliceous sediments containing well-preserved diatoms, silicoflagellates, ebridians, actiniscids and archaeomonads, were obtained from the Central Arctic Ocean during the Arctic Coring Expedition (ACEX; Integrated Ocean Drilling Program Leg 302) in summer 2004. Although a number of papers have already documented the diatom resting stages in these deep-sea drilling samples, new scanning electron microscope (SEM) observations on some of the remaining taxa are presented here.

For instance, the samples contain well-preserved specimens of *Corethron* with spines still articulated in their sockets, as well as hook spines lying nearby. The hook spines are like tiny parasols, totally unlike those of modern taxa, and probably represent the oldest known example of hook spines in the fossil record. The ACEX specimens are compared with two similar taxa from Mors, Jutland (Early Eocene); *C. penicillus* (Grunow) Fenner, which is currently the oldest known species in the genus, and *Pseudopyxilla harrensis* Fenner, which we believe also belongs in *Corethron*. The data suggests that *P. harrensis* (and the ACEX specimens) may be the vegetative stage of *C. penicillus*, with the type specimen representing the resting stage. In the Mors sample, the resting stage usually occurs as a doublet, with opposing valves characterized by spines that are fused to the valve (i.e. there are no sockets), whilst the other valves are domed and spineless. The two valves are joined by a long single, perforated girdle band, identical to that found in the vegetative stage. However, so far we have not found any *Corethron* resting stages in the ACEX material.

The ACEX samples also contain a number of quadrangular centric diatoms that appear to be closely related to *Triceratium basilicum* Brun, which was originally described from Kuznetsk, Russia (Middle Eocene). SEM observations on the ACEX material and light microscope observations on the type slide, including the type specimen, have revealed at least three distinct morphotypes, and suggest that *T. basilicum* belongs in *Trinacria*.

We have also found several examples of transition cells, which bear valves of both the vegetative and resting stages (e.g. of *Pseudostictodiscus* and *Pseudopyxilla*). These specimens will prove invaluable when reconstructing the life cycles of extinct taxa and documenting the synonymy of each species.