

## 25. DIATOM OCCURRENCES, DEEP SEA DRILLING PROJECT SITE 604<sup>1</sup>

William H. Abbott, Mobil Exploration and Producing Services<sup>2</sup>

Site 604, from the uppermost continental rise 100 mi. southeast of Atlantic City, New Jersey, was investigated for diatoms, utilizing the processing methods of Abbott (1978). Most of this assemblage is poorly preserved and appears to be reworked from Miocene and Eocene deposits. Species found are listed in Table I.

The interval between Cores 604-4 and 604-22 contains both Eocene forms like *Brightwellia hyperborea* and *Triceratium barbadense*, Miocene forms like *Actinocyclus ingens* var. *nodus* (middle Miocene), *Bruniopsis mirabilis*, and *Coscinodiscus lewisianus* (middle Miocene), and Miocene/Pliocene forms like *Coscinodiscus temperei* (middle Miocene to early Pliocene) and *Nitzschia reinholdii* (late Miocene to Pliocene). The assemblage suggests a late Miocene to Pliocene age, with middle Miocene and Eocene reworking. Nannoplankton studies (Lang and Wise, this volume) place this entire interval in the Pliocene and Quaternary.

Diatom diversity increases in Core 604-23. Although many of these species are again the result of Eocene and Miocene reworking, *Rhaphoneis fusus* appears for the first time in this interval. This species was described by Andrews (1980) from the Petersburg diatomites of Virginia, which are probably uppermost Miocene or lower Pliocene. On this basis, an early Pliocene to late Miocene age is suggested for the interval. Nannoplankton studies (Lang and Wise, this volume) suggest that Cores 604-23 and 604-24 are within the lower Pliocene and Core 604-25 within the upper Miocene, giving credibility to the assigned diatom age.

Cores 604-26 through 604-30 have a mixture of Miocene and Eocene diatoms similar to the intervals just described. An increase in the concentration of the Miocene forms, combined with the overall character of this assemblage, suggests that this interval is probably no older than middle Miocene. Nannoplankton studies (Lang and Wise, this volume) indicate the presence of both middle and late Miocene species.

### TAXONOMIC LIST

#### Diatoms

*Actinocyclus ehrenbergii* Ralfs in Pritchard, 1861  
*A. ellipticus* Grunow in Heurck, 1881  
*A. ingens* Rattray, 1890  
*A. ingens* var. *nodus* Baldauf and Barron, 1980  
*Actinoptychus senarius* Ehrenberg, 1838  
*A. splendens* Ralfs in Pritchard, 1861  
*Biddulphia rhombus* (Ehrenberg) W. Smith, 1856

*Brightwellia hyperborea* Grunow, 1883  
*Bruniopsis mirabilis* (Brun) Karsten, 1928  
*Cocconeis placentula* Ehrenberg, 1838  
*Coscinodiscus lewisianus* Greville, 1866  
*C. marginatus* Ehrenberg, 1841  
*C. nitidus* Gregory, 1857  
*C. nodulifer* Schmidt, 1878  
*C. oculus-iridis* Ehrenberg, 1840  
*C. perforatus* Ehrenberg, 1844  
*C. praenitidus* Fenner, 1977  
*C. rothii* (Ehrenberg) Grunow in Schneider, 1878  
*C. superbus* Hardman, 1889  
*C. temperei* Brun in Brun and Tempère, 1889  
*C. temperei* var. *delicata* Barron, 1981  
*C. vetustissimus* Pantocsek, 1886  
*C. yabei* Kanaya, 1959  
*Craspedodiscus coscinodiscus* Ehrenberg, 1844  
*Cymatogonia amblyoceros* (Ehrenberg) Hanna, 1932  
*Delphineis biseriata* (Grunow) Andrews, 1979  
*D. novaecaesaraea* (Kain and Schultze) Andrews, 1977  
*D. ovata* Andrews, 1977  
*D. penelliptica* Andrews, 1977  
*D. surirella* (Ehrenberg) Andrews, 1979  
*Denticulopsis hustedtii* Simonsen and Kanaya, 1961  
*D. norgwegica* Schrader in Schrader and Fenner, 1976  
*Diploneis crabro* Ehrenberg, 1844  
*D. elliptica* Cleve, 1894  
*Eunotogramma weissi* var. *producta* (Grove and Sturt, 1887)  
*Goniothecium odontella* Ehrenberg, 1844  
*Hemiaulus curvatulus* Strelnikova, 1971  
*H. polycystinorum* Ehrenberg, 1854  
*H. polymorphus* Grunow, 1884  
*Hemidiscus ovalis* Lohman, 1938  
*Hyalodiscus scoticus* Grunow, 1879  
*Melosira architecturalis* Brun, 1893  
*M. granulata* (Ehrenberg) Ralfs in Pritchard, 1861  
*M. ornata* Grunow, 1884  
*M. rossica* Mills, 1934  
*M. westii* Smith, 1856  
*Navicula constricta* Ehrenberg, 1838  
*N. directa* (Smith) Ralfs in Pritchard, 1861  
*N. hennedyii* Smith, 1856  
*N. praetexta* Ehrenberg, 1840  
*Nitzschia marina* Cleve and Grunow, 1880  
*N. miocenica* Burckle, 1972  
*N. reinholdii* Kanaya and Koizumi, 1970  
*Paralia sulcata* (Ehrenberg) Cleve, 1873  
*Pseudodimerogramma elegans* Schrader and Fenner, 1976  
*Pseudopodosira bella* Gleser and Posnova, 1964  
*P. wittii* Vechina, 1961  
*Pseudopyxilla americana* (Ehrenberg) Forti, 1909  
*Pyxilla* (*Pseudopyxilla*) *dubia* (Grunow) Forti, 1909  
*P. gracilis* Forti, 1909  
*P. prolongata* Brun, 1893  
*Rhaphidodiscus marylandicus* Christian, 1887  
*Rhaphoneis diamantella* Andrews, 1975  
*R. fusus* Andrews  
*R. gemmifera* Ehrenberg, 1844  
*R. parilis* Hanna, 1932  
*R. petropolitana* (Grunow) Pantocsek, 1886  
*R. scalaris* Ehrenberg, 1845  
*Rhizosolenia barboi* Brun, 1894  
*R. styliformis* Brightwell, 1858

<sup>1</sup> van Hinte, J. E., Wise, S. W., Jr., et al., *Init. Repts. DSDP*, 93: Washington (U.S. Govt. Printing Office).

<sup>2</sup> Address: Mobil Exploration and Producing Services, P.O. Box 900, Dallas, TX 75221.





- Lohman, K. E., 1938. Pliocene diatoms from the Kettleman Hills, California. *U.S. Geol. Surv., Prof. Pap.*, 189-C:81-94.
- Mills, F. W., 1933-1935. *An Index to the Genera and Species of the Diatomaceae and their Synonyms 1816-1932*: London (Wheldon and Wesley).
- Pantocsek, J., 1886, 1889, 1892. *Beitrage zur Kenntnis der fossilen Bacillarien Ungarns*, Pt. 1, 1886; Pt. 2, 1889; Nagy-Tapolcsany (J. Platzko); Pt. 3, 1892; Pozsony (C. F. Wigand, 1905).
- Pritchard, A., 1861. *A History of Infusoria* (4th ed.): London (Whittaker and Co.).
- Rattray, J., 1890. A revision of the genus *Actinocyclus*, Ehrb.. *J. Quekett Microsc. Club*, 4(n.ser.):137-212.
- Schmidt, A., et al., 1875-1959. *Atlas der Diatomaceenkunde*: Leipzig (O. R. Reisland).
- Schrader, H. J., 1974. Cenozoic marine planktonic diatom stratigraphy of the tropical Indian Ocean. In Fisher, R. L., Bunce, E. T., et al., *Init. Repts. DSDP*, 24: Washington (U.S. Govt. Printing Office), 887-967.
- Schrader, H. J., and Fenner, J., 1976. Norwegian Sea Cenozoic diatom biostratigraphy and taxonomy. In Talwani, M., Udintsev, G., et al., *Init. Repts. DSDP*, 38: Washington (U.S. Govt. Printing Office), 921-1099.
- Schulz, P., 1928. Beitrage zur Kenntnis fossiler und rezenter silicoflagellaten. *Bot. Arch.*, 21:225-292.
- Sheshukova-Poretskaya, V. S., and Gleser, S. I., 1962. Diatomovie vodorovli, silikoflagellati i ebridei iz malkopskikh otlozhenii s r. Shibik (Krasnodarskie kraii). (Bacillariophyta, Silicoflagellatae and Ebrideae from Maikop Series Deposits [River Shibik, Krasnodar Region].) *Uch. Zap. Igu, Ser. Biol. Nauk* (Leningrad Univ.), 49(313):171-202.
- Simonzen, R., and Kanaya, T., 1961. Notes of marine species of the diatom genus *Denticula* Kutz. *Int. Rev. Ges. Hydrobiol.*, 46(4): 498-513.
- Smith, W., 1853, 1856. *A Synopsis of the British Diatomaceae* (Vol. 1: 1853; vol. 2, 1856): London (Smith and Beck).
- Strelnikova, N. I., 1971. Species Novae Bacillariophytorum e sedimentis cretae posterioris in declivitate orientali partis polaris ec praepolaris montium uralensium. *Acad. Sci. U.R.S.S. Novs. Syst. Plant. Non Vasc.*, 8:41-52.
- Vechina (Vekschina), V. N. 1961. Novyi rod i novye vidy diatomovykh iz Melovyikh i Paleogenovykh Otlozhenii zapadno-sibirskoi nizmennosti. *Tr. Sibirsk. Nauchno-issled. Inst. Geol., Geofiz. Mineral. Syrja*, 15:89-93.

Date of Initial Receipt: 17 May 1985

Date of Acceptance: 5 March 1986