Phytoplankton biogeography in the western Pacific and Indian Ocean

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A recent analysis of 153 filtered, surface seawater samples, collected in December 1996 to February 1997, along north-south and south-north transects, has revealed a number of interesting points. First, diatoms dominated the assemblages at most stations, even those in oligotrophic areas, with coccolithophorids and dinoflagellates rarely abundant. Second, the diatom assemblages and absolute abundances changed drastically upon entering coastal/shallow waters, from low abundances of open-ocean *Mastogloia* and *Nitzschia* to higher abundances on the shelf or in marginal seas of colonial taxa like *Chaetoceros*, *Bacteriastrum,* and *Thalassiosira*. Third, the sea surface temperature and salinity records were closely associated with changes in the phytoplankton assemblage and absolute abundance. In addition to the surface water samples, two hydrocasts were analyzed in the Sulu Sea and South China Sea. These revealed the presence of tropical Parmales, which were seemingly restricted to the deep photic zone by low water temperature and high silicate concentrations.

By combining this dataset with those previously compiled for the Southern Ocean (Indian Sector) and subarctic Pacific and Bering Seas, a generalized picture of phytoplankton biogeography can be visualized that has a distinct latitudinal zonation. Furthermore, clear differences are apparent with regard to vertical distribution, and coccolithophorids, for example, often are found below the top 10m in subtropical/tropical waters but within the top 10m in temperate/subpolar waters. Silicoflagellates also show some discrete patterns in which *Octactis* prefers coastal waters, *Dictyocha* prefers warmer waters, and *Stephanocha* prefers cooler waters.