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Palynomorph variations as indicator of Holocene paleoenvironment changes in inner-continental shelf core sediments, southeastern Mediterranean

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The palynology of marine core sediments (CS Core) from the inner continental shelf core (27 m water depth), off the Nile Delta, southeastern Mediterranean, has been studied to assist in reconstructing the regional palaeoenvironment during the past 5380 YBP. These studies include quantification and the relative abundances of the organic-walled palynomorphs (dinoflagellate cysts, acritarchs, prasinophytes and other algal spores, microforaminiferal linings, crustacean eggs, and fungal hyphae). In this paper, the report is carried on the composition and ecological interpretation of the dinoflagellate cyst assemblages, acritarchs and other non-pollen palynomorphs in the self cores. Concentrations of dinoflagellate cysts ranged from 5926 to 416 specimens per gram of sediment, and the most common taxa were Lingulodinium, Polysphaeridium, Spiniferites ramosus, S. mirabilis, and Protoperidinium. The dinocyst assemblages are like those on the Tunisian Shelf, but protoperidinioid cysts are more abundant off the Nile Delta, as also found in the Alboran Sea.
Prasinophytes (including Tasmanites), Pediastrum and fungal hyphae are abundant on the shelf sediments. Based on the oxidation resistance of selected dinocyst species, it concludes the shelf sediments were deposited under suboxic bottom water conditions.
The high nutrient supply to the area during the deposition of CS Core sediments is documented by common microforaminifera throughout the core sediments and the strong significant values (R) between the nutrient rich species, Lingulodinium machaerophorum Polysphaeridium zoharyi, toxic species and Total Phosphorous percent (TP%) and TOC %. This data suggest that Nile discharge from the Damietta Channel increased during 5830 yr BP, accompanied by increases in fresh or brackish water algae and fungal hyphae in continental shelf sediments. Fine-grained organic matter from the Nile River can be traced eastwards as far as the Sinai shelf by the presence of Pediastrum coenobia and Concentricystis circulus.

Keywords: dinoflagellate cysts, southeastern Mediterranean, Nile Delta, Late Pleistocene, Holocene