

DISTRIBUTION OF PHYTOPLANKTON IN SPRING ALONG THE SUEZ CANAL

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Abstract: Phytoplankton along the Suez Canal (SC) was studied in May 1983. 133 species were recorded. This number is four times that recorded before in the same month. The changes in the environmental conditions in the Canal during the last 50 years led to significant variations in the composition and density of the phytoplankton populations.

Introduction: Mixing of different water masses (Red and Mediterranean seas, Bitter lakes and brackish water of lake Manzalah) in SC creates a unique environment with biota of different origins. Surprisingly little work has been done on the SC phytoplankton. Ghazzawi (1939) made a 12 months survey from 6 stations along the Canal. Dorgham (1974) and Dowidar (1976) concentrated on the extreme ends and the Bitter lakes in February and July only. Heimdal et al (1977) admitted the net phytoplankton of the Great Bitter Lake. Halim (1970) observed a new dinoflagellate species, Ceratium egyptiacum, and recorded a number of Red Sea dinoflagellate immigrants from the SC. Apart from Ghazzawi (1939), no information is available on Spring distribution on the phytoplankton. The present work is a trial to fill this gap.

Materials and Methods: Surface samples were collected in May 1983 using a fine net from 10 stations along the SC. The samples were preserved in 4% formalin and then examined.

Results and Discussion: Phytoplankton included 102 diatom and 31 dinoflagellate species. The dominant genera were: Nitzschia (13 sp.), Pleurosigma (12 sp.), Navicula (10 sp.), Biddulphia (6 sp.), Chaetoceros (6 sp.), Rhizosolenia (5 sp.), Melosira (5 sp.) and Synedra (5 sp.). Some species extended the whole length of the SC, while others were only found at the extreme ends. This may be related to the salinity barrier of the Bitter lakes (Dorgham et al, 1983). The brackish water assemblages from lake Manzalah were restricted to the northern part of the Canal. Occurrence of some species such as Suriella fastuosa and Nitzschia sigma along the SC with decreasing abundance towards the Suez Bay indicates that they are Mediterranean immigrants. Record of the brackish water species, Nitzschia lorenziana at most stations points to the southward transference of plankton in this month. The abundance of Hemiaulus membranaceus in the southern part of the SC compared to the northern part indicates that it is a Red Sea immigrant.

Dinoflagellates were dominated by Ceratium and Peridinium (15 sp.). The most dominant species were Ceratium furca and Goniaulax polygramma. The following species are first records in the Canal: Peridinium excentricum, P. oblongum, P. subinerme, P. striolatum and Leucosolenia blanca.

Most of the important diatom genera recorded herein were not recorded by Ghazzawi (1939) such as Pleurosigma, Nitzschia, Navicula, Biddulphia, Melosira, Licmophora, Campylodiscus, Cyclotella meneghiniana and Bacillaria paradoxa. The continuous increase in the number of phytoplankton species in the Canal within the last 50 years (from 9-15 sp. by Ghazzawi to 38-71 sp. in the present work) points to the penetration of the plankton toward the two extremes of the SC. Further, abundance of species along the Canal was also different. Ghazzawi found Skeletonema costatum in small numbers from Port Said to the Bitter lakes. While it dominated in 1983 samples (13-80%), it was restricted to a shorter distance (northern 65 km). This is mainly related to the affinity of this species to the low salinity. According to Ghazzawi, Rhizosolenia alata and Guinardia flaccida were restricted to certain areas in the Canal. However, these two species were recently observed at most stations. The long term variation in the composition and distribution of the plankton along the SC may be attributed to the transference of plankton between its two ends, fresh and brackish water species from lake Manzalah, continuous changes of water salinity, current regime in the Canal (Morcos, 1967) and the heavy traffic of big ships (average: 62/day) in both directions.

References:

- Dorgham, M.M., 1974- Plankton diatoms of Port Said area. M.Sc.Thes., Fac. Sc., Alexandria University, Egypt.
- Dorgham, M.M., N.M. Dowidar and Y. Halim, 1983- Seasonal and spatial biometric variations in Rhizosolenia shrubsolei from 3 areas in the Suez Canal, Rapp. Comm. Int. Mer. Medit. 28, 9.
- Dowidar, N.M., 1976- The phytoplankton of the Suez Canal. Acta Aadr. V. 18.
- Ghazzawi, F.M., 1939- A study of the Suez Canal plankton A- The phytoplankton. Notes and Memoirs, No. 24.
- Halim, Y., 1970- Microplancton des eaux egyptiennes. III- Especies indopacifique ou erythreennes a l'extreme nord de Canal de Suez. Etud. planctonol., pp. 57-59 Monaco, C.I.E.S.M.
- Heimdal, B.R., J.P. Taasen & M. Elbrachter, 1977- Net phytoplankton of the Great Bitter Lake in the Suez Canal. Sarsia 63: 75-83.
- Morcos, S.A., 1967- Effect of the Aswan High Dam on the current regime in the Suez Canal. Nature 214 (5991), pp. 901-902.