The planktonic cyanobacteria int the Gulf of Aqaba, Red Sea : Species composition and biomass

Baruch KIMOR*, Amir NEORI** and Nurit GORDON**

*Technion Institute of Technology, Faculty of Agricultural Engineering, HAIFA **(Israel)**

Israel Oceanographic and Limnological Research, National Center for Mariculture, EILAT **(Israel)

Earlier records of Cyanobacteria in the northern part of the Gulf of Aqaba off Eilat (Fig.1) revealed two annual peaks, in May-June and October-November, coinciding with the transition periods in the temperature of the water (KIMOR and GOLANSKY, 1977). These peaks were found to consist mainly of *Trichodesmium eythraeum*, recently reidentified as *T. thiebautii* (courtesy A. SOURNIA), occurring mostly in the surface waters down to about 100m, then gradually diminishing with depth.

Current studies of the planktonic microbiota were carried out at an offshore and at a reef station in the same area using the filter-transfer-freeze (FTF) technique for collection and preservation (HEWS and HOLM-HANSEN, 1983). The algal biomass was calculated by multiplying cell volume by cell/biomass conversion factor (STRATHMANN, 1967). These studies indicated the occurrence of *T.thiebautii* during October 1989 and October 1990 (Fig.2). In October 1989, it constituted 61.13% C of total autotrophs in the surface layer, gradually declining with depth to 6.26% C at 60m. However, the overall biomass within the whole water column was low (0.2-0.3gr C m2). The minor record of *T. thiebautii* during October 1990 was located at 80m depth and its biomass was similarly very low. A second *Trichodesmium* species, identified as *T. hildebrandtii* (courtesy A. SOURNIA), characterized by broader and shorter cells, was also recorded sporadically in the samples.

A number of *Oscillatoria* species, both at the off-shore and at the reef sampling stations, varying in cell size and shape, add to the species diversity of Cyanobacteria in the Gulf, though not necessarily to the autotrophic biomass. They may however be transition forms rather than well-defined species. The occurrence of the lilttle-known species *Katagnymene pelagica* is significant, as this appears to be the first record after its original description at the turn of the century (LEMMERMANN, 1899; KARSTEN, 1907).

The chroococcoid Cyanobacteria are represented in the Gulf by the ubiquitous *Synechococcus/Synechocystis* populations, which constitute an important component of the total autotrophic biomass (Fig.2). Among the colonial forms, the ephemeral occurrence was recorded of *Aphanocapsa litoralis* with amorphous thallus without any definite shape and of the raft-shaped *Merismopedia* sp.

Symbiotic Cyanobacteria have been found to occur either as ectobionts, known as phaeosomes, in the horizontal grooves of heterotrophic dinoflagellates or as trichomes of nitrogen-fixing *Richelia intracellularis*, within several species of centric diatoms of the genera *Rhizosolenia* and *Hemiaulus*.

None of the species recorded so far in this study was found in bloom condition. However, some species, both free-living and symbiotic, are known to have the ability to fix molecular nitrogen in oligotrophic seas and, as such, they may be important to the nitrogen budget of the Gulf. Furthermore, the co-existence of two species of *Trichodesmium* in the plankton of this environment requires further elucidation as to their ecological requirements and bloom-forming ability.

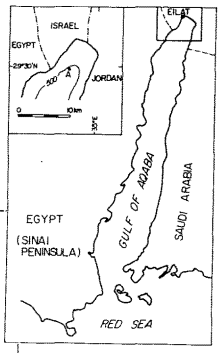

Fig.1: Location of the study area in the Gulf of Aqaba off Eilat (inset).

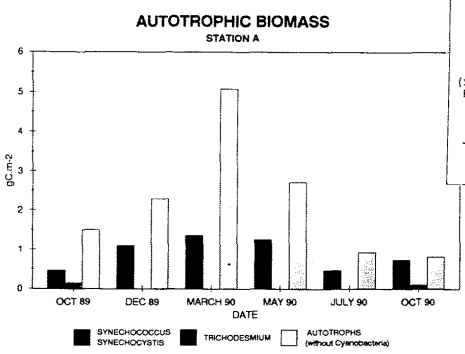

Fig.2: The contribution of Synechococcus/Synecocystis and Trichodesmium (gr C/m2) to the total autotrophic biomass with the whole water column, October 1989-October 1990.

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