

**Seasonal variability of size-classes of phytoplankton biomass in a sub-tropical embayment, Muscat, Sea of Oman**

**ABSTRACT**

The contribution of three different cell size classes of picoplankton: 0.74-2  $\mu\text{m}$ , nanoplankton: 2-20  $\mu\text{m}$  and microplankton, >20  $\mu\text{m}$  of the phytoplankton population and their relationship to environmental conditions were studied over two annual cycles at one station in Bandar Khyran Bay, Sea of Oman, from May 2006 to August 2008. Nanoplankton was the most important class contributing 54.4% to total Chl a (range 6-82%). Its seasonal highest concentrations was during the cold periods when temperature ranged from 28-29 °C in fall and near 24 C in winter when the supply of nutrients was sufficient to sustain their growth. Picoplankton had the second level of the contribution, comprising (23.5%, range 4-74 %) of the total Chl a. and their concentration was generally constant (0.04-.06  $\mu\text{g l}^{-1}$ ) throughout the study period. The drop of picoplankton population coincided with an increase in the microplankton and nanoplankton populations indicating a high grazing pressure exerted on the picoplankton population. Microplankton size-class occupied the third level of the contribution comprising (22.2%, range 3-65 %). Their general concentration was below 0.1  $\mu\text{g l}^{-1}$  and only dominant when temperatures were lowest and nitrate, nitrite, silicate and phosphate concentrations were the highest. The temporal variability observed was associated with changes in the nanaoplankton indicating that in some cases, it is the small fraction of phytoplankton that drives changes in abundances and productivity.

**Keyword:** Phytoplankton; Chlorophyll a; Size-class; Picoplankton; Nanoplankton; Upwelling; Sea of Oman