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Strategy of Dominant Phytoplankton Species Based on Size Classification in Iranian Coastal Water of the Caspian Sea

Nasrollahzadeh Saravi, Hassan[1*]; Makhlough, Asieh[2];
Pourgholam, Reza[3]; Rahmati, Rahimeh[4]

1- Assistant Professor and Scientific Member of Caspian Sea Ecology Research Center, Sari, Iran. Email: hnsaravi@yahoo.com
2- M.Sc. in Laboratory in Caspian Sea Ecology Research Center, Sari, Iran. Email: asieh_makhlough@yahoo.com
3- Assistant Professor and Lecturer of Caspian Sea Ecology Research Center, Sari, Iran. Email: r_pourgholam@yahoo.com
4- M.Sc. in Laboratory in Caspian Sea Ecology Research Center, Sari, Iran. Email: rahimehrahmati@yahoo.com

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Abstract

Phytoplankton life pattern based on size, shape and available nutrient was classified in three major strategies namely R (high S/V ratio, resistance to water mixing), C (medium to high S/V ratio, invasive growth and high competitors' species) and S (low S/V ratio, resistant to stratified water and nutrient deficiency). Seasonal sample collected by Niskin in eight transects perpendicular to the coast at depths of 5, 10, 20, 50 and 100 meters at different layers (surface, 10 and 20m) in 2009-2010 from Iranian coast of the Caspian Sea. The objective of the survey is determination of dominant phytoplankton species strategies with emphasis on size (surface to volume ratio) as morphology parameter. Important Species Index (ISI) of Exuviaella cordata, *Chrysochromulina* sp. (C-Strategy) and *Oscillatoria* sp. (R-Strategy) were high in spring. This value was for *Oscillatoria* sp. and *Thalassionema nitzschioides* (R-Strategy) in fall. In winter, high ISI belonged to *Pseudonitzschia seriata*, *Cerataulina pelagica*, and *Dactyliosolen fragilissima* (R-Strategy). Finally in summer, *Oscillatoria* sp. (R-Strategy) was the predominant species. Multivariate analysis (CCA) showed the interaction between environmental parameters and species presence as well as role of morphology in the phytoplankton communities' without their phylogenic relationships. This research, as first attempt in the Caspian Sea, showed the applied phytoplankton morphological studies in determining the ecological status and management of water resources.

Keywords*: Phytoplankton, Size, Strategy, Caspian Sea, Iran.*