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RESEARCH ARTICLE

Influence of environmental factors on macrofoulant assemblages on moored buoys in the eastern Arabian Sea

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Abstract

Factors governing the distribution of organisms in the pelagic ocean are understudied. In this paper we describe environmental parameters and macrofouling assemblages on 11 buoys deployed in the Arabian Sea for an average duration of 322 days. Macrofoulants on all the mooring components extending from the sea-surface to a depth of 1800–4300 m were documented. Role of temperature, salinity, dissolved oxygen, biological productivity and zooplankton community in governing the macrofoulant distribution are described. Species composition, vertical zonation and wet biomass exhibited significant spatial variations. *Lepas anatifera* constituted more than 90% of foulant wet biomass on all moorings. Assemblages in the southeastern (SEAS), east-central (ECAS) and northeast (NEAS) regions were distinct. Density of *L. anatifera* on surface buoys were low in SEAS (0.2±0.09 no./cm^2), high in ECAS (0.32±0.11 no./cm^2) and moderate in NEAS (0.23±0.04no./cm^2). Macrofoulants were observed up to a depth of 75 m in SEAS, 130 m in ECAS and 120 m in NEAS. The depth profile of macrofoulant assemblages on moorings could be related to the prevalent hypoxic condition. Vertical profiles of wet biomass on all moorings exhibited subsurface maxima at depth ranging from 10 to 20 m, consequent to the abundance of *L. anatifera* in a thermally stable depth of water column, wherein diurnal and semidiurnal temperature variability was minimal. We attribute the observed variation in fouling assemblages to dissolved oxygen levels, salinity and diurnal variability in temperature and salinity.

Introduction

Gaining insight into factors that govern patterns of assemblages is a fundamental objective in ecology. Assemblages are shaped by biotic and abiotic stresses in their respective environments. Mobile and sessile organisms respond differently to the stresses. While the mobile organisms could survive a stressful condition by retreating to a favorable environment, the survival of a sessile organism is determined by tolerance to stresses[1]. The study of sessile assemblages may provide information on the habitat and health of the ecosystem. When compared to terrestrial assemblages, sessile assemblages in marine environments are relatively