

TAXONOMY AND BIOGEOGRAPHY OF MACROALGAL COMMUNITIES IN THE UPWELLING REGION OFF THE COAST OF DHOFAR, OMAN

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This study investigates the floristic composition and the ecological and biogeographical characteristics of macroalgal communities in three bays along the coastline of the southern province of Dhofar in the Sultanate of Oman. Dhofar is located in the north-western Arabian upwelling province. From June through September the south-west monsoon winds cause Ekman transport of surface waters away from the Arabian coastline. This brings cold nutrient-rich waters from deeper layers into the euphotic zone.

At each study site nine 0.25m² quadrants were sampled, three in the intertidal zone, three at a depth of 5m and three at a depth of 10m. In the intertidal zone *Ulva fasciata* and *Melanothamnus somalensis* are the dominant species. At two of the study sites *Nizamuddinina zanardinii* and *Sargassum oligocystum* are the dominant species in the subtidal zone, at the third site *Jania* sp. and *Codium duthieae* are the most abundant.

Multivariate analysis was carried out on the data collected in the present study and data from previous studies on the macroalgal assemblages of the Socotra Archipelago and Masirah Island (Schils & Coppejans, 2003). DCA at species level showed a strong gradient in floristic composition from upwelling sheltered sites (Gulf of Oman, west coast of Masirah, north coast of Socotra and seagrass beds of both Masirah Island and the Socotra Archipelago) to upwelling exposed sites (east coast of Masirah Island, south coast of Socotra and Dhofar). The bays of Dhofar clearly have high affinities with the other upwelling exposed sites, but nonetheless cluster analysis showed that they are very well separated from all the other study areas. This uniqueness is also illustrated by the large number of indicator species pointed out by the indicator species analysis, among which are many endemics and species with a disjunct distribution.

Affinities with remote areas were assessed based on the data collected in this study and species inventories of 11 countries in the Indian Ocean. For all Arabian Sea locations the similarity with the tropical coasts of east Africa and Indonesia is much lower than the similarity with South Africa and Australia, where besides subtropical conditions also temperate conditions occur. The *rbcL* gene of a number of specimens of *Codium* and *Portieria* was sequenced in order to assess whether these specimens are related to morphologically similar Japanese specimens. This analysis has shown that the Japanese and Omani specimens of the supposedly disjunctly distributed species are not related.

References

Schils T. and E. Coppejans. 2003. Phytogeography of upwelling areas in the Arabian Sea. *Journal of Biogeography* 30(9): 1339-1356.