

## Accepted Manuscript

Characterization of macroalgal communities in the coastal waters of Sindh (Pakistan), a region under the influence of reversal monsoons

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PII: S2352-4855(16)30265-1

DOI: <http://dx.doi.org/10.1016/j.rsma.2017.05.008>

Reference: RSMA 251

To appear in: *Regional Studies in Marine Science*

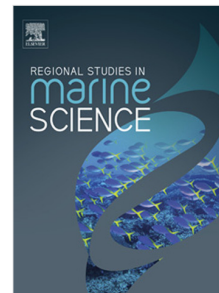
Received date: 11 November 2016

Revised date: 11 May 2017

Accepted date: 17 May 2017

Please cite this article as: Ali, A., et al., Characterization of macroalgal communities in the coastal waters of Sindh (Pakistan), a region under the influence of reversal monsoons. *Regional Studies in Marine Science* (2017), <http://dx.doi.org/10.1016/j.rsma.2017.05.008>

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1 **Characterization of macroalgal communities in the coastal waters of Sindh (Pakistan), a**  
2 **region under the influence of reversal monsoons**

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8 **ABSTRACT**

9 Marine benthic seaweeds have a significant academic, biological, environmental and economic  
10 importance. Coastal waters of Pakistan have a rich algal resource due to nitrate fluctuations  
11 caused by convective mixing and up-sloping. Studies on seaweeds in Pakistan are mainly  
12 confined to intertidal areas or on the basis of drift samples with much emphasis on taxonomy and  
13 phycochemistry without an in-depth study of the ecology. In the present study, samples were  
14 collected by SCUBA diving from 5 dive sites. Quadrat techniques were used to determine the  
15 relative diversity and abundance of benthic macroalgal communities. A total of 36 species (16  
16 Phaeophyceae, 12 Rhodophyta, and 8 Chlorophyta) were recorded. An increase in diversity and  
17 distribution patterns was noted from west to east ward. High diversity occurred at Hawks Bay  
18 followed by French Beach. The coral sites (northern sheltered site of Churna Island and Mubarak  
19 Village) had a less diversity. Very few recorded species had a restricted distribution (Yemen,  
20 Oman and India). One species was found endemic to Pakistan whereas the rest are widely  
21 distributed in the entire Indian Ocean, Atlantic and Pacific. Stunted growth of *Sargassum* species  
22 and changes in community structure were observed after the Cyclone 'NILOFAR'. Distribution  
23 and diversity patterns appeared to be linked with habitat type, topography, wave exposure and  
24 prevailing climatic conditions.

25 **Key words:** Arabian Sea; Pakistan; Sindh coast; Monsoons; Seaweeds; upwelling

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