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REPRODUCTIVE BIOLOGY OF THE JELLYFISH OUTBREAK ALONG THE UAE COASTAL WATERS

by

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Abstract

Jellyfish are a ubiquitous occurrence in the world's oceans. During the past decades, dramatic spatial increases and temporal shifts in jellyfish distributions have been reported around the world. The United Arab Emirates (UAE), coastal area also has experienced several blooms along with severe adverse impacts on its economic facilities. Few studies have been conducted within the Arabian Gulf and the Sea of Oman, to identify the blooming species and the environmental parameters that favor such breakout. The present study aimed to identify the jellyfish species found along the coastal area of UAE and trying to link their occurrence with seasonal variations in environmental parameters during the period from December 2019 until August 2022. Another objective of this study was to increase our knowledge of the mechanisms leading to the proliferation of the two most common jellyfish species along the study area i.e. *Catostylus mosaicus*, and *Cassiopea andromeda*. Morphological analysis and molecular confirmation were used to identify these two species. Moreover, histological and biochemical analyses of the gonads were carried out to understand the seasonal variations in the reproductive biology of the two-dominant species. During the study period, six species have been identified as *Catostylus mosaicus*, *Cassiopea andromeda*, *Aurelia aurita*, *Chrysaora quinquecirrha*, *Cephea cephea* and *Carybdea sivickisi*. The spatial and temporal occurrence of all identified species have been discussed in light of the monthly temperature variations during the study period. The obtained results indicated that the Gonadosomatic Index (GS-I) of the two-dominant species showed a well-defined fluctuation throughout the study period. Indeed, Gametogenesis resembled descriptions for other rhizostomes and semaestomes which can reproduce throughout the year with higher rate fluctuations in carbohydrates, protein, and lipid concentrations too. This research represents the most comprehensive study of jellyfish along the UAE coastal area. From the obtained results and observations, the need for continuous monitoring of jellyfish blooms as well as surveying for new species introduction to the Arabian Gulf and the study of its habitat and its reproduction and feeding habits are recommended. This will be helpful in predicting any negative impact of its blooming, and to face the consequences by taking enough precautionary measures.

Keywords: Jellyfish outbreak, Arabian Gulf, spatial and temporal occurrence, reproductive biology, Gonadosomatic Index (GS-I), histological analysis, biochemical analysis.