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## **Bio-optical characterization in an ultra-oligotrophic region: the North central Red Sea**

malika kheireddine and Burton Jones

King Abdullah University of Science and Technology, Red Sea Research Center, Thuwal, Kingdom of Saudi Arabia (malika.kheireddine@kaust.edu.sa)

Until recently, satellite-derived ocean color observations have been the only means of evaluating optical variability of the Red Sea. During a cruise in autumn 2014, we investigated the variability of Inherent Optical Properties (IOPs) in the North Central Red Sea (NCRS) with a particular focus on the particulate backscattering coefficient, bbp, and colored dissolved organic matter, CDOM, absorption. To our knowledge, these are some of the measurements of these properties in the Red Sea. The IOPs are derived from the concentration and physical properties of suspended particles in the ocean. They provide a simple description of the influence of these particles on the light within the water column. Bio-optical relationships found for ultra-oligotrophic waters of the six stations sampled significantly depart from the mean standard relationships provided for the global ocean, showing the peculiar character of the Red Sea. These optical anomalies relate to the specific biological and environmental conditions occurring in the Red Sea ecosystem. Specifically, the surface specific phytoplankton absorption coefficients are lower than the values predicted from the global relationships due to a high proportion of relatively large sized phytoplankton. Conversely, bbp values are much higher than the mean standard values for a given chlorophyll-a concentration, Chl a. This presumably results from the influence of highly refractive submicrometer particles of Saharan origin in the surface layer of the water column.