

Spatial Variability of Phytoplankton Assemblages during the Intermonsoon in Baler Bay, Outer and Inner Casiguran Sound, Aurora, Fronting Philippine Rise

Authors : Aime P. Lampad-Dela Pena, Rhodora V. Azanza, Cesar L. Villanoy, Ephrime B. Metillo, Aletta T. Yniguez

Abstract : Phytoplankton community changes in relation to environmental parameters were compared between and within, the three interconnected basins. Phytoplankton samples were collected from thirteen stations of Baler Bay and Casiguran Sound, Aurora last May 2013 by filtering 10 L buckets of surface water and 5 L Niskin samples at 20 meters and at 30 to 40 meters depths through a 20 μ m sieve. Duplicate samples per station were preserved, counted, and identified up to genus level, in order to determine the horizontal and vertical spatial variation of different phytoplankton functional groups during the summer ebb and flood flow. Baler Bay, Outer and Inner Casiguran Sound had a total of 89 genera from four phytoplankton groups: Diatom (62), Dinoflagellate (25), Silicoflagellate (1) and Cyanobacteria (1). Non-toxic diatom *Chaetoceros* spp. bloom (averaged 2.0×10^5 to 2.73×10^6 cells L^{-1}) co-existed with *Bacteriastrium* spp. at surface waters in Inner and Outer Casiguran. *Pseudonitzschia* spp. (1.73×10^6 cells L^{-1}) bloomed at bottom waters of the innermost embayment near Casiguran mangrove estuary. Cyanobacteria *Trichodesmium* spp. significantly increased during ebb tide at the mid-water layers (20 meters depth) in the three basins (ranged from 6, 900 to 15, 125 filaments L^{-1}), forming another bloom. *Gonyaulax* spp. - dominated dinoflagellate did not significantly change with depth across the three basins. Overall, diatoms and dinoflagellates community assemblages significantly changed between sites ($p < 0.001$) while diatoms and cyanobacteria varied within Casiguran outer and inner sites ($p < 0.001$) only. Tidal fluctuations significantly affected dinoflagellates and diatom groups ($p < 0.001$) in inner and baler sites. Chlorophyll significantly varied between (KW, $p < 0.001$) and within each basins (KW, $p < 0.05$), no tidal influence, with the highest value at inner Casiguran and at deeper waters indicating deep chlorophyll maxima. Aurora's distinct shelf morphology favoring counterclockwise circulation pattern, advective transport, and continuous stratification of the water column could basically affect the phytoplankton assemblages and water quality of Baler Bay and Casiguran inner and outer basins. Observed spatial phytoplankton community changes with multi-species diatom and cyanobacteria bloom at different water layers of the three inter-connected embayments would be vital for any environmental management initiatives in Aurora.

Keywords : aurora fronting Philippines Rise, intermonsoon, multi-species diatom bloom, spatial variability

Conference Title : ICGEES 2019 : International Conference on Geography, Environment and Earth Sciences

Conference Location : Tokyo, Japan

Conference Dates : December 04-05, 2019