

## Bloom of *Palmerina hardmaniana*, a marine centric planktonic diatom in a coastal mangrove ecosystem- implication for coastal carbon cycling

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Large celled diatoms play an important role in export of carbon in coastal ecosystems. In the Sundarbans mangrove ecosystem located on the delta of Ganga-Brahmaputra-Meghna riverine systems and facing the coastal Bay of Bengal, a bloom of *Palmerina hardmaniana* (Greville) Hasle was tracked in 2015. The bloom of this centric diatom species was tracked from April- July, 2015 in Sundarbans Biological Observatory Time Series (SBOTS) site of Sundarbans. During pre-bloom (April) dissolved oxygen (DO) concentration was 6.82 mg/L while during bloom (May-June) DO concentration decreased to 3.83 mg/L. This also coincided with Chlorophyll-a concentration which ranged from 0.22-6.28 mg/L during the study period, with highest concentration of 6.28 mg/L in bloom period and overwhelmingly dominated by cells belonging to *Palmerina hardmaniana* ( $40.8 \times 10^4$  cells/L). In total 72 phytoplankton species were observed from April-July, 2015 in SBOTS site. The frustules of *Palmerina hardmaniana* ranged from 291-358  $\mu$ m in length and from 195 to 260  $\mu$ m in width. Based on *rbcl* phylogeny of RuBISCO, the dominance of *P. hardmaniana* was also confirmed. Increased air and surface water temperatures in SBOTS site showed significant correlation with observed cell abundance of *P. hardmaniana* with the onset of bloom. This is the first report of *P. hardmaniana* bloom in the coastal Sundarbans mangrove ecosystem. Therefore, understanding the physiological success of this centric diatom species in relation to dynamic environmental conditions has consequences for tracking export of carbon by centric diatoms in coastal water and resulting implications for coastal carbon cycling.

Keywords: diatom, phytoplankton bloom, mangrove, carbon cycling