

Harmful Algal Blooming Micro-Algae in Kenya's Coastal Waters

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Abstract : Harmful Algal Blooms (HABs) are a threat to coastal water quality, marine biodiversity, and human health. The attention on HABs and associated phycotoxins is still very low in tropical coastal developing countries despite the high dependence of local communities on coastal and marine resources for food and livelihoods and the growing evidence of the global increase in HABs frequency, toxicity, and geographical expansion. Lack of HABs monitoring thus creates a high risk of exposure due to uncertainty. This study assessed the spatial and temporal variability and effects of potential HAB-forming species in Kenya's coastal waters. The preliminary results from 463 samples collected over a series of 10 coastal surveys conducted over 267 Km of Kenya's coastline between August 2021 and July 2022 revealed the presence of 87 potential algal blooming species belonging to 47 genera dominated by species capable of producing toxins, causing physical harm and high biomass at 41, 31 and 21 % respectively. The taxonomic composition was also dominated by dinoflagellates at 47%, followed by diatoms, cyanobacteria, and silicoflagellates at 39, 12, and 2%, respectively. About 92 % of the toxin-producing species were established in the creek waters. However, there were no significant variations established in species richness between the dry and wet seasons. Paralytic Shellfish Poisoning (PSP) toxin-producing dinoflagellates *Alexandrium* spp., *Aphanizomenon* spp., *Gonyaulax* spp., *Gymnodinium* spp., and *Brachydinium capitatum*, and Amnesic Shellfish Poisoning (ASP) Toxin producing diatoms *Amphora* spp., *Nitzschia* spp. and *Pseudo-nitzschia* spp. frequented the area in low cell densities ranging between 5 and 1500 cells/L. However, no domoic acid (DA) and saxitoxins (SXTs) were detected during the July surveys. This does not mean that the toxins are absent in the area, and longer studies are recommended.

Keywords : harmful algal blooms, phycotoxins, saxitoxin, domoic acid, Kenya

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