

TOXIN-PRODUCING CYANOBACTERIA IN THE GANGA RIVER SYSTEM: SPATIOTEMPORAL DYNAMICS AND ENVIRONMENTAL DRIVERS

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*Toxin-producing cyanobacteria have emerged as a significant global threat, impairing ecosystem services and posing risks to human, animal, and environmental health. This study investigated the seasonal distribution of harmful cyanobacteria in the Ganga River from 2021 to 2023 across 20 sites, from Harshil to Fraserganj. Notably, dense blooms of *Microcystis aeruginosa*, a microcystin-producing species, were observed in the river's middle stretch at Buxar, Patna, and Bhagalpur, with peak densities reaching 15.88 million cells/l during the monsoon. The proliferation of these blooms was strongly linked to anthropogenic nutrient inputs from domestic sewage, agricultural runoff, and increased levels of nitrate and phosphate. Supporting physicochemical parameters such as elevated specific conductivity and salinity further facilitated cyanobacterial growth. These findings highlight the need for targeted management strategies to mitigate bloom formation and protect water quality, offering critical insights into the seasonal ecology of harmful cyanobacteria in the Ganga River system.*
