

Assessment of Heavy Metal, Organochlorine Pesticide, and Bacteria Present in Gomti River in Lucknow

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Abstract:

The Gomti River originates from Gomati Taal (Fulhaar jheel) near Madho Tanda, Pilibhit, Uttar Pradesh India, and stretching over 960 km through Uttar Pradesh before merging with the Ganga river near Saidpur, Kaithi, 27 km from Varanasi district from Uttar Pradesh India. And the water of the Gomti River is very heavily polluted, and particularly as it passes through Lucknow city, making it unsafe and largely unacceptable for direct human consumption or agricultural use. And it is suffering from high levels of organic waste, like bacteria, and industrial effluents, resulting in critically low dissolved oxygen (DO) levels, approximate blew 0.9–3 ppm, and high (BOD) Biological Oxygen Demand / (COD) Chemical Oxygen Demand. Sustainable ecosystem is of essence to the river for its survival and maintenance of ecological balance. Gomti river, a groundwater-fed tributary of the Holy Ganges, is the lifeline of the middle Indo-Gangetic Plains. Screening of river pollutants for river cleanup is a challenging task. We are collected water samples from different five places: Gaughat, Hanuman Satu, Daliganj, Gomti Barrage, Kukrail Drain. To monitor pollution from city drains/industries, using standard methods (rinsing bottles, avoidin. And Collected samples were analyzed for pH, DO, BOD, COD, TDS, were used for heavy metal and organochlorine pesticide analysis. DO was 3.6 ± 0.4 to 8.4 ± 0.5 (avg 6 ± 1.9) mg/l, BOD was 10.6 ± 0.5 to 41 ± 1.7 (avg 22.9 ± 13.3) mg/l, while COD was 26.6 ± 4.6 to 93.5 ± 4.6 (avg 56 ± 31.3) mg/l. WQI values gradually increased from S1 (56.7) to S5 (181.8) which denotes a significant deterioration of water quality downstream of the river. Cd, Mn, Fe, Pb, and Cr had increment of 64, 18, 12, 6, and 2fold, respectively, as compared to individual BIS:10500 standards. Among the OCPs, concentrations were in the order: aldrin > pp-DDT > β -HCH > γ -HCH > α -endosulfan > pp-DDE > α -HCH. Statistically strong positive correlation ($r > 0.95$ at 0.01) was observed among physicochemical parameters.