

Microflora and fauna of the river Ganga in pristine conditions of Harsil, India

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ABSTRACT

The present study was conducted to document the flora and fauna from pristine of Harsil. During the study the water temperature at Harsil (31°02'10"N and 78°48'19" E) was very low (2.5-11.7°C) and velocity was very high (0.8-1.5 m/s) with 0.2-1.5 m river depth. The present study revealed (2017 May to Jan 2020) total 49 taxa (44 flora and 5 fauna). Wherein floral taxa belonged to Bacillariophyceae -28, Chlorophyceae -11, and Myxophyceae-5, while fauna belonged to Rotifera-3 and Protozoa-2. Planktonic abundance at Harsil ranged from 10 ul⁻¹ to 360 ul⁻¹ and periphytic population ranged between 40µm⁻² to 11,150 µm⁻². In the study bacillariophyceae noticed as dominant floral group at Harsil. So climatic changes resulted in occurrence of various planktonic groups, as previously only diatoms were recorded.

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KEY WORDS: Biodiversity, Harsil, Periphyton, Plankton, Pristine conditions, River Ganga

Introduction

The degradation in the mountain due to climate change is affecting the river ecosystem, habitats and the biotic diversity at all trophic levels. Freshwater ecosystem are vulnerable to multiple environmental stressors like organic and inorganic pollution, geomorphological alterations, water abstraction, invasive species climate change and scarcity of water as a key stressor, particularly in rivers, they act together producing complex responses¹. The biological receptors also differ in their sensitivities, vulnerabilities and response dynamics to different stressors². The upper Ganga for the practical purpose starts at Gangotri as terrain between Gomukh to Gangotri is devoid of biota due to hostile conditions, referred as no fish zone³. River Ganga at Harsil (Latitude 31°02'10"N and longitude 78°48'19" E) is apparently uninfluenced by human interventions except due to road construction, small human settlements, some hotels and guest house, bathing and cremation at a few places. The substrate consists of mature boulders, rocks and pebbles. River water quality can still characterizes as pristine with no fish population. The only organic input to the system is through fallout of forest leaves in the form of lignocelluloses material. Hence, there is an immense need to organise information on the biodiversity and

structure of major biotic communities in natural conditions. River Ganga at Harsil (Latitude 31°02'10"N and longitude 78°48'19" E) was undertaken to study biodiversity of Ganga in pristine conditions as this stretch of upper Ganga is devoid of various man made activities and any change may be regarded due to changes in climatic conditions only.

Materials and Methods

Samples were collected quarterly from the river Ganga at Harsil, during the period of studies (2017 May to 2020 Jan.). Plankton samples were collected using boiling silk net no. 25 by filtering 50 litres water and fixed in 4 % formalin solution in 50 ml tubes for qualitative and quantitative analysis in the laboratory. Samples of plankton were analyzed using the proposed methodology⁴. Periphyton were collected by scrapping 1cm area of river stone and analysed⁵. Analysis of water quality parameters were performed⁶. For periphytic analysis samples were scrapped from one cm area of stone near river bank at Harsil.

Results and Discussion

Water quality

The water temperature was very low 2.5-11.7 °C and water velocity was very high 0.8-1.5 ms⁻¹, with 0.2-

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