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Microbial diversity and physico-chemical attributes of glacier-fed Lake Satopanth, Garhwal Himalaya

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Satopanth Lake is a glacier-fed lake located in the Garhwal Himalaya of Uttarakhand at an altitude of 4,600 m a.s.l. in the midst of snow-capped peaks. The lake has religious significance to the native residents of Mana village, which is the last border village of India. The residents of this village immerse the ashes of their dead ones in this lake. The water of this lake is the only source of drinking water for the trekkers, sages, local inhabitants and wild life. Hence, it is the must to assess the water quality of this lake. A limited number of physico-chemical characteristics along with the microbial diversity (bacteria, actinomycetes and fungi) were recorded during the year 2014 and 2015 in the ice free period, as the lake was accessible only for a limited time span. The mean value of water temperature of the Satopanth Lake ranged from 0.1 to 0.3. The mean value of hydrogen ion concentration (pH) was recorded minimum (6.85) to a maximum (7.10). The mean value of dissolved oxygen concentration ranged from 5.0 mg. l⁻¹ to 6.0 mg. l⁻¹. The mean value of total dissolved solids (TDS) ranged from 88.0 mg. l⁻¹ to 89.5 mg. l⁻¹. However, the mean value of free carbon dioxide ranged from 8.40 mg. l⁻¹ to 8.60 mg. l⁻¹. No faecal and total coliform has been found in the water sample of Satopanth Lake. A total of six species of bacteria, four species of actinomycetes and five species of fungi were isolated from the lake. The α -diversity of microbes in Satopanth Lake was found to be fifteen during the study period.

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