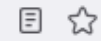




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DIVERSITY OF SOIL BACTERIA IN SOME SACRED PATCHES OF PURBA BARDHAMAN DISTRICT, WEST BENGAL, INDIA

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Abstract

Sacred patches are remnants of prehistoric land that some local populations preserve as a holy place. The diversity of bacterial population was studied from soil samples of five different sacred patches of Purba Bardhaman district in West Bengal. The sites explored were Baba Borthakur Tola at Paraj, Buro Raj Tola at Bhaghason, Dighi Par at Rayna, Maer Tola at Mohindar and Sahadol Tola at Narugram. The aerobic heterotrophic, starch-hydrolyzing, phosphate and lipid solubilizing, spore-forming, Gram negative, nitratereducing bacterial populations ranged from 4.66 to 6.79 $\times 10^6$, 1.57 to 7.19 $\times 10^6$, 2.76 to 5.14 $\times 10^6$, 2.30 to 5.65 $\times 10^6$ and 5.01 to 5.01 $\times 10^6$ c.f.u./g soil respectively. The physical properties of soil samples from the study sites were also

Diversity of soil bacteria in some sacred patches of Purba Bardhaman District, West Bengal, India

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ABSTRACT

Sacred patches are remnants of prehistoric land that some local populations preserve as a holy place. The diversity of bacterial population was studied from soil samples of five different sacred patches of Purba Bardhaman district in West Bengal. The sites explored were Baba Borthakur Tola at Paraj, Buro Raj Tola at Bhaghason, Dighi Par at Rayna, Maer Tola at Mohindar and Sahadol Tola at Narugram. The aerobic heterotrophic, starch-hydrolyzing, phosphate and lipid solubilizing, spore-forming, Gram negative, nitrate-reducing bacterial populations ranged from 4.66 to 6.79×10^6 , 1.57 to 7.19×10^6 , 2.76 to 5.14×10^6 , 2.30 to 5.65×10^6 , 1.18 to 5.31×10^6 , 0.22 to 2.30×10^6 and 1.69 to 4.26×10^6 cfu/g dry soil respectively. The physical properties of soil samples from the study sites were also evaluated. The organic carbon content, available nitrate nitrogen and phosphate was found to vary from 0.38% to 0.75%, 34.08 to 213.02 mg/kg and 102.25 to 477.18 mg/kg respectively. The bacterial population was found to vary significantly ($p < 0.05$) among the soil samples from the sacred patches studied as was shown by the results of one-way ANOVA. Three components with Eigenvalues of 2.893, 1.503 and 0.548 respectively were extracted from principal component analysis (PCA). Hierarchical classical clustering between the different groups of soil bacteria aided in deciphering the similarities between them. The Rényi diversity profiles helped to understand the diversity, richness and evenness of the soil bacterial population in the sacred patches. The results showed that Buro Raj Tola was the most diverse while Baba Borthakur Tola was the least diverse. The Berger-Parker index was, however, highest for Maer Tola (0.2553) indicating that the dominant species account for the majority of the total bacterial population in the area. The variations observed was probably because of the differences in the microhabitat in the different sacred patches studied.