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Characterization of pathogenic and denitrifying *Pseudomonas* spp. from agricultural fields isolated from various districts of West Bengal, India

Tapti Sengupta, Debapriya Nath and **Santwana Mandal**
West Bengal State University, India

Denitrification is an ecological process that treats water to reduce the nitrate levels to acceptable values, both in nature and water treatment enclosures. In our study, soil samples were collected from agricultural lands with leguminous cultivation in the districts of North 24 Parganas and Hoogly of West Bengal, India. 63 samples from various agricultural felids were assessed for heterotrophic bacterial count along with their denitrifying properties. 80% of the samples were positive for *Pseudomonas* spp., confirmed by bacteriological and biochemical typing. 57% of the samples were positive for oxidase, catalase, citrate, mannitol and negative for indol, MR-VP, urease, glucose, lactose, and maltose suggesting the presence of *Pseudomonas* spp. 46% were other associated species which were *Pseudomonas* negative. Significant co-relation was observed between soil quality parameters like TOC, phosphorus, DO, salinity and pH to the number of positive samples $p \leq 0.05$, co-relation coefficient $R=0.82$. The samples were pooled and molecular confirmation was done by 16SrRNA amplification showing bands at 1500bp, confirming the presence of *Pseudomonas* spp. The samples showed infections in the experimental zebra fishes significant at $p \leq 0.01$, and evolutionary analysis using MEGA6 confirmed the species as *Pseudomonas* otitidis. The pathogens having denitrifying properties were largely obtained from the Hoogly district followed by North 24 Parganas district, suggesting that the species are ubiquitous microflora of the system and they play an important role in the nitrification process. Degree of denitrification by the positive samples was significant at $p \leq 0.05$. *Pseudomonas* otitidis isolated from natural systems can be useful for industrial treatment of waste waters, with modification of the pathogenic trait, if cultivated on a large scale in the state of West Bengal. This study focuses on the positive quality traits of some animal pathogens, which needs to be studied further and is the first report of its kind from these districts.

Biography

Tapti Sengupta is serving at an esteemed position in Department of Microbiology, West Bengal State University, India. She is the recipient of numerous awards for her expert research works in related fields. Her research interests reflect in her wide range of publications in various national and international journals.

tapti.sg@gmail.com

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