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Diversity of nontuberculous mycobacteria prevalent in the districts of West Bengal, India: A statistical study

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Nontuberculous mycobacteria (NTM) are ubiquitous in the environment and are responsible for several ulcerative diseases in human and/or animals, also known as mycobacteriosis. These granulomatous ulcerations caused by NTM infections have been increasing in number over the past decades, especially in immunocompromised and HIV/AIDS patients and in domestic and free living animals. The aim of the study was to ascertain the spectrum of nontuberculous mycobacteria within mycobacterial isolates not belonging to *M. tuberculosis* and *M. avium* complexes but phylogenetically related to them. Fishermen and fish handlers were examined for ulcerative lesions typical for mycobacterial infections for consecutive years, 2015 and 2016, from various districts of West Bengal viz. A- Jalpaiguri, B- Murshidabad, C- North 24 Parganas and D- Kolkata, India. Isolated cultures were analyzed within the framework of ecological studies, carried out in fish models. A total of four mycobacterial species were identified based on bio typing and molecular analysis. 306 human samples (swab and pus from the sight of the ulceration, sputum) and 423 environmental samples viz. water and soil relating to the fish handlers, were pooled and screened for two years. 214 human samples were positive for *M. fortuitum* and *M. kansasii* whereas 274 environmental samples were positive for *M. kansasii* and *M. smegmatis*. *M. chelonae* was ubiquitous in nature. *M. fortuitum* showed significant positive correlation with the lower temperature suggesting the role of environmental factors in the rate and degree of infections by the pathogens. *M. kansasii* and *M. smegmatis* were found to be opportunistic and presented themselves in primary as well as secondary infections, and in significant levels ($p \leq 0.01$) in human samples having direct contact with the contaminated water. Degree of infection showed positive correlation with districts situated in the north of West Bengal with temperature ranging from 15o-25oC. Significant chi square (χ^2) value (78.20) was observed at $p < 0.001$ signifying that the degree of infection varied with temperature, with lower temperatures showing greater NTM occurrence visibly in the cooler districts. The present study signifies the prevalence of NTMs in West Bengal which was not reported earlier. The rise in the number and variety of NTMs especially of groups related to *M. tuberculosis* complex raises questions about drug regimens and undiagnosed symptoms. 70.02% of pathogenic mycobacteria reported in this study, from various districts of West Bengal, emphasize the need for research of these neglected and opportunistic pathogens particularly using multivariate analysis to identify causative factors.

Biography

Tapti Sengupta is an Assistant Professor and Coordinator in the Department of Microbiology at West Bengal State University. She started her career as a Fisheries Professional focusing on aquatic animal diseases and environmental modelling aspects but currently she is pursuing a research on Mycobacteriosis both in human and animals. She is involved in a number of projects with central and state government funding especially from Department of Biotechnology and ICAR. She is guiding a bunch of potential research scholars and supervising numerous summer projects along with her departmental and administrative work.

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