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## Composition and structure of denitrifying bacterial biofilm

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E filuents of some chemical industries contain high nitrate levels which need denitrification before discharge; otherwise it is a potential health hazard. Biological removal of nitrates from waste water using heterotrophic denitrifying bacteria is cost effective. Biofilm denitrifying reactors are gaining importance in recent times. A significant advantage biofilm reactors afford is the control of its "bios" component. Studies carried out in this perspective are presented here. The abundance, structure and activity of the denitrifying bacteria in the sludge studied to understand their composition revealed *Pseudomonas* sp. and *Alcaligenes* sp. to be numerically high by culturable approach and betaproteobacteria by culture independent method. Comparison of denitrification showed contrasting patterns while, *Diaphorobacter* sp. showed accumulation of nitrite in the medium while *Paracoccus* sp. showed no accumulation. Bacterial biofilm shape their structure in response to environmental conditions. Higher Mg or Ca ion concentrations induced cohesion of biofilm cells in *Paracoccus* sp. as well as high denitrification, but contrasting biofilm architectures. Influence of carbon showed that the nitrate removal efficiency was in the order acetate>glucose>methanol>ethanol. Conditions required to enhance the growth of denitrifier with degradative capabilities is desirable in waste water treatment processes. Different levels of nitrate did not display any significant effect on biofilm formation of *Paracoccus* sp. and its ability to tolerate and efficiently reduce nitrate could be said to confer a fitness payoff to the organism at high concentrations of nitrate in biofilm community. These set of studies conducted give valuable insights towards developing an efficient biofilm reactor.

## Biography

Anuradha S Nerurkar has completed her MSc (Microbiology) and PhD from RTM Nagpur University, Maharashtra, India. She has been teaching Microbiology in the Department of Microbiology & Biotechnology Centre, The M.S. University of Baroda since 1996 and currently she is a Professor of Microbiology. Her areas of research are denitrification and their biofilm structure-function relationship, bacterial amyloids and biotechnological applications, bacterial bioemulsifier and its ecophysiological role and Quorum quenching approach of biocontrol of plant pathogens. She has published 22 papers in reputed journals and written five book chapters.

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