

“Studies of Bacterial diversity from sediment samples collected from Mangrove forest using a polyphasic taxonomic approach”

Author(s) Mayilraj Shanmugam

Institution(s) 1. MTCC, Institute of Microbial Technology, IMTECH, Sector 39-A, Chandigarh, India

Abstract:

Abstract Marine microorganisms which are salt-tolerant provide an interesting alternative for therapeutic purposes. Marine microorganisms have a diverse range of enzymatic activity and are capable of catalyzing various biochemical reactions with novel enzymes. Especially, halophilic micro-organisms possess many hydrolytic enzymes and are capable of functioning under conditions that lead to precipitation of denaturing of most proteins. Further, it is believed that sea water, which is saline in nature and chemically closer to the human blood plasma, could provide microbial products, in particular the enzymes, that could be safer having no or less toxicity or side effects when used for therapeutic applications to humans. In this study an attempt to explore the diversity of bacteria associated with sediment samples collected from mangrove forest and investigated by polyphasic taxonomic approach. Totally 32 colonies were isolated on different mediums from the sediment samples and based on the difference in morphological characters, 20 colonies were selected for further characterization using polyphasic taxonomic approach. Upon the complete characterization of the isolates indicated that they belong to 10 different genera including Bacillus, Klebsiella, Vibrio, Pseudomonas, Kocuria, Acinetobacter, Brevundimonas, Janibacter, Brevibacterium and Exiguobacterium. Among the isolates 14 isolates belonged to Gram-positive group and 6 isolates belonged to Gram-negative group. Most of the isolates showed more than 99.0 % at 16S rRNA gene level with that of already validly published taxa. Isolates designated as FCS1, FCS2, FCS4, FCS6, FCS10, FCS11, FCS13 and FCS16 could be a novel species of respective genera mentioned above. 16S rRNA gene similarity levels of these isolates are less than 97.0%. Further analysis on these strains with chemotaxonomic markers including cell wall sugars, peptidoglycan pattern, type of lipids, quinone pattern, and oxidation of different carbon sources by using BIOLOG, API tests and genetic related studies like DNA – DNA hybridization would help in revealing the exact taxonomic status of these isolates. An attempt to study the un-culturable diversity of the sediment sample is going on and the study is focused on to identify the total community analysis of the sample.

Key words: Polyphasic taxonomy, Mangrove, 16S rRNA