

Isolation, characterization and evaluation of growth of salt tolerant mangrove microbes grown under NaCl stress

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An attempt Was made to evaluate the salt tolerance behaviour of *Aspergillus* sp. and *Bacillus* sp. isolated on Brain heart infusion agar from muddy water of Bhitarkanika mangrove ecosystem by growing them under different salt concentration in broth medium . It was observed that fungus could tolerate salt stress upto 16% where as bacteria could be able to grow upto 11 %. The *Aspergillus* sp. showed increase in growth with the increasing concentration of NaCl where as bacteria declined its growth in this condition. It was observed that acidic metabolites was produced by fungus, therefore, its pH was decreased with the increasing level of NaCl . Simultaneously, bacteria did not show any significant changes in pH of filtrate of different saline treated cultures. The protein content in the culture filtrate of fungus increased in higher concentration of salt . However, bacteria did not behave in the same manner rather showed negative effect of salinity on growth. The present attempt made to analyze the salt stress in fungus and bacteria was of primary nature that provided us various clues to work further.

Key words : Mangrove, Saline, Fungi, Bacteria, Salt tolerant , NaCl, Halotolerant

INTRODUCTION

It is well known that many bacteria and other microorganisms can proliferate in the presence of high concentrations of sodium chloride, provided that conditions are other wise favorable (Su and Lee, 2001; Turcoe *et al.*, 1999) . For many microorganisms sodium chloride is an indispensable nutrient; some grow best in a medium that is almost saturated with sodium chloride. It has long been known that various types of bacteria occur in the great salt lake the dead sea , and other natural waters of extremely high salinity (Goyal and Kaushik ,2002). In habitats of lesser salinity as, for instance, in the sea and in marine mud, a rich and varied population of microbes can be found (Yadav and Yadav , 2003, Sengupta and Chadhury, 1995 and Purkaystha and Pal, 1998, Schmit and Shearer, 2004)). Many of the microbes indigenous to such habitats are halophilic and the degree of their halophilism directly related to the salt concentration of their environment. Mangrove ecosystems are one of the important saline habitat accommodating various groups of organisms. Thus study is based on the salt tolerant isolates obtained from such habitat.

MATERIALS AND METHODS

Source of Organisms :

The fungus and Bacteria were isolated from the water samples collected from different locations of creek and

vegetations of Khola region of Bhitarkanika mangrove ecosystem, Orissa.

Isolation and characterization :

The test organisms were isolated on brain heart infusion agar (Hi.Media) being used for the isolation of salt tolerant organisms. The bacteria was characterized for its morphology and biochemical behaviour. The fungus was identified according to morphological norms.

Experimental set up for salt tolerance :

Twenty one different concentrations of sodium chloride i.e. 0 to 20 % was taken into consideration along with the other factors remaining constant. Potato dextrose broth medium added with different concentration of NaCl was prepared and final pH 6.0 was maintained (Narsen and Patel, 2000). The fungus was inoculated by 5 mm disc cut into the previous fresh culture into the individual sets of NaCl added medium in triplicate. Finally after 15 days of incubation at 30°C, fresh weight biomass and pH of the culture filtrate were measured.

The bacteria was inoculated in the same experimental set separately at the rate of 1×10^2 CFU in 25 ml potato dextrose broth and incubated at 37 C. The 10^{-3} diluted inoculum of 96 hrs. old bacterial cultures were used for analysis of population count on potato dextrose agar medium .The total protein was estimated by Lowry Method (1951).

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