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ISOLATION OF A COPPER RESISTANT STRAIN OF A CYNOBACTERIUM, NOSTOC CALCICOLA BREB

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ABSTRACT

A tolerant strain of diazotrophic cyanobacterium, Nostoc calcicola was isolated in the laboratory which is capable to grow at 70μm Cu. A further study on characterization of this mutant is under process.

Table : 00    Figure : 00    References : 06

KEY WORDS: Bioremediation, Copper, Nostoc calcicola, Resistant.

Introduction

Cyanobacteria are Gram -ve prokaryotes that perform oxygenic photosynthesis like plants. These cells are important in increasing nitrogen fertility in paddy fields. In our investigation we isolated a copper resistant strain that may be used in bioleaching programmes.

Materials and methods

Nostoc calcicola, a local isolate of rice field, from Algal Research Laboratory, Centre of Advanced study in Botany, Banaras Hindu University, Varanasi (U.P.) INDIA, was cultured in 250 ml Erlen-mayer flask containing 100 ml Allen-Amno.1’s combined nitrogen free growth medium. The cultures were kept in culture room, which was illuminated by two 40W fluorescent tubes for 16 hrs daily. The culture received 2500-3000 lux light intensity and a temperature of 26±1°C.

Isolation of Copper-resistant strain

Log phase population of present algae Nostoc calcicola with a cell density of approximately 1x10⁶ cells per ml was seeded on nutrient agar prepared in nitrogen free medium containing different copper levels (0-100μm) and subsequently shifted to growth conditions in culture room. As cyanobacterial cells could not grow in 40μm Cu, this formed the basis of isolation of colonies, growing in the presence of 70μm Cu under diazotrophic condition. There was general methodology for scoring the copper resistant strain. The Cu²⁺ strain clones grown as nutrient plates arose with a frequency of 2x10⁻⁷ as calculated and all of these were adopted for further studies. Its stability was checked through replating on nutrient plates containing 70μm Cu. This population was grown in bulk.

Observation

A copper resistant strain of Nostoc calcicola was obtained that was able to grow at 70μm copper whereas 5μm Cu²⁺ was found to lethal for growth in Nostoc calcicola cells.

Discussion

The acquisition of heavy metal resistant in algae was known previously. In some case heavy metal efflux was the major mechanism of heavy metal tolerance further characterization of this strain would clearly result about the reason of Cu tolerance in present organism.

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References


