NITRATE REMOVAL POTENTIAL OF NEWLY ISOLATED *Pseudomonas aeruginosa* STRAIN (A22) IN A SYNTHETIC MEDIUM

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ABSTRACT

Nitrate contamination of water bodies has become a serious issue worldwide. This study aimed to isolate and identify nitrate reducing bacteria and investigate their nitrate removal efficiency in synthetic medium as the initial step for bioremediation of nitrate contaminated water. The strain (A22) was isolated from poultry manure enriched soil sample. Primary screening was carried out on BTB agar plate supplemented with KNO_3. The efficiency of the bacterial strain on nitrate removal was investigated using mineral salt medium either with glucose or starch as carbon source at three levels (0.25 %, 0.5 %, and 1 %) with 500 mgl^{-1} KNO_3. Strain A22 reduced 93 % of nitrate without nitrite accumulation in 60 hours of incubation with 0.5 % of glucose while 64.5 % and 52.3 % of nitrate reduction was observed with 0.25 % and 1 % of glucose, respectively. Moreover, strain A22 did not grow in the medium containing starch. Therefore, among two carbon sources in three levels (0.25, 0.5, and 1.0 %), glucose 0.5 % showed significantly highest nitrate reduction and found to be the best level of carbon source for efficient nitrate reduction. Strain A22 was identified as *Pseudomonas aeruginosa* by biochemical studies and 16s rRNA sequencing analysis. The results of this study suggest *Pseudomonas aeruginosa* is capable of reducing nitrate in nitrate rich medium. However, due to its opportunistic pathogenicity, application of the strain for drinking water treatment is not recommended. Further studies are required to decide the suitability of its application in waste water treatment.

Keywords: Carbon source, groundwater, nitrate contamination, Pseudomonas aeruginosa