

Stress Induced Phosphate Solubilization by Fungi *Aspergillus awamori* bxq33110 Isolated from Green House Soils in South Korea

Buddhi Charana Walpola*, and Min-Ho Yoon*

*Department of Bio-Environmental Chemistry, College of Agriculture and Life Sciences, Chungnam National University, Daejeon 305-764, Korea

ABSTRACT

A fungal strain, capable of solubilizing insoluble phosphate under diverse temperature, pH and salt conditions was isolated from a green house soil in South Korea. Based on 18S rRNA analysis, the strain was identified as *Aspergillus awamori* bxq33110. The strain showed maximum phosphate solubilization in AYG medium (525 µg/ml) followed by NBRIP medium (515 µg/ml). The strain solubilized $\text{Ca}_3(\text{PO}_4)_2$ to a greater extent and rock phosphate and FePO_4 to a certain extent. However AlPO_4 solubilizing ability of the strain was found to be very low. Glucose at the rate of 2% (561 µg/ml) was found to be the best carbon source for *Aspergillus awamori* bxq33110 to solubilize maximum amount of phosphate. However, no significant difference ($P \leq 0.05$) in phosphorus solubilization was found between 1% and 2% glucose concentrations. $(\text{NH}_4)_2\text{SO}_4$ was the best nitrogen source for *Aspergillus awamori* bxq33110 followed by NH_4Cl and NH_4NO_3 . The pH 7, temperature 30°C and 5% salt concentration (674 µg/ml) were found to be the optimal conditions for insoluble phosphate solubilization. However, strain *Aspergillus awamori* bxq33110 was shown to have the ability to solubilize phosphate under different stress conditions viz 30-40°C temperature, 7-10 pH and 0-10% salt concentrations indicating its potential to be used as bio-inoculants in different environmental conditions.

Keywords: Phosphate solubilization, *Aspergillus awamori* bxq33110, bio-inoculants

Corresponding author

Min-Ho Yoon

Address: Department of Bio-Environmental Chemistry, College of Agriculture and Life Sciences, Chungnam National University, Daejeon, 305-764, Korea.

Tel:+82-010-3412-7957, Fax:+82-042-823-9241

E mail: mhyoon@cnu.ac.kr