

Isolation of the Nitrogen Fixing Bacterium *Azospirillum* from the Rhizosphere of Rice

Tharangani, G.K.M.^{1*}, Kumari, S.U.², Fernando, T.D.¹

¹Department of Bioprocess Technology, Faculty of Technology, Rajarata University of Sri Lanka.

²Department of Biosystems Technology, Faculty of Technological Studies,
Uva Wellassa University.

*bst1718075@tec.rjt.ac.lk

Azospirillum is a naturally occurring soil bacterium which has the potential to be used as a biofertilizer for crop enhancement in agriculture. The special ability of this bacterium in fixing atmospheric nitrogen is one of the most significant attributes that helps enhancing the nutrient uptake by the agricultural crops especially rice which is the staple food in Sri Lanka. Biofertilizers developed comprising nitrogen fixing bacteria reduce the reliance on synthetic fertilizers, promote environmental harmony, increase water quality and promote crop growth and yield. The current study was focused on isolation of *Azospirillum* spp. by collecting rhizosphere soil samples from the rice plants of several locations in Anuradhapura district. Screening and isolation of *Azospirillum* spp. was done on nitrogen free bromothymol blue semisolid media. Serially diluted soil extracts were inoculated into the tubes containing nitrogen free bromothymol blue semisolid media and incubated for 5 to 7 days at 37 °C. Pellicle formation under the surface of the medium was the positive indication for the presence of *Azospirillum*. Bacteria forming a pellicle under the surface of the semi-solid medium were purified by streaking onto nitrogen free bromothymol blue solid medium containing yeast extract and Congo Red. After 7 days of incubation, the scarlet-coloured colonies formed by *Azospirillum* were selected, further purified and labelled accordingly. *Azospirillum* isolates were stained and observed under the microscope in order to characterize morphologically. Identification of the *Azospirillum* isolates using molecular techniques is essential prior to optimization of a formulation containing nitrogen fixing *Azospirillum* for rice.

Keywords: *Azospirillum*; nitrogen fixating bacteria; biofertilizer; rice cultivation; sustainable agriculture