

QUANTITATIVE AND QUALITATIVE ANALYSES OF NITROGEN FIXING CYANOBACTERIAL POPULATIONS IN RICE SOILS

Ms. I.M. Samarakoon

It has been reported that cyanobacterial populations from different localities differ qualitatively and quantitatively depending upon their microenvironments. In the present study cyanobacterial populations were examined in soils collected from different localities in Sri Lanka.

Air dried and sieved soil samples were sent by scientific collaborators participating in a project on Azolla co-ordinated by the Institute of Fundamental Studies. These samples came from Ambalantota, Kelaniya, Kirimatiyana, Mahailuppallama, Matara, Tammannagama and Waikkala. They were analysed quantitatively for nitrogen fixing cyanobacteria by the MPN method using dilution series prepared with a nitrogen-free selective medium. Qualitative analyses were done by direct microscopic examination of the dilution tubes and by plating, followed by microscopic observations. The samples were also analysed for pH, Olsen's P and total N.

Cyanobacterial densities varied from 4.9×10^3 to 5.4×10^6 colony forming units per gram of soil. The higher populations were generally associated with dry zone localities having higher soil pH and low N content, but no such correlation with Olsen's P could be observed. The dominant species from all the localities was Nostoc, with Anabaena and Calothrix as the sub dominants. Fisherella and Scytonema were found only in Tammannagama, Mahailuppallama and Ambalantota.

It can therefore be inferred that high pH and low N content favour the abundance of N_2 -fixing cyanobacteria and that Nostoc is a cyanobacterium which is adapted to the widest range of soils.