

ISOLATION AND EVALUATION OF NITROGEN FIXING BACTERIA IN TEA SOILS FOR THE PRODUCTION OF BIOFERTILIZER

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By
ANUPAMA RATHNAMALI SAMARATHUNGA

**Faculty of Animal Science and Export Agriculture
Uva Wellassa University**

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ABSTRACT

Since ancient times, Sri Lankan economy was mainly depending upon the profit made by agricultural outputs which obtained greater input component at product chain. Fertility management is most significant factor and collective function of fertile elements play different roles with the presence of nitrogen that enhance the quality harvest which mainly govern by the chemical fertilizers. Though the chemical fertilizers acquire better output, it was attained to arising of negative impacts. This study was access to isolate the nitrogen fixing bacteria to develop a biofertilizer that has the potential for address those issues.

Soil samples and parts of root samples of Mana (*Cymbopogon confertiflorus*), Guatemala (*Tripsacum laxum*), Guinea (*Panicum maximum*) grasses and Maize (*Zea mays*) were used to isolate the *Azospirillum* by using Nitrogen free Bromothymole blue semi solid medium. Dilution series was followed for soil samples while surface washed solutions used for root and leaves samples to culture the bacteria in semisolid medium. Developed white pellicle at those medium was indicates the presence of *Azospirillum* and samples that were taken from this pellicle were undergone for purification procedure. After the completion of purification procedure, microbial observations were taken to obtain the final conclusion.

White pellicle was formed at samples in related to each rehabilitation grasses and maize samples that indicated the presence of *Azospilum* excluding the samples from leaves. Therefore the total nitrogen content of the Isolated 10 *Azospirillum* strains was measured by micro kjeldhal method after 10 days of the incubation period. Mean value of fixed nitrogen content of the three replicates were used for screen the nitrogen fixing ability. Mean value of three replications are presented in mg per gram of malate. The nitrogen fixing ability was ranged from 1.71 to 3.61 mg 'N'/g. Amongst them, the maximum nitrogen fixing ability (3.61mg'N'/g) was recorded from Guatemala grass soil (NBE/Gua S/110) and minimum (1.71 mg 'N'/g) was recorded in Mana grass soil (UWU/MS/106). Therefore Guatemala grass soils content the *Azospirillum* species which has the greatest nitrogen fixing ability that revealed the highest potential towards the development of nitrogen biofertilizer.

Key words: Nitrogen fixation, *Azospirillum*, Isolation, kjeldhal analysis