EVALUATION OF ASSOCIATIVE ACETYLENE REDUCTION ACTIVITY OF A DIAZOTROPH FROM A LOCAL RICE FIELD AND SOME MICROSCOPIC OBSERVATIONS

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The most abundant, rhizospheric, diazotroph isolated from local rice fields was tested for its acetylene reduction activity (ARA) using the spermosphere model (Thomas-Bouzon, et.al., 1982). The spermosphere model is preferred for evaluating this activity due to several factors such as (a). the rice seedling provides the diazotrophs with the actual carbon sources they would encounter in the natural environment, (b). the growing rice seedling constantly utilizes any fixed nitrogen making the medium selected for diazotrophs.

For the purpose of standardization, a diazotroph obtained from the International Rice Research Institute (IRRI) was used in combination with the rice variety, IR 42, while the local isolate was tested with Bg 400-1. Our isolate in combination with the local rice variety constantly gave high ARA compared to the IRRI combination. The association of this diazotroph at several selected cell concentrations with the rhizosphere of rice was observed microscopically under sterile conditions. This diazotroph was seen to concentrate in large numbers, embedded within the mucilagenous sheath around the rice roots. Inoculation tends to increase the secretion of mucilage by the rice roots and induce a characteristic curvature of root primordia.