Isolation of Diazotrophs from Different Soils of Tanjong Karang Rice Growing Area in Malaysia

ABSTRACT

Isolation and biochemical characterization of diazotrophs were carried out on seven soil series/types of Tanjong Karang Rice Irrigation Project area. The soil population ranged from 4 × 104 to 2.2 × 106 cfu g-1 soil. Diazotrophic populations were significantly (P<0.01) influenced by soil types, plant age and rice varieties. Higher soil and rhizosphere populations were recorded in Organic Clay and Muck, Bakau, Sedu and Serong soils. The highest root (6.3 × 107) and shoot (2.5 × 107) populations were found in MR219 rice planted in Organic Clay and Muck and Sedu soil series, which had higher C, N and P contents. The highest acetylene reduction assay (ARA) value (1.26 × 10-6 μmoL C2H4 cfu-1 hr1) was found in isolate Sb35. Several diazotrophic strains produced 32 to 69 mg L-1 of indoleacetic acid(IAA). The highest IAA was produced by the diazotrophic strain Sb41 (Corynebacterium sp). Eleven of the diazotrophic strains isolated from root and shoot of the rice varieties were capable of producing cellulose degrading enzyme. Tanjong Karang rice growing area harbor a diverse group of bacteria and most of the isolates belonged to the genera of Rhizobium, Burkholderia and Corynebacterium.

Keyword: Diazotrophs, Endophytes, Indoleacetic acid, Acetylene reduction assay, Cellulase activity