Effect of inoculation on root exudates carbon sugar and amino acids production of different rice varieties.

ABSTRACT

An experiment was conducted in axenic condition to study the effect of Corynebacterium sp. (Sb26) and Rhizobium sp. (Sb16) inoculation on the root exudates carbon sugars and amino acid production in three different rice (Oryza sativa) genotypes. A total of seven carbon sugars and 16 amino acids were determined from the Mahsuri, Mayang Segumpal and MR219 rice root exudates. The concentration of root exudate sugars, amino acids and its released pattern were significantly different with rice genotypes. Mahsuri released the highest sugar (25.73%) followed by MR219 and Mayang Segumpal (23.14% and 20.85% of plant dry wt.) rice, respectively. Inoculated plants produced different amount of sugar and amino acids in the presence of diazotrophs compared to non inoculated plants. Mahsuri rice inoculated with Corynebacterium sp. released the highest amount of fructose (791 μmol g-1 root dry wt.) and arabinose (640 μmol g-1 root dry wt.). Mayang Segumpal rice inoculated with Rhizobium sp. produced the highest amount of sucrose μmol g-1 root dry wt in the root exudate. A significantly higher amount of glycine and isoleucine were detected in the inoculated root exudates of all rice varieties. However, inoculation enhanced production of sugars and amino acids in root exudates. In general rice genotypes inoculated with Rhizobium sp. produced higher amount of total sugars and amino acids in root exudates compared to that of Corynebacterium sp.

Keyword: Corynebacterium sp.; Rhizobium sp; Rice genotypes; Root exudates.