Abstract

Objective. To isolate nitrogen fixing bacteria to be used in a fertilization regime of an organic agriculture program. Materials and methods. The isolation of nitrogen fixing bacteria was done in an Ashby-benzoate medium from soil of a Stevia rebaudiana plantation. Isolates identified as Azotobacter nigricans were evaluated by their growth kinetics and the strain with the fastest growth was used for the production of a biofertilizer by discontinuous fermentation. The preliminary evaluation of the biofertilizer was done by its inoculation into three ridges of a plantation of S. rebaudiana and yield determination was based upon biomass production and glycoside concentration. Results. Two isolates (A5 and A6) were identified as A. nigricans based on their phenotypic and genotypic characterization. Isolate A5 was selected for preparing the biofertilizer because it showed a better stability, pigmentation, a faster growth rate (0.1405 h⁻¹ exponential phase of 18 hours) and an average IAA production of 38.4 mg/ml after 150 hours. The bio-fertilizer was obtained in milk medium with a cell concentration of 4x10¹² CFU/ml. Conclusions. The preliminary field evaluation showed a positive correlation between the increase of the glycoside concentration in the leaves of S. rebaudiana and a higher production of biomass in response to the bio-fertilizer application.

Keywords

IAA, Azotobacter nigricans, glycosides, Stevia rebaudiana Bert.