Effects of Sb16 bacterial strain and herbicides on endophytic bacterial populations and growth of aerobic rice

ABSTRACT

Pot experiment was conducted under glasshouse conditions to investigate the effects of the inoculation of N_2 fixing Stenotrophomonas maltophilia strain Sb16 and application of three herbicides (paraquat, pretilachlor and 2,4-D) at 0, 1/2X, X and 2X their recommended field application rates (X) on endophytic bacterial populations and physio-morphological parameters of aerobic rice. The physio-morphological traits such as plant height, leaf area, chlorophyll content, nitrogen (N) content, root dry mass, root length, root volume and root average diameter were assessed at 60^{th} day after the treatment. Data on endophytic bacterial counts were collected at 15, 30, 45 and 60 days after the treatment. Results obtained from the study revealed that the number of endophytic bacteria and physio-morphological characters of aerobic rice significantly decreased with increasing herbicides dose. Sb16 inoculation significantly ($P \leq 0.0001$) increased all the parameters measured. N contents were the highest (2.53 %) in the inoculated samples treated with half dose of 2, 4-D; but the lowest contents (1.89 %) were obtained in the non-inoculated samples treated with double dose of paraquat. The results suggest that Sb16 strain can improve productivity of aerobic rice under herbicide-stressed soil.

Keyword: Oryza sativa; Weed control; Nutrient uptake; Microbial communities; Rhizosphere