EFFECT OF TWO BACTERIAL STRAINS ON VEGETATIVE GROWTH AND YIELD RESPONSE IN THE SRI LANKAN TRADITIONAL RICE VARIETY OF "KURULUTHUDA"

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ABSTRACT

Rice is a major food for humans in worldwide especially, in Sri Lanka. For more than three millennia, Sri Lankan farmers have developed, preserved, and utilized traditional rice types. The main objective of this research was to evaluate the two bacterial strains on vegetative growth and yield response in the Sri Lankan traditional rice variety of "Kuruluthuda". The pots experiment was conducted under Completely Randomized Design (CRD) with Three treatments. Kuruluthuda is traditional red rice variety in Sri Lanka (Accession Nu of Kuruluthuda:3549). Bacteria strains were used as bacterial-based biofertilizers. They were known as "Plant Growth Promoting Bacteria". In this study, used two bacterial treatments and another one is control. Bacteria strains were members of the *Bacillus* genus. In this study, Treatment One was known as Bacterial strain I-I (Accession Nu: PV174539). The treatment two was known as Bacterial strain I-II (Accession Number:174565) in NCBI. These Bacteria were already isolated from Rhizosphere soil and 16S rRNA gene was partially sequenced using sangar dideoxy sequencing method by Faculty of Agriculture, University of Ruhuna. Biofertilizers were added once every two weeks for rice plants. Vegetative growth parameters were analyzed by ANOVA version of Minitab 17 at 0.05 significant level. Bacteria strain I-I (T1) had significantly different from other two treatments in plant height. T1 had highest mean plant height (118.00 ±3.62cm). T2 recorded minimum mean plant height (94.50±9.12cm). T3 indicate the moderate mean plant height (110.00±3.03cm). About tiller number had no significant difference by treatments. Statistically significant difference among treatments results in number of leaves. Bacterial strain I-I (T1) resulted in the longest leaves while bacterial strain I-II (T2) produced the shortest but higher width, and the control plants (T3) showed moderate values. Also, Colour of leaves were observed by visually using Leaf Colour Chart. Bacterial strain I-II (T2) had very greenest colour other than treatments. The study demonstrates that *Bacillus* inoculation can improve vegetative growth and yield in traditional rice varieties of Kuruluthuda, offering a sustainable alternative to chemical fertilizers.

Key words: *Bacillus sp.*, Biofertilizer, Kuruluthuda, Plant Growth Promoting Bacteria, Vegetative growth

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