

**EVALUATING THE EFFICACY OF BIOSTIMULANT TO  
MITIGATE THE SALT STRESS IN MUNG BEAN**



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# ABSTRACT

Salinity is a major environmental stress affecting crop production, particularly in regions with saline soils. Mung beans (*Vigna radiata*) are known to be sensitive to salinity, which limits their growth and yield. Traditional fertilization methods, such as basal or top-dressing applications, are commonly used but often have environmental drawbacks. Using organic fertilizers, such as fermented rice water and plant bio stimulants like *Mimosa pudica*, offers an alternative method to mitigate salinity stress and promote sustainable agriculture. This study evaluates the efficacy of a foliar application of biostimulant in alleviating the effects of salinity stress in mung beans. A Completely Randomized Design (CRD) was used with four treatments and five replications, each including (T1) negative control, (T2) positive control, (T3) 50% biostimulant with diluted 50% distilled water (166 ml/m<sup>2</sup>) with 100 mM saline water, and (T4) 100% biostimulant without distilled water (332 ml/m<sup>2</sup>) with 100 mM saline water. Mung bean plants were subjected to saline water (100 mM NaCl) irrigation, and the biostimulant was applied as a foliar spray. Growth parameters such as plant height, number of leaves, branches, root length, and reproductive traits (pods, flowers) were measured. Yield was assessed based on seed weight. The results showed that mung beans treated with 100% bio stimulant (T3 and T4) significantly ( $p < 0.05$ ) improved growth and yield compared to the (T1) negative control and (T2) positive control. Notably, plants in the T4 groups had increased leaf number, branch number, pods per plant ( $6.60 \pm 0.24$ ), and root length ( $14.34 \pm 0.27$ ), indicating enhanced growth and reproductive development. The foliar application of fermented rice water with *Mimosa pudica* dried root powder proved to be an effective strategy for mitigating the adverse effects of salinity stress on mung beans. This method enhanced plant growth and yield ( $312.0 \pm 8.00$ ), presenting a sustainable alternative to conventional fertilization methods. Future studies should further explore the impact of this bio stimulant on other crops and under different environmental stress conditions.

**Keywords:** Biostimulant, Fermented rice water, Foliar application, *Mimosa pudica*, Mung beans, Salinity stress, Sustainable.

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