

**ASSESSMENT OF THE SUITABILITY OF DIFFERENT CARRIER MATERIALS FOR NITROGEN FIXING BACTERIA UNDER PARACHUTE METHOD OF PADDY CULTIVATION (*Oryza sativa* L.)**

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Biofertilizers contain live cells of microorganisms that can be added to soil to increase the number of beneficial microorganisms. Biofertilizers with nitrogen-fixing bacteria need carrier material for effective soil and plant activity. This study was conducted to discover suitable carrier material for biofertilizer with nitrogen-fixing bacteria; Azotobacter to be used in the parachute method of paddy cultivation. Nitrogen-fixing Azotobacter was isolated from traditional rice variety: *Madathawulu* using Ashby Mannitol media. Morphological characters and gram staining test methods were used for the identification process. Azotobacter was inoculated to seed paddy (Bg250) in bubble trays. Ten treatments added (T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub>, T<sub>5</sub>) and non-added with biofertilizer (T<sub>6</sub>, T<sub>7</sub>, T<sub>8</sub>, T<sub>9</sub>) were used for the experiment with three replicates each. Plant growth performances were measured through morphological parameters. Plant nitrogen percentage was measured in each plant at tillering. Analyses were done using ANOVA and LSD for mean separation. The growth results revealed that all the biofertilizer added and non-added treatments had a significantly higher ( $p < 0.05$ ) plant height, dry shoot weight, plant nitrogen percentage, and the number of tillers per plant over the control (T<sub>0</sub>). Among three carrier materials, biochar added with biofertilizer treatment (T<sub>4</sub>) gained the highest significant ( $p < 0.05$ ) mean number of tillers per plant (7) compared to other treatments. Furthermore, it also reported higher mean dry shoot weight (2.45 g) and mean plant nitrogen percentage (2.47%) than the other treatments. In conclusion, biochar can be identified as the most suitable carrier material for biofertilizer with nitrogen-fixing bacteria for rice under parachute method of paddy cultivation. However, further field experiments are needed to validate results with growth and yield performances of rice.

**Keywords:** Biofertilizer, Carrier materials, Rice, Parachute method