

Inoculation effect of endophytic bacterium (*Bacillus sp.*) isolated from wild rice '*Oryza nivara*' on Sri Lankan traditional rice variety Ma wee

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Rice (*Oryza sativa*) feeds 50% of the world population. Nitrogen (N) fertilizer is a major cost of rice production. Sri Lankan wild rice *Oryza nivara* thrives without N fertilizer. We have isolated an endophytic bacterium from Sri Lankan wild rice *Oryza nivara*, which was identified as *Bacillus megaterium* or a very closely related species through 16S rDNA analysis. We studied the effect of inoculation of Sri Lankan traditional rice variety Ma wee with our endophytic *Bacillus*. A complete randomized design (CRD) with 10 replications was carried out in greenhouse. There were four treatments based on inoculation and with N at an equivalent concentration of 25 kg/ha; [inoculated and fertilized (I/F), inoculated and non-fertilized (I/NF), non-inoculated and fertilized (NI/F) non-inoculated and non-fertilized (NI/NF)]. Total chlorophyll content (TC) and plant height (PH) were measured at 5th week during vegetative stage. First panicle length (PL), number of filled grains (FG) and filled grain weight (FGW) were recorded and harvest index (HI) was calculated. A significant positive effect ($p < 0.05$) of inoculation was identified for TC in I/F and I/NF versus NI/NF plants; PH was highest in I/F 130.25 cm (± 3.56) versus the lowest in NI/NF 107 cm (± 0.40). I/F, I/NF and NI/F treatments showed significantly ($p < 0.05$) higher PL [24.63 (± 0.87) 24.02 (± 1.07), and 22.03 cm (± 1.16)] and FGW [1.14 (± 0.11), 1.13 (± 0.12) and 1.04 (± 0.14) g] respectively than NI/NF [18.73 (± 2.26) cm and 0.65 g (± 0.11)]. I/F and I/NF had a significantly higher HI [21.16 (± 1.53) and 23.4% (± 1.41)] than in NI/NF 15.4% (± 2.19). Significantly lowest FG was recorded from NI/NF (32.71) (± 4.03), in contrast to I/F, I/NF and NI/F treatments (53.50 (± 4.41), 49.25 (± 4.11) and 45.42 (± 4.94) respectively). Our experiment indicates that our bacterial isolate may reduce the requirement of Sri Lankan traditional rice for N fertilizer.

Biography

H.W.K.S.L. Kumara has obtained the B.Sc (honours) degree in Agricultural Science and Management in 2012 from Sabaragamuwa University of Sri Lanka. He currently studies at University of Ruhuna for Mphil degree under the supervision of Dr. S. Geekiyanage, Prof. Gamini Senanayake and Prof. E. Peter Greenberg. His research is funded by the project of transforming University of Ruhuna into international status to SG.

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