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Opportunistic endophytism of *Trichoderma* species in rice Pusa Basmati-1 (PB1)

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Microbes that colonize internal tissues of plants are called endophytes, andare known for their functional role against biotic/abiotic stress and growth promotion activity in plants. The ascomyceteous fungus *Trichoderma* spp. (Teleomorph: *Hypocrea*) are well known antagonists cum biocontrol agents. In this study, a total of five *Trichoderma* isolates from two different species *viz*., *T. asperellum* (TaR1, TaR2 and TaR3) and *T. asperelloides* (TaR4 and TaR5) collected from different agro-climatic zones in Rajasthan, India were evaluated for their endophytism in rice variety Pusa Basmati-1 (PB-1) through soil and seed treatment. An attempt was made to re-isolate the fungus from rice roots (seed and soil treated) and further subjected to microscopic and molecular analysis. Re-isolation results revealed that culture growth of *Trichoderma* spp. isolated was similar to that of the inoculated ones. The microscopic analysis (light and scanning electron microscopy) results also confirmed that the re-isolated endophytic fungus were identical to the inoculated ones. These results were further confirmed by polymerase chain reaction (PCR) amplification of the rDNA region (18SrRNA, ITS1, 5.8SrRNA, ITS2 and 28SrRNA) and translation elongation factor 1 (*Tef1*) with the re-isolated *Trichoderma asperellum* and *T. asperelloides* isolates. In this study, it has been confirmed that *Trichoderma asperelium* and *T. asperelloides* turns endophytic in rice after introduction through seed and soil treatment.

Keywords: Ascomyceteous fungus, Molecular phylogeny, Mycoparasitism, Pusa Basmati-1 (PB-1), Rajasthan, SEM, Translation elongation factor 1 (*Tef1*)