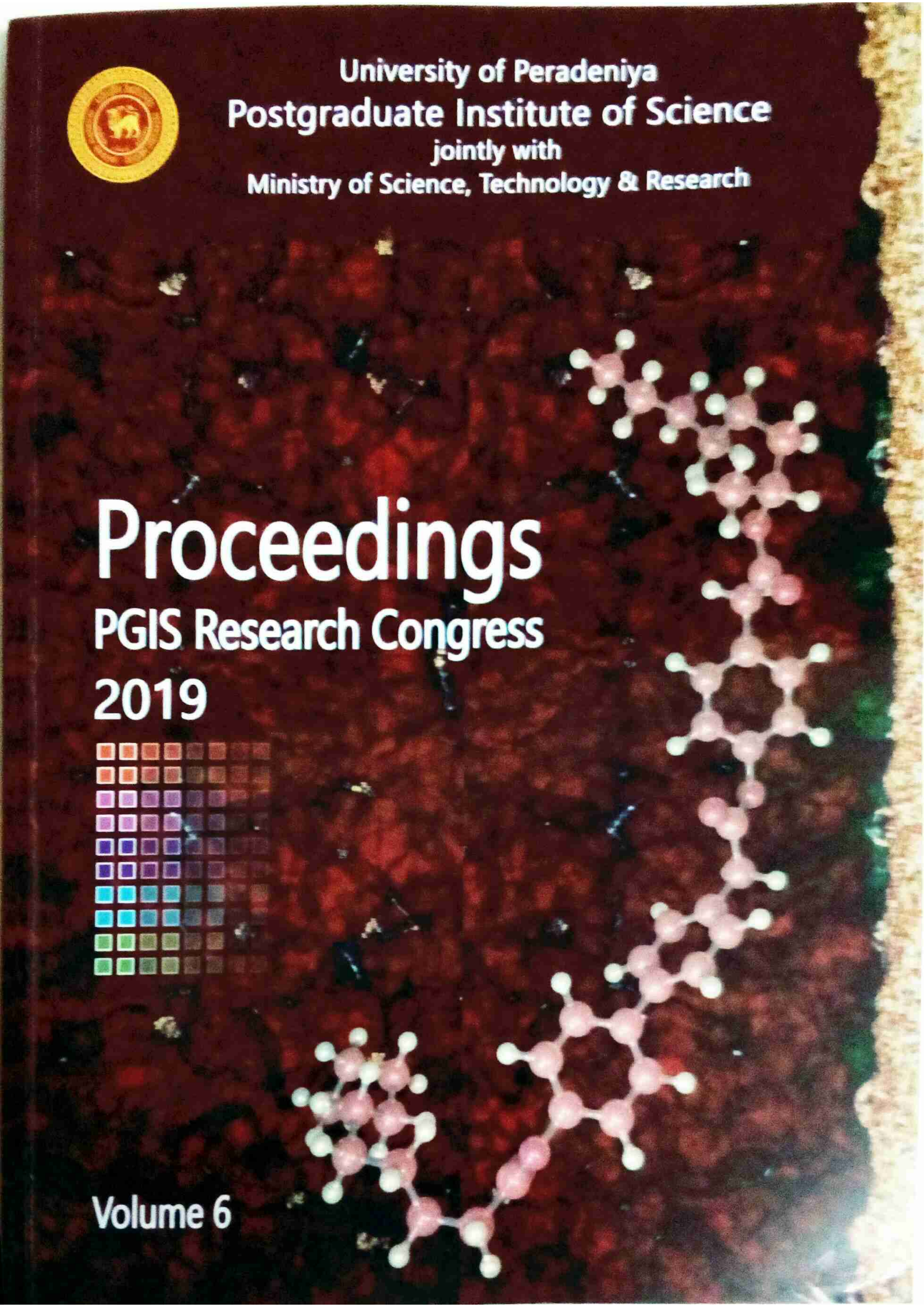
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BIOFILM BIOFERTILIZER MEDIATED RESTORATION OF NITROGEN FIXERS IN THE SOIL-PLANT SYSTEM IN PADDY CULTIVATION

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Soil microbes and fauna living in the soil-plant system contribute to ecosystem sustainability through signalling in complex network interactions. Chemical nitrogen (N_2) fertilizers applied to agroecosystems suppress the action of soil microbes, particularly N_2 fixers (diazotrophs), thus leading to produce N-poor soil microbial communities with low biomass. Microbial biofertilizers increase diversity and abundance of soil microbes by introducing beneficial microbes which are depleted in agroecosystems. Among microbial biofertilizers, biofilm biofertilizer (BFBF) can reinstate lost microbial diversity in degraded soils and possibly in plants. Thus, the present study focused on evaluating the effect of BFBF on recovering abundance of plant endophytic and soil diazotrophs in conventional agriculture using rice as the test plant. A field experiment was conducted with four treatments *viz*: 100% CF DOA recommendation (DCF), NIFS CF recommendation for BFBF practice (NCF), NIFS CF recommendation for BFBF practice + BFBF (NCF + BFBF), and the control (without CF and BFBF), each having three replicates. Soil and plant samples were collected from all four treatments and microbes were isolated and grown in N free Combine Carbon Media (CCM) prescribed for growing diazotrophs. Microbial counts were taken and analyzed using Minitab statistical package. According to the results, soil and plant endophytic diazotroph abundances of NCF + BFBF were significantly higher than that of DCF, NCF and the control ($P < 0.05$). This may be due to the dormancy breaking of microbial seeds after BFBF application. Further, diazotroph abundance of NCF was significantly higher than that of DCF. This is because the dosage of N used in NCF is lower than that of DCF, and hence suppression of diazotrophs in the NCF is less. The study concludes that application of BFBF together with a reduced dosage of N fertilizers can restore lost diazotrophs abundance in the soil-plant system of conventional rice cultivation.

Keywords: Biofilm biofertilizer, Chemical fertilizer, Diazotrophs, Rice