Abstract No: 269 ***Life Sciences***

PLANT DIVERSITY IN ORGANIC AND CONVENTIONAL RICE FARMING: A CASE STUDY FROM MALSIRIPURA, KURUNEGALA DISTRICT, SRI LANKA

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Use of chemical fertilizers in conventional farming contributes significantly to many environmental issues including biodiversity loss, whereas organic farming practices enhance agro-biodiversity by promoting a healthier ecosystem and enhanced ecosystem services. This study investigates the effects of organic (using organic fertilizer and other organic methods) and conventional farming (using chemical fertilizer, weedicides, pesticides and other conventional methods) on plant diversity in selected paddy fields in the intermediate climatic zone of Sri Lanka, during "*Maha* season". Vegetation sampling was conducted in rice fields (representing 12 quadrats per field, inside fields and along field bunds), covering three growth phases of rice: vegetative (V), flowering (F), and ripening (R) using pin frame method. During V, F, and R stages, the organic paddy recorded a total plant abundance of 730, 1322, and 986 individuals, while conventional paddy recorded 429, 874, and 1349 individuals, respectively. Nearly 42%, 46% and 4% in organic paddy and 43%, 43% and 7% in conventional paddy were of native, exotic and endemic plant species, respectively. Although 100% of plants belonged to weeds in conventional paddy, only 80% of plants in organic paddy were weeds. The species richness was 13, 15, 15 in organic paddy and 7, 9 and 6 in conventional paddy for V, F and R stages, respectively. Shannon-Wiener diversity indices were 0.44 ± 0.55, 0.68 ± 0.40 and 0.31 ± 0.42 in organic paddy, 0.35 ± 0.36, 0.57 ± 0.41 and 0.44 ± 0.49 in conventional paddy, for the three phases, respectively. Species richness was significantly higher in organic than conventional farming in all phenophases. However, Shannon-Weiner Diversity Indices did not significantly vary among conventional and organic fields for the *Maha* season. Conventional farming had greater evenness in all three phases (V = 0.178, F = 0.261, R = 0.191) than organic farming (V = 0.171, F = 0.258, R = 0.103). The highest value of Simpsons' Diversity index was reported in organic farming at F phase (5.07) followed by V (4.50) and R (3.45), and in conventional farming, the highest was recorded for R (3.77), followed by F (3.75) and V (2.72). *Cyperus rotundus* was the most abundant species (excluding *O. sativa*) in both paddy fields during all phenophases. The study underscores that while farming practices influence plant species richness, they do not significantly impact plant diversity.

Financial assistance from PGIS (Grant No. PGIS/2022/10) and the University of Peradeniya (Grant No.URG-2023-32-S) are acknowledged

Keywords: Chemical fertilizer, Diversity indices, Organic fertilizer, Paddy field ecosystem, Paddy phenophases