

**Dynamics of Odonata in an Agroecosystem: Effects of Paddy Cultivation Phases on the Diversity of Dragonflies and Damselflies**

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**Abstract**

Wetlands represent a major part of biodiversity and provide habitat to many species which cannot succeed in other ecosystems. Man-made wetlands like Paddy fields represent a greater percentage of wetland ecosystems in Sri Lanka. However, there are only a few studies that observed the Odonata diversity in man-made wetland ecosystems in Sri Lanka. Therefore, this study was conducted to observe the effect of cultivation phases of a paddy-field ecosystem on the diversity of Odonata. The paddy culture period chosen for the study was started in June 2022 and ended in September 2022 and the study covered the Seeding, Tillering, Booting, Flowering, and Harvesting phases. Fixed-radius point count method was used for the data collection purpose and ten circular plots of 5m radius were laid maintaining a 50 m distance between two plots in the study area which had a total area of 785m<sup>2</sup>. At all five successive stages of the cultivation cycle, the number of Odonata species and their abundance were recorded once a week in each plot. Data was recorded each day from 8.00 am to 10.00 am and from 3.00 pm to 5.00 pm. Odonata diversity was calculated separately at each of the stages of the paddy cultivation cycle using Simpson's index (D) and Shannon-wiener index (H'). According to results, 592 individuals were recorded belonging to 14 species of Odonata in 02 families. Among the total recorded species, 64% of species belonged to the family Libellulidae. Sri Lankan Orange-faced Sprite (*Pseudagrion rubriceps ceylonicum*) was the only endemic Odonata species that were recorded during the study. The overall H' and D diversity indexes were 1.71 and 0.75, respectively. Values of H' and D diversity indexes for these five stages (Seeding, Tillering, Booting, Flowering, and Harvesting) were 1.36 & 0.65, 1.59 & 0.72, 1.72 & 0.76, 1.81 & 0.79 and 1.59 & 0.78, respectively. The study revealed that among the index values of each cultivation phase, the flowering stage had the highest diversity, while the seeding phase showed the lowest diversity. Therefore, it is evident that the transformation of land use/habitat in different stages plays a major role in the diversity of Odonata. and this study can be used to depict the impacts on biodiversity due to the degradation of wetlands.

**Keywords:** Odonata, Paddy cultivation phases, Biodiversity, Man-made wetland