

Organic Farm Habitats as a Wildlife Refuge for Increasingly Endangered Amphibians in the Piduruthalagala Lower Mountain Range, Sri Lanka

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Abstract

Permanent changes caused due to agriculture have resulted in wide-ranging impacts on amphibian diversity and abundance. Altered environmental conditions such as using chemical fertilizer, insecticides, antibiotics, growth hormones, and soil erosion have pushed amphibians to the end of their range of tolerance. Therefore, this study was designed to ascertain the amphibian species diversity of an urban ecosystem: Nuwara Eliya, with the objective of assessing the contribution of organic farming for the conservation of amphibian species. Two different habitat types viz. a terrestrial habitat with an organic farm garden (OFG) and a habitat with a non-organic farm garden (NOFG), were studied. Amphibian species inside the square were recorded during the night (19:00 – 21:00) using 5m² quadratic plots. For each new species recorded within the plot, a new square was plotted adjacently, and observations were repeated once a month for a period of 09 months from January - September 2019. As per the observations, 206 amphibians belonging to 06 species and 04 families were recorded within the area representing critically endangered, endangered and least concern amphibian species. The Simpson's index and Shannon diversity index for OFG & NOFG were 0.34/0.36 and 0.53/0.07, respectively. The most dominant species recorded were the common house toad (*Duttaphrynus melanostictus*), small eared shrub frog (*Pseudophilautus microtypanum*), Mountane hour-glass tree frog (*Taruga eques*), with relative abundances of 44.66%, 36.40% and 14.07%, respectively. The globally critically endangered and endemic schmarda's shrub frog (*Pseudophilautus schmarda*) was the least recorded species with a relative abundance of 0.48%, recorded when heavy rains began in the area (September). The least diversity was recorded in NOFG with a Shannon diversity index (0.53) and the highest (0.34) was recorded in OFG representing all six recorded amphibian species including one critically endangered species, leaf nesting shrub frog (*Pseudophilautus femoralis*) which was not recorded in NOFG. Therefore, it is evident that these organic farm habitats act as wildlife refuges and neutralize the negative effects of non-organic farming on amphibians to a certain extent. Thus, proper conservation plans should be implemented through research to manage and improve the existing local habitats and thereby protect the amphibians.

Keywords: Amphibians, Conservation, Nuwara Eliya, Organic farming, Jetwing St. Andrew's

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