

SPECIES DIVERSITY AND ABUNDANCE OF ODONATES IN THREE DIFERENT TANK\$ IN MIHINTALE AREA

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INTRODUCTION

Dragonflies and damselflies are diverse insects and are in the insect order 'odonata'. Odonata is one of the oldest groups of winged insects found today. They are well known insects occurring on all continents except Antarctica (Trueman 2007). The vast majority of this group occur on tropical and subtropical climate zones (Ebrahimi *et al.* 2009). Dragonflies mostly occur in the vicinity of different fresh water habitats like rivers, streams, marshes, lakes and even small pools and rice fields. Dragonflies are often addressed as the "Guardians of water shed", habitat selection of adult insects strongly depends on vegetation structure, and their larvae develop in water and are critical with regard to water quality and aquatic habitat structure. Although this order is an important group, Odonata fauna is poorly known in Sri Lanka. The available information is only restricted to the guides. The dragonflies of Mihinthale sanctuary are poorly known and no synthesized data is available to assess the situation there. Therefore this study mainly focuses on the diversity and abundance of Dragonflies in Mihinthale sanctuary and to check whether this group could act as an indicator of water quality.

METHODOLOGY

Periodic adult dragonfly count was conducted at Mihintale tank, Kaludiyapokuna and Kanadarawa tank and they were collected with insect nets. Collected odonates were identified using Keys (De Fonseka, T .2000 and Bedjanic, et al. 2007). Distribution of odonates in different sites in the sanctuary was compared. Water samples were collected from the pokuna and tanks and measured BOD, DO and pH in different locations on site as well as in the laboratory. Data were analyzed using Minitab version 14.

RESULTS AND DISCUSSION

Species composition

Total of 19 dragonfly species (two families Gomphidae and Libellulidae) and 6 species of damselflies (family Coenagrionidae) were recorded within the study area. One endemic damselfly species *Pseudagrion rubriceps ceylonicum* was found during the study period in all three sites. The *Ictinogophus rapax* is rare and was recorded in Kaludiyapokuna. A very rare damselfly namely *Agriocnemis sp* was found from the Kanadarawa Tank. This species has not been recorded and not well described in Sri Lanka. At Mihintale all the 19 species of dragonflies and five species of damselfies were recorded while 15 species of dragonflies and five species of damselfies were recorded from the Kanadarawa tank. Kaludiyapokuna pond had 9 species of dragonflies and four species of damselfies, and the small numbers recorded may be due to unfavorable conditions for the development of dragonfly larvae with the covering of invasive species. Mihintale tank consisted of the most common dragonflies than the other sites. Most of the rare dragonflies were found in Kanadarawa tank (Figure 1). None of an endemic dragonfly species was recorded. Kanadarawa tank consisted of the most common, rare and endemic damselfies (Figure 2). *Rhyothemis variegata* was the most abundant species in both Mihintale and Kanadarawa tanks.

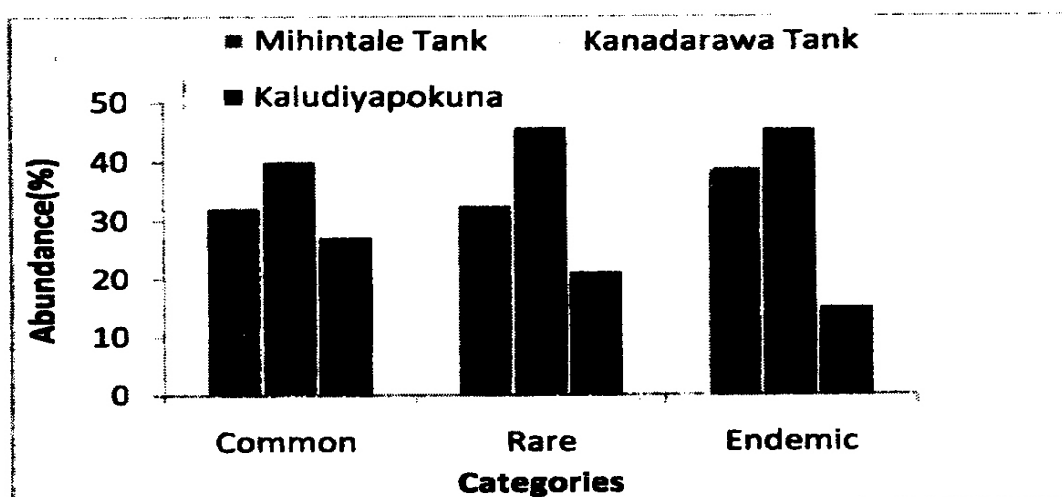


Figure 1- Abundance of Dragonflies

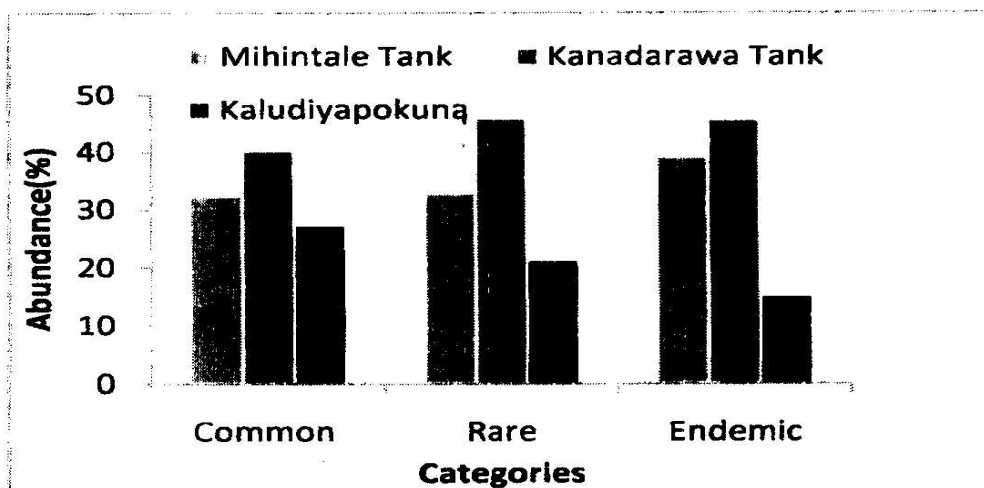


Figure 2- Abundance of Damselflies

Diversity and distribution pattern of Odonata

Among the three sites highest diversity was recorded at *Kanadarawa* tank (H'-2.55) while the lowest was at *Kaludiyapokuna* (H'-2.28). Though *Kaludiyapokuna* was a watery area its diversity was low compared to other sites because of poor water conditions in the pond. Though the diversity is less in Mihintale tank (H'-2.43) the species richness of dragonflies was higher than other two tanks. When the diversity of damselfies were compared, highest diversity was recorded at Mihintale tank (H'-0.93) while the lowest was at *Kanadarawa* Tank (H'-0.80). The high ratio of species distribution indicates the habitat with less human modification. In open canopy areas and in tanks the species distribution was high and the dragonflies seemed to be more frequent in sunny areas near water bodies. *Orthetrum pruinosum*, and *Trithemis aurora* were in very few numbers in all sites and this may be due to habitat alteration and pollution by human activities. The abundance of *Brachythemis contaminata*, *Rhyothemis variegata* and *Neurothemis tullia* were high in the study areas.

Pollution effect on Odonata distribution

The higher BOD amount indicates the pollution of the tanks and pools. Total number of individuals and BOD has a strong negative correlation ($r=-0.791$). There is high effect on pollution on dragonfly species where their number is highly reduced. In *kaludiyapokuna* the pond is completely covered by invasive species indicating less favorable conditions for the development of dragonfly larvae and thus the species composition is very low. Dragonflies vary in their sensitivity to different sorts of pollution.

CONCLUSION

There is an effect of water quality in the species richness of dragonflies and damselflies. The modification of vegetation greatly affect their species distribution. A count of dragonflies would provide a quick and low-cost indication to detect the healthiness of the ecosystem.

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