

SPATIAL INTERACTIONS OF ODONATES FREQUENTING 'LANKA POKUNA' AT THE ROYAL BOTANIC GARDENS, PERADENIYA

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Introduction

In the vicinity of most fresh waters, large numbers of dragonfly and damselfly (Order Odonata) species are seen. Adult males of dragonflies and damselflies spend much time near fresh water engaged in reproductive activities. Females visit water only at brief episodes to lay eggs. The objective of this study was to ascertain how a large number of individuals and species of Odonates would share a single water body to pursue their reproductive activities.

Materials and Methods

'Lanka Pokuna', a man-made pond in the Royal Botanic Gardens was selected for the study. Six stations around the pond were selected for the study based on accessibility, vegetation and exposure to sunlight. Variation in species composition and abundance of Odonates (number of individuals present per unit length of water edge) in relation to different stations, time of the day and ambient temperatures were recorded weekly for 6 months. At intense competition, territorial behaviours (relating to chasing, hovering and physical fighting) were observed and evaluated using a scoring system. Data were analyzed using species accumulation curve and Analysis of Variance (ANOVA). The relationship between species abundance and territoriality was analyzed by Correlation and Regression analyses. For the

identification of Odonates, pictorial guides of Bedjanic *et al.* (2006) and digital photographs taken in the field were used.

Results

A total of 13 species of damselflies (10 genera in 5 families) and 14 species of dragonflies (11 genera in 2 families) were recorded at the pond (Figure 1). Monthly variation in species composition and species presence of Odonates during the study period is shown in Figure 1. The highest species composition was recorded during January- March 2009 and the lowest in December. Only 2 species were present throughout the study period while majority (25 spp.) was confined to certain months of the year. Presence of different species at the pond varied depending on the time of the day (Figure 1). Majority were active between 10.00-12.00 noon. Two species were present throughout the daytime and others for 2-3 hrs of the day.



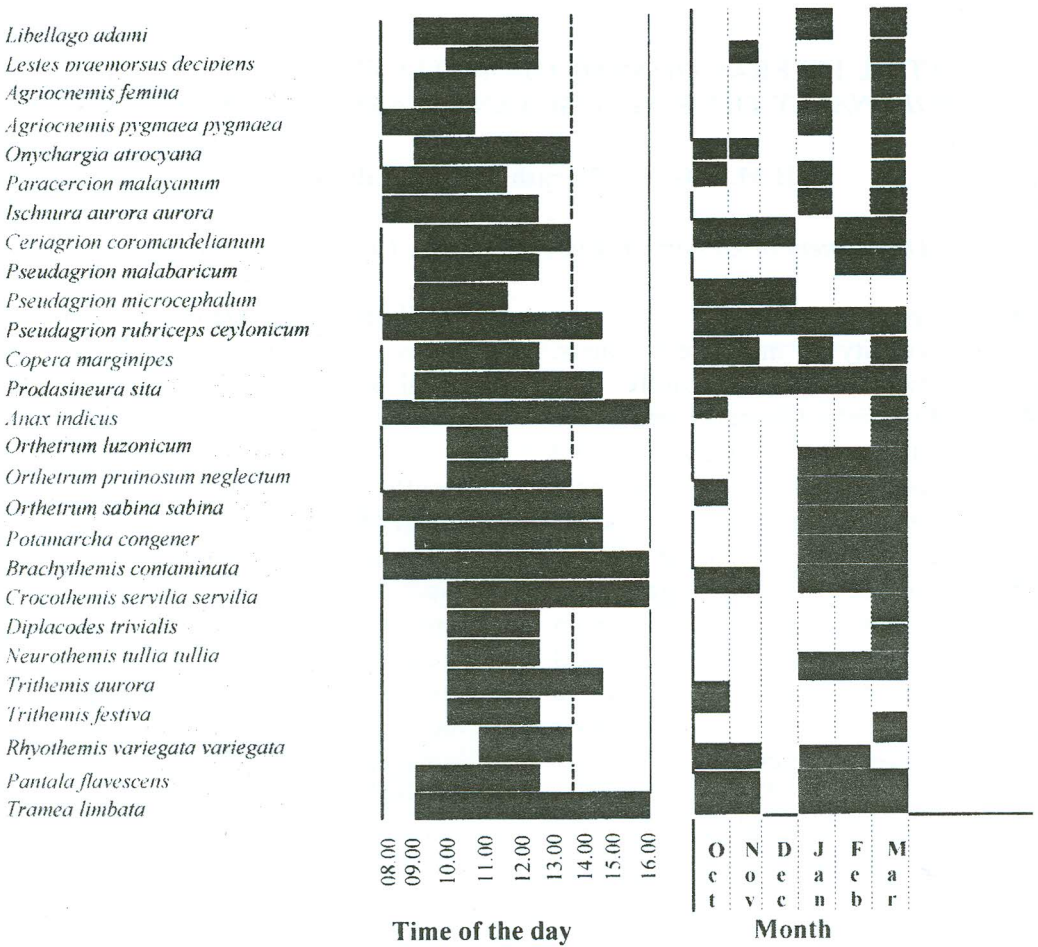


Figure 1. Damselflies and dragonflies recorded at the pond: their diurnal and monthly presence. (damselflies in bold lettering)

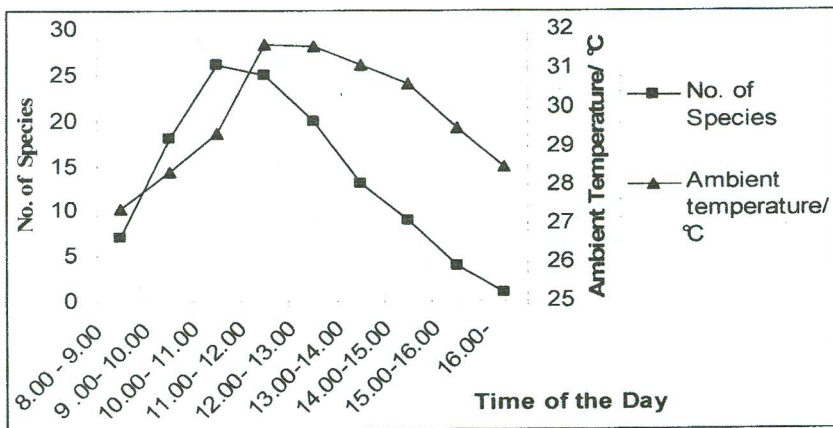


Figure 2. Variation in the number of odonate species at hourly intervals and the corresponding ambient temperature at the pond.

The highest number of species presence coincided with the highest day time temperature (29-32 °C) (Figure 2). Scores on territorial behaviour and species abundance of Odonates ascertained that there is no significant relationship between them (dragonflies: Correlation Coefficient = 0.584 P>0.05; damselflies: Correlation Coefficient = 0.303, P>0.05). Dragonflies were never observed to attack damselflies or vice versa. In dragonflies, physical attacks and chasing occurred at both intra- and interspecific levels. In damselflies, at intraspecific level there was no physical attack but only hovering facing each other was observed. Distribution of the 27 species of Odonates in the 6 stations showed a marked difference (Figures 3 & 4). Species Accumulation curve constructed for 18 days of observations showed a gradual increase and did not plateau.

Discussion

The study focused on how adult Odonates vary in composition and abundance spatially and temporally through behavioural interactions and thus fulfill their reproductive needs. The species composition in different stations appears to be governed by the vegetation structure and the amount of sunlight received; thereby providing suitable conditions for Odonates with different ecological requirements. Highest species composition of Odonates was associated with the hot weather during January- March and when the diurnal temperatures are rising. Odonates need to warm up there flight

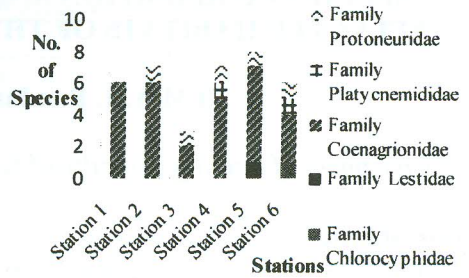


Figure 3. Distribution of damselfly species at the 6 stations.

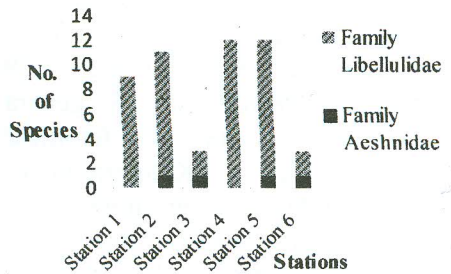


Figure 4. Distribution of dragonfly species at the 6 stations.

muscles before flight, hence their presence in large numbers during these periods. Species accumulation curve infers that there are more Odonate species to be recorded at the pond. Findings of this preliminary study infer that numbers and species of Odonates at the pond are not regulated by territoriality.

References

Bedjanic, M., Coniff, K. and De Silva, G. (2006). A Photographic guide to the Dragonflies of Sri Lanka. Jetwing Eco Holidays.
 De Fonseka, T. (2000). The Dragonflies off Sri Lanka, WHT Publications.