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Research Article

SEASONAL VARIATION OF DRAGONFLIES DIVERSITY IN MUTHUPET MANGROVE FOREST, TAMIL NADU, INDIA

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ABSTRACT

The present study was aimed to examine the diversity and dominance of dragonfly in Muthupet mangrove forest in Thiruvarur District, Tamil Nadu was carried out for a period of one year from January 2014 to December 2014. Combine technique sampler (Core and Sweeping net) were used sampling of Odonata. Totally 8 species (*Rhyothemis variegata*, *Anax guttatus*, *Pantala flavescens*, *Brachythemis contaminata*, *Orthetrum sabina*, *Diplacodes trivialis*, *Crocothemis servilia* and *Tramea basilaris*) of Anisoptera (dragonflies) were recorded and all these species were grouped into two families. Libellulidae was the dominant family with 7 species followed by Aeshnidae family (1 species). Species diversity and abundance were maximum in the months of monsoon and dropped to the minimum in the months of summer.

Keywords: Dragonflies, Species diversity, Muthupet Mangrove forest.

INTRODUCTION

The order Odonata includes the dragonflies and damselflies, globally 5,952 species of Odonates under 652 genera have been reported (Schorr and Paulson, 2013). India harbours 474 species and 50 subspecies belonging to 142 genera in18 families (Subramanian, 2014). The adults are generally predacious insects and acting as an important bio-control agent of many harmful insects and playing a crucial role in controlling pest populations of agro as well as in the forest ecosystems. Odonates are also good indicators of environmental changes as they are sensitive to changes in the habitats, atmospheric temperature and the weather conditions (Tiple, 2012).

The taxonomy of Indian Odonata is well worked. Fraser (1933, 34, 36) published three volumes on Odonata in the 'Fauna of British India' provides documentation of 536 species and subspecies from India with many species from several countries. The Odonate fauna of the Western Ghats diverse with 176 species, 68 of which endemic (Subramanian, 2009; Subramanian *et al.*, 2008 and Kulkarni and Subramanian, 2013). Tsuda (1991) mentioned approximately 906 odonate species in his world list of Odonata from continental Asia, out of these 499 species belonged to 139 genera and 17 families are known from India (Prasad and Varshney, 1995). Kulkarni *et al.* (2012) recorded 101 species of Odonate in Maharashtra. However, no detailed work on the diversity of Odonate insects (Dragonflies) in the mangroves of India has been done to date. Keeping in view this fact here an attempt has been made to study the diversity and distribution of dragonflies in the Muthupet mangroves.

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MATERIALS AND METHODS

Study Area: Muthupet mangroves (Lat. 10° 46' N; Long. 79° 51' E) is located at the southern end of the Cauvery river delta on the Bay of Bengal, covering an area of approximately 6,803.01 ha. The study area is fully covered with dense mangroves vegetations like *Avicennia officinalis, Avicennia marina, Acanthus illicifolius, Sueda martima, Fimbristylis polytrichoidea* and *Rhizophora mucronata*.

Sampling method: Line transects method was used for study of odonates (Sutherland, 1996). Sweep-net technique was followed in the sampling with a 30-45 cm (dia) depth 80 cm hand net. Observations were made while walking on fixed transect of 500 m length. In each transect, 10 sweeps were made at a time. The diameter of the net, the number of sweeps and the collection area were kept constant throughout study period. Collection and estimation of population density was done once a week and the data was compiled on a monthly basis.

Identification: The collected specimens have been identified with the help of binocular stereoscopic microscope up to the species level (Fraser, 1933; 1934; 1936) and Subramanian (2009).

RESULTS AND DISCUSSION

A total 1925 individuals of dragonflies belonging to 8 species and 2 families were recorded during the study period (Table 1 and Plate 1). On the basis of number of collected species family Libellulidae was the most dominant family with 7 species followed by Aeshnidae with one species. Per cent contribution of the relative number of individual species of dragonfly collected from the study area is present in the Table 1 and Figure 1. The dragonfly, *Diplacodes trivialis* was the most dominant species which constituted 26.59% of the total individuals followed by *Orthetrum sabina* (21.19%), *Brachythemis contaminata* (16.36%), *Pantala flavescens* (15.84%), *Crocothemis servilia* (14.85%), *Tramea basilaris* (2.23%), *Rhyothemis varigata* (1.92%) and *Anax guttatus* (0.98%) (Figure 2).

Seasonality is a common phenomenon in insect populations which was noted in the present study of Odonates at Muthupet mangroves with significant seasonal variations in all the transects. In the present study, the diversity of Odonate species was highest during monsoon period represented by 42%, followed by the pre monsoon, post monsoon and summer period represented by 23%, 25% and 10%, respectively. The various environmental factors such as temperature, humidity, rainfall, vegetation and food sources directly affecting the diversity and distribution of insect populations **(**Morais *et al*., 1999**,** Kittelson, 2004**,** Bispo and Oliveira, 2007 and Goldsmith, 2007**).** The monsoon being the major factor in density and distribution of plants leads to increase in abundance of herbivorous insects, the prey for odonates. Thus, influence of rainfall in the form of humidity on density and diversity in environment is likely to be an indirect effect operating via effects on food availability.

Table 1. List of dragonfly species and their percentage of abundance recorded from Muthupet Mangrove.

Rhyothemis variegata	*Anax guttatus*	*Pantala flavescens*	*Brachythemis contaminata*	*Orthetrum sabina*	*Diplacodes trivialis*	*Crocothemis servilia*	*Tramea basilaris*
1.92%	0.98%	15.84%	16.36%	21.19%	26.59%	14.85%	2.23%

PLATE 1

1. *Rhyothemis variegata*

2. *Tramea basilaris*

3. *Orthetrum sabina*

4. *Pantala flavescens*

5. *Brachythemis contaminata*

6. *Crocothemis servilia*

7. *Diplacodes trivialis*

8. *Anax guttatus*

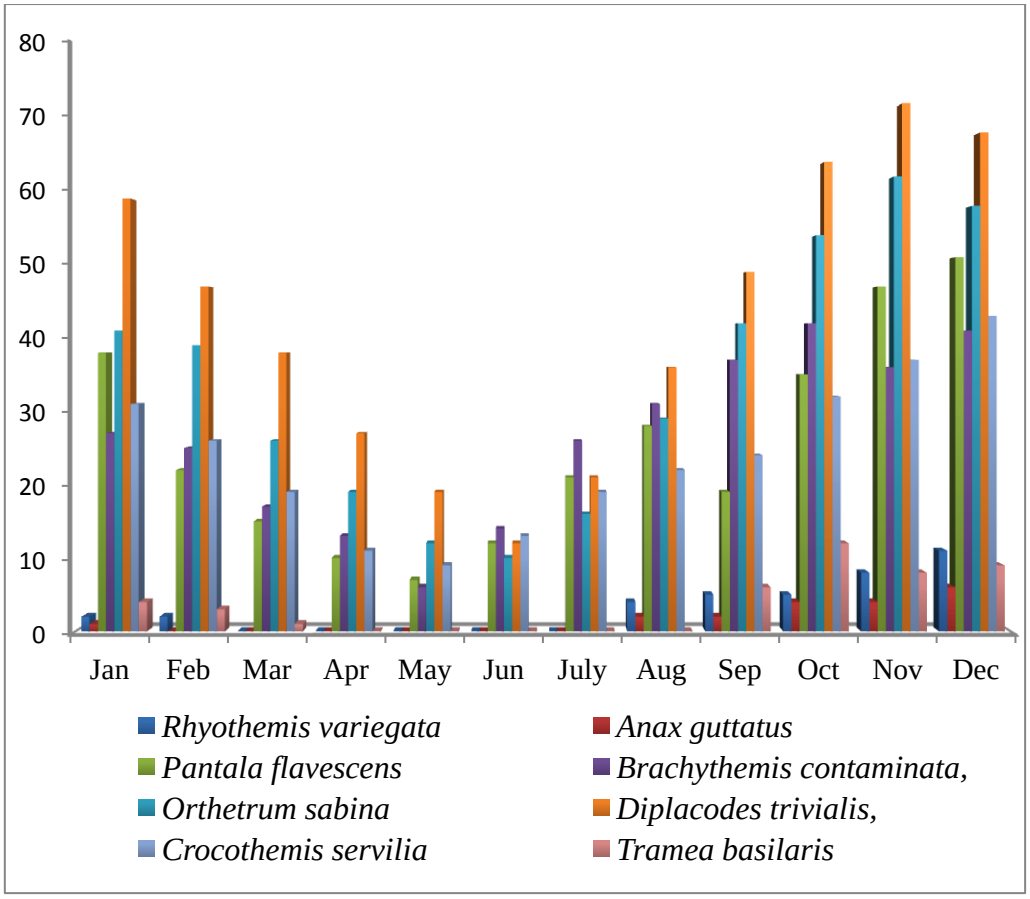

Figure 1. Monthly abundance patterns of dragonfly communities in Muthupet Mangroves.

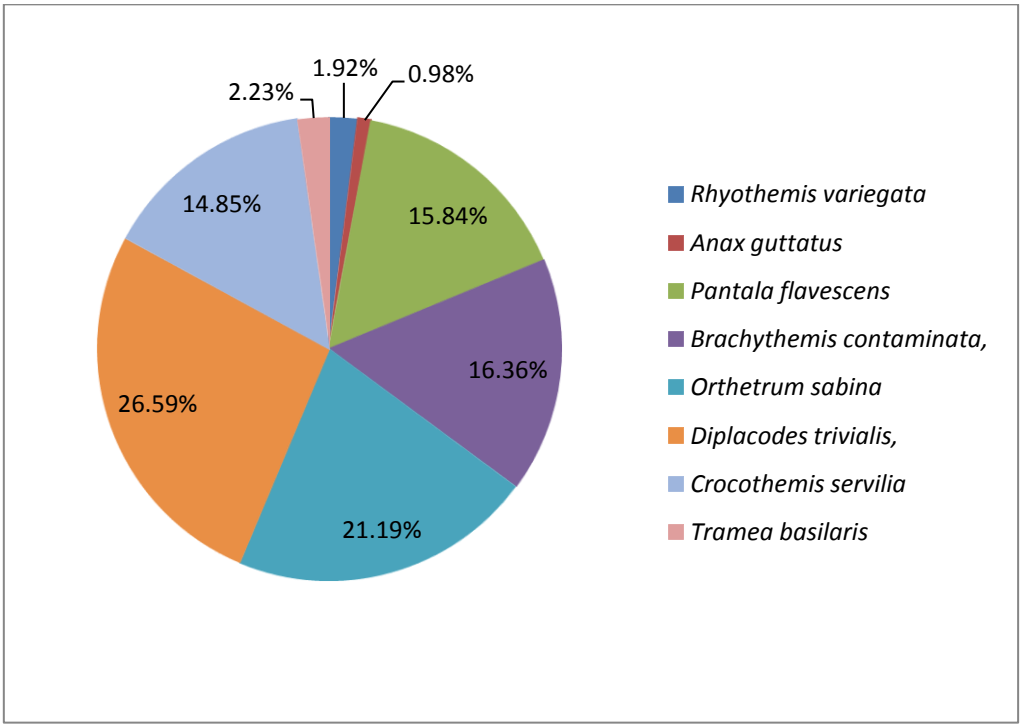

Figure 2. Species composition (%) of dragonflies in Muthupet Mangroves.

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