

# BugsRAll

Newsletter of the  
Invertebrate Conservation & Information Network of South Asia (ICINSA)

## Observations of dragonflies and damselflies from an urban backyard in central Kerala

Odonates (dragonflies and damselflies) are freshwater insects with an amphibiotic, hemimetabolous life cycle. They are predatory both as aquatic nymphs and adult flies and have been used widely as indicators of ecological change. Urban ecosystems which are becoming increasingly common can play important ecological roles. This may include protection of local biodiversity and rare or imperilled species, either directly for organisms that reside in urban areas or via creation of corridors or stepping stone patches for individuals moving through cities (Gibb & Hochuli 2002).

Urban sites with a variety of vegetation composition, along with a proper management to minimise water pollution can host diverse communities of dragonflies and damselflies. Urban ecosystems offer a vast diversity of water bodies, ranging from ornamental ponds to drainage systems, each of these being subjected to different management plans. This heterogeneity of habitat types provides different hydrological and ecological

conditions which may promote a higher diversity of odonates (Hassall 2014).

In India, Koparde (2016) studied odonates of selected wetlands in the city of Pune and identified the loss of green spaces as one of the major threats faced by tropical urban odonates. Larvae of many odonate species were found to be tolerant of moderately polluted waters of the Mula River that flows through Pune city. It has been recommended that for conserving odonates and rivers in cities, restoring original river-side habitats and reducing the disturbance at highly urbanized sites needs to be done on an urgent basis (Jere et al. 2020). This study is an attempt to document the odonate species that use a typical wooded home yard in an urban setting as adult habitat.

Poonkunnam is a rapidly urbanizing small town under Thrissur Municipal Corporation in central Kerala, India. It is mainly a residential area with apartments and small homesteads. The study was carried out in the author's homestead and surroundings

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(10.5332°N 76.2066°E), in an area less than 1,000 m<sup>2</sup>. *Caesalpinnia pulcherrima*, *Psidium guajava*, *Moringa oleifera*, *Artocarpus heterophyllus*, and *Averrhoa bilimbi* are the main plants present at the site. There are no permanent water bodies present at the site except two uncovered synthetic water tanks, each of 1,000 litres capacity. The closest permanent water body is a pond located at an aerial distance of about 400 m, which has an area of approximately 2,100 m<sup>2</sup>. Other water bodies in the vicinity are an open drainage canal (aerial distance: 500 m) and paddy fields (aerial distance: 800 m).

The study was conducted from 01 May 2019 to 30 April 2020. At least two casual observations were made in each month, where the observer walked throughout the site and recorded the odonate species and their numbers seen. Odonates spotted at the site were observed using Celestron 8 x 40 binoculars and photographed using a Nikon Coolpix P900 camera with Raynox DCR-250 macro lens. Individuals encountered were counted and identified to the species level referring to taxonomic monographs (Fraser 1933, 1934, 1936) and field guides (Subramanian 2009; Kiran & Raju 2013).

A total of 131 individual odonates belonging to 22 species and three families were recorded from 78 observations (Table 1). Odonate sightings showed a peak in the month of October. No odonate could be observed in the months of July, January, and February. While *Pantala flavescens* and *Rhyothemis variegata* were the most abundant species and could be observed in five months, 10 of the 22 species reported were seen only once during the study. Out of the 80 individuals that could be sexed, 50 were males and 30 females. Among the males, eight individuals could be identified as immature from their pigmentation.

This included three individuals of *Orthetrum chrysis* and one individual each of *Diplacodes trivialis*, *Aethriamanta brevipennis*, *Pseudagrion malabaricum*, *Urothemis signata*, and *Brachydiplax sobrina*. *Bradinopyga geminata* was the only species that displayed sexual behaviour at the study site, a pair of which was seen mating and egg laying in one of the synthetic tanks during the month of April. Three exuviae and five nymphs were seen in the tank.

The study recorded 12% of the total odonate species recorded from Kerala till date (Society for Odonate Studies 2020). It can be assumed that except for

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**Table 1. List of odonates recorded from the urban backyard**

	Order Odonata	Common name
	<b>Suborder Zygoptera</b>	
	<b>Family Coenagrionidae</b>	
1	<i>Ischnura rubilio</i> Selys, 1876	Western Golden Dartlet
2	<i>Pseudagrion malabaricum</i> Fraser, 1924	Jungle Grass Dart
3	<i>Pseudagrion microcephalum</i> (Rambur, 1842)	Blue Grass Dart
	<b>Suborder Anisoptera</b>	
	<b>Family Gomphidae</b>	
4	<i>Ictinogomphus rapax</i> (Rambur, 1842)	Common Clubtail
5	<i>Paragomphus lineatus</i> (Selys, 1850)	Common Hooktail
	<b>Family Libellulidae</b>	
6	<i>Aethriamanta brevipennis</i> (Rambur, 1842)	Scarlet Marsh Hawk
7	<i>Brachydipax sobrina</i> (Rambur, 1842)	Little Blue Marsh Hawk
8	<i>Brachythemis contaminata</i> (Fabricius, 1793)	Ditch Jewel
9	<i>Bradinopyga geminata</i> (Rambur, 1842)	Granite Ghost
10	<i>Crocothemis servilia</i> (Drury, 1773)	Ruddy Marsh Skimmer
11	<i>Diplacodes trivialis</i> (Rambur, 1842)	Ground Skimmer
12	<i>Lathrecista asiatica</i> (Fabricius, 1798)	Asiatic Bloodtail
13	<i>Neurothemis tullia</i> (Drury, 1773)	Pied Paddy Skimmer
14	<i>Orthetrum chrysis</i> (Selys, 1891)	Brown-backed Red Marsh Hawk
15	<i>Orthetrum sabina</i> (Drury, 1770)	Green Marsh Hawk
16	<i>Pantala flavescens</i> (Fabricius, 1798)	Wandering Glider
17	<i>Potamarcha congener</i> (Rambur, 1842)	Yellow-tailed Ashy Skimmer
18	<i>Rhodothemis rufa</i> (Rambur, 1842)	Rufous Marsh Glider
19	<i>Rhyothemis variegata</i> (Linnaeus, 1763)	Common Picturewing
20	<i>Tamea limbata</i> (Desjardins, 1832)	Black Marsh Trotter
21	<i>Trithemis aurora</i> (Burmeister, 1839)	Crimson Marsh Glider
22	<i>Urothemis signata</i> (Rambur, 1842)	Greater Crimson Glider

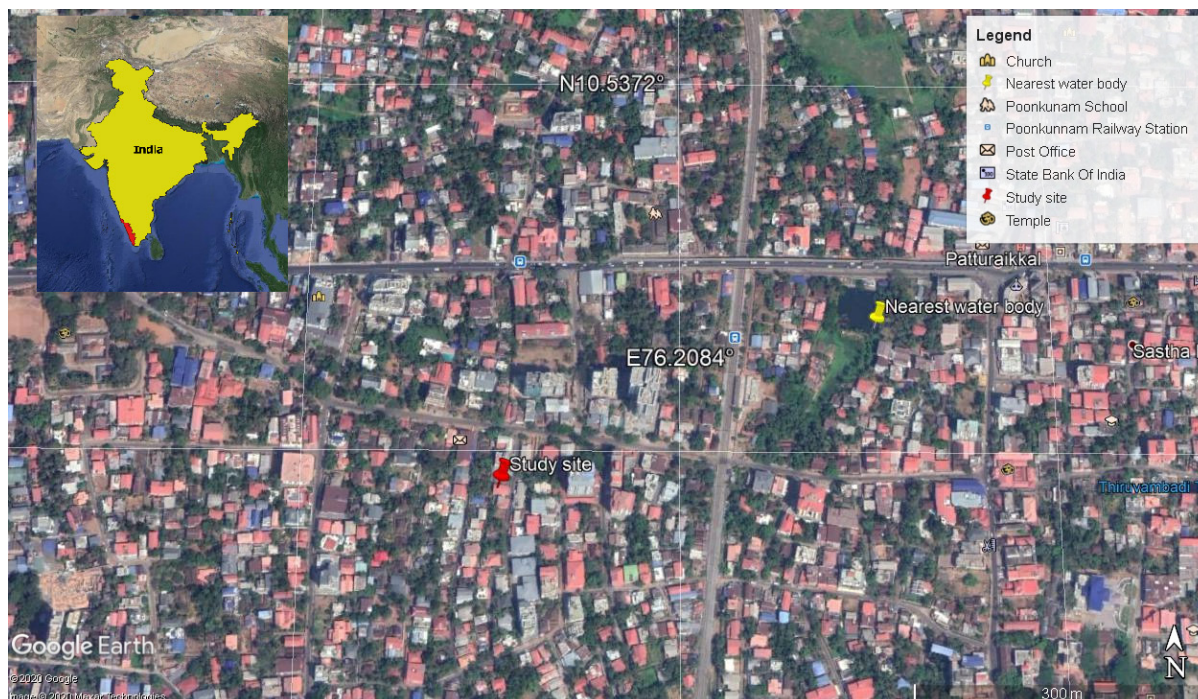
*Bradinopyga geminata* which was observed to complete its life cycle at the site, most other odonates visited the site in their pre-reproductive adult stage when their primary activity is foraging. Observations of males with incomplete adult pigmentation

and absence of post-reproductive adults (old individuals with pruinescence/ broken wings) support to this assumption. Maximum number of individuals was detected in October. This is mostly due to the influx of large numbers of the migratory

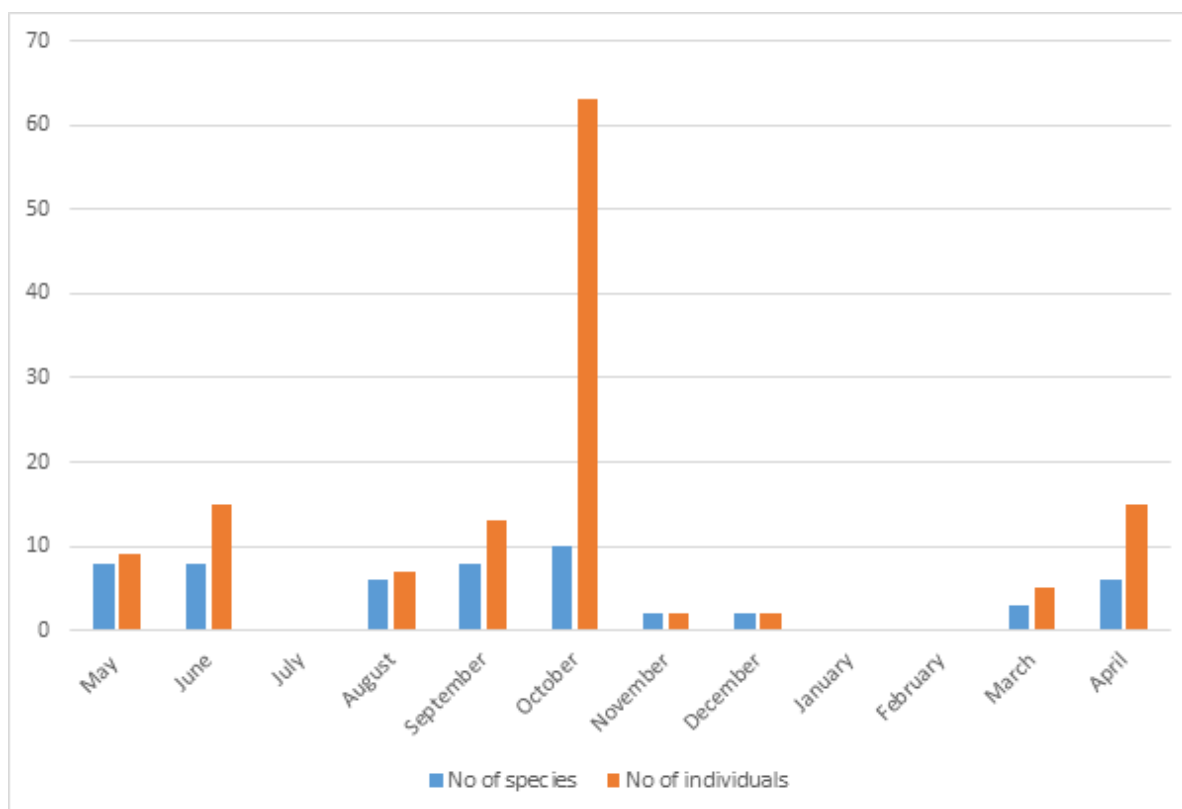


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Map showing the study site.

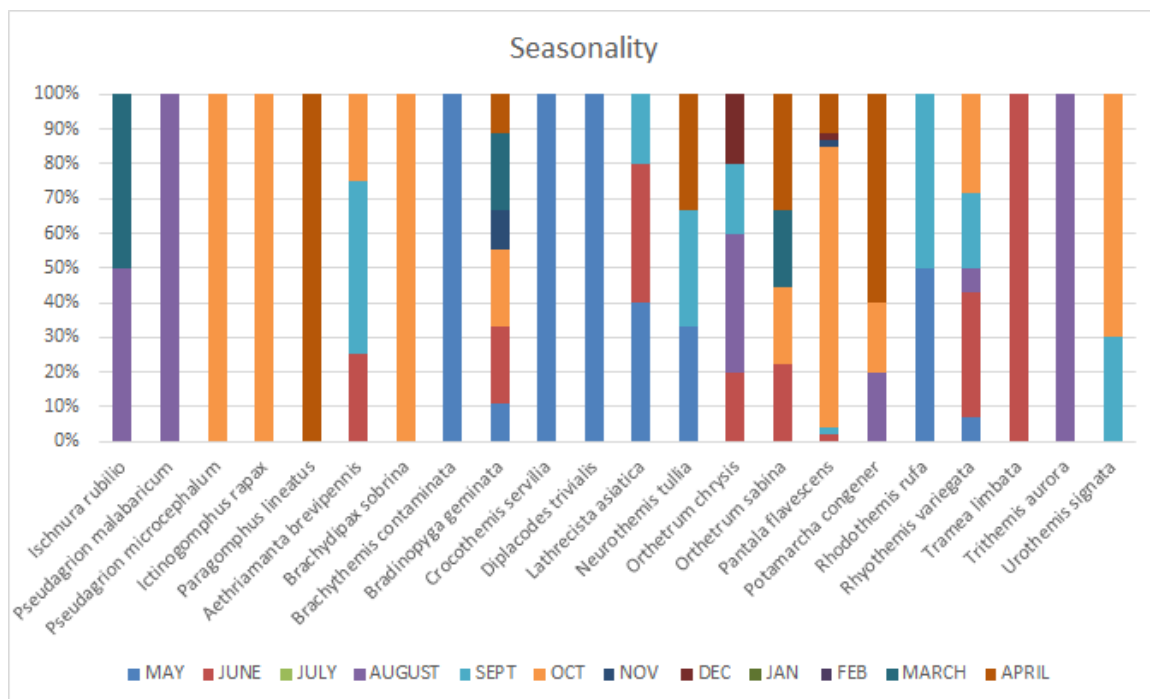


Number of odonate species and individuals recorded in each month of the study.



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Seasonal occurrence of odonate species in the study site.



A juvenile male *Orthetrum Chrysis*. © Vivek Chandran A.



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*Bradinopyga geminata*; an exuvia and a larva shown in insets. © Vivek Chandran A.



*Pseudagrion malabaricum*; structure of caudal appendages that help in identification shown in insets. © Vivek Chandran A.



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dragonfly, *Pantala flavescens* in this month. Number of species recorded was also maximum (10) in October, consistent with earlier studies that show detection of maximum number of odonate species in the post monsoon period (Kulkarni & Subramanian 2013). Since the behaviour of adult males and females differs greatly, it can be nearly impossible to obtain precise measures of sex ratio during the adult stage. The excess number of males detected (62.5% of the sexed individuals) in this study could be because of variability in dispersal of the sexes or their differential detectability, most female odonates being cryptic and males more colourful.

Although urban sites host an abundance of generalist species of odonates, there are some specialist species that can also find refuge in urban habitats. *Pseudagrion malabaricum* (Image 3) is a species known to breed in small lakes in submontane and montane areas (Fraser 1933). Sighting of such species deserves special mention as it highlights the importance of the freshwater-woodland matrices in urban areas in the conservation of odonates.

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