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A Preliminary Survey on Odonate Communities of Saipung Reserve Forest, Meghalaya, India

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ABSTRACT: Odonate diversity of Saipung Reserve Forest was studied during 2016-2017. A total of 31 species belonging to two sub-orders, 5 families, and 20 genera were recorded, which include 22 species of Anisoptera and 9 species of Zygoptera. The genera *Neurothemis,* Orthetrum *and Agriocnemis* were found to be the most dominant contributing 3 species each. Being legally protected under state legislation, the forest faces high levels of human interference and anthropogenic activities. The study area therefore requires immense attention to be utilized as a prime site for odonate conservation of the state. The author hopes this study will provide the baseline information for future studies on odonates of the state and of north-east India.

Keywords: Saipung, Odonates, Anisoptera, Zygoptera, North-East, Meghalaya, conservation.

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INTRODUTION

Meghalaya, being one of the seven sister states of North-East India is a narrow stretch of land lies between 24° 58′N to 26° 07′N latitudes and 89° 48′E to 92° 51′E longitudes. The state covers a geographical area of about 22,429 sq. km. The total forest area is about 15,657 sq. km of which only 1,027.20 sq. km is under the control of State Forest Department. Meghalaya is surrounded by the Brahmaputra valley of Assam in the North and Northwest and Cachar area of Assam in the East; the Surma valley (Bangladesh) borders in the South and partly in the Southwest. The state has two National Parks (399.8 sq. km), four Wildlife Sanctuaries (91.40 sq. km.) and 23 Reserve forest (712.7 sq. km.). In addition, the state has a total of 41 community reserves that provide protection of about 38.89 sq. km of land.

Besides having high potential as a biodiversity hotspot of India, North-East India has gain less attention over the past few years. This region has never been extensively surveyed to explore the rich diversity of odonates with their distribution assessment. The major taxonomic work on odonates of North-East India was done by Fraser (1933, 1934 and 1936) in Naga Hills. Lahiri (1987, 1977) made notable contributions to odonates of Meghalaya and Manipur followed by Mitra (2002) who provides comprehensive work on odonates of north-east India. Nonetheless, more works needs to be done in this part of India to pursue a regular update of the checklist of India. Keeping this in mind, a preliminary study was conducted to study the diversity of odonates in Saipung Reserve Forest located in the Jaintia hills district of the state.

MATERIALS AND METHODS

Saipung reserve forest is located in the Jaintia hills district of Meghalaya. The area lies between 25° 19' 60"N latitudes and 92° 45' 00″E longitudes. Saipung is the biggest forest reserve of the state comprising of a total area of 150.35 sq. km. The habitats include mostly tropical dry evergreen forest, tropical semi evergreen forest and tropical moist deciduous forest with large tracts of sub-tropical pine forest. The area is near the North Cachar hills district in neighboring Assam State and is relatively inaccessible. The area is rich in wildlife but information is available only on primates and wild elephants (Choudhury 1999). Many other species are also found in the forests that includes Leopard Cat, Clouded Leopard, Hoolock Gibbon, Tiger, Python, Indian Pied Hornbill, Great Indian Hornbill, Peacock Pheasants etc. The reserve forest is included in the Important Bird Areas of India (IBA).

The author surveyed different localities of the reserve forest during 2016-2017 by random walks along forest paths, hills, roads, streams, grasslands and other habitats that can support odonate population. All the species that come across were photographed in the fields during survey periods. For similar looking species that are very difficult to identify based on photographs only, capture and release method was followed. The odonates were netted using a long handle insect net in the field, observe their anal appendages carefully and photographed them from all possible angles to make notes of wing and thorax colour, head and tail morphology, etc.

After careful observation, the captured insects were released on the spot without harming them. For proper identification, we followed keys provided by Fraser (1933, 1934, 1936), Laidlaw (1950), Asahina (1967, 1984), and Nair (2011). The author followed standard taxonomy and binomial names given by Subramanian (2009, 2014).

RESULTS AND DISUSSION

In the present study, a total of 31 species belonging to 20 genera of dragonflies and damselflies were recorded from Saipung Reserve Forest during 2016-2017 (Table 1). Out of the total count, sub-order Anisoptera (Dragonflies) accounts for 22 species while sub-order Zyoptera (Damselflies) accounts for the remaining 9 species. The 22 species of the sub-order Anisoptera is distributed under 2 families while those of 9 species of the suborder Zygoptera is distributed under 3 families. In terms of species number, the family Libellulidae was found to be most dominant contributing 21 species to the total count of odonates. Among 20 genera recorded, genera *Neurothemis,* Orthetrum *and Agriocnemis* were found to be most dominant genera in the study area representing 3 species each. During the present study, a total of 21 species are common, 8 species were uncommon, and remaining 2 species are rare to the study area. As far as the IUCN red list is concerned, all the 31 species recorded are under the category Least Concern. The habitat assessment of odonates was also done in this study. A total of 22 species were found to be associated with riverine habitats that include all types of wetlands, lakes, hill streams and forested streams found in the study area. The least numbers of species are found in the agricultural landscapes associated with nearby villages of the study area. However, we also recorded a number of species that are associated with only one habitat type and others that are associated with more than one habitat.

Table 1: Preliminary checklist of odonates of Saipung Reserve Forest.

Sl. No.	Scientific Names	Common Names	Habitats	Visual Abundance	IUCN Status
Family: Gomphidae					
1.	*Ictinogomphus rapax*	Common Clubtail	RV	C	LC
Family: Libellulidae					
2.	*Acisoma panorpoides*	Trumpet Tail	RV	C	LC
3.	*Brachydiplax chalybea*	**Rufous-Backed Marsh Hawk**	RV, GL	C	LC
4.	*Brachythemis contaminata*	Ditch Jewel	RV	UC	LC
5.	*Bradinopyga geminata*	Granite Ghost	FE	C	LC
6.	*Cratilla lineate*	Emerald-Banded Skimmer	FI, FE	UC	LC
7.	*Crocothemis servilia*	Ruddy Marsh Skimmer	RV, GL, AGL	C	LC
8.	*Diplacodes trivialis*	Ground Skimmer	RV, FI, FE, GL, AGL	C	LC
9.	*Hydrobasileus croceus*	Amber-Winged Marsh Glider	FI, FE	R	LC
10.	*Neurothemis fulvia*	Fulvous Forest Skimmer	FI, FE, GL	C	LC
11.	*Neurothemis intermedia*	Ruddy Meadow Skimmer	FI, FE, GL	C	LC
12.	*Neurothemis tullia*	Pied Paddy Skimmer	GL, AGL	UC	LC
13.	*Orthetrum glaucum*	Blue Marsh Hawk	FE	UC	LC
14.	*Orthetrum pruinosum*	Crimson-Tailed Marsh Hawk	RV	C	LC
15.	*Orthetrum sabina*	Green Marsh Hawk	RV, FI, FE, GL, AGL	C	LC
16.	*Palpopleura sexmaculata*	Blue-Tailed Yellow Skimmer	RV	UC	LC
17.	*Pantala flavescens*	Wandering Glider	RV, FE	C	LC
18.	*Potamarcha congener*	Yellow-Tailed Ashy Skimmer	RV, AGL	C	LC
19.	*Rhodothemis rufa*	Rufous Marsh Glider	RV, GL	UC	LC
20.	*Rhyothemis variegata*	Common Picture Wing	RV, FI, FE	C	LC
21.	*Tholymis tillarga*	Coral-Tailed Cloud Wing	RV	C	LC
22.	*Trithemis aurora*	Crimson Marsh Glider	RV	R	LC
Family: Calopterygidae					
23.	*Neurobasis chinensis*	Stream Glory	RV	C	LC
Family: Clorocyphidae					
24.	*Rhinocypha bisignata*	Stream Ruby	RV	C	LC
25.	*Rhinocypha quadrimaculata*	Black Emperor	RV	C	LC
Family: Coenagrionidae					
26.	*Agriocnemis femina*	Pruinosed Dartlet	GL, AGL	UC	LC
27.	*Agriocnemis lacteola*	Milky Dartlet	GL, AGL	C	LC
28.	*Agriocnemis pygmaea*	Pigmy Dartlet	RV, GL	C	LC
29.	*Ceriagrion cerinorubellum*	Orange-Tailed Marsh Dart	RV, GL	C	LC
30.	*Ceriagrion coromandelianum*	Coromandel Marsh Dart	RV, FI, FE, GL	C	LC
31.	*Ischnura aurora*	Golden Dartlet	RV, GL, AGL	UC	LC

Habitats: FI – Forest Interior; FE – Forest Edge; RV – Riverine; GL – Grasslands; AGL – Agricultural Landscape, Visual Abundance: C – Common; UC – Uncommon; R – Rare, IUCN: International Union for Conservation of Nature and Natural Resources; LC – Least Concern

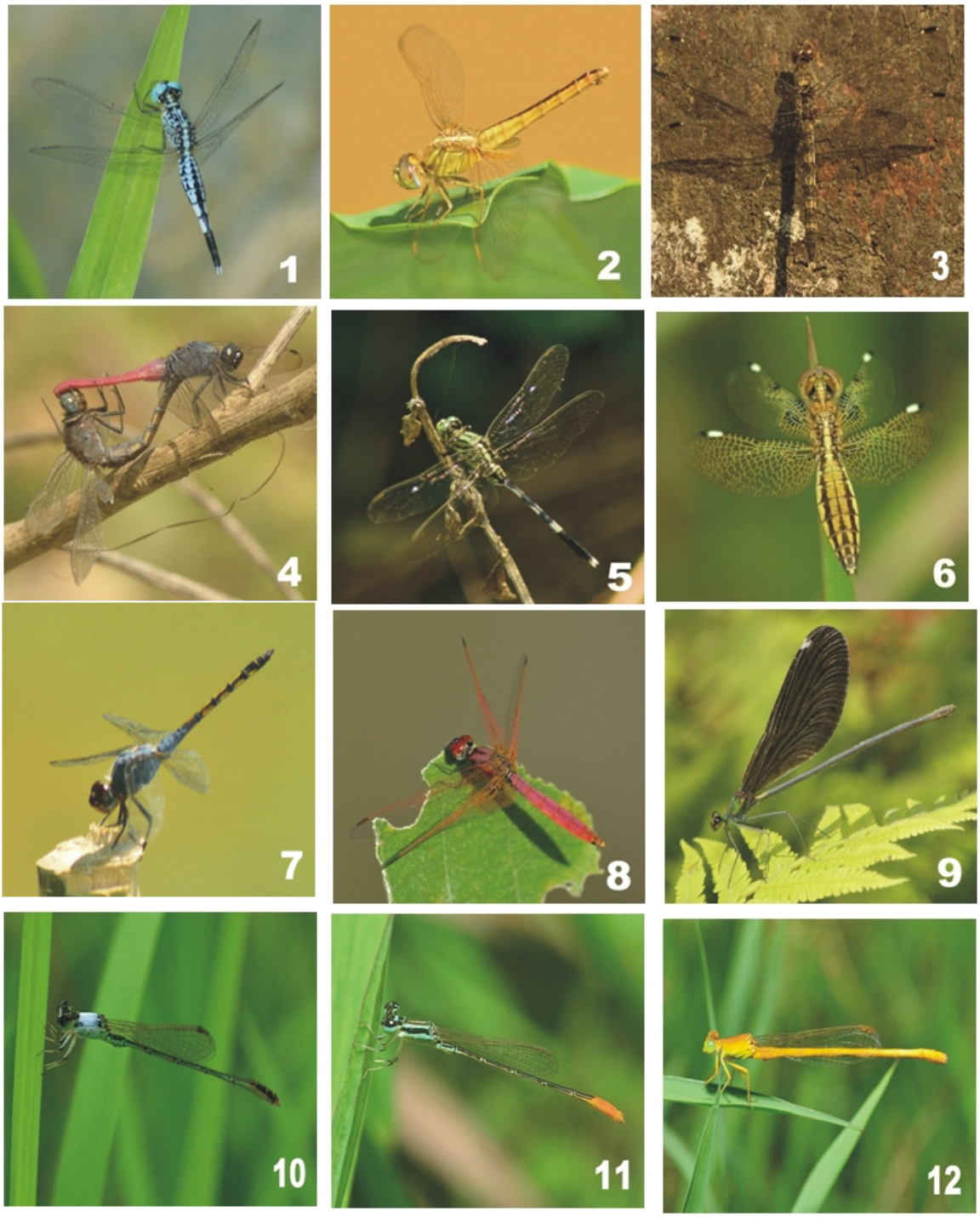

Plate I. 1. *Acisoma panorpoides*, 2. *Brachythemis contaminata*, 3. *Bradinopyga geminate*, 4. *Orthetrum pruinosum*, 5. *Orthetrum Sabina*, 6. *Palpopleura sexmaculata*, 7. *Potamarcha congener*, 8. *Trithemis aurora*, 9. *Neurobasis chinensis*, 10. *Agriocnemis femina*, 11. *Agriocnemis pygmaea*, 12. *Ceriagrion coromandelianum*.

The present work is the first attempt initiated to study the odonates of the study area. A review of the past works revealed that Lahiri (1987) reported 112 species and subspecies of odonates belonging to 68 genera from the state which was later updated by Mitra (2002) to 295 species belonging to 112 genera from Eastern India. The findings of 31 specis of odonates from a protected reserve clearly underscore the importance of Saipung Reserve Forest as a potential site for conservation of odonates of the state. In a similar study Bora and Meitei, 2014 reported 33 species from ICAR campus, NEH region which was situated 170 kms. away from the present study site.

During this study, the family Libellulidae was found to top the list in terms of species number which was supported by a number of similar studies (Sharma *et al*, 2009; Joshi and Kunte, 2014; Charjan *et al*, 2015; Rathod and Parasharya, 2018; Husain, 2018; Bora, 2019). Most of the species recorded in the study are found to be common as these species are recorded most frequently during the study period. This indicates the availability of suitable habitats and food in the study area throughout the year across different seasons supporting a wide array of odonate species. However, some species are found to be associated with a single habitat only. These species can be considered habitat sensitive and hence further studies and information are required to build a successful conservation plan to support the local population. In a study, Sharma (2017) reported that reproductive behavior can play a key role in determining the diversity and distribution of odonates over a geographical landscape.

CONCLUSIONS

The present study underscores the importance of the study area as a potential site to support a substantial number of odonate species. Although being legally protected under Meghalaya state legislation, Saipung Reserve Forest faces high levels of human interference and other anthropogenic activities. Hence, the forest needs more protection to be utilized as a prime area for conservation of odonates and also by creating awareness in nearby inhabitant villages regarding the value of sustainable use of forest products. We hope our study will provide the baseline information for future studies in the state and in north-east India.

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DECLARATION

The author declares that there is no conflict of interest regarding the publication of this article. The photographs of odonates used in this article are copyrighted to the author.

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