

## Diversity of Odonata (Insecta) in Padmatola wetland, Balasore, Odisha, India

Bitupan Boruah<sup>1\*</sup>, Arjush Payra<sup>1</sup>, Gaurab Nandi Das<sup>1</sup>, R. K. Misra<sup>1</sup>, S.D. Rout<sup>1</sup>, H. K. Sahu<sup>2</sup>

<sup>1</sup>Department of Wildlife and Biodiversity Conservation. North Orissa University, Odisha- 757003, India.

<sup>2</sup>Department of Zoology. North Orissa University, Odisha-757003, India.

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### ABSTRACT

The present study has been carried out in the Padmatola wetland of Balasore district of Odisha, India during December 2013 and May 2014. This study emphasises a checklist of total 51 species of odonata (Dragonflies and Damselflies). Among this the suborder anisoptera represented by 33 species with 22 genera from 4 families and suborder zygoptera represented by 18 species with 9 genera from 3 families. Family Libellulidae belonging to anisoptera is dominant with 28 species and Coenagrionidae belonging to zygoptera is richest with 15 species. But the rapid degradation of the wetland by human activities are the main threat to the odonates along with the biodiversity.

**Key words:** Habitat degradation, Odisha, Odonata, Padmatola wetland

### INTRODUCTION

Odonates are collectively represented by dragonflies (suborder: anisoptera) and damselflies (suborder: zygoptera). They are flying insects with coloured or transparent wings, associated with stream, river, pond, croplands and other wetlands. Being predator odonates are very important biodiversity controlling agents. Adults are predacious, feeds on harmful insects and also on own kind while larvae are carnivorous and voracious feeders. They represents the status of freshwater ecosystems as a sensitive taxa. Globally 5,952 species of odonates have been reported, of which 474 species in 142 genera and 18 families are known from India. In Odisha odonate study can be traced back to Laidlaw, Fraser & Drover, Srivastava & Das, Mitra, Sathy & Siddiqi, Das et al. and Nair. Recently, 101 species has been reported by Nair and finally led to listing of total 110 species of Odonates from all over Odisha. But odonate studies in India remain poor or insufficient than other fauna. The data on odonates is non-existent to the present study area (Padmatola) before. Through this survey we tried to explore the diversity of dragonflies and damselflies in Padmatola wetland.

### MATERIALS AND METHODS

Padmatola wetland is an unprotected area, lies between 21° 35' 0" N to 21° 35' 30" N and 86° 44' 0" E to 86° 45' 0" E in the Nilgiri block of Balasore Wildlife Division of Odisha, India (Figure 1). It is located at north of the Kuldiha Wildlife Sanctuary covering an area of 40 hectare. Shallow and marshy wetland having water spreading area varies from 17 ha in monsoon to 2.47 ha in summer or dry period of the year. Maximum water level is 3m and minimum water level is 1.1m. The flora is characterised by seasonal flooding of the wetlands. 30 species of macrophytes and 16 species of microphytes

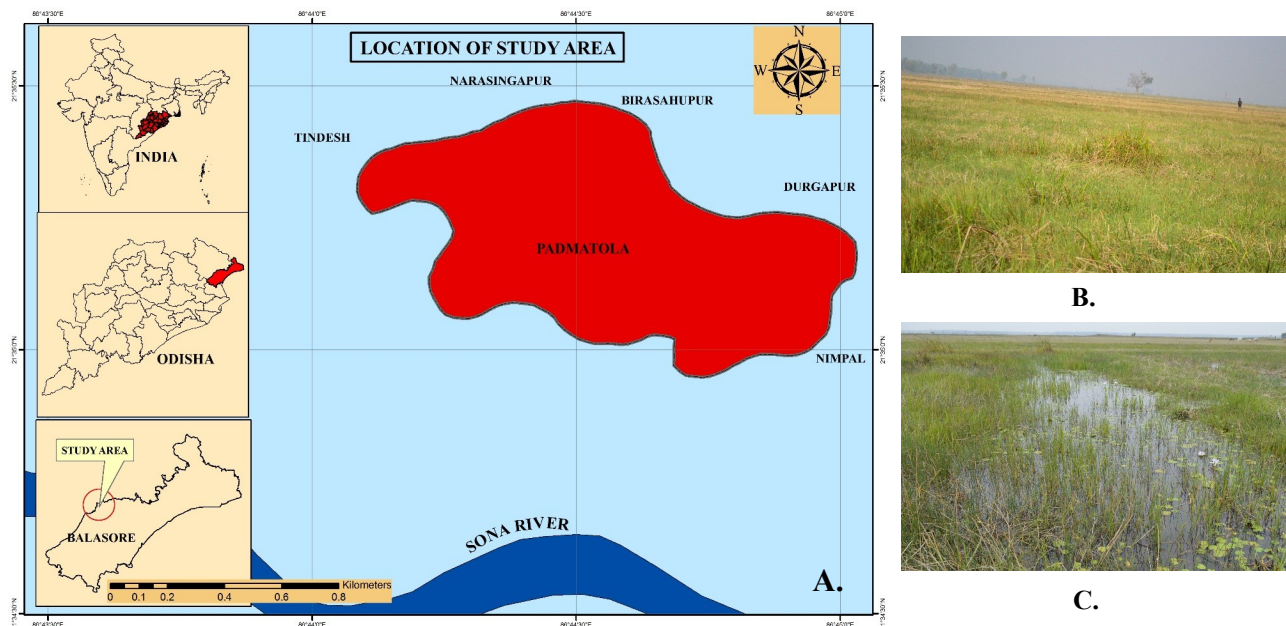
are found. The Physico-chemical properties of the water of Padmatola wetland is given below (Table 1).

Regular observations were made in each month during the study period from December 2013 and May 2014. Species were photographed from various angle and identified with the help of standard identification manuals. Some species were caught with an insect catching net for proper identification and released without any harm. Our surveys were also focussed in the adjacent areas and nearby crop fields of the wetland.

**Table 1. The Physico-chemical properties of the water of Padmatola wetland** (Misra. *et al.*, 2014. Action plan for sustainable management of Padmatola wetland).

Parameter	Minimum value	Maximum value	Average value
Temperature (°C)	19.4	22.6	21.5
pH	7.26	7.69	7.52
DO (mg/l)	3.18	4.31	4.08
Acidity (mg/l)	1.65	3.23	2.6
Alkalinity (mg/l)	19.54	25.73	22.8
Total hardness (mg/l)	5.43	6.87	6.44
Chloride (mg/l)	10.79	15.62	13.01
TDS (mg/l)	386.27	456.46	425.25
Salt (%)	0	0	0
Nitrate-Nitrogen (mg/l)	0.223	0.248	0.239
Phosphate (mg/l)	0.061	0.087	0.076

\*Corresponding Author's E-mail: bitupan.kaz@gmail.com



**Figure 1.** A. Location map of the Padmatola wetland; B & C. Photographs of Padmatola wetland.

## RESULTS AND DISCUSSION

Odonates are highly specific to a habitat. The present study recorded a total number of 51 species of odonates in Padmatola wetland. The sub-order anisoptera contributed 33 species followed by Libellulidae 28, Gomphidae 3, Aeshnidae 1 and Macromiidae 1 (Table 2). The sub-order zygoptera contributed 18 species followed by Coenagrionidae 15, Platynemididae 2 and Lestidae 1 (Table 3). On the basis of direct sighting we found that *Pantala flavescens* and *Ceriatrion coromandelianum* are most abundant. *Brachythemis contaminata*, *Diplacodes trivialis*, *Neurothemis tullia*, *Trithemis pallidinervis*, *Agriocnemis lacteola*, *Agriocnemis pygmaea* and *Ischnura aurora* are also common species to the wetland. Odonates belonging to the families Corgulegasteridae and Cordulidae of Anisoptera and Protoneuridae, Calopterygida, Chlorophidae, Euphaeidae and Platystictidae of Zygoptera are not found in the study area probably because most of the species of these families are restricted to high altitude and/or breed in running water streams in forest landscape.

Padmatola wetland is very least known area and there is no data regarding the biodiversity of this area. Besides the odonates diversity, the area harbours a wide variety of other fauna like bird and butterfly. Bird species like Munias, Egrets, Sandpipers, Kingfishers etc. and Butterflies like Grass Blues, Gulls, and Mormons etc. were commonly sighted. The main threats to the wetland are intensive agricultural practice around the wetland area and lack of integration in local and regional land use planning. Use of poison for fishing by the common tribe in this wetland is another great threat to the larval stage of odonates as well as to other aquatic fauna. These rapid degradation and disturbance of the habitat considered to be crucial to the threatened species and declining of population of common species. So there is need have further study about the faunal diversity and needs a legal protection regarding to protect the biodiversity of this wetland.

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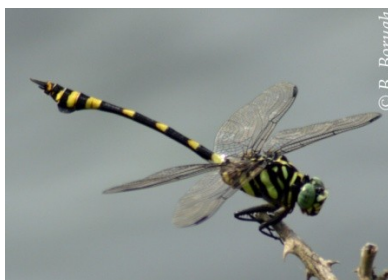
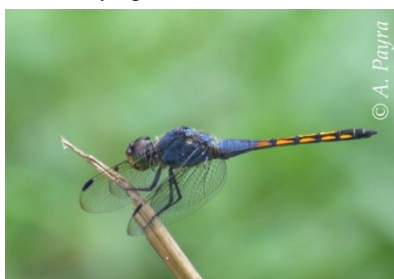
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**Table 2.** Checklist of Anisoptera recorded from Padmatola wetland, Balasore, Odisha, India.

Sl. No.	Common Name	Scientific Name
<b>Family: Gomphidae</b>		
1	Deccan Bowtail	<i>Macrogomphus annulatus</i>
2	Common Hooktail	<i>Paragomphus lineatus</i>
3	Common Clubtail	<i>Ictinogomphus rapax</i>
Family: Aeshnidae		
4	Blue Darner	<i>Anax immaculifrons</i>
<b>Family: Libellulidae</b>		
5	Trumpet Tail	<i>Acisoma panorpoides</i>
6	Scarlet Marsh Hawk	<i>Aethriamanta brevipennis</i>
7	Rufous-Backed Marsh Hawk	<i>Brachydiplax chalybea</i>
8	Emerald-Flanked Marsh Hawk	<i>Brachydiplax farinosa</i>
9	Little blue marsh hawk	<i>Brachydiplax sobrina</i>
10	Ditch Jewel	<i>Brachythemis contaminata</i>
11	Granite Ghost	<i>Bradinopyga geminata</i>
12	Ruddy Marsh Skimmer	<i>Crocothemis servilia</i>
13	Black-Tipped Ground Skimmer	<i>Diplacodes nebulosa</i>
14	Ground Skimmer	<i>Diplacodes trivialis</i>
15	Asiatic Bloodtail	<i>Lathrecista asiatica</i>
16	Fulvous Forest Skimmer	<i>Neurothemis fulvia</i>
17	Ruddy Meadow Skimmer	<i>Neurothemis intermedia</i>
18	Pied Paddy Skimmer	<i>Neurothemis tullia</i>
19	Blue Marsh Hawk	<i>Orthetrum glaucum</i>
20	Crimson-Tailed Marsh Hawk	<i>Orthetrum pruinosum</i>
21	Tricoloured Marsh Hawk	<i>Orthetrum luzonicum</i>
22	Green Marsh Hawk	<i>Orthetrum sabina</i>
23	Wandering Glider	<i>Pantala flavescens</i>
24	Yellow-tailed Ashy Skimmer	<i>Potamarcha congener</i>
25	Common Picture Wing	<i>Rhyothemis variegata</i>
26	Coral-tailed Cloud Wing	<i>Tholymis tillarga</i>
27	Black Marsh Trotter	<i>Tramea limbata</i>
28	Red Marsh Trotter	<i>Tramea basilaris</i>
29	Crimson Marsh Skimmer	<i>Trithemis aurora</i>
30	Long-legged Marsh Skimmer	<i>Trithemis pallidinervis</i>
31	Greater Crimson Glider	<i>Urothemis signata</i>
32	Rufous Marsh Glider	<i>Rhodothemis rufa</i>
<b>Family: Macromiidae</b>		
33	Common Torrent Hawk	<i>Epopththalmia vittata</i>

**Table 3.** Checklist of Zygoptera recorded from Padmatola wetland, Balasore, Odisha, India.

Sl. No.	Common Name	Scientific Name
<b>Family: Coenagrionidae</b>		
1	Green-Striped Slender Dartlet	<i>Aciagrion occidentale</i>
2	Pale Slender Dartlet	<i>Aciagrion pallidum</i>
3	Milky Dartlet	<i>Agriocnemis lacteola</i>
4	Tiny Hooded Dartlet	<i>Agriocnemis sp.</i>
5	Pigmy Dartlet	<i>Agriocnemis pygmaea</i>
6	Orange-Tailed Marsh Dart	<i>Ceriagrion cerinorubellum</i>
7	Coromandel Marsh Dart	<i>Ceriagrion coromandelianum</i>
8	Rusty Marsh Dart	<i>Ceriagrion olivaceum</i>
9	Black Marsh Dart	<i>Onychargia atrocyana</i>
10	Golden Dartlet	<i>Ischnura aurora</i>
11	Senegal Golden Dartlet	<i>Ischnura senegalensis</i>
12	Blue Dart	<i>Pseudagrion microcephalum</i>
13	Three-Lined Dart	<i>Pseudagrion decorum</i>
14	Saffron-Faced Blue Dart	<i>Pseudagrion rubriceps</i>
15	Azure Dartlet	<i>Enallagma parvum</i>
<b>Family: Platynemididae</b>		
16	Yellow Bush Dart	<i>Copera marginipes</i>
17	Pied Bush Dart	<i>Copera ciliata</i>
<b>Family: Lestidae</b>		
18	Sapphire- Eyed Spreadwing	<i>Lestes praemorsus</i>

**Photographs:** Odonata recorded from Padmatola wetland, Balasore, Odisha, India*Macrogomphus annulatus**Ictinogomphus rapax**Paragomphus lineatus**Brachydiplax sobrina**Neurothemis fulvia**Rhodothemis rufa**Potamarcha congener**Pantala flavescens**Brachythemis contaminata*





*Aethriamanta brevipennis*



*Crocothemis servilia*



*Neurothemis intermedia*



*Tramea basilaris*



*Lathrecista asiatica*



*Orthetrum pruinosum*



*Orthetrum luzonicum*



*Trithemis pallidinervis*



*Orthetrum sabina*



*Acisoma panorpoides*



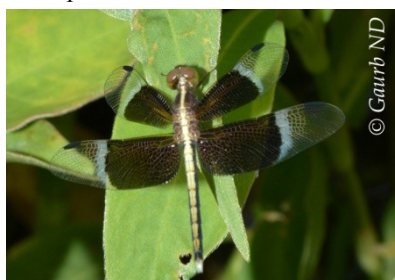
*Diplacodes nebulosa*



*Brachydiplax chalybea*



*Urothemis signata*



*Neurothemis tullia*



*Aciagrion pallidum*



*Agriocnemis* sp.



*Copera ciliate*



*Copera marginipes*



*Pseudagrion rubriceps*



*Agriocnemis pygmaea*



*Ceriagrion cerinorubellum*



*Ceriagrion coromandelianum*



*Agriocnemis lacteola*



*Lestes praemorsus*



*Pseudagrion decorum*



*Enallagma parvum*



*Ischnura senegalensis*



*Onychargia atrocyana*