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Dragonflies and Damselflies of Hazara Pukhuri, Sonitpur, Assam, India

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ABSTRACT

The study is an attempt to provide description of Odonate species (Insecta:Odonata) commonly known as Dragonflies (Odonata, Anisoptera) and Damselflies (Odonata, Zygoptera) collected from the 'Hazara Pukhuri', a large perennial pond in Tezpur, Sonitpur, Assam, India. The attractive group of aquatic insects forms an important component of freshwater macroinvertebrate fauna. Collection of both adult and naiads reveals altogether 12 species belonging to 3 families and 7 genera. The dragonflies represent 6 species under the single Family Libellulidae and the damselflies also represent 6 species under the Families Coenagrionidae and Platycnemididae. Most of the nymphs are found sluggish, dull in colour and collected from the top soft layer of bottom soil near littoral zone of the ponds and also in association with aquatic macrophytes such as *Eichhornia cressipes* and *Hydrilla verticillata*. The adults are beautifully coloured with long and slender 10-segmented bodies and are collected from the vegetation stands around the ponds.

Key words: Dragonflies, damselflies, ecology, Hazara Pukhuri, Sonitpur, Diversity

INTRODUCTION

Dragonflies (Suborder- Anisoptera) and Damselflies (Suborder- Zygoptera) collectively called as Odonates (Order- Odonata) are hemimetabolous exopterygotes. Nearly all the odonates pass their immature stages of their life cycle in water. Adults are aerial. Both the adults and the naiads are predatory in nature, having characteristics feeding habit. The adults are beautifully coloured with long and slender 10-segmented bodies. The damselflies are differed from dragonflies by their slender, delicate bodies and slow flights. The dragonflies are comparatively larger. Both damselfly and dragonfly naiads are usually brown or green in colour to camouflage them from predators and for ambushing prey. The habitat specificity makes the odonates a good indicator of wetland health (Subramanian, 2005) and their large size makes them valuable for quickly assessing water quality and for the study of insect behaviour (Asaithambi and Manickavasagam, 2002). The dragonfly and damselfly are true enemies of mosquitoes as the larvae of these insects are able to utilize mosquito larvae as food, and the adults are efficient predators of adult mosquitoes (Moore, 1997).

India with its unique geography and diverse bioclimatic regions, support a rich odonate fauna. Odonata of India is represented by 488 species and 27 subspecies in 154 genera

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and 18 families (Subramanian, and Babu, 2017). The Suborder Zygoptera Family comprise of 211 species under 59 genera and 9 families Anisozygoptera one species under one genus and one family; Anisoptera 276 species under 94 genera and 8 families.

Survey on dragonflies and damselflies in North-eastern part of India mainly pertains to the work of Joshi &Kunte (2014) in Nagalandrepresenting90 species under 53 genera and 14 families; Prasad (2007) in Mizoram, recorded64 species belonging to 41 genera and 12 families;Srivastava & Sinha (2004)in Manipur-68 species belonging to 41 genera and 8 families;Mitra(2003)in Sikkim - 65 species under 34 genera and 11 families; Majumder (2014)in Tripura-53speciesunder37generaand 9 families;Mitra (2006) in Arunachal Pradesh-92 species under 50 genera and 11 families and in Srivastava & Sinha (1995) in Meghalaya, documented 151 species under 79 genera and 14 families. In Assam, Kalita& Ray (2015) reported 39 species with 22 genera from DeeparBeel Bird Sanctuary of Kamrup (Metro) district;Borah (2012) recorded 7 speciesof damselflies from Gauhati University campus,Kamrup (Metro); Basumatary *et al.* (2015) reported 34 species from the Bodoland University, Kokrajhar; Baruah *et al.* (2016) recorded 82 species belonging to 51 genera and 10 families from Kaziranga National Park and Karbi Hillsof Assam; Gupta and Veeneela (2016) reported 14 species from Cachar district, Neog and Rajkhowa (2016) reported 17 species from Assam University, Silchar. The present investigation is the first one of these kind in Tezpur, Sonitpur, Assam.

MATERIALS AND METHODS

The present investigation is carried during the period of April, 2017 to march 2018. Standard literatures have been followed for collection and identification of the species.

Study area

Hazara Pukhuri is located within the geographical range of $26^0 37^/ 37^{//}$ N - $26^0 37^/ 58^{//}$ N and $92^0 46^/ 54^{//}$E - $92^0 46^/ 47^{//}$E at an elevation of 245ft (Figure 1 & 2). Covering an area of 28.5 ha, it is the largest perennial pond in the city Tezpur of Sonitpur District (about 175 kms from Guwahati), Assam. The pond was constructed during the day of Ahom King Harjjar Barman (ruled Assam during 815 AD 835 AD) after whom it was named *(*Harjjar= *Hazara; Pukhuri*= Pond). The pond attract tourist from different places for its historic background and an important habitat for migratory and residential aquatic birds. The pond is maintained by the District Fishery Department, Sonitpur, Assam.

Collection and Identification

Random survey is carried out by walking along the different zones of the selected habitats in daytime. Individuals of the species are photographed and identified in their natural habitats, but in few cases when assessment was difficult, they are collected with a specially designed hand operated net with long handle. for further identification.The species were identified with the help of keys provided by Subramanian (2017), Mitra (2006), and Prasad and Varshney (1995).

RESULTS

Collection of both adult and immature forms of the individual belonging to the Order Odonata reveals 12 species from the studied ponds which are among the common Indian dragonflies (Suborder Anisoptera) and damselflies (Suborder Zygoptera). The dragonflies are represented by 6 species under the single Family Libellulidae and the damselflies also represented by 6 species under the Family Coenagrionidae and Family Platycnemididae.

Systematic enumeration of the species

Phylum: Arthropoda
Class: Insecta
Order: Odonata
Suborder: Zygoptera

Family: Coenagrionidae
1. *Ceriagrion olivaceum* (Laidlaw)
2. *Ceriagrion coromandelianum (Fabricius)*
3 *Ischnura aurora aurora (Brauer)*
4. *Ischnura senegalensis (Rambur)*
5. *Rhodischnur a nursei (Morton)*

Family : *Platycnemididae*
6. *Calicnemia eximia (Selys)*

Order : *Odonata*
Suborder : *Anisoptera*

Family : Libellulidae
7. *Orthetrum Sabina sabina (Drury)*
8. *Orthetrum luzonicum (Brauer)*
9. *Orthetrum pruniosum neglectum (Rambur)*
10. *Neurothemis tullia tullia (Drury)*
11. *Neurothemis sp.*
12. *Rhyothemis sp.*

DISCUSSION

Dragonflies and damselflies are amongst the prominent and colourful insects in tropical landscapes. In addition to providing aesthetic pleasure, studying them could give us valuable insights about ecosystem health, especially of wetland (Subramaninan, 2005). Odonates, being predators both at larval and adult stages, play a significant role as natural biocontrol agent of mosquito vector. Many species of odonates inhabiting in agro ecosystems play a crucial role controlling pest populations. In addition to the direct role of predators in ecosystem, their value as indicators of quality of the biotope is now being increasingly recognized.The present investigation reveals 12 species of odonateswhich are among the common Indian dragonflies (Suborder Anisopter) and damselflies (Suborder Zygoptera). The dragonflies represent 6 species under the single Family Libellulidae and the damselflies also represent 6 species under the Families Coenagrionidae and Platycnemididae are significant in respect of pond ecosystem management. Occurrence, abundance and distribution of invertebrates with longer life cycles and metamorphosing larva may be influenced directly by span as well as timing of the hydroperiod (Taylor *et al.*, 1999) in freshwater ecosystem. The studied pond is a perennial water body, 100% water holding in a year. As a result, the pond brings up a community of insects having long life cycles such as dragonflies and damselflies. Indeed, due to higher water stagnation the groups constitute higher representation with their prolonged life cycles. Except from some scattered literature, studies on the diversity and ecology of this important group of aquatic insects including their taxonomic detail in Assam in general and Sonitpur district in particular is limited. The occurrence of 12 species in presently studied pond signifies the rich diversity of this insect group in the state. However, there may be many more species of this group as the larval forms are found to be extremely difficult to separate and identification is mainly supported by the adult forms collected from vegetation around the ponds tentatively simulating with larval forms.

CONCLUSION

Though the Indian odonate fauna is well described in terms of adult taxonomy, their ecology is poorly known (Subramanian, 2009). Large scale habitat destruction and alterations is the major threat to odonate fauna of India in general and Assam in particular. The ecological information of both the adult and larval forms of odonates is of utmost importance for designing any conservation measure. This can be attempted only by fresh field surveys to know the threat status. Future studies on dragonflies in Assam in general and Sonitpur district in particular may be directed to have a comprehensive understanding of their ecology and their value as a biomonitoring tool.

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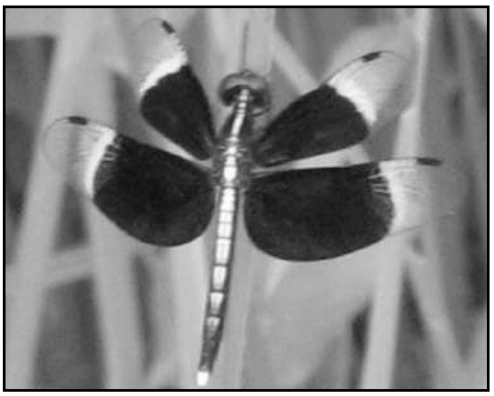
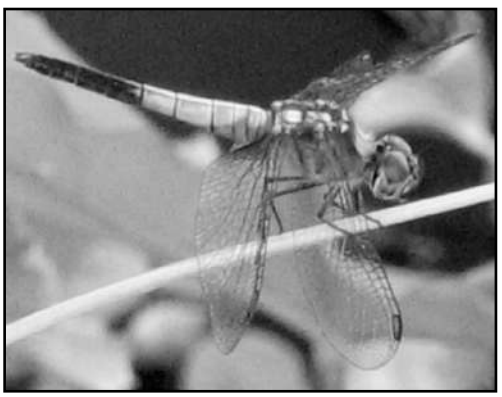
Photo plate 1 (A-F). Adult morphs of the Dragonflies (Order- Odonata)

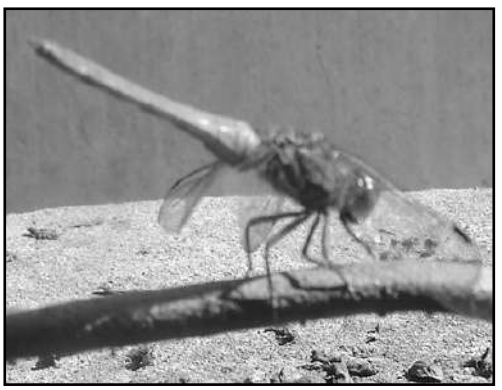


A. ***Neurothemis tullia tullia***

B. ***Rhyothemis sp.***

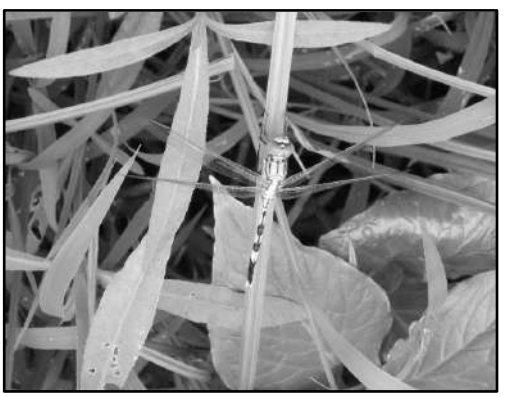


C. ***Orthetrum luzonicum***



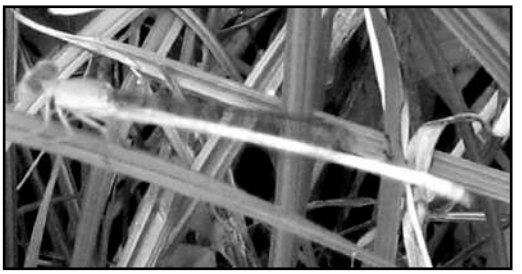
D. ***Orthetrum pruniosum neglectum***

E. ***Neurothemis sp.***



F. ***Orthetrum sabina sabina***

Photo plate 2 (G-L). Adult morphs of the Damselflies (Order- Odonata)

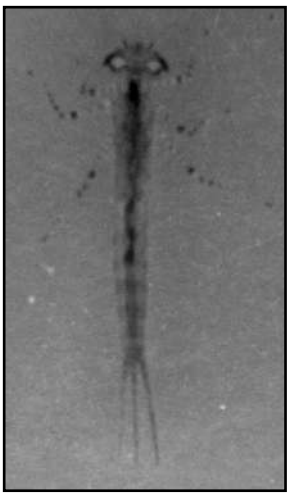


G.*Ceriagrion coromandelianu* (Fabricius)

H. *Ceriagrion olivaceum (Laidlaw)*

I. *Ischnura aurora aurora*

J. *Ischnura senegalensis*



E. *Neurothemis sp.*

L. Rhodischnura nursei (Larva)