



Aquatic insects of Kapla Beel, a flood plain wetland of Barpeta District of Assam, India

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Abstract

This paper presents the aquatic insects of Kapla Beel, a perennial freshwater wetland located at Barpeta district, Assam. Aquatic insects perform essential role in keeping fresh water ecosystem at proper functioning state. Many fishes, amphibians, shorebirds, waterfowl and other animals forage heavily on both aquatic and terrestrial stages of aquatic insects for their survival. During the study period 5 orders of aquatic insects viz. Coleoptera, Diptera, Ephemeroptera, Hemiptera and Odonata are recorded from the wetland of which Hemiptera dominate the total insect population.

Keywords : Aquatic insects, Kapla Beel.

1. Introduction

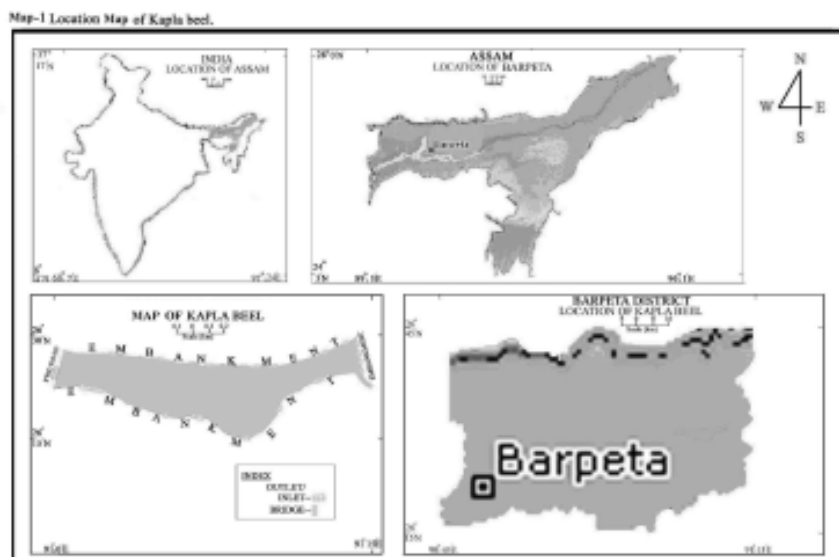
Aquatic insects are those who spend their some part of their life cycle closely associated with water, either living beneath the surface or skimming along on top of the water. Of the great variety of insects, aquatic forms, though of less variety, are important constituent of freshwater ecosystem. While some of these insects may be beneficial to human being, few others are quite harmful (Ahmed, 1983). Aquatic insects are among the most prolific animals on earth, but are highly specialized and represent less than 1% of the total animal diversity (Pennak, 1978). Aquatic insects form an important component of the food chain and energy flow pathways and comprise of a high proportion of biomass in fresh water. Studies have shown that between 1% and 57% of the biomass produced by immature aquatic insects (i.e. secondary production of aquatic insects) emerges from the aquatic system in the form of adult insect (Jackson *et al.*, 1986). Some of the aquatic insects are responsible for breaking down the dead leaves and other plants that fall into wetland from terrestrial

habitat. These materials provide the base of the food chain in some aquatic environment.

Studies on the aquatic insects were reported by Tonapi (1954), Ahmed (1983), Mishra (1984), Thirumalai (1999), Bhattacharya (1998), Deepa and Rao (2007), Kalita (2008), Das and Gupta (2010) and Hazarika and Goswami (2010). Till date no work has been reported on aquatic Insects of Kapla Beel; therefore the present study was undertaken to assess the aquatic insects population of Kapla Beel.

2. Study area

Kapla Beel is a perennial freshwater wetland is located at Barpeta district, Assam. Geographically it lies at the intersection of 26°15'–26°30' N latitude and 91°0'–91°15' E longitude covering an area of about 91 hectares. It is about 120 Km away towards west from the Guwahati, the capital of Assam. The marginal areas of the beel become shallow during lean season (September–April). The average depth of the core area of the beel is about 5-6 m in monsoon and average depth about 2–3.5 m during the lean season (Deka, 2009).



Source : Deka (2009)

Figure - 1 : Location map of the study area.

3. Methodology

The present study was carried out for a period of one year during May, 2010 to April 2011. For sampling of the aquatic Insects the Beel area was arbitrarily divided into five zones namely North, South, East, West and Central. Samples were collected randomly at the above mentioned zone using dip net having mesh size of 500 μm (approx). Kick net, pond net and small sieve also used to collect aquatic insect. The collected samples preserved in 70% ethanol in glass vial. Insect were identified with the help of a simple dissecting microscope and a compound microscope. Identification was done by using aquatic insect taxonomic key suggested by Winterbourn (1981), Subramaniam (2005), Epler (2006), Subramaniam & Sivaramakrishnan (2007) and Subramaniam (2009).

4. Result and Discussion

During the study period altogether 5 orders of aquatic insects viz. Coleoptera, Hemiptera, Odonata, Diptera and Ephemeroptera were recorded from the wetland (Table-1). Among these Hemiptera was recorded in highest number with 7 genera comprising of 6 families. Coleoptera recorded with 4 genera comprising of 3 families, Odonata with 2 genera comprising of 2 families, Diptera with 2 genera and 2 families and Ephemeroptera with 2 genera belonging to single family. During the study period it was

observed that most part of the wetland was occupied by emergent, floating and submerged type of macrophyte vegetation and mostly dominated by *Eichhornia crassipes* (water hyacinth) and *Hydrilla verticellata*. Aquatic insect were found associated with all these three types of vegetation. Coleoptera and Hemiptera are primarily associated with the macrophyte and Hemiptera was found in both surface water and macrophyte. All the Coleoptera were collected from root of the macrophyte. Larval stages of the aquatic Insect were found associated with floating and emergent macrophyte. During the study period it was noticed that most of the aquatic insect were most active during morning period i.e. between 6.00 A.M. to 10.00 A.M. and during evening period i.e. 3.00 PM to 6.00 PM. This indicated that temperature play a vital role in the activity of the aquatic insect.

In the similar study on aquatic insects of Deepor Beel (a Ramsar site) revealed presence of 25 species (Saikia, 2007). Hazarika and Goswami (2009) recorded 43 species of aquatic insects in two freshwater ponds located in Guwahati city. Comparatively less number 21 species of aquatic insects was reported by Bhattacharya (1998) in wetlands West Bengal.

The present study recorded only 17 species of 5 different orders of aquatic insects in the Beel. Less

abundance of insect population in the Beel habitat was the indicative of environmental stress as well as environmental instability. During summer rainy season the Beel receives flood water and remain fully inundated. Further, during winter lean season 25% of the Beel area was cultivated for crop production (Deka, 2009). Both in summer and winter seasons, the hydrological character of Beel water as well as macrophyte vegetation were

affected resulting alternation of environmental quality which had direct bearing on the aquatic insect community. Moreover, the Beel is subjected to lease to private parties for fishing. As a result, the Beel environment is frequently and extensively disturbed for fishing thereby damaging the aquatic & littoral vegetation on which the aquatic insect population is fully depended for their growth and survival.

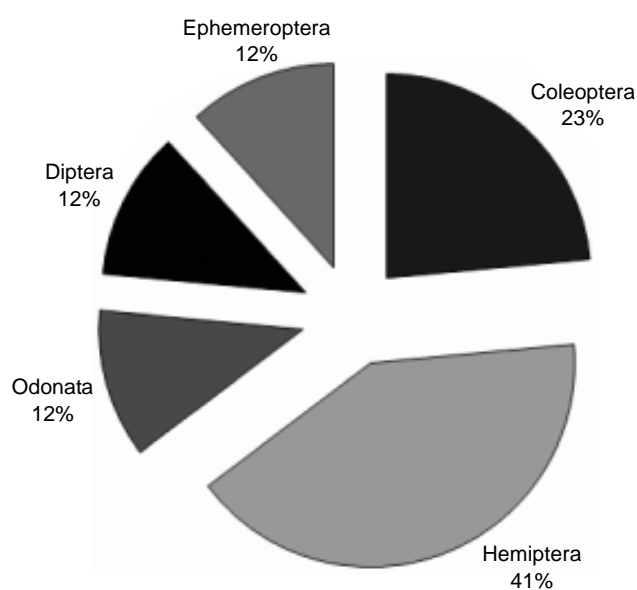


Figure - 2 : Different orders of aquatic insect % of Kapla Beel.

Table-1 : Aquatic insects of Kapla Beel

Order	Families	Genera /species
Coleoptera	Dytiscidae	<i>Dytiscus sp.</i>
	Hydrophilidae	<i>Tropisternus sp.</i>
		<i>Cercyon sp.</i>
	Noteridae	<i>Hydracanthus sp.</i>
Hemiptera	Belostomatidae	<i>Lethocerus indicus</i> Lepeleier & Serville
		<i>Diplonychus rusticus</i> Fabricius
	Corixidae	<i>Micronecta scutellaris scutellaris</i> Stal
	Gerridae	<i>Gerris gracilicornis</i> Horvath
	Hydrometridae	<i>Hydrometra greeni</i>
	Nepidae	<i>Laccotrephes sp.</i>
	Pleidae	<i>Plea liturata</i> Fiebr

Odonata	Libellulidae	<i>Orthetum sp.</i>
	Euphoidae	<i>Torrent dart</i>
Diptera	Culicidae	<i>Culex sp.</i>
	Chironomidae	<i>Chironomous sp.</i>
Ephemeroptera	Baetidae	<i>Baetis sp.</i>
		<i>Cloeon sp.</i>

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