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DIVERSITY OF FISH AND INSECT FAUNA OF DIYUNG THIEP WATERSHED, ARUNACHAL PRADESH

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ABSTRACT
Fish and insect fauna was studied for a period of one year (2009-2010) in the Diyung Thiep watershed of Arunachal Pradesh. The watershed was surveyed in three seasons *i.e*. premonsoon, monsoon, and post monsoon during two years. (2009-2011). Fishes were recorded in the landing sites where fisherman catches the fishes with cast net (mesh size 2cm). They also use hooks and lines for catching fishes. Aquatic insects were collected by aquatic net. During the survey period, nine fish species belonging to eight genera, four families and two orders were recorded in the river. *Schizothorax richarsonii* was the dominant fish species in all the seasons. Aquatic insects belonging to 13 families and 7 orders were recorded in the water bodies present in the watershed.

KEYWORDS: Diversity, Diying kho River, stream, aquatic fauna, water bodies.

INTRODUCTION

Arunachal Pradesh is a part of "Indo-Burma" biodiversity hotspot regions of the world (Myers et al 2000) lies between 26° 28' to 29° 30' N and 90° 30' to 97° 30′ E, with an area of 83,743 km^2 . Major parts of the state comprise of hill ranges of varying elevation and are traversed by rivers and streams, which are home to diverse fish species. Various workers studied fishery resource of the state. Nath and Dey (1997) published their pioneering work on systematic account of fish resources of Arunachal Pradesh recording 131 fish species belonging to 10 orders and 27 families. Sen (1999a) studied fish species from Siang and Subansiri districts of Arunachal Pradesh and reported 52 species under 11 families and 4 orders. Sen (1999b) reported fish fauna from Lohit, Tirap and Changlang districts of Arunachal Pradesh. Sen (2003) studied endemic and threatened fish species from North Eastern India. Daimari et al (2005) reported 52 fish species from Subansiri River belonging to 4 orders and 14 families. Sen (2006) recorded 143 fish species belonging to 8 orders, 21 falimies,61 genera from Arunachal Pradesh. Two new species *Pseudecheneis sirenica* and *Psilorhynchus arunachalensis* were described by Vishwanath and Darsan (2007) and Nebeswar et. al(2007) respectively. Tamang et al. (2007) studied icthyofaunal diversity of the Senkhi stream of Papumpare district and reported 47 species belonging to 31 genera and 16 families. Bagra et al (2009) prepared a checklist based on their ichthyological survey and added 43 species to previous record of 170 species in total of 213 species from the drainage systems of Arunachal Pradesh. Bagra and Das (2010) reported 44 fish species from river siyom of Arunachal Pradesh.Tamang and Choudhury (2011) reported a new species of sisorid catfish from the Dikrong River, Arunachal Pradesh. Geetakumari and Kadu(2011) reported a new fish species (Teleostei: Badidae) from Singen River, Arunachal Pradesh, Northeastern India.

Insect fauna of Arunachal Pradesh, northeastern India was studied by various workers viz. Tandon & Khera (1978), Lahiri (1979), Basu & Sengupta (1980), Chatterjee & Saha (1981), Sengupta & Sengupta (1981), Bhargava (1989), Pal (1992),Chakrabarty et al. (1994), Bordoloi et al(2002), Mitra(2006),Mandal et al(2006) and Sewak(2006). Singh et al (2010) studied the entomofauna of Kane Wildlife Sanctuary, Arunachal Pradesh,India. In the present study an attempt has been made to record the fish fauna and aquatic insects of the Diyung thiep watershed, Aruanachal Pradesh.

Study area

Diyung Theip watershed is located at Tenga valley, West kameng District of Arunachal Pradesh. It lies approximately between 92°28/ to 92°29/ East longitudes and 27°12/ to 27°14/ North latitudes. A greater part of it falls within the mountain zone. The total area of the watershed is 231.28 hectares.

Panitanki nala: This stream named by the locals due to the presence of a water tank occupies major part of the study area. It is a slow moving small hill-stream flowing from the upper mountain region and drains into the river Diying kho. The stream bed is rocky and with sandy soil. The water of the stream is transparent. The stream is surrounded by the forest with small to medium sized trees, mostly pine trees (*Pinus sp*.).

Diying Kho River

Diying Kho River is flowing throughout the Tenga valley. It is a highly torrential river and its depth varies at different points ranging up to 1meter. The riverbed is stony with sandy bottom. The water of the river is not clear. All the streams originating from the hill drain into this river.

MATERIALS AND METHODS

The watershed was surveyed in three seasons i.e. premonsoon, monsoon, and post monsoon during two years. (2009-2011). Fishes were recorded in the landing

sites where fisherman catches the fishes with cast net (mesh size 2cm). They also use hooks and lines for catching fishes. Aquatic insects were collected by aquatic net and preserved in 4% formaldehyde solution for later identification. For taxonomic identification of the fishes, Talwar & Jhingran (1991);Nath and Dey (1997); Jayaram (1999) and Vishwanath et. al (2007) was followed while nomenclature was based on Fish base. The conservation status of the fish species is based on CAMP (1998) and IUCN (2011). The insects were identified up to the lowest possible taxa with the help of available literature (Tembhare, 1997; Khan and Ghosh, 2001, Mitra, 2006, Subramanian and Sivaramkrishnan, 2007 and Thirumalai, 2007.

TABLE 1 : List of fishes recorded in Diying Kho River

En-Endangered; VU-Vulnerable; LRnt-Lower risk near threatened; L.C- Least concern; N.T- Near threatened ;NE – Not Evaluated.

Sl. No	Family	Species	CAMP status	IUCN status
1	Cyprinidiae	*Schizothorax richardsonii* (Gray.1832)	VU	VU
2	Cyprinidiae	*Schizothorax progastus* (McClelland, 1839	LRnt	L.C
3	Cyprinidiae	*Garra kempi* (Hora,1921)	VU	L.C
4	Cyprinidiae	*Garra gotyla gotyla* (Gray,1830	VU	L.C
5	Cyprinidiae	*Tor tor* (Hamilton-Buchanan,1822)	En	NT
6	Balitoridae	*Schistura arunachalensis*(Menon)	En	NE
7	Psilorhynchidae	*Psilorhynchus balitora*(Hamilton-Buchanan, 1822)	NE	LC
8	Sisoridae	*Pareuchiloglanis kamengensis* (Jayaram, 1966)	En	DD
9	Sisoridae	*Pseudocheneis sulcata* (McClelland,1842)	VU	LC

RESULTS AND DISCUSSION

This is first record of aquatic biodiversity in Diyung kho watershed. During the survey period, nine fish species were recorded belonging to 8 genera, 4 families and 2 orders. Of these, family Cyprinidae was represented by 5 fish species, family Sissoridae by two species, Balitoridae one species and Psilorhynchidae one species. Table 1. provides scientific names and conservation status of the recorded fish species.

Of the nine-recorded fishes, three species enlisted as endangered (EN) and 4 species in the vulnerable (VU) category. One species enlisted as lower risk near threatened (LRnt) category and rest one species is in not evaluated (NE) category as per CAMP (1998). As per IUCN Red list of threatened species (2011), of the 9 recorded species, one species in vulnerable(VU) category; 4 species are in least concern (LC) category ,1 species in near threatened (NT) category and rest 3 species are not evaluated(NE) category.

TABLE 2: Aquatic insects recorded in the watersheds.

Class :Insecta			
Order	Family	Common Name	Scientific Name
Odonata	Cordulegasteridae	Dragon fly	*Cordulegester sp*
	Libelluidae	Dragon fly	*Sympetrum sp*
	Coenagrionidae	Damselfly	*Argia sp*
Plecoptera	Perlidae	Stonefly	
Dermaptera	Forficulidae	Earwig	*Forficula sp*
Orthoptera	Gryllidae	Cricket	*Gryllus sp*
	Acrididae	Grasshopper	
Dictyoptera	Blattidae	Water cockroach	*Blatta sp*
	Mantidae	Praying mantis	*Mantis sp*
Hemiptera	Nepidae	Water scorpion	Nepa sp
	Nepidae	Water scorpion	*Ranatra sp*
	Gerridae	Water striders	*Gerris sp*
Coleoptera	Carabidae	Ground beetle	
	Scarabaeidae	Scarab beetles	

Of the recorded fish species, *Schizothorax richardsonii* (Gray, 1832) is present in all the three seasons. The fish species *Tor tor* (Hamilton) could be recorded only during monsoon season. The status of this fish is in near threatened category (IUCN) and in endangered category as per CAMP. During the survey period, aquatic insects belonging to 7 orders and 13 families and nine species have been recorded(Table 2).This includes 3 species each of the order Odonata and Hemiptera, 2 species each of Dityoptera, Orthoptera and Coleoptera, one species each of the order Plecoptera, and Dermaptera. Odonata fauna were dominant in the present collection. Three families namely Cordulegasteridae, Libelluidae, and Coenagrionidae of the order Odonata were recorded. The

Hemipteran collection contained 3 species belonging to 2 families. Between them two species were under the family Nepidae and one species under the family Gerridae. Table 2 provides systematic position ,common name and scientific names of the recorded insects in the watershed.

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