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RESEARCH ARTICLE

"DIVERSITY OF DRAGONFLIES AND DAMSELFLIES (ODONATA) FROM ANKALGA VILLAGE (GULBARGA DISTRICT) KARNAKATA, INDIA"

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ABSTRACT

The objectives of the present study were to explore the Diversity and abundance of Dragonflies and damselflies (Order – Odonata, Class Insecta, phylum Arthropoda) of Ankalgavillage, near back waters of Bennethora reservoir, Gulbarga District, Karnataka. Odonata fauna of present study was investigated in monsoon season from July 2013 to October 2013, total 14 species belonging to four families of dragonflies and damselflies were recorded, in which the most abundant family was Libellulidae followed by Coenagrionidae, Gomphidae and Platycnemididae. Libellulidae family represents 10 species, Coenagrionidae represents 2 species, Gomphidae represents 1 species, while Platycnemididae also represents with 1 species. We also calculated the Species diversity (H) and Evenness (E) which is 2.371 and 0.901 respectively. From above study we conclude that the present study area is rich in dragonflies and damselflies fauna in monsoon season.

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INTRODUCTION

Insects are the largest group among animals and plants in the world. It is commonly believed that 75-80 % of the total animal species on this planet are insects (Ehrlich and Wilson, 1991).

Dragonflies and damselflies collectively called Odonates, are one of the most common insects flying over forest, fields, meadows, ponds and rivers. Dragonflies and damselflies are amongst the most attractive of creatures on earth. They are well-known insects, and many people appreciate their striking colors and equilibristic flight.

Globally 5,740 species of Odonates are known of this 470 species in 139 genera and 19 families exist in India. They are valuable as indicators of aquatic and terrestrial ecosystem health and also play a vital role as prey and predator to maintain the balance of tropic levels of food chain.

Their aquatic larvae constitute a natural biological control over mosquito larvae and thus help to control several epidemic diseases like malaria, dengue, filaria etc. (Mitra, 2002).

Odonate taxa are ideal models for the investigation of the impact of environmental warming and climate change due to their tropical evolutionary history and adaptations to temperate climates.

In India, 499 species and subspecies under 139 genera in 17 families, 32 subfamilies and 7 superfamilies have been documented (Prasad and Varshney, 1995). Fraser (1933, 1934, 1936), Prasad (1996). Prasad and Kulkarni (2001) reported 71 species from Nilgiri Biosphere reserve. Further, Prasad and Kulkarni (2002) reported additional 34 species from Kerala. Shinde and Sathe (2006) recorded a total of 36 species of dragonflies from Koyna dam area (Western Ghats). The dragonflies of western Himalayas have been catalogued by Kumar and Prasad (1981) and Kumar (1995). Similarly, in the

recent past this group has been well studied in Himachal Pradesh by a number of field workers like Bhasin *et al.* (1953), Singh (1963), Kumar and Juneja (1976), Kumar (1978, 1982), Kumar and Prasad (1981) and Chandra (1983). There is, however no report on Diversity and abundance of Dragonflies and Damselflies of Ankalgavillage, Gulbarga district, Karnataka. The present work was therefore, undertaken to make the study on Diversity and abundance of Dragonflies and Damselflies of Ankalgavillage.

MATERIALS AND METHODS

The study area is located in Ankalgavillage near Kurikotta Bridge (longitude 76.921163 and latitude 17.491258) of Gulbarga district which is about 25 km from Gulbarga. This village receives the back waters of Bennethora reservoir. The climate of this area is generally dry and healthy with temperature ranging from 16°C to 45 °C and an average annual rainfall of about 750mm. The factors like temperature, humidity, wind and rainfall of an area have a great impact on the vegetation as well as on the fauna. This region is situated in Deccan Plateau and the general elevation ranges from 300 to 750 meters above sea level (MSL).

METHODOLOGY

The present study was carried out monthly in monsoon season during the month of July-October 2013 for Kharip crops. Observations were carried out in morning between 8:00 am to 1:00 pm. The adult Dragonflies and Damselflies were collected by insect collecting net; the collected species were preserved after collection and kept in an insect box. After collection the species were stretched in a stretching box and pinning with the help of entomological pin. Naphthalene is used for the preservation. The adult specimens were identified with the help of identification keys provided by Fraser (1933, 1934,

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1936), Mitra (2006), Subramanian (2005), Andrew *et al.*, (2009), and Subramanian (2009).

RESULTS

A total of 14 species representing 13 genera from 4 families recorded from Ankalg village, Gulbarga district, Karnataka.

500 known species of Odonata (Subramanian, 2005).Madhya Pradesh and Chhattisgarh states present 70 species of the entire Odonata diversity of India, which has now increased from 70–76 species. Manwar, *et al* (2012) studied diversity and abundance of dragonflies and damselflies of Chatri Lake Region, in Pohara Malkhed Reserve Forest and reported 22

Table 1 Composition of Dragonflies and damselflies recorded from the study area.

SL	NAMES OF SPECIES	FAMILIES	GENUS	SPECIMENS	Pi	pi*ln(pi)
1	Brachythemis contaminata (Fabricius, 1793)	Libellulidae	Brachythemis	8	0.054	-0.432
2	Trithemis pallidinervis (kirby 1889)	Libellulidae	Trithemis	7	0.047	-0.331
3	Rhodothemisrufa(Rambur, 1842)	Libellulidae	Rhodothemis	8	0.054	-0.432
4	Trithemis kirbyi (Selys 1891)	Libellulidae	Trithemis	26	0.175	-4.567
5	Diplacodes trivialis (Rambur 1842)	Libellulidae	Diplacodes	4	0.027	-0.108
6	Pantala flavescens (Fabricius 1798)	Libellulidae	Pantala	32	0.216	-6.918
7	Tholymis tillarga (Fabricius 1798)	Libellulidae	Tholymis	12	0.081	-0.972
8	Orthetrum sabina (Drury , 1770)	Libellulidae	Orthetrum	8	0.054	-0.432
9	Potamarcha congener (Rambur 1842)	Libellulidae	Potamarcha	6	0.040	-0.243
10	Tramea basilaris burmeister(Kirby,1889)	Libellulidae	Tramea	5	0.033	-0.168
11	Ictinogomphus rapax (Rambur 1842)	Gomphidae	Ictinogomphus	3	0.020	-0.0601
12	Enallagma insula(Fraser,1920)	Coenagrionidae	Enallagma	5	0.033	-0.168
13	Pseudagrion hypermelas	Coenagrionidae	Pseudagrion	19	0.128	-2.439
14	Calicnemia mortoni	Platycnemididae	Calicnemia	5	0.033	-0.168
TOTAL				148	1	

In case of sub order Anisoptera (Dragonfly) family Libellulidae is the dominant by 10 species followed by Gomphidae 1 species. In case sub order Zygoptera (Damselfly) family Coenagrionidae is the dominant by 2 species followed by Platycnemididae 1 species.

Libellulidae or skimmers are the most diverse group of odonates. They are large, medium or small dragonflies and noniridecently coloured. Eyes are always broadly confluent. The wings vary in size, shape, width and colouration.

Gomphidae or clubtails are large or medium sized dragonflies. They are generally black or yellow and marked with yellow or green. The eyes are well separated and large. The wings are transparent. The last abdominal segments of many species are bulbous, giving a club shaped appearance.

Coenagrionidae or marsh darts are slender and small damselflies with varied colouration.

Table 2 Species richness (S), Species diversity (H) and Evenness (E) of dragonflies and damselflies in Ankalg village, Gulbarga district, Karnataka.

Measure	Value
Species Richness(S)	14
Shannon-Wiener Index(H)	2.371
Evenness(E)	0.901

These non-iridescent damselflies rest with wings closed over their body. The wings are transparent and rounded at the tip. The long and slender abdomen is slightly longer than the hind wing.

Platycnemididae or bush darts are small, slender Damselflies. They are predominantly black damselflies With blue, red or yellow Markings. The narrow, transparent wings are rounded at the tip. Abdomen is longer than then hind wing.

DISCUSSION

Approximately 6000 species and subspecies to 630 genera in 28 families are known from all over the world (Tsuda1991), out of which 499 species and subspecies of Odonata under 139genera in 17 families, are represented in India (Prasad and Varshney 1995). India is also highly diverse with more than

species. 32 species of odonates was reported fromBandhavgarh Tiger Reserve of Madhya Pradesh Mishra (2009) and 36 species also was reported earlier to Kanha National Park (Tiple *et al.* 2011). 82 species of Odonates were reported under 42 genera and nine families fromVidarbha Region of Maharashtra state (Tiple *et al.*, 2012).

CONCLUSION

Dragonflies are bio indicators of the aquatic ecosystems. Hence, this study is only a preliminary assessment of examining whether the quality of the water samples have any influence on the diversity of the dragonfly communities and further warrants detailed research in this particular area to serve as a milestone for the conservation of the wetlands and their insect communities ultimately.

Table 3 Distribution of genera and species of different families of Dragonflies and damselflies in Ankalg village, Gulbarga district, Karnataka.

Family	Genera	Species	% of Species	Status		
				VC	C	R
Libellulidae	9	10	72	5	4	1
Gomphidae	1	1	7		1	
Coenagrionidae	2	2	14	1	1	
Platycnemididae	1	1	7			1
Total	13	14	100			

The life cycle of the dragonfly constitutes two life stages: the nymphal (aquatic) and the adult (aerial) phase. Mostly nymphal stage is predominant than the adult stage and much of the lifetime is spent in the water. Since the nymphal life stage is predominant in the life cycle of a dragonfly, it is directly associated with the aquatic ecosystem therefore the effects from polluted water system would have direct influence on the distribution of nymphs rather than the adult dragonflies.

Temporary water bodies are found throughout the world particularly in tropical countries (Williams 1997). Anisoptera was abundant in most of the water bodies sampled. This might be due to their high dispersal ability (Batzer & Wissinger 1996; Williams 1997; Lawler 2001; Kadoya *et al.* 2004) and their adaptability to wide range of habitats (Hodgkin & Watson 1958; Suhling *et al.* 2004, 2005). Less abundance of

damsel flies was probably due to their limited dispersal ability (Weir 1974), undulating environment afforded by the temporary water bodies (Williams 1997; Kadoya et al. 2004) and partial or absence of shade cover (Clark & Samways 1996). The abundance of Libellulidae (Anisoptera) and Coenagrionidae (Zygoptera) in the present study might be due to their shorter life cycle and widespread distribution (Norma-Rashid et al. 2001) and tolerant to wide range of habitats (Gentry et al. 1975; Samways 1989).

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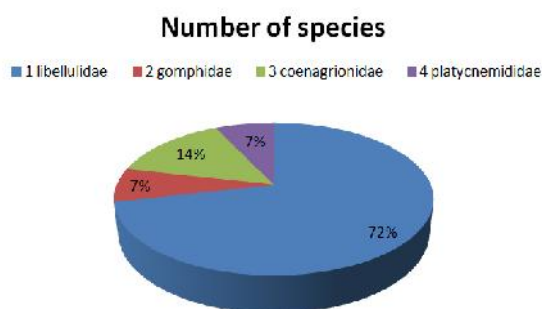


Fig. 1 Percentile distribution of families of dragonflies and damselflies in Ankalga village

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