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## PREMONSOON HEALTH STATUS ASSESSMENT OF KILLIYAR, A TRIBUTARY OF KARAMANA RIVER USING ODONATE POPULATION AS BIOMONITORING TOOL

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### ABSTRACT

An aquatic ecosystem has a major role in regulating the life existing on earth. Purity and quality of water is essential for this process. The present study was conducted using aquatic odonates as bioindicators in Killiyar, a tributary of Karamana River to analyze the health status of the river. The investigation was conducted during the month of January 2019. The study adopted rapid bioassessment protocol to assess the impact of anthropogenic pressure in Killiyar. Odonata population showed variations in reference site and test sites. A total of 7 families of insects under Order Odonata were recorded from the reference site and reductions in the number of Odonata families were noticed on test sites. The decline in the number of sensitive families and significant increase in the number of tolerant families of Odonata in the test sites reveals considerable ecological degradation during study period.

**Key words:** Killiyar, Biomonitoring, Aquatic insects, Odonates

### INTRODUCTION

Global population is increasing, modernization and rapid expansion of industrial and urban activities and unscientific agricultural practices results in the accumulation of waste materials in water bodies causing its gradual degradation (Subhendu, 2000). River water pollution is a major global issue and it is severely affects the aquatic biodiversity. Several stream ecosystems are heavily polluted by anthropogenic activities like dumping of sewage, agricultural runoff, urban waste and industrial effluents (Trivedy and Goel, 1985; Kumar, 2001). Biological approach to river water quality monitoring involves the use of the river organisms as a basis for assessing the intensity of pollution.

### MATERIALS AND METHODS

Killiyar is the main tributary of Karamana River, originated from the ottakompu kunnu and karimchathi mala in Theerthankara in Nedumangadu taluk. It flows north- south direction for about 35 km through Kalliodu, Panavoor, Anad, Karakulam, Kodappanakunnu and Vattiyoorkavu panchayaths and it joins with the Karamana River at Pallathukadavu near Thiruvallam. Collection of entamofauna was conducted at four sites along killiyar, the study sites were Theerthankara (River origin), Vazhayila, Jagathy and Pallathukadavu respectively. The study sites were categorized into reference site and test sites. River origin was taken as reference site, where anthropogenic activity is minimum and was near

natural condition during the study period. The present investigation adopted rapid bioassessment protocol for sampling aquatic insects. Premonsoon sampling was done during the month of January 2019.

## RESULTS AND DISCUSSION

Premonsoon collection of odonates from the reference site showed a total of 33 individuals under 7 families. Among the collected Odonata families Gomphidae constitutes the highest percentage it is 24.2%, and a least percentage of 6% was represented by family Coenagrionidae. In Vazhayila a total of 28 individuals of odonates under four families were recorded. The highest percentage was represented by Coenagrionidae is about 39.2% and Gomphidae constitute a least percentage of 10.7%. In Jagathy segment of Killiyar a total of 38 individuals under 2 families were collected a highest percentage of 55.2% is contributed by Coenagrionidae. A total of 47 individuals of odonates under two families were collected from Pallathukadavu segment 68% is dominated by family Coenagrionidae. Reduction in number and absence of some sensitive families of odonates in the test site indicates that pollutants are highly increasing in Premonsoon season especially due to anthropogenic activities. Aquatic ecologists show an enthusiasm towards relationship between river water quality and diversity of aquatic insects (Bonada *et al.*, 2007). Advantage of Biomonitoring is they give exact data about the anthropogenic effect on aquatic ecosystem about prolonged time period but the physico chemical data is only momentary evidence (Camargo *et al.*, 2004).

Table:1 Number and Tolerance values of insects under Order Odonata collected from reference and test sites of Killiyar during Premonsoon

S.I NO	Taxa			Number of insects			
	Order	Family	Tolerance value	Theerthankara ( River origin)	Vazhayila	Jagathy	Pallathukadavu
1	Odonat a	Calopterygidae	5	4	8	-	-
2		Corduliidae	4	6	6	-	15
3		Macromiidae	3	5	-	17	-
4		Gomphidae	1	8	3	-	-
5		Chlorocyphidae	0	4	-	-	-
6		Coenagrionidae	9	2	11	21	32
7		Euphaeidae	0	4	-	-	-
Total				33	28	38	47

## CONCLUSION

River is a major source for humans. It must be properly protected to maintain its quality. Killiyar showed a significant level of pollution load during study period. Survival of aquatic insect population is severely affected due to anthropogenic pressure. Immediate attention is needed for the protection of river.

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