

## Diversity of aquatic Hemipteran and other aquatic insects in Rims Talab, Ranchi, during pre monsoon season

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**Abstract:** Biodiversity embraces multiple facets of the variability of nature. Aquatic insects are those which live a part of their life cycle in water. The present study deals with the aquatic Hemipteran insects and other aquatic insects survey on Rims Talab, Ranchi, during pre-monsoon season of 2020. Order Hemiptera represent the highest number of species followed by the other aquatic insects. There are many different kind of aquatic insects and almost every type of freshwater environment will have some kind of aquatic insects living in it.

**Keyword:** Biodiversity, Aquatic insects, aquatic Hemipteran, pre monsoon, Talab

### Introduction

India is one of the mega diverse countries with a notable diversity of aquatic habitats of about 3,166,414km<sup>2</sup> with significant variations in rainfall, altitude topography and latitude<sup>1</sup>. Science of aquatic entomology embraces Hemiptera, Coleoptera, Odonata, Diptera and such others. They spend a part of (or) their whole life in aquatic system. There are many different kinds of aquatic insects and almost every type of freshwater environment will have some kind of aquatic insects living in it<sup>2</sup>. Freshwater ecosystems are colonized by a diverse array of aquatic organism<sup>3</sup>. Aquatic insect are used for assessing water quality and provide information to environment managers and decision makes to take accurate and justifiable actions in regard to the state and quality of water bodies<sup>4</sup>. Ponds are common features of many landscapes and often contribute the bulk of regional freshwater biodiversity<sup>5,6,7</sup>. Ponds also show greater biotic and environmental amplitudes than rivers and lake<sup>8</sup>. The presence or absence of aquatic insects can indicate whether a particular system is healthy or polluted. The changes in the physico- chemical properties of water can adversely affect the diversity,

distribution and composition of aquatic insects<sup>9</sup>. Aquatic bugs (hemiptera) and other aquatic insects can be found in almost every freshwater biotops. They have many morphological adaptations to their aquatic environment, making them excellent subjects for ecological and biogeography<sup>10,11</sup>.

Further studies on diversity of aquatic Hemiptera bugs of Pocharam lake in Andhra Pradesh was done by Deep and Roa<sup>12</sup>. and another one was studies on diversity of hemipterans in Sengunam pond in Tami Nadu was done by Mirian et.al<sup>13</sup>. Therefore the present paper focuses on the Diversity of aquatic Hemiptera and others aquatic insects in Rims Talab Ranchi during pre-monsoon season.

### Material and Methods

#### Study Area-

Rims talab located near Rajendra Institute of Medical science, Ranchi, Jharkhand, India, was taken as the study area. The study was taken from march to May 2020 pre monsoon season.

#### Aquatic insects sampling-

Aquatic insects samples were collected from three sites of the ponds (talab). The aquatic net with a dimension of 30x30 c.m frame, 50 c.m length dragged for a distance of ten meter on the sediment floor and aquatic plants in littoral

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zone. Samples were placed in white trays for sorting and screening only aquatic insects. Aquatic insects were handpicked from the tray, Any non –aquatic insects caught were immediately returned to the water. The content of each sample were transferred into properly – labeled plastic , preserved in 80% ethanol and identified to the family level using taxonomic key by several authors.

**Analysis of water quality parameters-**

The water quality parameters such as water temperature, PH, air temperature, and dissolved oxygen were measured on the field. For the collection and analysis of various water quality parameters standard methods describe by Adoni <sup>14</sup>.

**Data analysis**

Species diversity indices of the collected of aquatic insects such as Shannon Weiner, Simpsons were computed to understands the biotic community of each study area.

**Result**

The water quality parameters of RIMS talab Ranchi during the study period are depicted in the Table- 1 and the aquatic Hemipteran and other aquatic insects species are in Table- 2

**Table- 1:** Water analysis result of RIMS talab ecosystems Ranchi during pre-monsoon season-

Parameter	Site1	Site2	Site3
AT (Atmospheric temperature)	26 <sup>0</sup> C	26 <sup>0</sup> C	26 <sup>0</sup> C
WT (water temperature)	21.5 <sup>0</sup> C	21 <sup>0</sup> C	21 <sup>0</sup> C
P H	7.5	7.1	7.4
DO mg1(Dissolve oxygen)	7.3	4.5	4.6

List of aquatic Hemipteran and other aquatic insects recorded during pre-monsoon season 2020 at RIMS Talab-

Sl. No.	Taxa	Common Name	Site 1	Site 2	Site 3
Order-Hemiptera					
Family:Nepiidea					
1	Nepa sp.	Water Scorpions	+	+	+
2	Ranatra sp.	Water Stick Insects	+	+	-
Family:Corixidae					
3	Sigara alternata	Water boatman	+	+	-
Family:Gerridae					
4	Aquarius remigis	Common Water strider	+	-	-
Family:Belostomidae					
5	Lethocerus indicus	Giant water bug	+	-	+
6	Diplonychus indicus	Water bug	+	+	-
Family:Villidea					
7	Microveliasp	Common pond skater	+	+	+
Family:Naucoridae undulate					
8	Pelocoris sp.	Creeping water bug	+	-	-
Order:-Coleoptera					
Family : Notoridae					
9	Hydrocanthus sp.	Burrowing water beetle	+	-	-
Order:- Diptera					
Family : Syrphidae					
10	Eristalis sp.	Rat tailed maggot	+	+	-
Family : Chironomidae					
11	Ablabesnyia sp.	Non biting midges	+	+	-
Order:-Odonata					
Family : Coenagrionidae					
12	Ishnura sp.	Narrow winged damselflies	+	-	+
Family :Lestidea					
13	Lestes dryas	Spread winged damselflies	+	+	-

**Discussion-**

During the present study a total of 13 species of aquatic insects belonging to 4 order and 11 families have been recorded from the three sampling sites of the RIMS talab Ranchi. The majority of the aquatic insects species (15 in number )were recorded from the site 1 of the water body where there was the presence of majority of vegetation. From the sites 2 and 3 total of 6 to 10 species were recorded respectively in pre- monsoon season. According to Ganie.et.al <sup>15</sup> have reported total of 27 species of aquatic insects belonging to 6 order and 21 families have been recorded from the three sampling sites of the lower lake of the Bhopal. The majority of the aquatic insects species (20 in number) were there was presence of majority of macrophytes in pre monsoon season. From the sites 2 and 3 a total of 11 and 12 species were recorded respectively According to Maneechan and prommi have reported of aquatic insects representing 64 family from 9 order were collected and identified

from the three stream in April and May (pre monsoon season)2011.

In this present study water parameter recorded the AT have been recorded 26 °C was same in three study area sites, WT site 1 have been recorded 21.5 °C and site 2 and 3 was 26 °C .PH of water have been recorded sites 1,2 and 3 were respectively 7.5,7.1 and 7.4. DO have been recorded three sites were 7.3,4.5 and 4.6. According to Ganie.et.al<sup>15</sup>have reported three sites of AT have been 28 °C recorded. WT have been recorded site 1 was 22 °C site 2 and 3 was 22.4 °C. PH of water have been recorded site1 was 7.9 and site 1 and 2 were recorded 8.6 and 8.4. DO have been recorded three sites were 7.6,4.8 and 4.6. Temperatures values recorded during sampling range from 26 °C was also reported by Ayodele and Ajani<sup>17</sup>.

### Conclusion

The present study shown that the insects were more diverse near the vegetation rich area of the water body and aquatic hemipteran were dominant than other aquatic insects thought out the study period.

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### References

- 1.Ramachdra, TV, Chandran, MDS, Bhat, HR,Dudani, S,Rao, GR,Boominathan, M. Mukri, V,Bharath S,(2010).Biodiversity, Ecology and socio economic aspects of Gundia river basin in the context of proposed mega hydroelectric power projects, CES Technical Report-122,center for ecological sciences, Indian Institute of sciences Bangalore.
- 2.Reese VJR.(2003). Sustaining Americans Aquatic Biodiversity,Fisheries and wildlife, 420-531.
- 3.Sharma BK. (2011).Zooplankton communities of Deepor Beel (a Ramsar site),Assam

N.E.India):ecology, richness and abundance tropical ecology.52:293-302.

4. Arimoro FO, Ikomi RB. (2008). Ecological integrity of upper warri river, Niger Delta using aquatic insects as bio indicators,Ecological Indicators. 395:1-7.
- 5.Collinson NH, Biggs J. Cornifield A, Hodson MJ, Walker D, Whitefield ,M, William PJ.(1995).Temporary and permanent ponds an assessment of the effect of drying out on the conservation value of aquatic macro invertebrate communities. Biol conserve 74:125-134
6. Williams P, Whitfield M, Biggs J, Bray S, Fox G ,Nicolet P. Sear D (2004).Comparative biodiversity of rivers ,steams ditches and ponds in an agriculture landscapes. Biol conserve 115:329-341.
- 7.Scheffer M, Van Geest G J. Zimmer K .Jeppsen E, M, Bulter MG, Hanson MA, Declerck S,De Meester (2006).Small habitat size and isolation can promote species richness: second-order effect on biodiversity in shallow lakes and ponds .Oikos 112;227-237.
8. Davies BR (2005).Developing a strategie approach to the protection of aquatic bio diversity .PHD,Oxford Brookes University, Oxford,UK.
- 9.Majumder J , Das K, Majumder P,Ghose D, Agarwala BK. (2013). Aquatic Insect of fauna and diversity in urban- fresh water lakes of Tripura , Northeast India . Middle- East Journal of Scientific Research.;13(1)25-32.
- 10.Millan ,A.P .Abellan , I.Ribera ,D.Sanchez & J. Velasco.(2006). The Hyradephaga of the segue basin (SE spain): twenty five year studing water beetle (coleoptera). Memoriadella sacieta Entomologica Italiana 85:137-158.
- 11.Moreno, J.L.,A.Millan , M.L.Suares,M.R.Vidal-Abarca & J. Velasco .(1997). Aquatic Coleoptera and Hetroptera assemblages in water bodies from ephemeral coastal streams of south- eastern spain. Archiv for hydrobiology 141:93-107.
- 12.Deepa J, Roa C A. (2002). Aquatic hemiptera of Pocharam lake , Andhra Pradesh .2005 print journal . (12):2937-2939.

13. Mirrian, vassou C.M; Surya. G; Nawas. M.A, Tennyson. S, Raveen. R, Arivoli.S. (2017). Diversity of Hemiptera ns in Sengunam ponds Peranbalur, Tamilnadu. International Journal of Entomology Reserch, 83-89.
14. Adoni, A.D. (1985). Workbook in Limnology. Pratibha Publisher, Sagar (MP), India.
- P. 2016. American Public Health Association (Apha). (1998) Standard method for the examination of water, sewage and industrial wastes . American Public Health Association, New York, 20<sup>th</sup> edition.
15. Ganie. N.A, Wanganeo. A, Wanganeo. R.R.N, Ahmad. P. (2016). Diversity of aquatic insects in lower lake Bhopal during premonsoon season. International Journal of modern plants & Animal science, 4(1):20-27.
16. Ayodela, I.A. and E.K. Ajani, (1999). Essential of fish farming (aquaculture). Odufuwa press Ibadan, pp:46.
17. Barman B, Gupta S. (2016). Assemblage of coleopteran and Hemiptera community in a stream of Chakrashila wildlife sanctuary in Assam. Tropical Ecology. 57(2);243-253.