

## Percentage And Seasonal Variation of Fresh Water Molluscs In Daha River Of Siwan (North Bihar)

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### ABSTRACT

Molluscs diversity of Daha river (Siwan) was studied during year 2019-21 to seasonal variation. Fresh water Molluscs are the integral Part of every aquatic ecosystem and help not only in the ecosystem's functioning but also enable the ecologists to judge the health of their abode. These shelled animals are used as the best biomonitoring tools worldwide. During the study period pre-monsoon, monsoon and post-monsoon, total 25 species were collected.

**Keyword:** - Percentage, Seasonal Variation, Molluscs Biomonitoring, Ecosystem, Daha River.

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### Introduction-

Molluscs are most ancient invertebrates on earth today. Mollusca constitute an important part of ecosystem and play a critical role in maintaining aquatic ecosystem by recycling the nutrients and serve as main food for many aquatic creatures (Sharma et.al 2013,). The study of freshwater molluscs began nearly 200 years ago and took the direction and the paths taken by european traders and penetration of explorers in to the continent. The fresh water molluscs constitute on important Part of the aquatic ecosystem. Their Participation in the way of life of many organisms had made them significant Partners in the ecological communities. Aquatic ecosystem provides a home to various kinds of biota, including phytoplanktons, zooplanktons, aquatic plants, insect molluscs etc. They are organized at many level from smallest building block of life to complete ecosystems, encompassing communities, population, species and genetic level. Fresh water molluscs are one of the most widely distributed 2nd largest groups of aquatic macro invertebrata considered an emerging wealth of the fresh water bodies. (Elder and Collin, 1991; Maltchik et al., 2010). This macrobenthic found attached with a floating vegetation in fresh water bodies as prephyton organism. The fantastic survey of molluscs in any ecosystem provides crucial information about ecology and food chain of that ecosystem.

Molluscs are common components of the benthic communities understanding their contribution to biomass Production in deficient (Supian and Khwanddin 2002). They are now being used as an important faunal component for biomonitoring (Gupta et al 2015). They form an important component in terms of rating the water quality and status of aquatic system (strong et. al 2008) ,Most of the information on the status & distribution of Indo tropical fresh water molluscs based on the studies in the eastern Himalayas (Budha et al., 2010) western Ghat (Aravind et al, 2011) and Indo-Burma region (Kohler et al., 2012). Molluscans communities are good indicators for the localized conditions, which reflect the water quality and prime model because of its sedentary and sessile life style, along with benefit of quick assessment of biological resources to obtain the population indices.

### Materials and Methods-

➤ **Study Area:** - The District Siwan is located in the north western part of Bihar in interfluvial region of river Ghaghara and Gandak. This district extends from 25° 22 N to 26° 22 latitude and 84° E to 84° E longitudes. It has got a maximum length of 85 km from east and width of 52 km from north to south.

➤ **Collection and Identification of Mollusca-** The Collection of Mollusca fauna has been done at bimonthly interval of every season, pre-monsoon, monsoon and post-monsoon using necessary appliances Such as shovels, specimens bottle, forceps and scalpels. The Collected organism was fired in 5% formalin solution. For the identification of fauna standard literature was consulted (Sub ha rao 1989, Rama Krishna and Day 2007)

➤ **Selection of Study Sites-** Study of molluscan fauna was Carried out along different stretches of Daha River Siwan during 2019-21. The first study site (S1) Mirgang, is located in Gopalganj district upstream water flow of the river. The second study site (S2) tarwa is Sandy bottom in the middle stream of this river. The third study site (S3) pulwaghat has experience the contaminated water from the swage of the Siwan town. The fourth study site (S4) Terighat is endowed with rocky bottom sediment which is being contaminated by anthropogenic activities and the fifth study site (S5) Saraiyan is located in the Hasanpura block.

### Result and Discussion-

The distribution and abundances of fresh water molluscs in Daha river may be attributed to the availability of food and irrigation. Water bodies rich on organic and silt matter are known to support thriving population of macro invertebrates because of reduction in water current and as such the substratum tends to make molluscs indistinguishable from their typical lentic habitat (Whilton 1975).

During the present study total 25 species of molluscs belonging to 4 orders, 10 families of which. 14 Species were gastropods and 11 species were bivalves. Maximum number of specimens both classes were collected during pre-monsoon while maximum variety during pre-monsoon and Post-monsoon (Table-1) The families viviparidae followed by Thiaridae and Unionidae were founded to be dominating family were as representative of the family ampullariidae were rare. (Diagram - 1) This indicate the diversity molluscs population dominated by three species heterogeneously distributed in study are depend upon the seasonal variation .

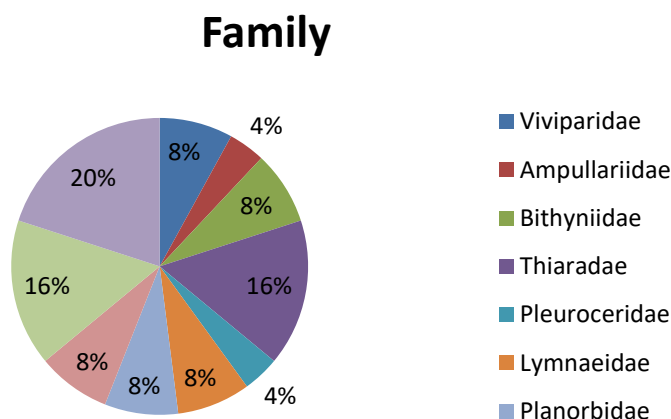


Diagram-(1) : Family wise percentage variation.

(Table-1): Seasonal Variation in Daha River, Siwan 2019-21

Group	Family	Species	Pre Monsoon	Monsoon	Post Monsoon	Annual Collection	Annual Percentage
FAMILY WISE PERCENTAGE OF SPECIES IDENTIFIED						1477	
Gastropoda	Viviparidae	<i>Bellamya bengalensis</i>	713	327	437		15.80%
		<i>Bellamya crassa</i>	266	91	112	469	5.02%
	Ampullariidae	<i>Pila globosa</i>	20	28	18	66	0.70%

						176	
	<i>Bithyniidae</i>	<i>Digoniostoma pulchella</i>	74	49	53		1.88%
		<i>Bithynia cerameopoma</i>	70	57	60	187	2.00%
						675	
	<i>Thiaridae</i>	<i>Melanoides tuberculata</i>	336	122	217		7.23%
		<i>Thiara scabra</i>	247	103	134	484	5.19%
		<i>Thiara granifera</i>	246	129	191	566	6.06%
		<i>Thiara lineata</i>	131	72	77	280	3.00%
	<i>Pleuroceridae</i>	<i>Brotia costula</i>	257	149	185	591	6.33%
						237	
	<i>Lymnaeidae</i>	<i>Radix ovalis</i>	90	65	82		2.54%
		<i>Lymnae accminata</i>	138	88	176	402	4.31%
						481	
	<i>Planorbidae</i>	<i>Gyraulus convexiusculus</i>	220	92	169		5.15%
		<i>Indoplanorbis exustus</i>	361	189	273	823	8.82%
						208	
<i>Bivalvia</i>	<i>Corbiculidae</i>	<i>Corbicula bensoni</i>	88	55	65		2.23%
		<i>Corbicula striatella</i>	45	25	31	101	1.08%
						295	
	<i>Unionidae</i>	<i>Lamellidens consobrinus</i>	136	63	96		3.16%
		<i>Lamellidens corrianus</i>	109	57	99	265	2.84%
		<i>Lamellidens maginalis</i>	117	66	97	280	3.00%
		<i>Lamellidens narainporensis</i>	80	53	46	179	1.91%
						291	
	<i>Amblemidae</i>	<i>Radiatula caerulea</i>	138	59	94		3.12%
		<i>Parreysia favidens</i>	104	73	120	297	3.18%
		<i>Radiatulla olivaria</i>	100	61	91	252	2.70%
		<i>Radiatulla occata</i>	43	23	23	89	0.95%
		<i>Parreysia sikkimensis</i>	55	42	57	154	1.65%
			4184	2138	3003	9325	

In present study The seasonal variation of the species *Bellamya bengalensis* (15.80%) of family vivparied is most dominating in (pre monsoon 713 monsoon 327 post monsoon 427) were as *Pila globosa* (0.70%) belonging to family Ampullariidae is least dominating (Pre Monsoon 20, Monsoon 28, Post Monsoon 18), *Indoplanorbis exustus* (8.82%), *Melanoides tuberculata* (7.23%) , *Brotia costula* (6.33%), *Thiara scabra* (5.19%), in between the most and least dominating species. (Diagram – 2). This % Variation in premonsson in 44.87% , Monsoon 22.93% andc post monsoon 32.21% . Which justify the result.

Their abundance might be attributed to the presence of vegetation in the shallow depth, which emerged when the stream was dry during the Post-monsoon period and formed a good feed leading to their multiplication as has also been observed by earlier workers Gupta (1976) and Manoharan et al. (2006). Minimum density of gastropods recorded during monsoon may be due to aestivation (Singh and Munshi 1992). A higher Count of Gastropods recorded during pre-monsoon may be due to the effect of reproduction of these macrobenthic invertebrates as small sized molluscs were observed in collection during this period (Dutta and Malhotra 1986).

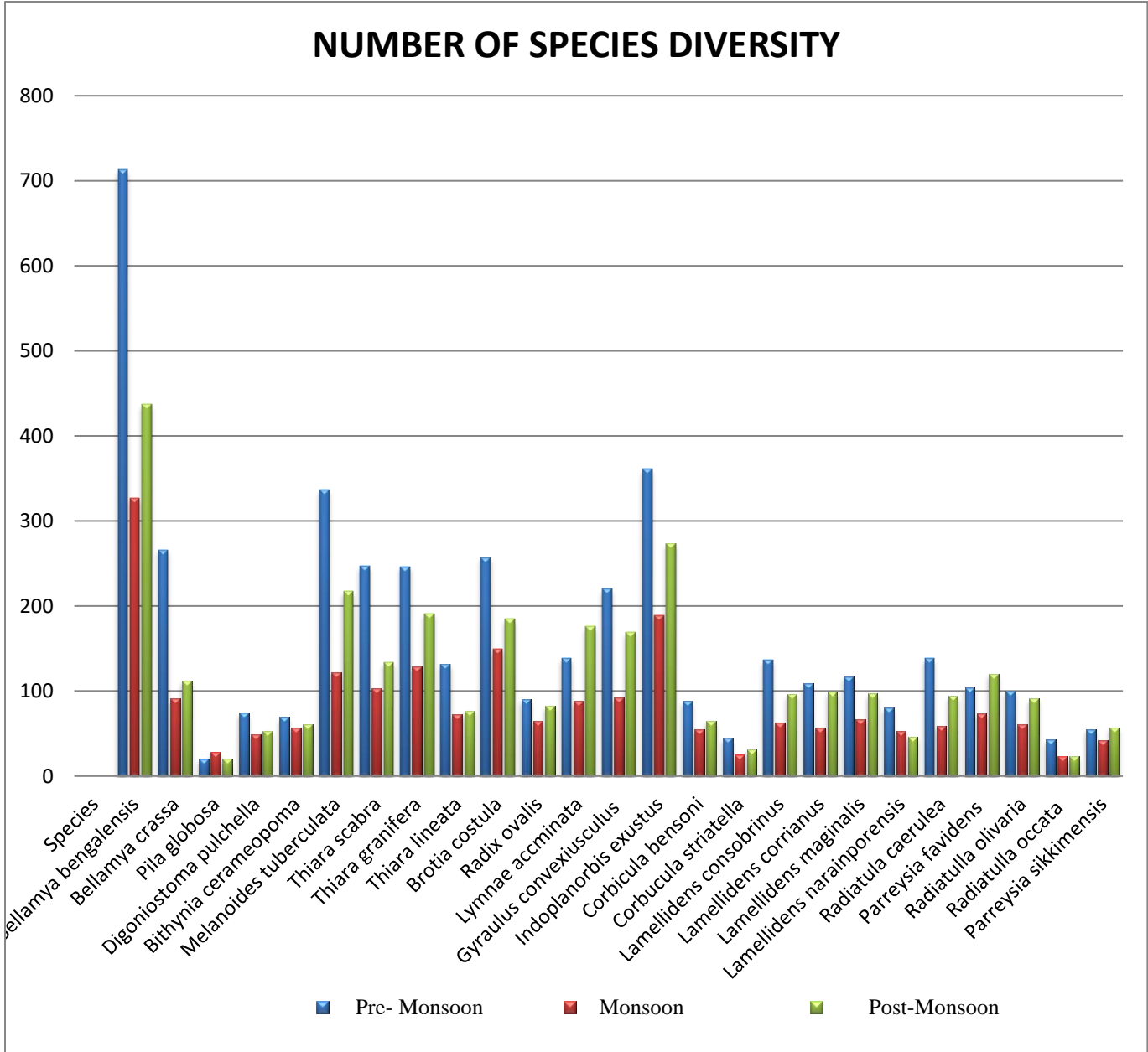


Diagram (2) : Shown Molluscs Diversity species in every season

In pre monsoon season molluscs population was found to be higher. It might be attributed to favorable environmental conditions such as dissolve oxygen, temperature and availability of food in the river ecosystem, rich nutrient loading may support the high phytoplankton production which can ultimately support to molluscs population, (Manickam et al., 2014). In present study, overall population density of molluscs were found to be minimum in monsoon season and this might be due to high turbidity, low light intensity, and high rainfall. The similar result have also been reported by earlier works (Bhavan et al., 2015; Dede & Deshmukh 2015; Dhanasekaran et al., 2017; Ezhili et al., 2013; Manickam et al., 2012, 2014, 2015; Patel, Shukla & Patel 2013; Thirupathaiah, Sammatha, & Sammaiah, 2011; watkar & Barbate, 2013). The molluscs population shows sudden decrease in monsoon month. that prevailed physio-chemical conditions that not supported for the growth of molluscs due to the lentic water system.

The population of molluscs falls during the monsoon due to dilution of river by rainfall, the molluscs population of river showed an increasing trend during the post monsoon because of favorable environmental conditions which include temperature, dissolve oxygen, and the availability of rich nutrients in the form of bacteria nanoplankton and suspended detritus. The elevated level of molluscs in post monsoon season due to favorable environmental factor the same has been also reported (Baker, 1779, Edmond-son 1965. Das (1996) and Maniekan et al., (2012) reported higher population of molluscs during pre monsoon and lower during monsoon months.

### **Conclusion:**

The result from this study is indicated that the seasonal variation of fresh water molluscs depends upon the quality of water. Variation in season i.e pre monsoon, monsoon and post monsoon the physio-chemical status of water that can positively support the population diversity of molluscs.

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