Biospectra : ISSN : 0973-7057, Vol. 15(1), March, 2020, pp.287-290
An International Biannual Refereed Journal of Life Sciences

26(AS).
Animal Science

ISSN : 0973-7057

Int. Database Index: 663 www.mjl.clarivate.com

A comparative study of monthly and seasonal variations in productivity of molluscs in Hardia wetland of Saran District of North Bihar, India

Chitralekha Sinha*
P.G. Department of Zoology, J.P. University, Chapra, Bihar, India

Received : 27th December, 2019 ; Revised : 20th February, 2020

Abstract : Other faunastic survey of the wetland was also made. It was focused on macro invertebrates: arthropods, molluscs and annelids. Sharma *et al*., (1983)[1] have studied molluscan fauna, Singh *et al*., (1994)[2], Sharma and Munshi (1995)[3] have studied other fauna of wetlands also. Altogether 85 species of macro invertebrate were recorded during the present investigation belonging to three major groups-arthropods, molluscs and annelids. The wetland is rich in molluscs fauna. Its abundance is due to profuse macrophytic growth. Rich organic matter in the bottom provides good habitat for molluscs growth. The macro invertebrates abundance in the wetland is directly controlled by the seasonal appearance and disappearance of the macro vegetation of the area, nature of bottom, rainfall and flooding (Subba Rao, 1989)[4]. Molluscs were represented by the members of single class Gastropoda. Gastropoda were represented by 11 species belonging to five families. The molluscan density varied between 29 no./m^2 (August) and 160 no./m^2 (Feb.). An increasing trend in the molluscan density was observed in winter and late monsoon while decreasing trend was observed in summer and early monsoon season. The maximum production of molluscs during post monsoon season may be due to high macrophytic growth and availability of dead and decaying organic matter (Reavell, 1980)[5].

Key words: Molluscan density, monthly & seasonal variations, organic matter, Hardia wetland, increasing & decreasing trend

INTRODUCTION

This study is about molluscs of Hardia wetland. Literature related to the productivity of molluscs are scanty but notable among those are of Haniffa (1980)[6] on *Pila globosa*, Vivekananda *et al*., (1974)[7] on the energy transformation of *Pila globosa*, Raut and Bhattcharya, (1986)[8] on the growth indicates of *Bellamya bengalensis*, Singh, (1990)[9] on density, biomass and production of apple snail and *Bellamya*. Sharma & Munshi (1995)[3] on some molluscs of Kawar Lake and others.

*Corresponding author :
Phone : 8210708417
E-mail : chitralekhasinhateacher@gmail.com

The present study relates to the biomass and secondary productivity of freshwater molluscs of Hardia Wetland.

MATERIAL AND METHODS

Molluscs were collected by hand and Ekman Dredge. The samples associated with macrophytes were collected using a nylon cloth net (75-80 meshes/cm^2). The collected samples were brought to laboratory, washed, counted and weighed then they were dried at 65^0C until weight constancy for estimating biomass. The secondary productivity was determined by dry weight method

(Haniffa, 1978)[10] and expressed as g. dry wt/m^2/year and g dry wt/m^2/day.

Molluscs were collected by specially designed cube of 1mx1mx1m size. The entangled molluscs were collected with the help of nylon net. The wet weight of the collected molluscs were taken. Specimen were preserved in 10% formalin. They were identified in the lab with the help of available literature of Needham and Needham (1966)[11], Ward and Whipple (1959)[12] and Subba Rao (1989)[4].

RESULTS AND DISCUSSION

Monthly samples of molluscs comprising *Bellamya bengalensis* were collected and biomass and secondary productivity were determined during 2011-13 (Table:1)

The secondary productivity of *Bellamya bengalensis* during Nov'11 to Oct'12 was recorded highest 93.2 g/m^2/yr and 0.250 g/m^2/day maximum biomass 115.80 g dry wt./m^2 during Sept' 12 and minimum biomass 22.60 g dry wt./m^2 during May' 12. During the second year of investigation November' 12 to October' 13 the secondary production was also found to be highest 77.40 g/m^2/yr and 0.212 g/m^2/day with maximum biomass 108g dry wt./m^2 during October' 13 and the minimum biomass 30.60g dry wt./m^2 during February 2013. (Table:1, Fig:1)

Table: 1: Biomass and Secondry Productivity of *Bellamya bengalensis* of Hardia wetland in (2011-13) values in g dry wt./m^2

	Biomass	
Month	2011-12	2012-13
Nov	72.2	78
Dec	76.5	62
Jan	60.4	42.3
Feb	62	30.6
Mar	55	40.2
Apr	42	38.7
May	22.6	*
Jun	*	*
Jul	30.4	66
Aug	68.4	78.8
Sep	115.8	90.6
Oct	88	108
Productivity	93.2 g/m^2/yr.	77.40 g/m^2/yr.
	0.255g /m^2/day	0.212g/m^2/day

Note: "*" Site was dry.

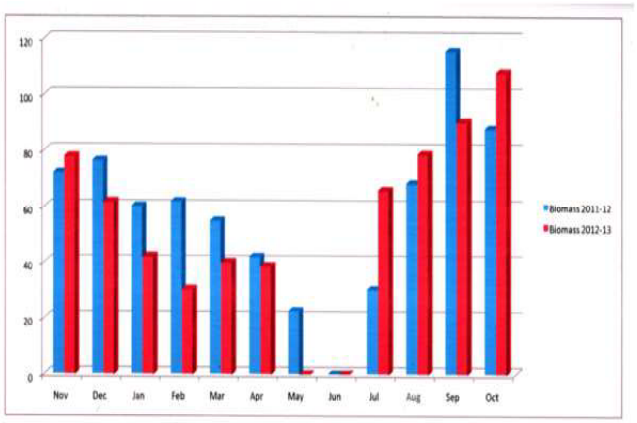

FIG.1 : Biomass and Secondary Productivity of Bellamya bengalensis of Hardia wetland in (2011-13) values in g. dry wt./m^2.

DISCUSSION

The freshwater molluscs form a high proportion of biomass and occupy a strategic position in the food chain and energy flow of the freshwater ecosystem. The maximum production and biomass of *Bellamya bengalensis* during post monsoon season may be attributed to high macrophytic growth and presence of decaying organic matter at the bottom of the wetland. Similar observations also have been made by Reavell (1980)[5] in British freshwater and Sharma and Munshi (1995)[3] in Kawar lake wetland. Minimum biomass production was observed during summer months it may be due to predation and migration of species. Similar observation has been made by Singh, (1990)[9] and Sharma and Munshi, (1995)[3]. Biomass and growth of mussel are influenced by many factors such as temperature food intake, salinity and population density. Temperature is a vital factor for the development of molluscs. *Bellamya* particularly shows distinct temperature preferences (Kulkarni *et al*., 1985)[13]. Although observation of Pidgaiko *et al*., (1972)[14] favours that temperature variation could have either positive or negative effect on secondary production depending upon geographic location and basin morphometry.

REFERENCES

1. **Sharma, U.P., Roy, S.P. and Rai, D.N. 1983.** Aquatic molluscs of Bhagalpur, *Biol.Bull. India* **5(2):** 147-155
2. **Singh, D.K., Sinha, A.K., Baruah, A. and Sharma, U.P. 1994.** Freshwater Gastropods of Kawar Lake wetland (Begusarai) North Bihar, India. *J. Freshwater Biol.* **5(1):** 41-47

3. **Sharma, U.P. and Munshi, J.S.D. 1995.** Ecology, conservation and Management of Kawar Lake. A major tropical wetland of South East Asia. 189p.

4. **Subba Rao, N.V. 1989.** Handbook of freshwater molluscs of India. *Zool. Survey of India*, Calcutta. 289p.

5. **Reavell, P.E. 1980.** A study of the clients of some British freshwater gastropods. *J. Conchol*. **30:**253-271.

6. **Haniffa, M.A. 1980.** Studied on life span, growth increments and energy budget of the freshwater Snail *Pila globosa* (Swainson) in an artificial pond. *Proc. Ind. Acad. Sci. (Animal Sci.)* **89(3):** 275-286.

7. **Vivekananda, E., Haniffa, M.A., Pandian, T.J. and Raghuraman, R. 1974.** Studies on energy transformation in the freshwater snail *Pila globosa*. Influence of feeding rate. *Freshwater Biol.* **4:**275-280.

8. **Raut, S.K. and Bhattacharya, R.K. 1986.** Growth Indices of Bandel pond snail *Bellamya bengalensis*. *Environ. and Ecol.* **4(2):** 295-296.

9. **Singh, R. 1990.** Density, biomass and secondary productivity of the prosobranch *Pila* and *Bellamya bengalensis* in a feeder tank Jamalpur. *J. Freshwater Biol.* **2(3)**: 251-256.

10. **Haniffa, M.A. 1978.** Secondary productivity and energy flow in a tropical pond. *Hydrobiol*. **59:** 839-928.

11. **Needham, J.G. and Needham, P.R. 1966.** A Guide to the study of Freshwater Biology. Holden Day Inc. San Fransisco. 108p.

12. **Ward, H.B. and Whipple, G.C. 1959.** Freshwater Biology. (ed. W.T. Edmondson) John Wiley and Sons. Inc. New York.

13. **Kulkarni, K.M., Baramatiwalla, D.O. and Holawala, D.Z. 1985.** To acclimatation temperature response to heat tolerance of the Snail *Bellamya bengalensis*. *Environ. and Ecol.* **3(2):** 254-256.

14. **Pidgaiko, M.L., Grin, V.G., Kititsina, L.A., Lenchina, L.G., Polivannaya, M.F., Sergeva, O.A. and Vinogradskaya, T.A. 1972.** Biological productivity of Kurakhov's power station cooling reservoir. In: Productivity problems in freshwaters. Led Kajak and Illowskas. Proc. of IBP, UNESCO. *Polish. Sci. Publ.*

***