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Research Article

EICHHORNIA CRASSIPES AS A MOST PREFERRED HABITAT FOR MACROBENTHIC INVERTEBRATES

Samita Chowdhary* and K.K. Sharma
Department of Zoology, University of Jammu, India
*Corresponding Author Email: c.samita30@gmail.com
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ABSTRACT
Macrophytes play an important role in aquatic ecosystems, providing shelter, breeding habitats and epiphytic forage for numerous fishes and aquatic animals. This work was based on the assumption that the structure of the macrobenthic invertebrates associated with *Eichhornia crassipes* is influenced its complex architecture. During the present investigative period a total of 40 species was observed chiefly belonging to platyhelminthes, annelida, arthropoda and mollusc. In addition to this some pollution tolerant species were also found associated with *Eichhornia crassipes*.
Keywords: Macrophytes, macrobenthic invertebrates, pollution tolerant

INTRODUCTION

Macrophytes are an extremely important community in aquatic environments and possess rich associated macrobenthic invertebrate fauna. Many species of aquatic macrophytes and their dense stands have an enormous spatial heterogeneity and therefore not only provide shelter for many species of macrobenthic invertebrates, but also play an important role in stabilization of environmental conditions[1]. They provide favourable conditions for many groups by serving both as substrate and food source for herbivores and periphyton feeders and subsequently for their predators[2]. Some studies depict that macrophytes could be used by macrobenthic invertebrates directly as food, and their role in their nutrition has been often underestimated[3]. *Eichhornia crassipes* commonly known as water hyacinth and terror of Bengal is wide spread in almost all the water bodies. However, it is found to harbour maximum macrpobenthic invertebrates. The plant roots have no direct connection with the soil so that they can move freely from place to place on water surface. Hence this group of plants are not seen permanently in a place.

MATERIALS AND METHODS

In order to find out the relationship between macrophytic and macrobenthic invertebrate fauna, macrophyte was collected with the help of an iron hook from different stations of the stream and was kept in a bucket so as to isolate the attached fauna. Then they were segregated using sieve no. 40 mesh size sieve (256 mesh per cm^2). The organisms retained were then identified as per the macrobenthic imvertebrates. The special adaptations and taxanomic details of macrophytes were identified with the help of pertinent literature[4-6].

Diversity Indices

To understand a particular biotic community it is very important to work out certain indices. Different diversity indices such as species diversity (Shannon Weiner, Simpson and Menhinick's), richness (Marglef's), dominance (dominance and Berger-Parker) and equitability were calculated by using Biostat software.

Table 1: List of Macrobenthic invertebrates found associated with *Eichhornia sp*

S. No.	Associated macrobenthic invertebrates	Frequency
1	*Tubifex tubifex*	++
2	*Lumbriculus* sps.	+++
3	*Dero* sps.	+
4	*Hirudinaria* sps.	++
5	*Helobdella* sps.	+
6	*Tabanus* sps.	+++
7	*Culicoides* sps.	++
8	*Chironomous* sps.	++
9	*Chaoborus* sps.	+
10	*Hydrocanthus* sps.	++
11	*Neohydrocoptus subvittulus*	++
12	*Canthydrus laelibilis*	++++
13	*Laccophilus sharpi*	++++
14	*Hydroglyphus* sps.	+++
15	*Hydrovalus* sps.	++
16	*Sternolophus rufipes*	++++
17	*Helochares* sps.	++
18	*Regimbartia attenuata*	++
19	*Berosus pulchellus*	++
20	*Enochrus* sps.	+
21	*Laccotrophes maculates*	+++
22	*Sphaerodema* sps.	+
23	*Libellula* sps.	++
24	*Leucorrhinia* sps.	++
25	*Enallagma* sps.	++++
26	*Coenagrion* sps.	+
27	*Hagenius* sps.	+
28	*Ephemerella* sps.	++
29	*Caenis* sps.	+
30	*Baetis* sps.	+
31	*Hydropsyche* sps.	+
32	*Macrobrachium kistensis*	++
33	*Bellamya bengalensis*	+
34	*Gyraulus ladacensis*	+++
35	*Indoplanorbis exustus*	+
36	*Lymnaea accuminata*	+
37	*Lymnaea auricularia*	+
38	*Mellanoides tuberculata*	++
39	*Pisidium mitchelli*	++
40	*Dugessia* sps.	+++

Table 2: Variation in diversity indices found among *Eichhornia sps.* and associated macrobenthic invertebrates

Taxa	40
Individuals	5769
Dominance	0.042
Shannon	3.427
Margalef	4.619
Equitability	0.92

Figure 1: Association of macrobenthic invertebrates with *Eichhornia crassipes*

RESULTS AND DISCUSSION

During the present investigative studies *Eichhorna crassipes* found to harbour 40 species. A perusal of Table 1 indicates that a total of 5,769 individuals of macrobenthic invertebrate were associated with the macrophytes. The following phyla were recovered from the macrophyte viz: phyla Platyhelminthes, Annelida, Arthropoda and Mollusca. Maximum contribution of Phylum Arthropoda was recorded during present observations which comprised of 3 classes viz: Class Arachnida (1 *sps.*), Class Crustacea (1 *sps.*) and Class Insecta[7]. Class Insecta with 7 orders viz: *Diptera, Coleoptera, Odonata, Hemiptera, Ephemeroptera, Trichoptera* and *Lepidoptera* have been recorded as the major contributor in the bottom faunal components. In this series Phylum Mollusca was placed at second order contributor to the overall diversity of macrobenthic invertebrate fauna. This Phylum was represented by two classes: Bivalvia and Gastropoda. Out of these two Classes gastropoda encompassed one order (mesogastropoda) with members of six families viz: Viviparidae, Bithynidae, Physidae, Planorbidae, Lymnaeidae and Thiridae. Class bivalvia comprised of one order (Trigoinoida) which was found to embodied by two species of family pisididae. High values of species diversity (Table 2) (H = 3.427), species richness (d = 4.61), equitability (E = 0.92) and low dominance values (D = 0.04) explained the rich diversity exhibited by *Eichhornia sps.* Such a high diversity exhibited by *Eichhornia sps.* may be due to the fact that floating macrophytes may support a remarkably diverse and abundant invertebrate assemblage as has also been suggested by Neiff[7] and Schiesari *et al.*[8]. According to Takeda *et al.*[9], Higuti *et al.*[10] and Marcal and Callil[11], the extensive root system of *Eichhornia sps.* harbour more species but the thin roots of *Eichhornia sps.* generally gather periphyton and sediments, offering better oxygenation conditions. Roots also provide feeding in niches and refuges[12,13]. Organisms like Chironomidae prefer *Eichhornia sps.* because of the accumulation of residues on the roots[9,11,14,15].

CONCLUSION

It is thus concluded that it is very important to recognize the role that plant communities play in supporting macrobenthic invertebrate populations with possible implications for biodiversity and aquatic ecosystem management practices.

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