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NEW RECORD OF SOME PLANKTONIC CLADOCERAN FROM FISH PONDS OF JAMSHORO SINDH, PAKISTAN

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Abstract

Five species of planktonic cladoceran *Bosminopsis deitersi* (Richard), *Ceriodaphnia setosa* (Matile), *Ilyocryptus bhardwaji* (Battish), *Moina chankensis* (Ueno), and *M. rectirostris* (Leydig) belonging to four families have been recorded for the first time from Pakistan, during the survey period of 2007- 2008 in fish ponds of Jamshoro thermal power plant effluent.

Keywords: Cladocera, zooplankton, Jamshoro thermal power plant.

1. Introduction

Cladoceran are considered to be the ecological indicators of the water bodies; these are the major group of zooplankton community. Cladoceran forms exist in lakes, reservoirs, natural depressions, ponds and irrigation canals. Most of the genera are occurring in less saline water bodies. Lot of studies have been carried out on the zooplankton forms in Pakistan by Arora (1931), Baqai and Ishrat (1973), Baqui *et al.* (1974a and b), Baqui and Iqbal (1976), Baig and Khan (1976), Mahoon and Zia (1985), Iqbal and Kazmi (1990), Tasneem and parvaiz (1994), Jafri *et al.* (1999), Leghari *et al.* (1999), Baloch *et al.* (2000), Mahar *et al.* (2000), Baloch *et al.* (2004), Mahar *et al.* (2007), Mahar *et al.* (2008) and Baloch *et al.* (2008).

Present study provides the information about the presence of five new recorded cladoceran species which would be the addition in the taxonomy of cladoceran zooplankton and their distribution up to Pakistan.

2. Materials and Methods

Collections of the cladoceran were carried out during October 2007 to May 2008 after noon. Specimens were collected by plankton net No. 25 (mesh size 55µ) and preserved in 5% formalin solution on the spot in transparent plastic bottles and brought to the laboratory. The specimens were identified with the help of taxonomic keys and illustrations, published by Ward and Whipple (1959), Edmondson, (1959); Hutchinson, (1967); Mizuno and Takahashi, (1991); Battish, (1992), Yunfang; (1995) Pennak, (2001). Photographs were taken at magnifications ×100 and ×400 with the help of digital camera model DCM-35 fitted on the trinocular microscope (Swift M. 3300D).

3. Results

Five species of cladoceran i.e *Bosminopsis deitersi* (Richard, 1895), *Ceriodaphnia setosa* (Matile, 1890), *Ilyocryptus bhardwaji* (Battish, 1981), *Moina chankensis* (Ueno) and *M. rectirostris* (Leydig, 1860) are newly recorded from Pakistan (**Tab.1**). The detail description is given below.

(i). *Bosminopsis deitersi* (Richard, 1895)

Body carapace is clearly transparent, and semi ovate. A very long pointed curved rostrum leads by head; diverging laterally near apex with long point at clove. Antenna with three jointed rami, basal part of antennules united with each other. Post abdomin tapering to point at claws, 1 large spine near claws and several small spinules anterior to it. Length near about 0.34 mm. this species was recorded in winter season in association with rotifers (**Fig. 1**).

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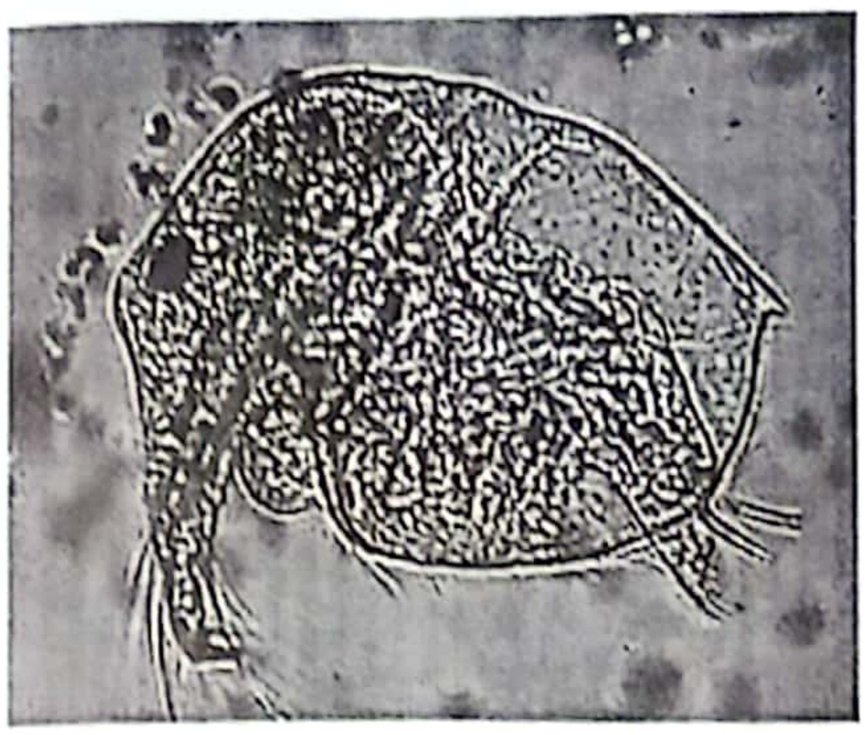


Fig.1. *Bosminopsis deitersi* Richard

(ii). *Ceriodaphnia setosa* (Matile, 1890)

The carapace more or less quadrate, body is transparent with an orange tinge and lack of posterior spines. Head ovate anteriorarily and produced below into an acuminate rostrum. The anterior oval portion of head provided a large eye. Antennules are small and weak do not extend up to the tip of rostrum. Ocellus is present at the base of antennules. Post abdomen is elongated, truncate with more than two abdominal setae. The claws are smooth, pointed and no pectin is found. The intestine is semi linear. Total length of the body is 0.76 mm recorded during spring months (**Fig. 2**).

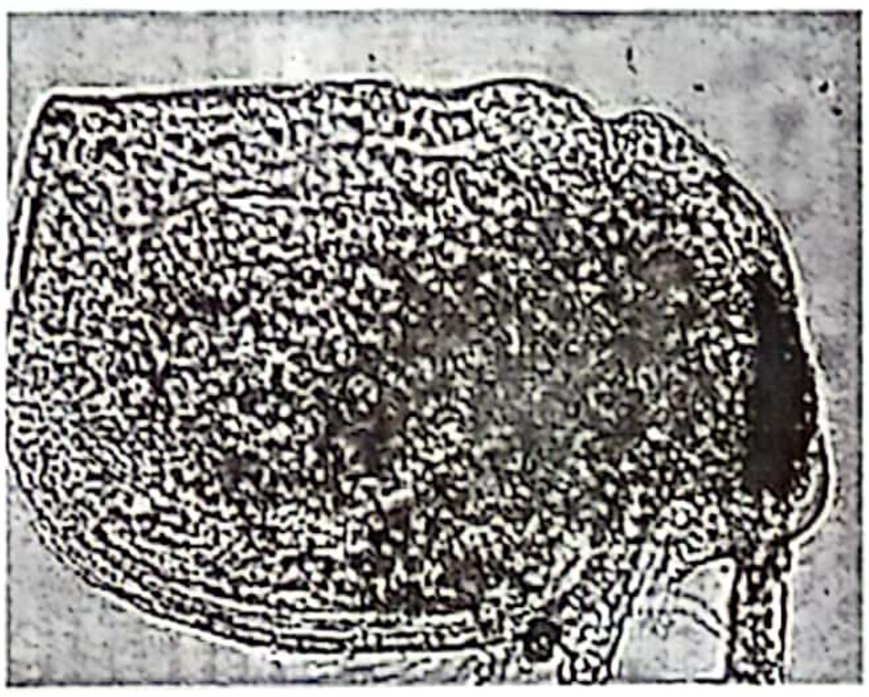


Fig. 2. *Ceriodaphnia setosa* Matile

(iii). *Ilyocryptus bhardwaji* (Battish, 1981)

Body shape oval-triangular with small head forming apex. Ventero- posterior margins of the carapace bears several concentric lines and plumore fixed setae occur. Eye prominent, ocellus smaller, antennules long and freely movable. Post abdomen very large, broad and compressed with eight pre-anal spines. Total body length of the species recorded 0.53mm and height of the body 0.43 mm (**Fig. 3**). This species was recorded from weedy area during August.



Fig. 3. *Ilyocryptus bhardwaji* Battish

(iv). *Moina chankensis* (Ueno)

Transparent body carapace and head are rounded without any depression and also having sinus above the eye. The eye large with numerous lenses but ocellus is absent. Antennules are long with censory cilia. Total length measured from head to posterior portion of carapace recorded about 1.02mm and from dorsal to ventral side 0.92 mm (**Fig.4**). This species was collected from open water during summer season in planktonic form.



Fig. 4. *Moina chankensis* Ueno

(v). *Moina rectirostris* (Leydig, 1860)

Head depressed and little linear rounded. Carapace ball shaped antero-posteriorly without spine and horn; eye and ocellus are quite prominent and surrounded by numerous lenses. Antennules are long with terminal setae and bearing cilia distally in middle of the antennule. Body is colourless transparent, total length of the ball shaped body is 1.28 mm from head to posterior end (**Fig.5**). This species was commonly reported in association with copepod and rotifers during winter period.



Fig. 5. ***Moina rectirostris*** **Leydig**

4. Discussion

Five species of cladoceran i.e. *Bosminopsis deitersi* (Richard, 1895), *Ceriodaphnia setosa* (*Matile*, 1890), *Ilyocryptus bhardwaji* (Battish, 1981), *Moina chankensis* (Ueno) and *M. rectirostris* (Leydig, 1860) are reported for the first time from Pakistan **(Tab.1).** The earlier studies on cladoceran including those of Arora (1931) documented fifteen species of caldoceran from Lahore. Baqai *et al.*, 1974a, b, who recorded 16 species of cladocera and Baig and Khan (1976) who described four genera. Preliminary observations on seasonal abundance of cladoceran genera in Keenjhar lake were noted by Iqbal and Baqai (1976). Iqbal and Kazmi (1990) reported 15 species of cladocera from Hub lake. Nine species were recorded from Chotiari reservoir by Leghari *et al.*, (1999). Baloch *et al.*, (2000) reported 6 species from Indus river. In another study 3 species were documented by Baloch *et al.*, (2005) from Rawal lake. Report on seasonal variation and species composition of cladoceran zooplankton was reported by Mahar *et al.*, (2008) with new record of a cladoceran species *Dunhevidea crassa* (King). Baloch *et al.*, (2008) reported 5 species of cladocera in association with rotifers from Kheer Thar hill torrents. In all 49 species have already been reported from Pakistan **(Tab. 2),** the present new record of 5 species from ponds of waste water of Jamshoro Thermal Power Plant Sindh is an addition to already known freshwater Cladoceran zooplanktons fauna of Pakistan.

Table -1. Cladoceran recorded from fish ponds of Jamshoro Thermal Power Plant, during present study.

Suborder: Cladocera
Family: Bosminidae
1 .Bosminopsis deitersi (Richard, 1859)
Family: Daphnidae
2. *Ceriodaphnia setosa (*Matile, 1890*)*
Family: Macrothricidae
3. *Ilyocryptus bhardwaji* (Battish, 1981)
Family: Moinidae
4. *Moina chankensis* (Ueno)
5. *M. rectirostris* (Leydig, 1860)

Table -2. List of Cladoceran species recorded (previously) from Pakistan. Source: Arora(1931), Iqbal (1990), Kazmi (2002) and Baloch (2004, 2005 and 2008).

Suborder: Cladocera
Family: Alonidae
1. *Alona guttata* Sars
2. *A. rectangula* Sars
3. *A. quadrangularis* O.F. Muller
4. *Leydigia acanthocercoides* Fischer
Family: Bosminidae
5. *Bosmina coregoni* Baird
6. *B. longirostris* O.F. Muller
Family: Chydoridae
7. *Chydorus barroisi* Richard
8. *C. globosus* Baird
9. *C. ovalis* Kurz
10. *C. poppei* Richard
11. *C. sphaericus* O.F. Muller
12. *Dunhevedia crassa* King
13. *Leydigia acanthocercoides* Fischer
14. *Oxyurella tenuicaudis* Sars
15. *Pleuroxus denticulatus* Birge
Family: Daphniidae
16. *Daphnia ambigua* Scourfied
17. *D. dubia* Herrick
18. *D. galeata* Sars
19. *D. longispina* O.F. Muller
20. *D. longiremis* Sars
21. *D. lumholtzi* Sars
22. *D. magna* Straus
23. *D. pulex* Leydig
24. *D. psittacea* Baird
25. *D. hyaline* Leydig
26. *Camptocerys* sp.
27. *Ceriodaphnia cornuta* Sars
28. *C. laticaudata* P.E. Muller
29. *C. megalops* Sars
30. *C. pulchella* Sars
31. *C. reticulate* Jurine
32. *C. rigaudi* Richard
33. *Scaphloleberis kingi* Sars
34. *Simocephalus exspinosus* Koch
35. *S. vetulus* O.F. Muller
Family: Leptodoridae
36. *Leptodora kindti* Focke

Family: Moinidae
37. *Mediomoina elliptica* Arora
38. *Moina affinis* Birge
39. *M. brachiata* Jurine
40. *M. flagellate* Hudendroff
41. *M. irrasa* Brehm
42. *M. macrocopa* Straus
43. *M. micrura* Kurz
44. *Moinodaphnia* sp.

Family: Macrothricidae
45. *Macrothrix laticornis* Fischer
46. *Macrothrix rosea* Birge

Family: Sididae
47. *Diaphanosoma excisum* Sars
48. *D. brachyurum* Sars
49. *Sida crystalline* O.F. Muller

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