

NEW RECORDS OF TWO INTERESTING CHYDORID CLADOCERANS (BRANCHIOPODA: CLADOCERA: CHYDORIDAE) FROM FLOODPLAIN LAKES OF ASSAM, INDIA

B.K. Sharma¹ and Sumita Sharma²

¹Department of Zoology, North-Eastern Hill University, Permanent Campus, Umshing, Shillong, Meghalaya 793022, India;

²Eastern Regional Station, Zoological Survey of India, Risa Colony, Fruit Gardens, Shillong, Meghalaya 793003, India

Email: ¹bksharma@nehu.ac.in; ²smitazsi@hotmail.com

During the course of the study on "Zooplankton diversity of the floodplain lakes of Assam", the authors came across two rare and interesting species of chydorid Cladocera. These include a new record from Asia and a new record from the Indian subcontinent. The documented species are diagnosed, illustrated and remarks are made on their distribution.

Material and Methods: The material for the present study was collected during survey on zooplankton diversity in the floodplain lakes of Assam. Qualitative plankton samples were collected from different floodplain lakes by towing a nylonbolt plankton net (No. 25) and were preserved in 5% formalin. The samples were deposited in Freshwater Biology Laboratory, Department of Zoology, North-Eastern Hill University, Shillong. The collections of the Eastern Regional Station, Zoological Survey of India, Shillong were also examined for this systematic study.

The examined species and their disarticulated appendages were mounted in Polyvinyl alcohol-lectophenol mixture. The head pores and their arrangements were studied following Megard (1965). The cladoceran species were identified following the works of Smirnov (1971, 1996b). The drawings were made with a Leitz-Dialux phase contrast stereoscopic microscope using a drawing-tube attachment and the measurements were indicated in millimeters (mm).

Super-class: Crustacea Lamarck, 1821

Class: Branchiopoda Latreille, 1817

Super-order: Cladocera Milne-Edwards, 1840 (*s. str.*)

Order: Anomopoda Sars, 1865

Family: Chydoridae Dybowski & Grochowski, 1896 emend. Stebbing, 1902

Subfamily: Aloninae Frey, 1966

Leydigiopsis curvirostris Sars, 1901

(Figs. 1-8)

Material examined: 26.viii.2006, 5 parthenogenetic females, Deepor beel, Kamrup district, Assam (90°36'39"E-26°03'26"N), coll. Dr. Sumita Sharma.

Characters: Body oval in outline and with maximum height in the middle. Postero-dorsal and postero-ventral corner of valves rounded. Ventral margin of valves protruding before the middle; entire ventral margin with setae which continue

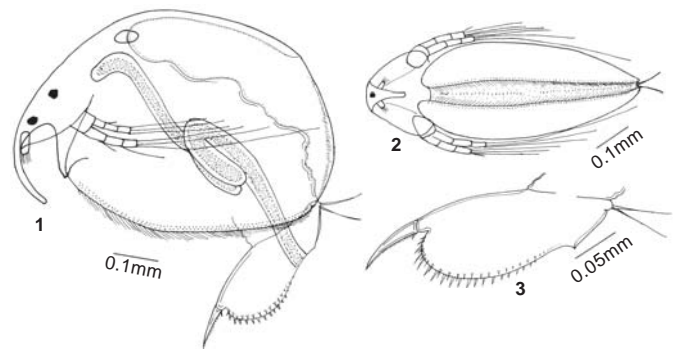
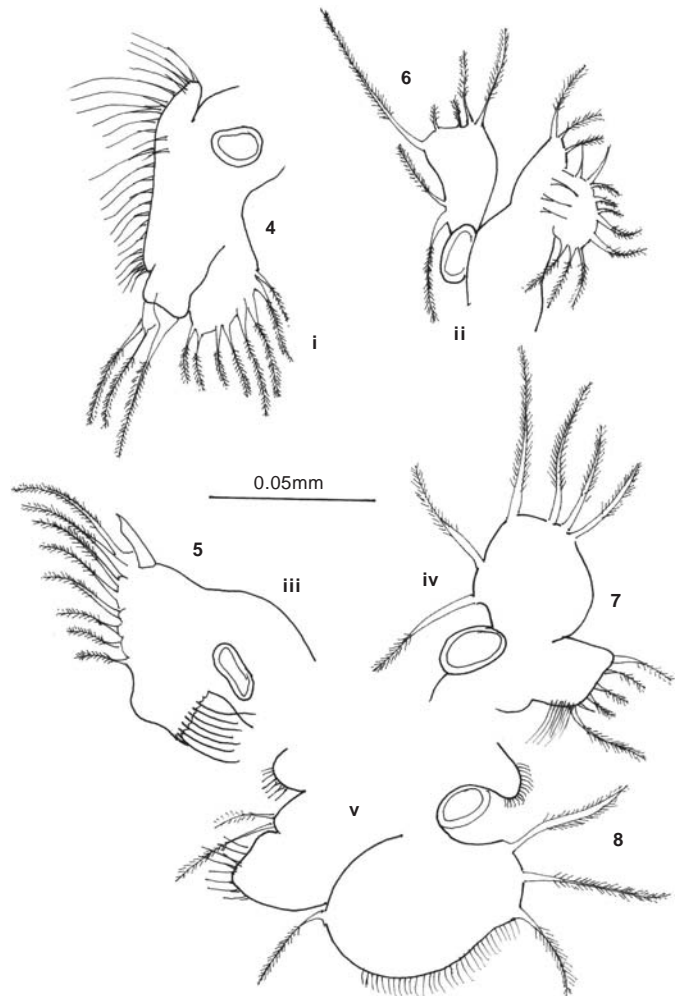


Figure 1-3. *Leydigiopsis curvirostris* Sars, 1901
1 - parthenogenetic female (lateral view);
2 - parthenogenetic female (ventral view); 3 - postabdomen



Figures 4-8. *Leydigiopsis curvirostris* Sars, 1901
4 - leg I; 5 - leg II; 6 - leg III; 7 - leg IV; 8 - leg V

along posterior margin in a row of fine hairs, margin of valves with concentric rows of dots. Rostrum diagnostic, very long and curved posteriorly. Distance from apex of rostrum to apex of antennule nearly twice the length of antennule. Head-shield with two broadly connected main head pores and two small pores close to them. Plate of labrum triangular and with slightly pointed apex. Fornices with slightly curved margin.

Manuscript 1741; © ZOO; Date of publication 21 July 2007
Received 23 March 2007; Finally accepted 15 June 2007

Ocellus about as large as the eye. Endopodite of antenna slightly shorter than exopodite when directed posteriorly; the lowest seta on the apical segment of the exopodite longest than the two others and reaching the posterior margin of the valve.

Postabdomen large and characteristic; its dorsal margin distinctly convex distal to the anus; distal end of postabdomen rounded, preanal corner distinct. Postabdomen with double row of 16-20 anal denticles, decreasing in size proximally and a row of lateral spinules on each side. Claw large, with a small basal denticle and with setae on the concave margin.

Five pairs of thoracic legs present. Leg I of normal structure. Leg II with uniform thin, hook-shaped setae. Leg III with a square exopodite with two setae on the dorsal side and five setae on the posterior side; the dorsal posterior seta twice as long as the others. Leg IV with rounded endopodite with six setae. Leg V with a large exopodite with four setae, one on the anterior side and three on the posterior side.

Differential diagnosis: *L. curvirostris* can be differentiated by its very long and posteriorly curved rostrum, ocellus about as large as the eye and the characteristic shape of postabdomen.

Distribution: India: new record. Elsewhere: Brazil and Thailand.

***Disperalona caudata* Smirnov, 1996**

(Figs. 9-12)

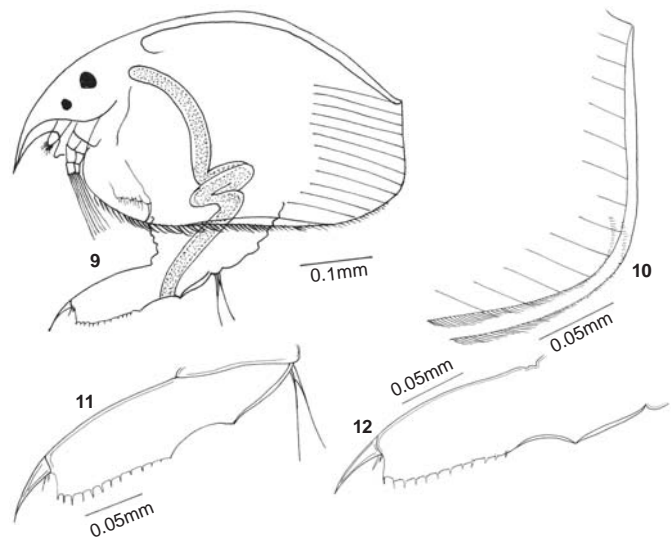
Material examined: 26.viii.2006, 5 parthenogenetic females, Deepor beel, Kamrup district, Assam (90°36'39"E-26°03'26"N), coll. Dr. Sumita Sharma; 30.xi.2005, 4 parthenogenetic females, Raidong beel, Dibru-Saikhowa Biosphere Reserve, Tinsukia district, Assam (27°35'53.7"N-95°20'43.0"), coll. Dr. Sumita Sharma.

Characters: Body elongated in shape; posterior dorsal angle expressed and posterior ventral angle rounded. Valves longitudinally striated. Rostrum long, pointed and ventrally directed. Head shield with two main head pores and two small pores between them. Antennule reaching half-way the tip of rostrum. Postabdomen relatively elongated, with distinct dorso-distal corner and preanal angle not distinct. Postabdomen with 14 anal teeth, proximal teeth small. Claw with two basal spines; second basal spine smaller than the diameter of the base of claw. IDL with three setae, one hook-like and one much shorter than the others.

Differential diagnosis: *D. caudata* is characterized by an elongate body, downwardly directed rostrum and a rather long postabdomen with prominent dorso-distal angle.

Distribution: India: new record; Elsewhere: Australia and Thailand.

Remarks: *Leydigiopsis*, a rare genus of Cladocera, was described from Brazil by Sars (1901) and had since believed to be restricted to South America (Smirnov, 1971). Interestingly, this genus was recently reported from north-east Thailand (Sanoamuang, 1998) after a time lag of nearly one century. The present report assumes biogeographical importance as it extends the distribution range of *Leydigiopsis* to the Indian subcontinent and also comprises its second record



Figures 9-12. *Disperalona caudata* Smirnov, 1996
9 - parthenogenetic female; 10 - posterior ventral corner of valves; 11 - postabdomen; 12 - postabdomen (enlarged)

from the Oriental region. The occurrence of this rare genus of Cladocera in India may, however, represent an example of its introduction by man and thus deserved further study. This statement endorses the comments on the Thai material (Sanoamuang, 1998) and re-affirms remarks of Dumont (1997) regarding emphasis on human introductions of several cladoceran taxa in different parts of the globe.

The genus *Leydigiopsis* included only four species namely *L. curvirostris*, *L. brevirostris*, *L. megalops* and *L. ornata*; the first three species were known to be restricted to South America while the last occurred in neotropical region (Smirnov, 1971). Of these, a single specimen of *Leydigiopsis* was recently collected (Sanoamuang, 1998) from a swamp (Bung Bung) in Kalasin province of north-east Thailand; it resembled with *L. megalops* in certain aspects but the status of the Thai taxon was not ascertained because of insufficient material. On the other hand, the specimens examined from Deepor beel, a Ramsar site and an important floodplain lake of the Brahmaputra river basin of lower Assam (northeast India) belong distinctly to *L. curvirostris* Sars, 1901 which represents a new record from Asia. Further, the present report this rare and interesting chydorid species results in significant extension of its distributional range.

Disperalona caudata was described (Smirnov, 1996a) from Mudginberri Lagoon, Kakadu National Park, N. Territory, Australia and was believed to be an Australian endemic (Smirnov, 1996b). This chydorid was, however, recently examined from north-east Thailand by Sanoamuang (1998) as incidentally its first record from Asia. The present report of occurrence of *D. caudata* in two floodplain lakes of the Brahmaputra river basin further extends its distributional range to the Indian subcontinent. In view of the current biogeographical limit, *D. caudata* is presently proposed to be designated as an Australasian element. Further, this interesting species depicts an important link between the Cladocera faunas of northeastern India, Southeast Asia and

Australia. The presence of this species holds parallel to the reports of several Australasian species of Rotifera from northeastern India (Sharma, 2004, 2005; Sharma & Sharma, 2001, 2005) and thus endorses our earlier remarks on the affinities of zooplankton communities of northeastern India with those of Southeast Asia as well as Australia. A careful future examination of Zooplankton collections from this region is likely to add more such interesting micro-faunal elements.

REFERENCES

- Megard, R.O. (1965).** A chemical technique for disarticulating the exoskeletons of Chydorid Cladocera. *Crustaceana* 9: 208-210.
- Sanoamuang, L. (1998).** Contributions to the knowledge of the Cladocera of north-east Thailand. *Hydrobiologia* 363: 45-53.
- Sars, G.O. (1901).** Contributions to the knowledge of the freshwater Entomostraca of South America, as shown by artificial hatching from the dried mud. *Arkiv for Matematisk Naturvidenskabelig* 23: 1-102.
- Smirnov, N.N. (1971).** The World Chydorid Fauna (in Russian). *USSR Academy of Sciences, Zoological Institute, Nova Series* No. 101: 1-539.
- Smirnov, N.N. (1996a).** New and rare species of the Chydoridae (Cladocera, Anomopoda). *Arthropoda selecta* 5: 3-4.
- Smirnov, N.N. (1996b).** Cladocera: the Chydorinae and Sayciinae (Chydoridae) of the world. In: *Guides to the identification of the Microinvertebrates of the Continental waters of the World*. Vol. 11. SPB Academic Publishers, the Hague, 197pp.
- Sharma, B.K. (2004).** Rare and interesting monogonont rotifers (Rotifera: Eurotatoria) from North-Eastern India. *Mitteilungen aus dem Museum für Naturkunde, Zoologische Reihe* 80(1): 33-40.
- Sharma, B.K. (2005).** Rotifer communities of floodplain lakes of the Brahmaputra basin of lower Assam (N.E. India): biodiversity, distribution and ecology. *Hydrobiologia* 533: 209-221.
- Sharma, B.K. and S. Sharma (2001).** Biodiversity of Rotifera in some tropical floodplain lakes of the Brahmaputra river basin, Assam (N.E. India). *Hydrobiologia* 446/447: 305-313.
- Sharma, B.K. & S. Sharma (2005).** Biodiversity of freshwater rotifers (Rotifera, Eurotatoria) from north-eastern India. *Mitteilungen aus dem Museum für Naturkunde, Zoologische Reihe* 81(1): 81-88.

ACKNOWLEDGEMENTS

One of the authors (SS) is thankful to the Director, Zoological Survey of India, Kolkata and the Officer-in-charge, Eastern Regional Station, Zoological Survey of India, Shillong for kind permission to work on the project "Zooplankton diversity in the floodplain lakes of Assam" during which the examined samples were collected. The senior author is thankful to the Head, Department of Zoology, North-Eastern Hill University, Shillong for laboratory facilities.



CHECKLIST OF FISHES OF RAMSAGAR RESERVOIR, DATIA DISTRICT, MADHYA PRADESH, INDIA

R.K. Garg¹, R.J. Rao² and D.N. Saksena²

^{1,2}School of Studies in Zoology, Jiwaji University, Gwalior, Madhya Pradesh 474011, India
Email: ¹gargraj@rediffmail.com

Fish diversity of undivided India and various Indian states has been described by Jerdon (1849), Dutta & Majumdar (1970), Tilak & Hussain (1977), Srivastava (1980), Venkateswarlu & Rao (1980), Johal & Tondon (1981), Kaul *et al.* (1982), Lipton (1983-84), Dutta & Malhotra (1984), Tilak & Baloni (1984), Sen (1985), Johal & Rawal (2000), Meshram & Meshram (2005), Hiware (2006) among others.

Day (1889) described the fishes and their distribution in India including that of Madhya Pradesh. Though, the formal study of fish fauna in Madhya Pradesh starts with the work of D'Abreu (1925), Hora (1940) has listed the fishes of Mahanadi, and Malviya (1961) reported fish fauna of Jabalpur. Dubey & Mehra (1962) described 71 species of fishes from Chambal River. Mishra (1962) and Dubey & Verma (1965) have given a comprehensive account of the fish fauna of India and Pakistan and Madhya Pradesh, respectively. Dwivedi *et al.* (2000) studied the production dynamics and fisheries development in Naktara reservoir in Madhya Pradesh and Shukla *et al.* (2003) described fish biodiversity of Gambhir dam, Ujjain, Madhya Pradesh.

Fish fauna of Gwalior division was described by Agarwal & Saksena (1977). Dubey *et al.* (1980) recorded fish species from Chambal division and Rao *et al.* (1988) recorded fishes of Gandhisagar reservoir. Saxena & Srivastava (1989) studied fish fauna of Kunwari river and reported 46 fish species. In this note, a checklist of fish fauna of Ramsagar reservoir in Datia district is reported for the first time.

Materials and Methods: Ramsagar, a small man-made reservoir (140.09ha) located in Datia district, Madhya Pradesh, is used for different purposes like drinking, irrigation and fisheries. Geographically, the reservoir is located between 25°40'N - 78°23'E. The reservoir is constructed over a Nichrola nallah in the basin of Sindh river.

The studies were conducted during April, 2003 to March, 2005. The fish specimens were collected twice in every season using dragnets, gill nets and ghagara jaal (cast net) taking the help of local fishermen. The small fish specimens were preserved in 8% formaline directly while large fish specimens were dissected for visceral preservation and were then preserved in 8% formaline. The fish specimens were identified up to species level by using the keys provided by Srivastava (1980), Talwar & Jhingran (1991) and Jayaram (1999).

Result and Discussion: The fish diversity recorded was 42