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## ZOOPLANKTON INVESTIGATIONS FROM A PADDY FIELD IN TAMIL NADU

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### INTRODUCTION

Paddy fields are widespread and are integral parts of the landscape of India. Although biological cycles are interrupted by cultivation, colonization in the aquatic phase can be rapid by zooplankton, benthos and nektonic animals along with phytoplankton and macrophytes. There is a rapid buildup of diversity of aquatic organisms after the planting of rice (Fernando, 1995). Hence a study on the zooplankton composition of a paddy field in Tamil Nadu was undertaken.

### MATERIAL AND METHODS

From April 1998 to March 2000, regular monthly collections were made from a paddy field near Chennai in Singaperumalkoil. Though the studies were carried out in an area of 4.5 ha of paddy field behind Singaperumalkoil railway station, yet they were confined mostly to an easily accessible plot of 100 m<sup>2</sup>. Plankton samples were collected by using plankton net of 30 cm diameter with a mesh size of 100  $\mu$ . Samples were preserved in 5% formalin.

### ZOOPLANKTON

A group wise account of various species of Rotifera, Cladocera, Ostracoda and Copepoda collected/identified is as under (Table 1).

Class ROTIFERA Subclass EUROTATORIA Superorder MONOGONONTA Order PLOIMIDA	Family BRACHIONIDAE 1. <i>Brachionus calyciflorus f. borgerti</i> (Apstein) 2. <i>Brachionus rubens</i> Ehrenberg 3. <i>Brachionus falcatus</i> Zacharias
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4. <i>Keratella quadrata</i> (O.F. Muller)	Family DAPHNIIDAE
5. <i>Keratella tropica</i> (Apstein)	11. <i>Ceriodaphnia cornuta</i> Sars
Order GINESIOTROCHA	12. <i>Daphnia carinata</i> King
Family TESTUDINELLIDAE	Family MOINIDAE
6. <i>Testudinella patina</i> (Hermann)	13. <i>Moina micrura</i> Kurz
Family FILINIDAE	Family MACROTHRICIDAE
7. <i>Filinia longiseta</i> (Ehrenberg)	14. <i>Macrothrix spinosa</i> King
Phylum ARTHROPODA	Family CHYDORIDAE
Subphylum CRUSTACEA	15. <i>Chydorus parvus</i> (Daday)
Subclass OSTRACODA	16. <i>Chydorus reticulatus</i> Daday
8. <i>Strandesia indica</i> Hartmann	Subclass COPEPODA
9. <i>Stenocypris major</i> (Baird)	Order CALANOIDA
Subclass BRANCHIOPODA	17. <i>Heliodiaptomus viduus</i> Gurney
Order CLADOCERA	18. <i>Sinodiaptomus (Rhinediaptomus) indicus</i>
Family SIDIDAE	Kiefer
10. <i>Diaphanosoma excisum</i> Sars	

Further a brief taxonomic group wise profile of various species is as follows.

## ROTIFERA

### 1. *Brachionus calyciflorus f. borgerti* (Apstein, 1907)

1907. *Brachionus amphicerus borgerti* Apstein, *Zool. Jb. Abt. Syst.*, **25** : 211, Figs. G. 11.

1998. *Brachionus calyciflorus f. borgerti* (Apstein), *Zool. Surv. India, State Fauna Series 3, Fauna of West Bengal, Part 11* : 358.

*Material examined* : 5 exx., iv.1998; 5 exx., v.1998; 5 exx., vi.1998; iii.1999.

*Remarks* : Median occipital spines longer than laterals.

### 2. *Brachionus rubens* Ehrenberg, 1838

1838. *Brachionus rubens* Ehrenberg, *Ein Blick in das tiefere organize Leben der Natur. Leipzig* : p. 513, Lxiii, fig. 4.

1998. *Brachionus rubens* (Ehrenberg), *Zool. Surv. India, State Fauna Series 3, Fauna of West Bengal, Part 11* : 365.

*Material examined* : 5 exx., vii.1998; iii.1999.

*Remarks* : Lorica oval, firm and compressed dorsoventrally, anterior margin with six occipital spines.

*Distribution* : Assam, Haryana, Orissa, Punjab, Rajasthan and West Bengal.

3. ***Brachioums falcatus*** Zacharias, 1893

1898. *Brachionus falcatus* Zacharias, *Forschungsber Biol. Stn. Zu Plön*. VI p. 45, tab. iv, Fig. 4.

1998. *Brachionus falcatus* (Zacharias), *Zool. Surv. India, State Fauna Series 3, Fauna of West Bengal*, Part 11 : 361.

*Material examined* : 5 exx., vii.1998; 5 exx., ii.1999.

*Remarks* : Lorica rigid and compressed dorsoventrally, occipital margin with six spines.

*Distribution* : Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Kerala, Orissa, Punjab and Rajasthan.

4. ***Keratella quadrata*** (O.F. Muller, 1786)

1786. *Brachionus quadratus* Muller, *Havniae*, I-L VI p. 354, pl. 49; figs. 12, 13.

1998. *Brachionus quadratus* (Muller), *Zool. Surv. India, State Fauna Series 3, Fauna of West Bengal*, Part 11 : 368-369.

*Material examined* : 5 exx., ii.1999; 5 exx., iii.1999.

*Remarks* : Lorica rectangular with six occipital spines.

*Distribution* : Assam, Kashmir, Kerala, Tamil Nadu and West Bengal.

5. ***Keratella tropica*** (Apstein, 1907)

1907. *Ansurea valga f. tropica* Apstein, *Zool. Jb. Abt. Syst.*, 25 : p. 210, Fig. f.

1998. *Keratella tropica* (Apstein), *Zool. Surv. India, State Fauna Series 3, Fauna of West Bengal*, Part 11 : 369-370.

*Material examined* : 5 exx., iv.1999.

*Remarks* : Lorica elongate oboval and with six anterior occipital spines.

*Distribution* : Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Kashmir, Kerala, Madhya Pradesh, Orissa, Punjab and West Bengal.

6. ***Testudinella patina*** (Hermann, 1783)

1783. *Brachionus patina* Hermann, *Naturforscher Halle*. 19 : p. 48, Tab. 2, Fig. 10.

2000. *Testudinella patina* (Hermann), Taxonomic notes on Rotifer from India. *Indian Association of Aquatic Biologists*, p. 93.

*Material examined* : 5 exx., vii.1998.

*Remarks* : Lorica transparent, circular and dorsoventrally falttened.

*Distribution* : Andhra Pradesh, Assam, Gujarat, Kashmir, Orissa, Punjab and West Bengal.

7. *Filinia longiseta* (Ehrenberg, 1834)

1834. *Triarthra longiseta* Ehrenberg, *Folio, Berlin* : p. 222, pl. viii, fig. 1.

2000. *Filinia longiseta* (Ehrenberg), Taxonomic notes on Rotifer from India. *Indian Association of Aquatic Biologists*, p. 91.

*Material examined* : 5 exx., vi. 1998.

*Remarks* : Body thin, barrel shaped, with two long movable antero-lateral seta and one long immobile posterior setae.

*Distribution* : Assam, Gujarat, Haryana, Madhya Pradesh, Orissa, Punjab and West Bengal.

**OSTRACODA**

8. *Strandesia indica* Hartmann, 1964

1964. *Strandesia indica* Hartmann, *Int. Rev. gesamen. Hydrobiol. Syst. Beih.*, **3** : 101.

1979. *Strandesia indica* Hartmann, *Rec. zool. Surv. India*, **74**(2) : 169-171.

*Material examined* : 5 exx., vii.1998; 5 exx., ii.1999.

*Remarks* : Left valve overlaps right valve, entire margin of the valve hairy except dorsally, claws pectinate, maxillary spine smooth.

*Distribution* : Gujarat, Kerala, Pondicherry, Tamil Nadu and West Bengal.

9. *Stenocypris major* (Baird, 1859)

1859. *Cypris cylindrica major* Baird, *Proc. Zool. Soc. Lond.*, **389** : 233, Fig. 1, 1a-f.

1979. *Stenocypris major* (Baird), *Rec. zool. Surv. India*, **74**(2) : 193-197.

*Material examined* : 5 exx., ix.1998; 5 exx., x.1998.

*Remarks* : Left and right valves are of same size, valves margin hairy except dorsally, claws pectinate, maxillary spines toothed.

*Distribution* : Andhra Pradesh, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu and West Bengal.

**CLADOCERA**

10. *Diaphanosoma excisum* Sars, 1885

1885. *Diaphanosoma excisum* Sars, *Norske Videnst. Selsk. Forhandl. Christianin*, **8** : p. 13-18, pl. 2, Figs. 1-3.

1988. *Diaphanosoma excisum*, Michael and Sharma, *Fauna of India : Indian Cladocera*, p. 46-48.

*Material examined* : 5 exx., vii.1998; 5 exx., ix.1998.

*Remarks* : Carapace oblong in outline, posterior end truncate.

*Distribution* : Bihar, Rajasthan, West Bengal and Tamil Nadu.

11. *Ceriodaphnia cornuta* Sars, 1885

1885. *Ceriodaphnia cornuta* Sars, *Nrske Videnst Selsk Forhandl Christianin*, **8** : p. 26-28, pl. 5, Figs. 1-3.

1988. *Ceriodaphnia cornuta* Sars, *Fauna of India : Indian Cladocera*, p. 51-53.

*Material examined* : 5 exx., viii.1998; 5 exx., ix.1998; 5 exx., x.1998.

*Remarks* : Valves distinctly reticulate, head small depressed and separated from body by a distinct ocular depression.

*Distribution* : Bihar, Kerala, Meghalaya, Rajasthan, Tamil Nadu and West Bengal.

12. *Daphnia carinata* King

1853. *Daphnia carinata* form a, King, p. 246.

1988. *Daphnia carinata* form a, King, *Fauna of India : Indian Cladocera*, p. 59-62.

*Material examined* : 5 exx., xii.1998; 5 exx., i.1999.

*Remarks* : Carapace oblong and reticulated dorsal margin evenly arched and forming a slight concavity in anterior margin, posterior spine rather elongated and slightly upturned.

*Distribution* : Bihar, Gujarat, Karnataka, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.

13. *Moina micrura* Kurz, 1820

1820. *Monaculus rectirostris* Jurine, p. 134-145, pl. 13, Figs. 3-4.

1988. *Moina micrura* Kurz, *Zool. Surv. India. Fauna of India : Indian Cladocera*, p. 86-89.

*Material examined* : 5 exx., vii.1999; 5 exx., vii.1999; 5 exx., ix.1999.

*Remarks* : Head large, extended in anteroventral direction and with well developed supraocular depression.

*Distribution* : Bihar, Kerala, Punjab, Tamil Nadu, Rajasthan and West Bengal.

14. *Macrothrix spinosa* King

1853. *Macrothrix spinosa* King, p. 256, pl. vi F.

1988. *Macrothrix spinosa* King, *Zool. Surv. India. Fauna of India : Indian Cladocera*, p. 102-104.

*Material examined* : 5 exx., ix.1998; 5 exx., x.1998.

*Remarks* : Head moderately large, subtriangular and with slightly prominent rostral projection.

*Distribution* : Rajasthan and Tamil Nadu.

15. *Chydorus parvus* (Daday, 1898)

1898. *Chydorus sphaericus variparvus* Daday, p. 25-26, Fig. 7.

1988. *Chydorus parvus* (Daday), *Zool. Surv. India. Fauna of India : Indian Cladocera*, p. 142-144.

*Material examined* : 5 exx., i.1999.

*Remarks* : Body rounded in outline, posterodorsal corner of valves rounded.

*Distribution* : Kerala, Tamil Nadu and Andhra Pradesh.

16. *Chydorus reticulatus* Daday, 1898

1898. *Chydorus reticulatus* Daday, p. 27, Fig. 9.

1988. *Chydorus reticulatus* Daday, *Zool. Surv. India. Fauna of India : Indian Cladocera*, p. 153-154.

*Material examined* : 5 exx., ix.1998; 5 exx., viii.1999.

*Remarks* : Body spherical, posterodorsal corner of valves well marked posteroventral corner rounded.

*Distribution* : Kerala and Tamil Nadu.

**COPEPODA**

17. *Heliodiaptomus viduus* (Gurney, 1916)

1916. *Diptomus viduus* Gurney, *Proc. Zool. Soc. Lond.*, **1** : 338-339.

1994. *Heliodiaptomus viduus* (Gurney), *Guide Identification of Micro invertebrates of Continental waters of World. 5* : 7-9.

*Material examined* : 5 exx., xii.1998; 5 exx., i.1999.

*Remarks* : Antennule overreaching caudal rami by last 3 or 4 segments and genital somite asymmetrical in females, left coxal spine stouter than right in leg 5 of female, right antennule with spine on each of segments 8<sup>th</sup> and 10-16 in males.

*Distribution* : Most common in South India.

18. *Sinodiaptomus (Rhinediaptomus) indicus* Kiefer, 1936

1936. *Sinodiaptomus indicus* Kiefer, *Zool. Anz.*, **113** : 226-229.

1953. *Rhinediaptomus indicus* Brehm, *Ost. Zol. Z.*, **4** : 283-286.

1994. *Sinodiaptomus (Rhinediaptomus) indicus* Kiefer, *Guide Identification of Micro invertebrates of Continental waters of World. 5* : 202-207.

*Material examined* : 5 exx., vi.1998.

*Remarks* : Genital somite distinctly longer than the rest of the urosome and antennules extending to the end of the caudal rami in females, coxal spine strong in leg 5 of females, right antennule with spine on segments 8 and 10-16 in males.

*Distribution* : Common in South India.

### SUMMARY

For the first time an attempt has been made to study a paddy field in Tamil Nadu to reveal the faunal diversity during aquatic and semiaquatic phases. During the study period, in general, plankton population was very much restricted and was represented by 18 species. Interestingly *Moina oryzae*, a new species described from the paddy fields near Chennai could not be collected.

Plankton samples collected during the 24-month study indicated the presence of the following groups namely Rotifera, Cladocera and Copepoda. During the first part of the study, from April 1998 to July 1998, the samples contained only Rotifera. Cladocerans were observed in the samples from August 1998 to January 1999. Again the samples contained only Rotifera during February 1999 to May 1999. After this, both Cladocerans and copepods represented samples. Calanoid copepods were recorded only in November 1999.

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