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STUDIES ON THE ICHTHYOFAUNA OF SACRED GROVES IN KANCHIPURAM DISTRICT, TAMIL NADU

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INTRODUCTION

Sacred groves represent an ancient Indian conservation tradition and they may be forests, scrub jungles or may even be few trees. They are patches of land with trees, scrubs and other kinds of vegetation growing naturally and are dedicated to the local deity. Further the size also may range from few square meters to several hectares. Another tradition was the construction of artificial tanks to conserve water source.

Eventhough lot of information is available on the floristic wealth of the sacred groves, faunistic investigation is almost negligible. With a view to study the fauna of two sacred groves in Kanchipuram district, Tamilnadu investigations were made from Maraimalainagar sacred grove and Tiruvidanthai sacred grove. In this paper studies pertaining to fish fauna of a tank situated inside Tiruvidanthai sacred grove is presented.

TIRUVIDANTHAI SACRED GROVE

This is situated 30 km away from Chennai city near Kovalam town on the Mahabalipuram road. Here the temple is known as Nithyakalyanaperumal temple. The tree covered area is very limited and three tanks are available within the total area of 4.04 ha. One tank is situated on the main road and protection wall of this tank is constructed very recently. Near the entrance of the temple another tank with *Microcystis* bloom is situated. Further one more tank on the backside of the temple with macrophytes is also present. The total area of this tank is nearly 400 m² and the maximum depth noted was 1.5 m. Ichthyological investigations were carried out from this tank.

MATERIAL AND METHODS

Fish samples were collected monthly once from this tank from April 2000 to December 2002. For collection, one net cloth with a size of 6 m × 1 m was operated on the shores. For each sample

the net was operated five times. Also one waternet with 30 cm diameter was also utilised and this net was also operated five times for each collection. For the deeper parts of the tank, one fisherman was engaged for operating castnet with a meshsize of 3 cm for five times. Classification is after Jayaram (1999) and Menon (1999).

RESULTS

SYSTEMATIC LIST OF THE COLLECTED TAXA

Order CYPRINIFORMES

Family CYPRINIDAE

Subfamily DANIONINAE

1. *Amblypharyngodon microlepis* (Blkr.)
2. *Esomus danricus* (Ham.)
3. *Esomus thermoicos* (Val.)
4. *Rasbora caverii* (Jerdon)
5. *Rasbora daniconius* (Ham.)
6. *Chela laubuca* (Ham.)

Subfamily CYPRININAE

7. *Puntius chola* (Ham.)
8. *Puntius conchoniis* (Ham.)
9. *Puntius dorsalis* (Jerdon)
10. *Puntius sophore* (Ham.)
11. *Puntius ticto* (Ham.)
12. *Puntius vittatus* Day

Family COBITIDAE

13. *Lepidocephalus thermalis* (Val.)

Order SILURIFORMES

Family BAGRIDAE

14. *Mystus bleekeri* (Day)
15. *Mystus vittatus* (Bloch)

Family HETEROPNEUSTIDAE

16. *Heteropneustes fossilis* (Bloch)

Order BELONIFOMIES

Suborder ADRIANICHTHYOIDEI

Family ADRIANICHTHYIDAE

Subfamily ORYZINAE

17. *Oryzias carnaticus* (Jerdon)

Order CYPRINODONTIFORMES

Family POECILIDAE

18. *Gambusia affinis* (Baird & Girard)

Order SYNBRANCHIFORMES

Family MASTACEMBELIDAE

19. *Macrognaathus pancalus* Ham.

Order PERCIFORMES

Family CICHLIDAE

20. *Eetroplus maculatus* (Bloch)

21. *Oreochromis mossambica* (Peters)

Family GOBIIDAE

22. *Glossogobius giuris* (Ham.)

Family ANABANTIDAE

23. *Anabas testudineus* (Bloch)

Family BELONTIDAE

24. *Polyacanthus lalius* (Ham.)

25. *Pseudosphromenus cupanus* (Val.)

Family CHANNIDAE

26. *Channa punctatus* (Bloch).

DETAILS OF COLLECTIONS

1. *Amblypharyngodon microlepis* (Bleeker)

1853. *Leuciscus microlepis* Bleeker, *Verh. Bat. Gen.* 25, p. 141.

1999. *Amblypharyngodon microlepis* (Bleeker) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 32-33.

Material : 133 exs., 27.ii.02., (size 26–61 mm SL) M.B.R., 4 exs., 17.iv.02., (size 26–61 mm SL) M.B.R., 10 exs., 17.v.02 (size 26–27 mm SL) M.B.R.

Remarks : Size : 10.0 cm. TL.

Distribution : Ponds, slow-moving streams. (Throughout India except the westface of the western ghats).

2. *Esomus danricus* (Hamilton)

1822. *Cyprinus (Danio) danrica* Hamilton, *Fish. Ganges.*, pp. 325, 390, pl. 16. fig. 88.

1999. *Esomus danricus* (Hamilton) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 46-48.

Material : 1 ex., 27.ii.01, (size 27 mm SL) M.B.R., 1 ex., 17.iv.02, (size 18 mm SL) M.B.R., 4 exs., 17.v.02 (size 35–37 mm SL) M.B.R.

Remarks : Size : 12.5 cm. TL.

Distribution : Ponds and irrigation canals (Throughout India).

3. *Esomus thermoicos* (Valenciennes)

1842. *Nuria thermoicos* Valenciennes, *Hist. Nat. Poiss.*, 16 : 238, pl. 472.

1999. *Esomus thermoicos* (Valenciennes) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 49.

Material : 3 exs., 27.iii.01, (size 67–87 mm SL) M.B.R., 5 exs., 18.iv.01., (size 74–78 mm SL) M.B.R., 1 ex., 30.v.01. (size 68 mm SL) M.B.R., 2 exs., 17.xi.01. (size 48–52 mm SL) M.B.R., 6 exs., 27.ii.02. (size 49–50 mm SL) M.B.R., 1 ex., 17.iv.02. (size 81 mm SL). M.B.R., 5 exs., 17.v.02. (size 34–46 mm SL) M.B.R., 1 ex., 17.xii.02. (size 28 mm SL) M.B.R.

Remarks : Size : 12.7 cm. TL, usually 6 to 10 cm.

Distribution : Ponds, canals. (Peninsular India).

4. *Rasbora caverii* (Jerdon)

1849. *Leuciscus caverii* Jerdon, *Madras. J. Lit. Sci.*, 15 : 320.

1999. *Rasbora caverii* (Jerdon) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 52-53.

Material : 2 exs., 18.iv.01. (size 68–70 mm SL) M.B.R., 1 ex., 30.viii.01. (size 70 mm SL) M.B.R., 16 exs., 27.ii.02. (size 32–64 mm SL) M.B.R., 35 exs., 17.iv.02. (size 15–82 mm SL) M.B.R., 10 exs., 17.v.02. (size 26–36 mm SL) M.B.R.

Remarks : Size : 7.0 cm. TL.

Distribution : Forest streams, ponds, mountain streams. (Peninsular India).

5. *Rasbora daniconius* (Hamilton)

1822. *Cyprinus daniconius* Hamilton, Fish. Ganges, p. 327, pl. 15, fig. 89.

1999. *Rasbora daniconius* (Hamilton) Jayaram, *The Freshwater Fishes of The Indian Region* : 82.

Material : 166exs., 27.ii.01. (size 17–43 mm SL) M.B.R., 41 exs., 17.xi.01. (size 24–35 mm SL) M.B.R., 2 exs., 17.xii.01. (size 34 mm SL) M.B.R., 2 exs., 17.i.02. (size 28–32 mm SL) M.B.R., 1 ex. 17.iii.02. (size 32 mm SL) M.B.R., 6 exs., 17.v.02. (size 24–43 mm SL) M.B.R.

Remarks : Size : 10 cm. TL.

Distribution : Slowmoving streams, pools, with sandy substrate. (Throughout India).

6. *Chela laubuca* (Hamilton)

1822. *Cyprinuss (Chela) laubuca* Hamilton, Fish. Ganges. pp. 260, 384.

1999. *Chela laubuca* (Hamilton) Jayaram, *The Freshwater Fishes of The Indian Region* : 73.

Material : 3 exs., 17.xii.01. (size 32–38 mm SL). M.B.R.

Remarks : Size : 5.5 cm. TL.

Distribution : Streams, ponds, canals. (Throughout India).

7. *Puntius chola* (Hamilton)

1822. *Cyprinus chola* Hamilton, Fish. Ganges. pp. 312, 389.

1999. *Puntius chola* (Hamilton) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 88-90.

Material : 1 ex., 18.iv.01. (size 70 mm SL) M.B.R., 2 exs., 30.v.01. (size 35–54 mm SL) M.B.R., 1 ex., 19.vii.01. (size 80 mm SL) M.B.R., 2 exs., 17.xi.01. (size 68–93 mm SL) M.B.R., 6 exs., 17.iv.02. (size 61–93 mm SL) M.B.R.

Remarks : Size : 15 cm. TL, usually 12.0 cm.

Distribution : Rivers, streams, tanks (Throughout India).

8. *Puntius conchoni* (Hamilton)

1822. *Cyprinus (Puntius) conchoni* Hamilton, Fish. Ganges. pp. 317, 318, 389.

1999. *Puntius conchoni* (Hamilton) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 90-91.

Material : 6 exs., 27.ii.01. (size 18–35 mm SL) M.B.R., 1 ex., 17.xii.01. (size 38 mm SL) M.B.R.

Remarks : Size : 12.5 cm. TL.

Distribution : Fast flowing hill streams (Throughout India).

9. *Puntius dorsalis* (Jerdon)

1849. *Systemus dorsalis* Jerdon, *Madras J. Lit. Sci.*, **15** : 314.

1999. *Puntius dorsalis* (Jerdon) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 91-92.

Material : 4 exs., 19.vii.01. (size 76–150 mm SL) M.B.R., 5 exs., 17.xi.01. (size 105–126 mm SL) M.B.R., 1 ex., 17.iv.02. (size 116 mm SL) M.B.R.

Remarks : Size : 25 cm. TL, commonly 12 to 15 cm.

Distribution : Rivers, streams with pebbly substrate (Peninsular India).

10. *Puntius sophore* (Hamilton)

1822. *Cyprinus sophore* Hamilton, *Fish. Ganges*; 310, 389.

1999. *Puntius sophore* (Hamilton) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 101-102.

Material : 6 exs., 27.ii.01, (size 22–32 mm SL) M.B.R., 1 ex., 15.v.02, (size 48 mm SL) M.B.R.,

Remarks : Size : 13 cm. TL.

Distribution : Plains and sub-montane regions (Throughout India).

11. *Puntius ticto* (Hamilton)

1822. *Cyprinus ticto* Hamilton, *Fish. Ganges*. pp. 314, 398, pl. 8, fig. 87.

1999. *Puntius ticto* (Hamilton) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 103-104.

Material : 6 exs., 27.ii.01. (size 18–35 mm SL) M.B.R., 1 ex. 17.xii.01. (size 38 mm SL) M.B.R.

Remarks : Size : 20.0 cm. TL.

Distribution : Rivers, streams, ponds with clear waters (Throughout India except Kerala).

12. *Puntius vittatus* Day

1865. *Puntius vittatus* Day, *Proc. Zool. Soc. Lond.*, p. 303.

1999. *Puntius vittatus* Day Jayaram, *The Freshwater Fishes of The Indian Region* : 114.

Material : 5 exs., 27.ii.01. (size 20–21 mm SL) M.B.R., 4 exs., 17.xi.01. (size 18–30 mm SL) M.B.R., 1 ex., 17.xii.01. (size 23 mm SL) M.B.R., 25 exs., 17.iv.02. (size 28–41 mm SL) M.B.R.

Remarks : Size : 5.0 cm. TL commonly 3.5 cm.

13. *Lepidocephalus thermalis* (Valenciennes)

1846. *Cobitis thermalis* Valenciennes, *Hist. Nat. Poiss.*, **18** : 78.

1999. *Lepidocephalus thermalis* (Valenciennes) Jayaram, *The Freshwater Fishes of The Indian Region* : 217.

Material : 3 exs., 27.ii.02. (size 20–29 mm SL). M.B.R.

Remarks : Size : 8 cm. TL.

Distribution : Peninsular India south of Krishna river system.

14. *Mystus bleekeri* (Day)

1846. *Bagrus keletius* (Valenciennes) Bleeker, *Nat. Gen. Arch. Ned. India*, 3(2) : 135.

1999. *Mystus bleekeri* (Day) Jayaram, *The Freshwater Fishes of The Indian Region* : 235.

Material : 1 ex., 17.v.02. (size 85 mm SL) M.B.R.

Remarks : Size : 13.5 cm. TL.

Distribution : Upper reaches of rivers. Northern India. Southern India upto Mahanadi river.

15. *Mystus vittatus* (Bloch)

1797. *Silurus vittatus* Bloch, *Ichth. Hist. Nat.*, 11 : 40. pl. 371, fig. 2.

1999. *Mystus vittatus* (Bloch) Jayaram, *The Freshwater Fishes of The Indian Region* : 236.

Material : 1 ex., 17.xii.01. (size 75 mm SL) M.B.R.

Remarks : Size : 21.0 cm. TL.

Distribution : Rivers, streams, ponds, lakes (Throughout India).

16. *Heteropneustes fossilis* (Bloch)

1798. *Silurus fossilis* Bloch, *Ichth. Hist. Nat. Poiss.*, 11 36, 370. fig. 2.

1999. *Heteropneustes fossilis* (Bloch) Jayaram, *The Freshwater Fishes of The Indian Region* : 305.

Material : 1 ex., 17.xii.01. (size 95 mm SL) M.B.R.

Remarks : Size : 30.0 cm. TL.

Distribution : Ponds, swamps, marshes, muddy rivers (Throughout India).

17. *Oryzias carnaticus* (Jerdon)

1849. *Aplocheilus carnaticus* Jerdon, *Madras j. lit. Sci.*, 15 : 302-346.

1998. *Oryzias carnaticus* (Jerdon), Tyson Roberts, *Ichthyological Research* : 217-218.

Material : 4 exs., 17.v.02. (size 22–23 mm SL) M.B.R.

Remarks : Size : 4.0 cm. TL.

Distribution : Brackish water, estuaries, shallow lagoons, swamps, mangroves, readily adapt to freshwater conditions and breed in freshwater (Peninsular India).

18. *Gambusia affinis* (Baird & Girard)

1853. *Heterandia patruelis* Baird and Girard, *Proc. Acad. nat. Sc. Philad.* 6, p. 390.

1999. *Gambusia affinis* (Baird & Girard) Jayaram, *The Freshwater Fishes of The Indian Region* : 345.

Material : 47 exs., 27.ii.01. (size 17–36 mm SL) M.B.R., 7 exs., 30.viii.01. (size 11–30 mm SL) M.B.R., 1 ex., 17.xi.01. (size 19 mm SL) M.B.R., 77 exs., 17.xii.01. (size 16–31 mm SL) M.B.R., 112 exs., 17.i.02. (size 13–37 mm SL) M.B.R., 693 exs., 27.ii.02. (size 10–44 mm SL) M.B.R., 912 exs., 17.iii.02. (14–37), 555 exs., 17.iv.02. (size 11–47 mm SL) M.B.R.

Remarks : Introduced for mosquito control and most dominant species in the sacred grove.

Distribution : Throughout India.

19. *Macrogathus pancalus* Hamilton

1822. *Macrogathus pancalus* Hamilton, *Fish. Ganges.*, pp. 30, 364, pl. 22. fig. 7.

1999. *Macrogathus pancalus* Hamilton Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 302-303.

Material : 2 exs., 27.ii.01. (size 55–61 mm SL) M.B.R., 4 exs., 27.iii.01. (size 138–140 mm SL) M.B.R., 1 ex., 18.iv.01. (size 137 mm SL) M.B.R., 2 exs., 30.v.01. (size 106–118 mm SL) M.B.R., 2 exs., 17.iv.02. (size 125–145 mm SL) M.B.R.

Remarks : Size : 18.0 cm. TL.

Distribution : Rivers and estuaries (Throughout India).

20. *Etroplus maculatus* (Bloch)

1785. *Chaetodon maculatus* Bloch, *Syst. Ichth.*, pl. 427, fig. 2.

1999. *Etroplus maculatus* (Bloch) Jayaram, *The Freshwater Fishes of The Indian Region* : 399.

Material : 4 exs., 27.ii.01. (size 31–35 mm SL) M.B.R., 5 exs., 27.iii.01. (size 31–41 mm SL) M.B.R., 22 exs., 18.iv.01. (size 34–51 mm SL) M.B.R., 22 exs., 30.v.01. (size 40–48 mm SL) M.B.R., 19 exs., 30.viii.01. (size 39–58 mm SL) M.B.R., 4 exs., 17.xi.01. (size 30–58 mm SL) M.B.R., 2 exs., 17.xii.01. (size 32–36 mm SL) M.B.R., 19 exs., 27.ii.02. (size 39–58 mm SL) M.B.R., 57 exs., 17.iii.02. (size 11–60 mm SL) M.B.R., 46 exs., 17.iv.02. (size 18–60 mm SL) M.B.R., 4 exs., 17.v.02. (size 30–58 mm SL) M.B.R.

Remarks : Size : 7.5 cm. TL.

Distribution : Coastal freshwater, paddy fields, tanks, backwaters (Peninsular India).

21. *Oreochromis mossambica* (Peters)

1852. *Chromis mossambicus* Peters, *Monatsb. Akad. Wiss. Berlin.*, p. 681.

1999. *Oreochromis mossambica* (Peters) Jayaram, *The Freshwater Fishes of The Indian Region* : 400.

Material : 11 exs., 27.ii.01. (size 25–129 mm SL) M.B.R., 4 exs., 18.iv.01. (size 40–50 mm SL) M.B.R., 5 exs., 19.viii.01. (size 92–166 mm SL) M.B.R., 12 exs., 30.viii.01. (size 16–25 mm SL) M.B.R., 2 exs., 17.xi.01. (size 18–21 mm SL) M.B.R., 4 exs., 17.xii.01. (size 38–47 mm SL) M.B.R., 105 exs., 17.iv.02. (size 63–175 mm SL) M.B.R., 13 exs., 17.v.02. (size 13–36 mm SL) M.B.R.

Remarks : Maximum size recorded was 175 mm in April 2002.

Distribution : Throughout India.

22. *Glossogobius giuris* (Hamilton)

1822. *Gobius giuris* Hamilton, Fish. Ganges, pp. 51, 366, pl. 33, fig. 15.

1999. *Glossogobius giuris* (Hamilton) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 294-295.

Material : 2 exs., 27.iii.01. (size 80–220 mm SL) M.B.R., 4 exs., 18.iv.01. (size 68–96 mm SL) M.B.R., 6 exs., 30.v.01. (size 35–88 mm SL) M.B.R., 1 ex., 30.viii.01. (size 70 mm SL) M.B.R., 1 ex., 17.iii.02. (size 72 mm SL) M.B.R., 20 exs., 17.iv.02. (size 23–128 mm SL) M.B.R.

Remarks : Size : 30 cm. TL, usually 15 cm.

Distribution : Freshwaters, estuaries, (Throughout India).

23. *Anabas testudineus* Bloch

1795. *Anabas testudineus* Bloch, *Nat. Aus. Fish*, 7 : 121, pl. 322.

1999. *Anabas testudineus* Bloch Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 296-297.

Material : 1 ex., 27.ii.01. (size 64 mm SL) M.B.R.

Remarks : Size : 20.0 cm. TL, rarely 25.0 cm.

Distribution : Freshwaters and estuaries (Throughout Indi).

24. *Polyacanthus lalius* (Hamilton)

1822. *Trichopodus lalius* Hamilton, Fish. Ganges, pp. 120, 372.

1999. *Polyacanthus lalius* (Hamilton) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 298-299.

Material : 6 exs., 17.xii.01. (size 24–31 mm SL) M.B.R.

Remarks : Size : 5.0 cm. TL.

Distribution : Slow moving streams, lakes with vegetation (usually Northern India).

25. *Pseudosphromenus cupanus* (Valenciennes)

1831. *Polyacanthus cupanus* Cuvier (in C & V), *Hist. Nat. Poiss.*, 7 : 357.

1999. *Pseudosphromenus cupanus* (Valenciennes) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 300.

Material : 1 ex., 27.ii.01. (size 30 mm SL) M.B.R., 3 exs., 17.xii.01. (size 32–33 mm SL) M.B.R.

Remarks : Size : 7.5 cm. TL.

Distribution : Freshwater and brackishwater with vegetation (Peninsular India).

26. *Channa punctatus* (Bloch)

1793. *Ophicephalus punctatus* Bloch, *Natur. Aus. Fische.*, 7 : 139, pl. 358.

1999. *Channa punctatus* (Bloch) Menon, *Rec. zool. Surv. India, Occ. Paper No. 175* : 276-277.

Material : 3 exs., 27.ii.01. (size 28–72 mm SL) M.B.R., 1 ex., 19.vii.01. (size 160 mm SL) M.B.R., 1 ex., 17.xii.01. (size 76 mm SL) M.B.R., 1 ex., 27.ii.02. (size 25 mm SL) M.B.R.

Remarks : Size : 30.4 cm. TL, only upto 11 cm. in the plains.

Distribution : Tanks, ponds, swamps (Throughout India).

DISCUSSION

During the study period 26 species were recorded from this tank situated in the sacred grove. Eventhough there is no regular fishing, occasionally during the period of collection certain poachers were seen to be engaged in fishing operations. Both gill net and cast net, were used. *Gambusia* sp. occupies the first position with reference to the number of examples (2404 exs.). With reference to the richness in species diversity in a single month, the maximum number (15) was in February 2001. Certain species like *Esomus danricus*, *Mystus bleekeri* (distribution shown upto Mahanadi river) and *Polyacanthus lalius* (distribution shown as northern India) are well established species in Tamilnadu. The former species has been recently reported by the authors (Rema Devi *et al.*, 2001) and the latter by Ranjit Daniels (2002).

Of the 3436 specimens collected, the bulk was constituted by the exotic species *Gambusia affinis* constituting 70% of the total. About 4–6.5% was comprised by the following four species viz. *Rasbora daniconius*, *Eetroplus maculatus*, *Oreochromis mossambica* and *Amblypharyngodon microlepis* in the order of abundance. All the other species constituted less than 2%. For the months studied it was observed that maximum species abundance occurred during the month of February, and quantitatively also February and March were the peak months. This increase in fish number could be due to the decrease in water level.

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