



Species persistence: a re-look at the freshwater fish fauna of Chennai, India

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Chennai is amongst the few Indian cities that has had a long history of biodiversity studies. The erstwhile Madras that has since expanded considerably into today's Chennai has extensive and diverse aquatic habitats that amongst others attracted the attention of ichthyologists for at least 100 years. Two perennial rivers - Adyar and Cooum, numerous reservoirs that provide water for irrigation and drinking, seasonal tanks and extensive flood plains (example Pallikaranai Marsh), canals, channels, rice fields and open wells are typically freshwater habitats that add to the heterogeneity of the otherwise maritime landscape.

One of the earliest and most comprehensive of fish studies that considered a wide range of Chennai's aquatic habitats is that of Raj (1916). Raj's study carried out around 1910 is in fact the bench mark of the series of fish surveys that spanned the 100 years dealt with in this paper.

Raj (1916) recorded a total of 57 species of which 44 species may be treated as primary freshwater fishes (Menon 1999). He mainly surveyed the Adyar and Cooum rivers and sporadically the drinking water

reservoirs of Sembarambakkam (Chembarampakkam) and Red Hills. Subsequent surveys of fish carried out by other authors focused mainly on the Adyar and Cooum rivers (Panikker & Aiyar 1937; Ganapati 1964; Evangeline 1967; Mary Bai 1993) with a few surveying the Chembarampakkam Lake (Raghunathan 1978; Daniels & Rajagopal 2004). The few other available publications are based on studies around Chennai and its environs (Devi et al. 1999) with a couple focusing on specific habitats (Raghunathan et al. 2005; Raghunathan et al. 2008).

The present study focused mainly on the freshwater habitats around Chennai such as the Rettai Eri (near Red Hills), Madipakkam Lake, wetlands of Velachery, Kovillampakkam Lake, Adyar River and the Chembarampakkam Lake. Dipnet, dragnet and castnet were used for the surveys and in deep waters where these methods could not be used, fishermen's gill nets were regularly monitored.

A dip net of 45 x 30 cm with mesh size less than 1mm, a cast net of radius 480cm with mesh size 10mm and a dragnet of dimensions 210 x 120 cm with mesh size less than 1mm were used, apart from regularly monitoring fishermen's catches. Fishermen used four types of gill nets approximately 400 x 2 m each with different mesh sizes viz 25mm, 40mm, 55mm and 100mm. The species collected were identified using the available literature on freshwater fishes (Talwar & Jhingran 1991; Jayaram 1999).

The identity of a few primary freshwater fish which were recorded in the previous surveys conducted over the past hundred years by various authors (Raj 1916; Panikker & Aiyar 1937; Ganapati 1964; Evangeline 1967; Raghunathan 1978; Bai 1993; Devi et al. 1999; Daniels & Rajagopal 2004; Raghunathan et al. 2005; Raghunathan et al. 2008) have since undergone nomenclatural changes/revisions and the present paper is based on the current identity and geographical distribution of the species.

Aplocheilus blockii is restricted to the west coast and very similar to *A. parvus* a species which is quite common in the Coromandel Coast (Menon 1999). Therefore in this paper the species present in Chennai and its environs is confirmed to be *A. parvus* which is frequently confused with *A. blockii* (Jayaram 1999) and a few authors even consider them as synonyms (Talwar & Jhingran 1991).

The next species under question recorded in four surveys (Raghunathan 1978; Bai 1993; Devi et al. 1999; Raghunathan et al. 2008) is *Colisa fasciata*. This species is known to be a northern Indian species. *C. lalia* a very similar species is known from Chennai from the 1960s (Daniels & Rajagopal 2004) but did not feature in any of those surveys. Even though *C. lalia* was common for the past 50 years it was first officially reported only in 2004 (Daniels & Rajagopal 2004) and subsequently in 2005

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(Raghunathan et al. 2005). As both the species are very similar with reddish cross bands on the body it is likely that they have been confused. Therefore it is presumed that the record of *C. fasciata* is indeed *C. lalia* which is very common even today in Chennai and its environs.

Earlier taxonomic revisions have replaced *O. melastigma* which is the next species in question with *Oryzias dancena* and *O. carnaticus* (Daniels 2002; Parenti 2008). *Oryzias sp.* reported in the other surveys is being treated as *O. dancena* as the male specimens collected during the present study had filamentous extensions of the anal fin (Daniels 2002) and smaller adult size (Parenti 2008).

Puntius mahecola recorded by Raj (1916) is actually *P. filamentosus*. The two have frequently been confused and occasionally treated as synonyms (Menon 1999). *P. mahecola* is now known to be a species very similar to *P. amphibius* and the taxonomic status of *P. amphibius* is questionable (Pethiyagoda & Kottelat 2005). *P. melonostigma* recorded by Raghunathan et al. (2008) is being considered as *P. mahecola* (Pethiyagoda & Kottelat 2005).

Barring these, of the 66 species reported by earlier surveys, eight species were not recorded during the present study, while 17 others were added for the first time to the list of fishes known from Chennai. Thus, during the present study the presence of 75 species of fish has been validated. This is the highest number of primary freshwater fish species reported from Chennai and its environs. The eight 'missing' species are *Nandus nandus*, *Clarias magur*, *Ompok bimaculatus*, *Sperata aor*, *Cirrhinus reba*, *Salmostoma acinaces*, *Puntius amphibius* and *Anguilla bengalensis*. *Poecilia reticulata*, *Xiphophorus helleri*, *X. maculatus* and *Brachydanio rerio* reported from Chennai (Devi et al. 1999) have not been included in the checklist, as they were collected from a farm and not in the wild.

Four species of fish have been recorded after 100 years. Raj (1916) recorded *Anguilla bicolor*, *Labeo calbasu*, *Wallago attu*, *Channa gachua* in the year 1910-11 and these fish which were not reported in any other surveys were collected during the present study. *Macroglyptus aral* though not collected in the recent study was captured from Chembarampakkam recently (E. Ramanujam pers. comm.). The non-native *Osphronemus gourami* is one other species not collected in the present study but has been added to the checklist as there is a recent report of its presence in the Adyar River (Knight 2010a).

Exotic fish recorded for the first time can be attributed to more recent introductions by the ornamental fish trade and aquaculture. Species like *Pterygoplichthys disjunctivus*, *P. pardalis*, *Hemichromis bimaculatus* and *Amphilophus trimaculatum* (Knight & Devi 2009a) are sure to have been brought in by the aquarium trade. *Clarias gariepinus*, *Pangasius pangasius*, *Oreochromis niloticus*, *O. aureus* (Knight & Devi 2009b) and the large

carps have been brought in for aquaculture.

The recent record of northern Indian fish like *Badis badis* (Knight & Devi 2009c), *Puntius gelius* (Knight 2010b) and *P. orphoides* are rather interesting. These may have been brought in by the Krishna water transported to Chennai recently or earlier by ways of water imports from the north. What is more interesting is that these fish neither feature in the list of fishes of Hyderabad (Chandrasekhar 2004) which includes those of the River Krishna nor in the checklist of fishes of the River Krishna (Jayaram 1995).

Eighty-three species of fishes belonging to 49 genera and 23 families are known to inhabit the fresh water habitats of Chennai (Table 1). The presence of almost 90% of the fishes known in the past 100 years was validated in the present study, highlighting that species do persist. Conclusions and reports of species extinction can well be premature and misleading.

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Table 1. A consolidated list of the fishes of Chennai

Family / Scientific name
Notopteridae
1. <i>Notopterus notopterus</i> (Pallas 1769)
Anguillidae
2. <i>Anguilla bengalensis</i> (Gray 1831)*
3. <i>Anguilla bicolor</i> McClelland 1844
Cyprinidae
4. <i>Amblypharyngodon microlepis</i> (Bleeker 1854)
5. <i>Amblypharyngodon mola</i> (Hamilton 1822)
6. <i>Chela cachius</i> (Hamilton 1822)
7. <i>Cirrhinus cirrhosus</i> (Bloch, 1795)
8. <i>Cirrhinus reba</i> (Hamilton 1822)*
9. <i>Ctenopharyngodon idellus</i> (Cuvier & Valenciennes 1844)
10. <i>Cyprinus carpio</i> Linnaeus 1758
11. <i>Esomus barbatus</i> (Jerdon 1849)
12. <i>Esomus danricus</i> (Hamilton 1822)
13. <i>Esomus thermoicos</i> (Hamilton 1822)
14. <i>Gibelion catla</i> (Hamilton 1822)
15. <i>Horadandia atukoralii</i> Deraniyagala 1943
16. <i>Hypophthalmichthys nobilis</i> (Richardson 1845)
17. <i>Labeo calbasu</i> (Hamilton 1822)
18. <i>Labeo rohita</i> (Hamilton 1822)
19. <i>Laubuca laubuca</i> (Hamilton 1822)
20. <i>Osteobrama cotio peninsularis</i> (Silas 1952)
21. <i>Parluciosoma daniconius</i> (Hamilton 1822)
22. <i>Puntius amphibius</i> (Valenciennes 1842)*
23. <i>Puntius chola</i> (Hamilton 1822)
24. <i>Puntius conchoni</i> (Hamilton 1822)
25. <i>Puntius dorsalis</i> (Jerdon 1849)
26. <i>Puntius filamentosus</i> (Valenciennes 1844)
27. <i>Puntius gelius</i> (Hamilton 1822)
28. <i>Puntius mahecola</i> (Valenciennes 1844)
29. <i>Puntius orphoides</i> (Valenciennes 1842)
30. <i>Puntius sarana subnasutus</i> (Valenciennes 1842)
31. <i>Puntius sharmai</i> Menon & Rema Devi 1993
32. <i>Puntius sophore</i> (Hamilton 1822)
33. <i>Puntius ticto</i> (Hamilton 1822)
34. <i>Puntius vittatus</i> (Day 1865)
35. <i>Rasbora caverii</i> (Jerdon 1849)
36. <i>Salmophasia acinaces</i> (Valenciennes 1844)*
37. <i>Salmophasia bacaila</i> (Hamilton 1822)
38. <i>Salmophasia clupeioides</i> (Bloch 1795)
Cobitidae
39. <i>Lepidocephalichthys guntea</i> (Hamilton 1822)
40. <i>Lepidocephalichthys thermalis</i> (Valenciennes 1846)

Family / Scientific name
Bagridae
41. <i>Sperata aor</i> (Hamilton 1822)*
42. <i>Mystus bleekeri</i> (Day 1877)
43. <i>Mystus cavasius</i> (Hamilton 1822)
44. <i>Mystus gulio</i> (Hamilton 1822)
45. <i>Mystus keletius</i> (Valenciennes 1840)
46. <i>Mystus vittatus</i> (Bloch 1794)
Siluridae
47. <i>Neotropius atherinoides</i> (Bloch 1794)
48. <i>Ompok bimaculatus</i> (Bloch 1794)*
49. <i>Wallago attu</i> (Bloch & Schneider 1801)
Pangasiidae
50. <i>Pangasius pangasius</i> (Hamilton 1822)
Clariidae
51. <i>Clarias magur</i> (Hamilton 1822)*
52. <i>Clarias gariepinus</i> (Burchell 1822)
Heteropneustidae
53. <i>Heteropneustes fossilis</i> (Bloch 1794)
Loricariidae
54. <i>Pterygoplichthys disjunctivus</i> (Weber 1991)
55. <i>Pterygoplichthys pardalis</i> (Castelnau 1855)
Adrianichthyidae
56. <i>Oryzias dancena</i> (Hamilton 1822)
Belonidae
57. <i>Xenentodon cancila</i> (Hamilton 1822)
Aplocheilidae
58. <i>Aplocheilus parvus</i> (Sundara Raj 1916)
Poecilidae
59. <i>Gambusia affinis</i> (Baird & Girard 1853)
Mastacembelidae
60. <i>Macrognathus aral</i> (Bloch & Schneider 1801)
61. <i>Macrognathus pancalus</i> Hamilton 1822
62. <i>Mastacembelus armatus</i> (Lacepede 1800)
Chandidae
63. <i>Chanda nama</i> Hamilton 1822
64. <i>Parambassis lala</i> (Hamilton 1822)
65. <i>Parambassis ranga</i> (Hamilton 1822)
Nandidae
66. <i>Badis badis</i> (Hamilton 1822)
67. <i>Nandus nandus</i> (Hamilton 1822)*
Cichlidae
68. <i>Amphilophus trimaculatum</i> (Günther 1867)
69. <i>Eetroplus maculatus</i> (Bloch 1795)
70. <i>Eetroplus suratensis</i> (Bloch 1790)

Family / Scientific name
71. <i>Hemichromis bimaculatus</i> Gill 1862
72. <i>Oreochromis aureus</i> (Steindachner 1864)
73. <i>Oreochromis mossambicus</i> (Peters 1852)
74. <i>Oreochromis niloticus</i> (Linnaeus 1758)
Gobiidae
75. <i>Glossogobius giurus</i> (Hamilton 1822)
Anabantidae
76. <i>Anabas testudineus</i> (Bloch 1792)
Belontiidae
77. <i>Colissa lalia</i> (Hamilton 1822)
78. <i>Pseudosphromenus cupanus</i> (Cuvier 1831)
79. <i>Trichogaster trichopterus</i> (Pallas 1770)
Osphronemidae
80. <i>Osphronemus gourami</i> (Lacepède 1801)
Channidae
81. <i>Channa gachua</i> (Hamilton 1822)
82. <i>Channa punctatus</i> (Bloch 1793)
83. <i>Channa striatus</i> (Bloch 1793)

* - Species included only on basis of previous surveys

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