Chapter 2
SYSTEMATICS
2.1. Introduction

With the signing of the agreement on Convention of Biological Diversity, this subject has received considerable attention globally not only because the health of biosphere depends on the health of biodiversity, but also because the very future of plant and animal wealth (including human race) also depends on it. It is also clear that tropical-subtropical belt of the world is rich in biodiversity because it has remained unaffected by glaciation which has decimated biodiversity in temperate to polar belts. Keeping this in mind, of late, the taxonomic studies of India’s biodiversity have gained importance (Jayaram, 1999). With so much diversity it is but natural that in the Indian subcontinent, the variety and quantum of the catch is typical of the tropics. Of the total 8411 freshwater fishes known world over, Indian region alone abound 930 species with another 1570 species as marine. The Eastern and Western Ghats cover 10% of this country’s land area and are said to have about 55% of India’s terrestrial and freshwater biodiversity (Menon, 1999). It is no wonder that interest in study of fish is as old as Vedic times in India. The ancient Indians classified fish, based on shape and structure and their knowledge from keen observations are remarkable as seen from Kautilya’s Arthashasthra (300 B.C), King Someswara’s Manasallosa (1127 A.D.) etc. However, studies with a more scientific, more accurate and fulfilling the needs of modern taxonomy on the Indian freshwater fish fauna started only from the 19th century. Beginning with Hamilton-Buchanan’s (1822) account of the fishes of Ganges, followed by McClelland (1839), Sykes (1839), Jerdon (1849), Blyth (1858,1860), the vast array of fish found in this region came to light. All these pioneer researchers were instrumental
in lying solid foundations for Indian systematic Ichthyology. Day (1875-1878) brought out for the first time the monumental treatise "Fishes of India" embodying mostly the results of his own extensive observations. Day included in his work (including the supplement) 1418 species found within the boundaries of India, Pakistan (including Afganistan), Bangladesh, Myanmar and Sri Lanka. Though Day's work had its own limitations, however, his monograph is irreplaceable even today considering the wide coverage and compactness. Gunther's (1864, 1868) catalogue of the fishes in the British Museum is also worth mentioning. It includes a number of taxa of this region but without many illustrations or analysis as Day has done.

It is Hora (1921-1949) who placed Indian Ichthyology on a universal pedestal in the 20th century with his indomitable researches on modern ichthyology and zoogeography of fishes. For any student of Indian ichthyology the very first source of reference and further basic information, the publications of Hora are indispensable. Hora in his lifetime established 3 families, 28 genera, 139 species; many of them are still considered as valid. Hora's associate Dev Dev Mukherji within a small span of time made several noteworthy contributions to Indian Ichthyology. Misra (1947, 1952 and 1953) published a series of checklists and manuals for the identification of the fish fauna of Indian region and its adjacent countries. In 1962, Misra published "An aid to the identification of the common commercial fishes of India and Pakistan" dealing with 402 marine, brackish and freshwater fish species belonging to 205 genera under selected families. In "Fauna of India" he made an attempt to cover different families of fishes. Misra's (1969) volume on Elasmobranchii and Holocephali was first in this series on Pisces, followed by

Taking account the home scenario, there are numerous studies on the ichthyodiversity of Kerala. Day's (1865) "Fishes of Malabar" is the pioneer attempt in this direction which provides basic information on the fish fauna of Kerala. After Day, Pillay (1929), John (1936) and Hora and Law (1941) contributed much especially on the fish fauna of Travancore region which contributed several new species. Raj (1941a, b) and Herre (1942) were also added several new species. Other notable contribution during the period from

Siruvani in the Western Ghats (Shaji and Easa, 1995c); *Osteochilichthys longidorsalis*, *Travancoria elongata* and *Horabagrus brachysoma* from Vettilappara region of Chalakkudy river (Pthyagoda and Kottelat, 1994); *Homaloptera pillai* from Silent valley, Kunthi river (Indra and Remadevi, 1981); *Horadandia arunachalami* from a stream in Santhanparai hills (Johnson and Soranam, 2001); *Glyptothorax davissinghi* from Karimpuzha, Nilambur reserved forests, Chaliyar river basin (Manimekalan and Das, 1998); *Nemacheilus menoni* (Zacharias and Minimol, 1999) from Periyar Tiger Reserve and a sub species, *Horadandia attukorali brittani* (Remadevi and Menon, 1992) from Pathiramanal islands, Cherthala and Kurup and Radhakrishnan (2001, 2002, 2003 and 2004 in press; 2005) described eight new freshwater fishes by their extensive surveys and samplings in different river systems of Kerala. Among the new species, *Nemacheilus periarensis*, *Homaloptera silasi*, *Garra mlapparaensis*, *Garra travancoria* and *Garra emarginata* are described from Periyar river system, *Salarias reticulates* from Chalakkudy, *Tor remadevii* from Pambar and *Garra nilamburensis* was described from Chaliyar river system.

In spite of conducting a great deal of work on the ichthyology of freshwater fishes of Kerala, it appears that no comprehensive work has so far been brought out on the systematics of freshwater fishes of Kerala (Zacharias *et al.*, 1996). Though we have rich and varied freshwater fish diversity, however, most of the studies were carried out either as regional basis and just resulted in to listing of fish fauna of some of the water bodies or geographical region. More over, though a number of new species have been discovered together with so many new records and extension ranges of fishes to Kerala, no concerted attempt was made to prepare a holistic...
account on the freshwater fishes of Kerala by encompassing the recent addition of new species and new distributional records, even in the most recent publications of freshwater fishes of the country (Talwar and Jhingran, 1991; Jayaram, 1981 and 1999). The publications of Shaji and Easa (2001) and Ajithkumar et al. (2000) are worth mentioning, however, these are also incomplete for want of species description and other relevant informations for systematic classification of fishes. It is therefore asserted that after Day (1865), no subsequent effort was made to conduct another comprehensive taxonomic study on the freshwater fishes of Kerala and virtually there is no publication is available which deals with the biodiversity of freshwater fishes of Kerala with user-friendly keys for easy identification, revalidation of the species and distribution pattern of the species, etc. It is against this background that the present study was conceptualized and undertaken to generate an authentic database on systematics of freshwater fishes of Kerala by fulfilling the above gaps, descriptions with user friendly taxonomic keys and revalidation of the new species and new distributional records. Description of individual species is followed by a remarks section which deals mainly with aspects of conservation and fishery, habitat and fishing method, etc.

2.2. Material and methods

The materials for the present study were collected from 25 major river systems of Kerala during the period from April 2000 to December 2004. A map of Kerala showing the river system is given in Fig.2.1. Diverse types of fishing methods were employed for the collection of specimens (Plate I) which are summarized below.

Cast nets — 16 mm, 18 mm, 22 mm and 30 mm mesh sizes
Gill nets — 32 mm, 38 mm, 64 mm, 78 mm, and 110 mm mesh sizes
Drag nets — (4mm mesh size, 15 x 3 mtrss)
Scoop nets — 1 mm and 2 mm mesh sizes

Other local contrivances such as Koodu (a kind of traditional trap), Muppalli (a kind of spear)

All the resident and migratory fish species (visiting freshwater species) which were collected within the limits of freshwater area of different river systems (the lower limit of a river system from where the salinity observed as '0'ppt.) were brought under classification. The species collected from various reservoirs, irrigation canals, channels and ponds, which are built across, along or connected to the rivers/tributaries, are also included in the present study. However, the species, which were collected either from aquaculture farms or ornamental fish farms, but not found in natural waters, were excluded. The fish samples were preserved in 10% formalin in the field itself and brought to the laboratory for further systematic studies. Details of the coloration were recorded in the fresh specimens itself.

The fishes were identified up to species level with the help of authentic keys such as Day (1878), Talwar and Jhingran (1991), Jayaram (1981, 1999) and Tekrival and Rao (1999). The characters used for identification were morphology, morphometry and meristic counts (Jayaram, 1981, 1999). Meristic counts were made on alizarin stained material. The fin ray counts such as dorsal, pectoral, pelvic, anal and caudal and scale counts such as lateral line scales, transverse rows of scales between dorsal and lateral line and those between lateral line and pelvic fin were done following Jayaram (1999) and shown in the meristic formulae of the respected species. Morphometric measurements were recorded with a dial-reading caliper with an accuracy of 0.02 mm. Data are presented as percentages, with the range...
followed by the mean in parentheses. The number of morpho-meristic characters studied varied from family to family and also some cases between different genera of the same family.

List of morphometric measurements observed and abbreviations used in the present study are given below:

<table>
<thead>
<tr>
<th>Morphometric measurement</th>
<th>Abbreviation used</th>
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<tbody>
<tr>
<td>1. Total length</td>
<td>TL</td>
</tr>
<tr>
<td>2. Standard length</td>
<td>SL</td>
</tr>
<tr>
<td>3. Greatest body depth</td>
<td>BD</td>
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<tr>
<td>4. Head length</td>
<td>HL</td>
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<tr>
<td>5. Head width</td>
<td>HW</td>
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<tr>
<td>6. Pre dorsal length</td>
<td>PDL</td>
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<tr>
<td>7. Pre pectoral length</td>
<td>PPL</td>
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<tr>
<td>8. Pre ventral length</td>
<td>PVL</td>
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<tr>
<td>9. Pre anal length</td>
<td>PAL</td>
</tr>
<tr>
<td>10. Dorsal fin height</td>
<td>HD</td>
</tr>
<tr>
<td>11. Dorsal fin base</td>
<td>DB</td>
</tr>
<tr>
<td>12. Adipose fin base</td>
<td>ADB</td>
</tr>
<tr>
<td>13. Pectoral fin height</td>
<td>HP</td>
</tr>
<tr>
<td>14. Ventral fin height</td>
<td>HV</td>
</tr>
<tr>
<td>15. Anal fin height</td>
<td>AH</td>
</tr>
<tr>
<td>16. Anal fin base</td>
<td>AB</td>
</tr>
<tr>
<td>17. Caudal fin height</td>
<td>HC</td>
</tr>
<tr>
<td>18. Caudal peduncle length</td>
<td>LCPD</td>
</tr>
<tr>
<td>19. Least depth of caudal peduncle</td>
<td>HCPD</td>
</tr>
<tr>
<td>20. Interorbital width</td>
<td>INTO</td>
</tr>
<tr>
<td>21. Snout length</td>
<td>SNL</td>
</tr>
</tbody>
</table>
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22. Post orbital length
23. Length of sucking disc
24. Width of sucking disc
25. Vent to anal fin distance
26. Ventral fin to anal fin distance
27. Barbel length
28. Distance between pectoral and ventral
29. Distance between ventral and anal

The number of specimens used for various morphometric measurements and meristic counts ranged from 1-20, depending on the availability of specimens for various species. The number of specimens observed and its size ranges are shown under the taxonomic description of each species. The different sexes of a species were not treated separately for taking the measurements unless they exhibit any clear-cut sexual dimorphism.

The scheme of classification followed in this study is mainly of Jayaram (1999) with minor modifications based on the recent studies such as Menon (1999), Ajithkumar et al. (1999), Shaji and Easa (2001) and Talwar and Jhingran (1991). The families, subfamilies and genera were provided with concise introduction so as to provide a concept of each group. As far as possible, the keys and descriptions are made user friendly. Except for monotypic taxa, all other taxa are provided with dichotomous keys. All keys are prepared based on morphological appearance and they do not portray any phylogenetic arrangement or affinity. The various species under a genus are arranged and presented based on the order they appear in the key. But the sequence of suborders, families, sub families and genera are arranged and described according to their known phylogenetic and inter-generic
affinities. A more or less uniform pattern of citation and description of species has been adopted. Synonyms were greatly limited to a few monumental works. Common name and local name/names are provided for each species. Among the various morphometric ratios worked out, those essential ratios required for the identification of the species are only given and so is the description. The geographical distribution of the species within Kerala are revalidated and presented. Information on habitat and the most common fishing method are also provided. A photograph of the species in live condition follows each description. A total of 145 freshwater fishes belonging to 12 orders, 28 families and 66 genera were described in this chapter.

2.3. Results

Systematic account

The scheme of classification followed here is after Jayaram (1999)

Superclass: Gnathostomata
Class: Actinopterygii
Subclass: Neopterygii
Division: Telostei
Order: Osteoglossiformes
Family: Notopteridae
   Genus: Notopterus Lacepede
   *Notopterus notopterus* (Pallas)

Order: Elopiformes
Family: Megalopidae
   Genus: Megalops Lacepede
   *Megalops cyprinoides* (Broussonet)

Order: Anguilliformes
Family: Anguillidae
Genus: *Anguilla* Schrank

*Anguilla bicolor bicolor* McClelland
*Anguilla bengalensis bengalensis* (Gray)

Order: Clupeiformes
Family: Clupeidae
Genus: *Dayella* Talwar and Whitehead

*Dayella malabarica* (Day)

Order: Cypriniformes
Family: Cyprinidae
Subfamily: Cyprininae
Genus: *Cirrhinus* Cuvier

*Cirrhinus reba* (Hamilton-Buchanan)
*Cirrhinus mrigala* (Hamilton-Buchanan)

Genus: *Cyprinus* Linnaeus

*Cyprinus carpio* Linnaeus

Genus: *Catla* Valenciennes

*Catla catla* (Hamilton-Buchanan)

Genus: *Neolissochilus* Day

*Neolissochilus wynaadensis* (Day)

Genus: *Tor*

*Tor khudree* (Sykes)
*Tor remadevi* Kurup and Radhakrishnan

Genus: *Osteobrama* Heckel

*Osteobrama bakeri* (Day)

Genus: *Osteochilus* Gunther

*Osteochilus (Kantaka) brevidorsalis* (Day)
*Osteochilus longidorsalis* Pethiyagoda and Kottelat
*Osteochilus nashii* (Day)

Genus: *Gonoproktopterus* Bleeker

*Gonoproktopterus kulous* (Sykes)
*Gonoproktopterus dubius* (Day)
*Gonoproktopterus micropogon periyarensis* Raj
*Gonoproktopterus thomassi* (Day)
*Gonoproktopterus curmuca* (Hamilton-Buchanan)
*Gonoproktopterus kurali* (Menon and Remadevi)
Genus: **Labeo** Cuvier
- *Labeo dussumieri* (Valenciennes)
- *Labeo fimbriatus* (Bloch)
- *Labeo nigriscens* Day
- *Labeo kontius* (Jerdon)
- *Labeo calbasu* (Hamilton-Buchanan)
- *Labeo rohita* (Hamilton-Buchanan)

Genus: **Puntius** Hamilton-Buchanan
- *Puntius chola* (Hamilton-Buchanan)
- *Puntius parrah* (Day)
- *Puntius dorsalis* (Jerdon)
- *Puntius filamentosus* (Val.)
- *Puntius arulius* (Jerdon)
- *Puntius bimaculatus* (Bleeker)
- *Puntius denisoni* (Day)
- *Puntius amphibiaus* (Val.)
- *Puntius sarana subnasutus* (Val.)
- *Puntius carnaticus* (Jerdon)
- *Puntius bovanicus* (Day)
- *Puntius fasciatus* (Jerdon)
- *Puntius jerdoni* (Day)
- *Puntius ophicephalus* (Raj)
- *Puntius vittatus* Day
- *Puntius ticto* (Hamilton-Buchanan)
- *Puntius conchonius* (Hamilton-Buchanan)

Sub family: **Cultrinae**

Genus: **Chela** Hamilton-Buchanan
- *Chela dadiburjuri* (Menon)
- *Chela fasciata* Silas

Genus: **Salmostoma** Swainson
- *Salmostoma acinaces* (Valenciennes)
- *Salmostoma boopis* (Day)

Genus: **Esomus** Swainson
- *Esomus thermoicos* (Valenciennes)
Genus: *Amblypharyngodon* Bleeker  
*Amblypharyngodon microlepis* (Bleeker)

Genus: *Brachydanio* Weber and de Beufort  
*Brachydanio rerio* (Day)

Genus: *Rasbora* Bleeker  
*Rasbora daniconius* (Hamilton-Buchanan)

Genus: *Barilius* Hamilton-Buchanan  
*Barilius bendelisis* (Hamilton-Buchanan)  
*Barilius gatensis* (Valenciennes)  
*Barilius bakeri* Day  
*Barilius canarensis* (Jerdon)

Genus: *Danio* Hamilton-Buchanan  
*Danio malabaricus* (Jerdon)  
*Danio aequipinnatus* (McClelland)

Genus: *Lepidopygopsis* Raj  
*Lepidopygopsis typus* Raj

Sub family: Garrinae

Genus: *Crossocheilus* van Hesselt  
*Crossocheilus periyarensis* Menon and Jacob

Genus: *Garra* Hamilton-Buchanan  
*Garra gotyla stenorrhynchus* (Jerdon)  
*Garra mullya* (Sykes)  
*Garra ceylonensis* Bleeker  
*Garra periyarensis* Gopi  
*Garra mclellandii* (Jerdon)  
*Garra menoni* Remadevi and Indra  
*Garra hughi* Silas  
*Garra travancoria* Kurup and Radhakrishnan  
*Garra nilamburensis* Kurup and Radhakrishnan  
*Garra mlapparaensis* Kurup and Radhakrishnan  
*Garra surendranathi* Shaji, Arun and Easa  
*Garra emarginata* Kurup and Radhakrishnan

Family: Balitoridae

Subfamily: Balitorinae

Genus: *Bhavania* Hora  
*Bhavania auatralis* (Jerdon)
Genus: **Travancoria** Hora
  - *Travancoria elongata* Pethiyagoda and Kottelat
  - *Travancoria jonesi* Hora

Genus: **Baltora** Gray
  - *Baltora mysorensis* Hora

Genus: **Homaloptera** van Hesselt
  - *Homaloptera pillai* Indra and Remadevi
  - *Homaloptera silasi* Kurup and Radhakrishnan

Subfamily: **Nemachilinae**

Genus: **Oreonectes** Gunther
  - *Oreonectes keralensis* Rita and Nalbant

Genus: **Acanthocobitis** Peters
  - *Acanthocobitis botia* (Hamilton-Buchanan)

Genus: **Schistura** McClelland
  - *Schistura denisoni* (Day)
  - *Schistura semiarmatus* (Day)
  - *Schistura striatus* (Day)
  - *Schistura nilgiensis* (Menon)

Genus: **Nemacheilus** Bleeker
  - *Nemacheilus monilis* Hora

Genus: **Mesonemacheilus** Bananaescu and Nalbant
  - *Mesonemacheilus pambarensis* (Remadevi and Indra)
  - *Mesonemacheilus periyarensis* Kurup and Radhakrishnan
  - *Mesonemacheilus guntheri* (Day)
  - *Mesonemacheilus triangularis* (Day)
  - *Mesonemacheilus menoni* Zacharias and Minimol
  - *Mesonemacheilus petrubenarescui* (Menon)
  - *Mesonemacheilus remadevi* Shaji and Easa

Family: **Cobitidae**

Genus: **Lepidocephalus** Bleeker
  - *Lepidocephalus thermalis* (Valenciennes)

Order: **Siluriformes**

Family: **Bagridae**

Genus: **Horabagrus** Jayaram
  - *Horabagrus brachysoma* (Gunther)
  - *Horabagrus nigricollaris* Pethiyagd and Kottelat
Genus: *Batasio* Blyth
*Batasio travancoria* Hora and Law

Genus: *Mystus* Scopoli
*Mystus bleekeri* (Day)
*Mystus cavasius* (Hamilton-Buchanan)
*Mystus oculatus* (Valenciennes)
*Mystus armatus* (Day)
*Mystus gulioc* (Hamilton-Buchanan)
*Mystus montanus* (Jerdon)
*Mystus vittatus* (Bloch)
*Mystus menoda* (Hamilton-Buchanan)
*Mystus malabaricus* (Jerdon)

Family: Siluridae
Genus: *Wallago* Bleeker
*Wallago attu* (Schneider)

Genus: *Ompok* Lacepede
*Ompok malabaricus* (Valenciennes)
*Ompok bimaculatus* (Bloch)

Genus: *Silurus* Linnaeus
*Silurus wynaadensis* (Day)

Family: Schilbeidae
Genus: *Pseudeutropius* Bleeker
*Pseudeutropius mitchelli* Gunther

Family: Sisoridae
Genus: *Glyptothorax* Blyth
*Glyptothorax anamalaensis* Silas
*Glyptothorax annandalei* Hora
*Glyptothorax lonah* (Sykes)
*Glyptothorax madraspatnam* (Day)

Family: Clariidae
Genus: *Clarias*
*Clarins dussumieri* Valenciennes
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Family: Heteropneustidae
Genus: Heteropneustes
H. fossilis (Bloch)

Order: Beloniformes
Family: Belonidae
Genus: Xenentodon Regan
X. canicula (Hamilton-Buchanan)

Order: Cyprinodontiformes
Family: Aplocheilidae
Genus: Aplocheilus McClelland
A. blocki (Arnold)
A. lineatus (Valenciennes)

Family: Poeciliidae
Genus: Poecilia Bloch and Schneider
P. reticulata Peters

Order: Syngnathiformes
Family: Syngnathidae
Genus: Microphis Kaup
M. cuniculus (Hamilton-Buchanan)

Order: Synbranchiformes
Family: Mastacembelidae
Genus: Macrognathus Lacepede
M. aral (Bloch and Schneider)
Genus: Mastacembelus Lacepede
M. armatus (Lacepede)

Order: Perciformes
Family: Ambassidae
Genus: Parambassis Bleeker
P. dayi (Bleeker)
P. thomassi (Day)
Genus: Pseudambassis Bleeker
P. bacuilis (Hamilton-Buchanan)

Family: Nandidae
Genus: Nandus Valenciennes
N. nandus (Hamilton-Buchanan)
Sub Family: Pristolepidinae
Genus: *Pristolepis* Jerdon

*Pristolepis marginatus* Jerdon

Family: Cichilidae
Genus: *Oreochromis* Gunther

*Oreochromis mossambica* (Peters)

Genus: *Etroplus* Cuvier

*Etroplus maculates* (Bloch)

*Etroplus suratensis* (Bloch)

Family: Blennidae
Genus: *Salarias* Cuvier

*Salarias reticulates* Kurup and Radhakrishnan

Sub order: Gobiodei
Family: Eleotrididae
Genus: *Eleotris* Bloch and Schneider

*Eleotris fusca* (Schneider)

Family: Gobiidae
Sub family: Gobiinae
Genus: *Glossogobius* Gill

*Glossogobius giuris* (Hamilton-Buchanan)

Genus: *Awaous* Valenciennes

*Awaous gutum* (Hamilton-Buchanan)

Genus: *Sicyopterus*

Subfamily: Sicyidiaphiinae
Genus: *Sicyopterus* Gill

*Sicyopterus griseus* (Day)

Suborder: Anabantoidea
Family: Anabantidae
Genus: *Anabas* Cuvier

*Anabas testudineus* (Bloch)

Family: Belontidae
Genus: *Macropodus* Bleeker

*Macropodus cupanus* (Valenciennes)

Suborder: Channoidei
Family: Channidae
Genus: *Channa* Scopoli

*Channa orientalis* Bloch and Schneider
Channa micropeltes (Cuvier)
Channa marulius (Hamilton-Buchanan)
Channa striatus (Bloch)

Order: Tetradontiformes
Family: Tetradontidae
Genus: Tetradon Linnaeus
Tetradon travancoricus Hora and Nair

SYSTEMATIC DESCRIPTION

Superclass: Gnathostomata
Class: Actinopterygii
Subclass: Neopterygii
Division: Teleostei

Key to orders

1. a) Body eel shaped .................................................................2
   b) Body not eel shaped ............................................................3

2. a) Gill openings confluent, dorsal and anal fins vestigial
       ....................................................................................Synbranchiformes
   b) Gill openings free, dorsal and anal fins long, continuous with caudal
       fin ............................................................................Anguilliformes

3. a) Body short, round and bones on jaws fused to form a
       beak...........................................................................Tetradontiformes
   b) Body fusiform, bones on jaws not fused .................................4

4. a) Skin without scales, pectoral fin spine osseous, strong and
       serrated......................................................................Siluriformes
   b) Skin usually with scales, pectoral fin spine with no such
       modifications....................................................................5
5. a) abdominal edge keeled with serrations ..................................... 6
   b) Abdominal edge usually smooth and round .......................... 7

6. a) Abdominal edge with single serration, anal fin short and lateral line
    absent .............................................................................. Clupeiformes
   b) Abdominal edge with double serrations, anal fin very long and lateral
    line present ........................................................................ Osteoglossiformes

7. a) an osseous gular plate at symphysis of lower jaw covering the
    intermediate area .................................................................. Elopiformes
   b) No such gular plate present .............................................. 8

8. a) Body encased in a series of bony rings .......................... Syngnathiformes
   b) Body not encased in bony rings ...................................... 9

9. a) Body elongate, cylindrical and both upper and lower jaws extended
    in to long beaks and with sharp teeth ................................ Beloniformes
   b) Body compressed, jaws not forming beaks ......................... 10

10. a) No spines in dorsal and anal fins, snout spatulate, eyes placed much
    superiorly, lateral line chiefly on head ........................... Cyprinodontiformes
    b) Dorsal and anal fins may have spines, snout not spatulate, eyes
    placed in the middle of the head, lateral line if present, always on
    body .................................................................................. 11

11. a) Scales on head, jaws with teeth and generally with two dorsal
    fins .................................................................................. Perciformes
    b) No scales on head, jaws toothless, always with a single dorsal fin
    .................................................................................. Cypriniformes
ORDER: OSTEOGLOSSIFORMES

Family: Notopteridae

Genus Notopterus Lacepede

Notopterus Lacepede, Hist. Nat. Poiss, 2: 183, 1800 (Type, Gymnotus notopterus Pallas).

Notopterus notopterus (Pallas)

(Plate II, Fig. 1)

Gymnotus notopterus Pallas, Specil. Zool., Petersburg, 7:40, pl.6, fig.2, 1769 (Type locality: ponds and river of Bengal).

Notopterus kapirat Lacepede, Hist. Nat. poiss., 2:190,1800

Mystus kapirat Hamilton-Buchanan, Fish. Ganges, pp.235,385,1822 (Ponds and rivers of Bengal).


Common name: Grey feather back  Local name: Pulluvala, Ambattanvala

Distinguishing characters: (Based on 4 specimens, 152-256 mm TL)

D. 8; P.14-16; V. 5; A. 93-95; C.15.

Geographical distribution: Pakistan, India, Nepal, Bangladesh, Burma, Thailand, Malaya and Indonesia (Talwar and Jhingran, 1991; Menon, 1999)

Distribution in Kerala: Periyar Tiger Reserve (Chacko, 1948; Zacharias et al., 1996), Kerala part of Nilgiri Biosphere Reserve (Easa and Basha, 1995) Kabbini and Chalakkudy rivers (Shaji and Easa, 1996; Ajithkumar et al., 1999), 4 rivers of Kerala (Ajithkumar et al., 2000; Kurup, 2002; Kurup et al., 2004).

Habitat: Pools of stagnant or clear waters with sandy or gravelly bottom

Fishing methods: Cast nets and gill nets.

ORDER: ELOPIFORMES

Genus *Megalops* Lacepede


*Megalops cyprinoides* (Broussonet)

(Plate II, Fig. 2)

*Clupea cyprinoides* Broussonet, *Ichth.*, pl. 9, 1782


Common name: Oxeye tarpon Local name: Palan, Palankanni

Distinguishing characters: (Based on 3 specimens, 178-206 mm TL)

D. ii, 16-18; P. i, 14-15; V. i, 10; A. i, 22-24; C. 19; L. 40-41, Ltr. 4.5-5/2.5-3

Elongate, moderately deep and distinctly compressed body. Abdomen rounded, head moderate and compressed. BD 27.35-29.04 (28.20) and HL 29.12-29.32 (29.26) in SL. Eyes larger, 26.47-26.99 (28.23) in HL. Mouth superior, lower jaw prominent and slightly projecting. Two supramaxillaries
present on either side of mouth. A median bony gular plate present between arms of lower jaw. Cleft of mouth extending to first one by third of orbit. Barbells absent. Dorsal fin closer to caudal base than snout, last ray elongate, filamentous. HD 125.71-131.24 (128.47) in HL, upper margin concave. DB 27.54-40.75 (34.15) in HD. HP 50.15-54.69 (52.42) in HD. HV 69.47-71.31 (70.39) in HP. in LCPD 7.8-8.2 (8.00) in SL. Caudal deeply forked, HC 32.19-35.74 (33.97) in SL. Body with cycloid scales. Lateral line complete. Body brilliantly silver coloured. Fins generally red orange and pectoral fins yellowish.

**Geographical distribution:** Indo-West Pacific (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Chaliyar and low land waters of Trichur (Easa and Shaji, 1997), Periyar (Kurup et al., 2004).

**Habitat:** Pool habitats at the downstream with sand or mud as substratum.

**Fishing method:** Gill nets.

ORDER: ANGUILLIFORMES

Family: Anguillidae

Genus *Anguilla* Schrank

*Anguilla* Schrank, *Fauna Bioca*, 1:76, 1798 (Type, *Muraena anguilla* Linnaeus)

Key to species

1. a) Dorsal fin inserted near anus ..................... Anguilla bicolor bicolor
   b) Dorsal fin inserted far infront of anus
      ..................................................... Anguilla bengalensis bengalensis

Anguilla bicolor bicolor McClelland

(Plate II, Fig. 3)

Anguilla bicolor McClelland, Culcutta J. nat. Hist. 5(8): 178, pl.6, fig.1, 1845 (Type locality: Sandoway, Burma)
Anguilla mowa Bleeker, Verh. Bat Gen., 25.16, 1856
Anguilla maa Bleeker, Verh. Bat Gen., 25. 22.1853
Anguilla australis (nec Richardson) Jones and Sujansinghani, Indian J. Fish., 2:270, 1954 (Chilka lake)

Common name: Short fin eel
Local name: Mananjil

Distinguishing characters: (Based on 4 specimens, 342-386 mm TL)

D. 220-245; P. 16-18; A. 200-220


Geographical distribution: East Africa to Pakistan, India and Sri Lanka (Talwar and Jhingran, 1991)

Distribution in Kerala: Travancore (Hora and Law, 1941), Periyar Tiger Reserve (Chacko, 1948), Chalakkudy and Periyar rivers (Ajithkumar et al., 2000), rivers of Kerala (Shaji and Easa, 2001), Chalakkudy (Kurup et al., 2004)

Habitat: Riffle-pool habitats at upstream with bedrock and boulders as substratum. It is also available in pool-run habitats of low lands.

Fishing method: Gill nets.
**Anguilla bengalensis bengalensis** (Gray)

(Plate II, Fig. 4)

*Muraena bengalensis* Gray, *Ill. Ind. Zool*., pl. 95, fig. 5, 1831 (Type locality: The Ganges)


**Common name:** Indian longfin eel  
**Local name:** Mananjil

**Distinguishing characters:** (Based on 12 specimens, 312-512 mm TL)

D. 250-305; P.17; A.220-250

BD 5.36-6.1 (5.9) and HL12.96-14.2 (13.17) in SL. Eyes 6.32-7.84 (7.6) in HL, HD 14.62-16.24 (15.65) in HL, HP135.24-148.63 (143.39) in HD. Angle of mouth distinctly behind posterior margin of eyes. Dorsal fin inserted far infront of anus. Body olive green or greenish brown. Fins greenish brown. Ventral side at abdominal portion lighter or dirty white.

**Geographical distribution:** East Africa to Pakistan, India and Sri Lanka (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Travancore (Hora and Law, 1941), Periyar Tiger Reserve (Chacko, 1948), Kunthi river in Silent valley (Shaji and Easa, 2001), Chlakkudy, Periyar and Pamba river systems (Kurup et al., 2002 and 2004)

**Fishing method:** Gill nets.

**ORDER: CLUEPIFORMES**

**Family: Cluepidae**

**Sub family: Pellonulinae**

**Genus Dayella** Talwar and Whitehead

Dayella malabarica (Day)

(Plate II, Fig. 5)


Common name: Day's round herring

Distinguishing characters: (Based on 11 specimens, 46-72 mm TL)

D. ii, 11; P.1,10-12; V.i,8 A.iii,13; C.19; Ll.38; Ltr.3.5-4/3.5-4

Body small and slender, belly round and not keeled. Pre pelvic scutes present. BD 20.11-26.32 (22.45) and HL 21.36-32.45 (28.65) in SL. Eyes 23.58-29.65 (28.63) large, in HL. Mouth terminal, lower jaw slightly projecting. Dorsal fin placed at middle of body, HD 82.67-89.63 (87.61) in HL, HP 71.59-81.29 (79.02) in HD and HV 70.59-76.93 (73.25) in HP. Pelvic fins inserted behind dorsal fin origin. Body yellowish green, ventral side silvery white. A silvery golden stripe along flank. Upper lobe of caudal fin tipped with blue.

Geographical distribution: South Western India (Talwar and Jhingran, 1991)

Distribution in Kerala: Vembanad lake (Remadevi et al., 1996); Midland areas of rivers of Kerala (Ajithkumar et al., 1999), Periyar river system (Kurup et al., 2004)

Habitat: Riffle-pool habitats at upstream with gravel or cobbles as substratum.

Fishing method: Cast nets.
ORDER: CYPRINIFORMES

Family: Cyprinidae

Body covered with scales, generally compressed. Abdomen rounded or cutting. Eyes never covered with skin. Mouth with or without a sucker, more or less protractile and toothless. Upper jaw usually bordered only by pre maxilla, Lower jaw may be prominent, sharp or rounded, some times provided with a symphysial knob. Lips usually thin, not with papillae and sometimes absent from one of jaws or closely adnate to both jaws. Barbells present or absent. if present, usually one or two pairs. Labial fold present, continuous or interrupted. Gill openings wide and gill membranes usually joined with isthmus. Last unbranched ray of dorsal fin spiny, osseous, smooth or articulated. No well developed adipose fin. Pharyngeal teeth one to three rows, never more than eight teeth in any one row, Lateral line complete or incomplete.

Key to subfamilies

1. a) Upper lip not separated from snout.................................Garrinae
   b) Upper lip separated from snout..............................................2

2. a) Scales irregularly scattered over the body and some portion scale
   less, row of tile-like scales between vent and anal
   fin..........................................................................................Schizothoracinae
   b) Scales regular, complete, no such scale pattern between vent and
   anal fin.....................................................................................3

3. a) Abdominal edge keel like, dorsal fin inserted more towards caudal
   base than snout tip...............................................................Cultrinae
   b) Abdominal edge round, not keel like.....................................4
4. a) Lower jaw with a symphysial process ..................................Rasborinae  
b) Symphysial process absent ..................................................Cyprininae

**Sub family: Cyprininae**

Fishes with laterally compressed, elongate or ovate body. Head without scales. Abdomen usually round. Mouth mostly protractile and always toothless. Jaws smooth or with a horny covering. Barbells rostral and maxillary, both pairs may absent sometimes. Dorsal fin inserted before or opposite to (rarely slightly behind) base of pelvic fins, of varying heights, with or without a spine which may be smooth or serrated, weak or osseous and with 7-30 branched rays. Anal fin short with 5-9 branched rays, pectoral and pelvic fins laterally inserted. Scales small to large. Lateral line complete or incomplete, generally running in middle of body.

**Key to Genera**

1. a) Anal fin with anterior rays osseous, third spine serrated ...........Cyprinus  
b) Anal fin with anterior rays not serrated ........................................2

2. a) Dorsal fin inserted posterior to pelvic fin .............................Osteobrama  
b) Dorsal fin inserted above pelvic fins or slightly anterior to it ........3

3. a) Lower jaw with a small post symphysial knob .......................Cirrhinus  
b) Lower jaw without a post symphysial knob .................................4

4. a) Upper lip absent, Head comparatively large ..................Catla  
b) Upper lip present, Head normal ...........................................5

5. a) Snout with median and lateral projections, lips with dense and tiny papillae, scales with extensive radii ..................Gonoproktopterus  
b) Snout without any lateral projections, lips plain ..................6
6. a) Lower lip develops into a fleshy lobe below mandibular symphysis
b) Lower lip does not develop into fleshy lobe

7. a) Gill rakers on lower arm 6-9
b) Gill rakers on lower arm 10-14

8. a) No horny covering on inner side of lips
b) Horny covering on inner side of one or both lips

9. a) Horny covering inside lower jaw is covered with fringed lips
b) Horny covering inside lower jaw not covered by lips

10. a) Last unbranched dorsal ray osseous
b) Last unbranched dorsal ray week

Genus *Cirrhinus* Cuvier

*Cirrhinus* (Oken), Cuvier, *Regne Animale*, 2: 193, 1817 (Type, *Cyprinus cirrhosa* Bloch)

Body elongate, abdomen rounded. Head moderate to small. Mouth subterminal, lower jaw rather sharp, upper lip not continuous with lower lip. Lower lip thin and closely adnate to lower jaw. Barbells one pair. Eyes moderate to large, dorsal with last unbranched ray non-osseous and non-serrated. Lateral line complete, scales hexagonal, having grayish to dark edges which apparently give appearance of several continuous lines along flanks. Caudal forked. The members of this genus closely resemble *Labeo*, but differences are seen in the lower lip closely adnate to lower jaw and in the absence of the inner transverse labial folds.
Key to species

1.a) Dorsal fin with eight branched rays, body depth much more than head length, lateral line scales 40

... Cirrhinus reba

b) Dorsal fin with 12-13 branched rays, body depth about equal to head length, lateral line scales 40-42

... Cirrhinus mrigala

Cirrhinus reba (Hamilton-Buchanan)

(Plate II, Fig. 6)

Cyprinus reba Hamilton-Buchanan, Fish. Ganges, pp.280, 386, 1822 (Type locality: rivers and ponds of Bengal and Bihar)
Cirrhina dussumeiri Valenciennes, Hist. Nat. Poiss., 161291, pl. 480, 1842 (Mysore)
Cirrhina rewah Steindachner, Sitz. Akad. Wiss. Wein., p.56, 1867
Crossocheilus reba Gunther, Cat. Fish. Brit. Mus., 7:74, 1868 (India)

Common name: Reba carp
Local name: Kavori meen

Distinguishing characters: (Based on 3 specimens, 181-205 mmTL)

D. ii, 8; P.i,14; V.i,8; A.ii,5; C.19; Ll. 40, Ltr. 6.5-7/4.5-5

Elongate, BD 24.23-25.32 (24.942) and HL 14.36-16.19 (15.27) in SL. BD much more than HL, 168.72-162.35 (164.3) in latter. Snout slightly projecting.

Eyes 39.10-40.38 (39.74) in HL. Barbells one pair of rostrals only. Dorsal fin closer to snout than caudal, HD 156.05-162.56 (159.31) in HL, upper margin concave. DB 69.33-74.77(72.05) in HD. HP 70.03-75.69 (72.86) in HD. HV 96-99.16 (97.58) in HP. LCPD 17.20-18.44 (17.82) in SL. Caudal forked, HC 27.45-29.18 (28.32) in SL. Body with hexagonal scales. PDS 12-13. Grayish dorsally and flanks silvery. Scales with darker edges, forming grayish blue longitudinal bands especially above lateral line. Fins generally red orange.

Geographical distribution: India, Nepal, Pakistan and Bangladesh (Talwar and Jhingran, 1991)
Distribution in Kerala: Kabbini river, Kerala (Easa and Basha, 1995; Kurup et al., 2004)

Habitat: Found in the shallow riffle-pool and deep pool habitats with cobbles and sandy bottom.

Fishing method: cast nets and gillnets.

*Cirrhinus mrigala* (Hamilton-Buchanan)

(Plate II, Fig. 7)

*Cirrhinus mrigala* Hamilton-Buchanan, *Fish. Ganges*, pp. 297, 389, pl.6, fig.79, 1822 (Type locality: Ponds and freshwater rivers of Gangetic provinces)

*Cirrhina plumbea* Valenciennes, *Hist. Nat. pois.,* 16:289, 1842 (Type locality: River Irrawady)

*Cirrhina macrops* Steindachner, *Sitz. Akad.Wiss Wein.,* 61: 636, 1870 (Type locality: Madras)

*Cirrhinus mrigala mrigala* : Talwar and Jhingran, *Inland fish.,* 1:172,1991(Type locality: Northern India and Bangladesh)

Common name: Mrigal

Local name: Mrigal

Distinguishing characters: (Based on 4 specimens, 202-362 mm TL)

D. iii, 12; P,i,14; V,i,8; A.ii,5; C.19; Ll. 40-42, Ltr. 6.5/5

Elongate, BD 26.28-22.52 (24.35) and HL 26.52-20.26 (23.48) in SL. BD about equal to HL, 99.28-108.21 (103.73) in latter. Snout blunt, eyes 20.42-26.58 (24.55) in HL. Barbells one pair of rostrals only. Dorsal fin closer to snout than caudal, HD 102-116 (111.15) in HL and less than body depth, upper margin concave. DB 76-84 (82.00) in HD. HP 82.32-92.31 (88.45) in HL. HV 79.21-88.21 (85.73) in HP. LCPD 10.24-16.2 (13.06) in SL. Caudal forked, HC 22.31-26.41 (24.30) in SL. Body with hexagonal scales. PDS 13. Grayish dorsally and flanks silvery. Scales with darker edges, forming grayish blue longitudinal bands above lateral line. Fins generally yellowish orange.

Geographical distribution: India; Pakistan and Bangladesh (Talwar and Jhingran, 1991)
Distribution in Kerala: Peppara Reservoir (Thomas and Aziz, 1999); Chalakkudy, Periyar, Bharathapuzha, Karuvannur and Keecheri rivers (Ajithkumar et al., 2000), Bharathapuzha and Kabbini river systems (Kurup et al., 2004)

Habitat: Pools with sandy or muddy bottom

Fishing method: Gill nets

Genus *Cyprinus* Linnaeus

*Cyprinus* Linnaeus, *Systema Naturae*, Ed. 10. 1, p.320, 1758 (type, *Cyprinus carpio* Linnaeus)

*Cyprinus carpio* Linnaeus

(Plate II, Fig. 8)


*Cyprinus carpio* var. *speculans* Jones and Sarojini, *Jour. Bombay Nat. Hist. Soc.*, 1, 1952, fig. 4

Common name: Chinese carp

Local name: gold, goldfish

Distinguishing characters: (Based on 12 specimens, 256-361 mm TL)

D. iii, 18; P. i,15; V.i,9; A.i,5; C.19; Ll. 39-40, Ltr. 5.5/4.5

Body stout and deep. BD 40.65 and HL 35.50 in SL. Head triangular, Snout conical and tip blunt. Eyes moderate, 18.46 in HL. INTO 38.87 in HL. Barbells two pairs, rostral and maxillary, latter more in length than former. Dorsal fin equally placed between snout and caudal fin, long, HD small, 58.46 in HL and 20.75 in SL. DB 179.31 in HD. Pectorals longer, HP 68.72 in HL and 117.56 in HD. HV 93.22 in HP. LCPD 15.22 in SL. Caudal forked, HC 32.20 in SL. Scales on body are broader, PDS 10. Usually olivaceous with silvery or golden sides. Fins yellowish, reddish or golden.

Geographical distribution: Central Asia (Talwar and Jhingran, 1991)

Distribution in Kerala: Periyar, Malampuzha, Idukki, Peringalkuthu reservoirs and Kabbini and Chalakkudy rivers (Shaji and Easa, 2001; Periyar
Tiger Reserve (Zacharias et al., 1996, Kurup and Ranjeet, 2002) Kerala part of NBR (Easa and Basha, 1995), Chalakkudy river system (Kurup et al., 2004)

**Habitat:** Pools at upper, middle and lower stretches of river systems

**Fishing method:** Gill nets

**Genus Catla** Valenciennes

*Catla Valenciennes* in Cuvier & Valenciennes, *Hist. Nat. Poiss.*, 18, 410, 1844 (Type, *Catla buchanani* Valenciennes)

*Catla catla* (Hamilton-Buchanan)  
(Plate II, Fig. 9)

*Cyprinus catla* Hamilton-Buchanan, *Fish. Ganges.*, pp. 287, 318, 387, pl. 13, fig. 81, 1822  
(Type locality: rivers and tanks of Bengal)

*Cyprinus abramioides* Sykes, *Trans. zool. Soc.*, 2:353, pl. 61, fig. 2, 1841


**Common name:** Catla  
**Local name:** Catla

**Distinguishing characters:** (Based on 4 specimens, 202-452 mm TL)

D. iii, 14-16; P.i,20; V.i,8; A.ii,5; C.19; Ll. 40-43, Ltr. 6.5/6


**Geographical distribution:** India and Pakistan (The species is transplanted to many other countries including Sri Lanka and China) (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Chalakkudy, Periyar, Neyyar, Karuvannur, Moovattupuzha, Pambar, Valapatnam, Kuttiyadi, Chaliyar and...
Bharathapuzha rivers and connected reservoirs (Ajithkumar et al., 2000; Shaji and Easa, 2001), Malampuzha, Thenmala and Walayar reservoirs (Kurup et al., 2004).

**Habitat:** Pools with sandy or muddy bottom

**Fishing method:** Gill nets

**Genus Neolissochilus** Rainboth


*Neolissochilus wynaadensis* (Day) (Plate II, Fig. 10)

*Barbus wynaadensis* Day, *J. Linn. Soc.*, 11: 528, 1873 (Vithiry, Wynaad, Kerala)

*Puntius wynaadensis* Jayaram, *HBFW Fish India*, 103, 1981 (Type locality: Vythiri, Wynaad, Kerala)


**Common name:** South Indian Barb  
**Local name:** Kadanna

**Distinguishing characters:** (Based on 4 specimens, 202-452 mm TL)

D. iii-iv, 9-10; P.i,13-15; V.i,8; A.ii,5; C.19; L.I.28-30, L.tr.3.5-4

Body tapered from a rather broad head, moderately deep trunk to a compressed peduncle. BD 23.30-27.77 (19.88) in SL and 78.06-95.12 (67.05) in HL. HL 28.86-32.47 (30.23) in SL. Labial folds interrupted in middle. Mouth terminal. Eyes anteriorly placed, visible from lower side of head, 18.43-23.45 (21.38) in HL. INTO 30.75-32.82 (30.72) in HL. Barbells two prominent rostral and maxillary pairs, latter more than eyes and longer than former. Dorsal fin equidistant between snout and caudal, upper margin concave, HD 55.07-73.03 (66.65) in HL. DB 65.13-79.58 (73.29) in HD. HP 86.9-104.85 (93.35) HV 82.16-107.88 (92.59) in HP. LCPD 13.74-15.47 (14.56) in SL. Caudal forked, HC 25.97-30.93 (27.19) in SL. PDS 11-13. Back olivaceous, golden...
yellowish on flanks, a dark band running from behind eye to middle of caudal base where it often ends in a black blotch. Fins yellowish orange.

**Geographical distribution:** India (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Wynaad (Kerala) and headwaters of Cauveri river (Talwar and Jhingran, 1991); Kabbini river, Wynaad (Shaji and Easa, 2001; Kurup, 2002 and Kurup et al., 2004).

**Habitat:** shallow to deep pool-run habitats with thick instream cover and a substratum preferably with sand, cobbles.

**Fishing method:** cast nets and gillnets.

### Genus *Tor* Gray

*Tor* Gray, Ill Indian Zool, 2: 196, 1834 (Type, *Tor Hamilton-Buchananii* Gray)

Elongate and moderately compressed fishes. Head broadly pointed, Mouth terminal or subterminal in position, eyes at anterior part of head, not visible from ventral surface. Lips continuous, fleshy, often hypertrophied. Lower lip with a medium lobe (mentum) and post-labial groove continuous. A pair of rostral and maxillary barbells. Dorsal fin inserted above ventral fin with strong or weak but smooth spine. Caudal fin deeply forked. Lateral line complete.

### Key to species

1. a) Length of head shorter or more or less equal to body depth, dorsal spine weakly osseous, its length shorter than body depth ..............*Tor khudree*

   b) Length of head considerably greater than body depth, dorsal spine strong, osseous, its length equal to body depth.................................2

2. a) A characteristic hump over occiput, head and snout straight, mouth slightly upturned, Body bluish dark with fins red orange ..............*Tor remadevii*
b) No hump over occipit, Head and snout normal, mouth slightly subterminal, body silvery with fins yellowish...............\textit{Tor putitora}

\textbf{\textit{Tor khudree}} (Sykes)

(Plate III, Fig. 11)

\textit{Barbus malabaricus} Jerdon, Madras J. Lit. Soc., 15:312, 1849 (Mountain streams of Malabar)  
\textit{Barbus longispinus} Gunther, Cat. Fish. Brit. Mus., 7 132, 1868 (Ceylon)  
\textit{Barbus (Tor) khudree malabaricus} MacDonal, J. Bombay Nat. Hist. Soc., 44(3): 52, 1944 (South Canara, Western Gnats, Travancore hills)

\textbf{Common name:} Deccan Mahseer \hspace{1cm} \textbf{Local name:} Kuyil, Katti

\textbf{Distinguishing characters:} (Based on 16 specimens, 118-284 mm TL)

D. iii, 9; P. i, 14-15; V.i,8; A.i-ii,5; C.19; Ll. 22-23, Ltr. 3.5-4.5/2.5

Body elongate, dorsal profile more convex than ventral profile anteriorly. BD 26.23-27.73 (26.65) in SL and about equal to HL, 95.91-100.28 (98.10) of it.  
HL 26.15-28.22 (27.19) in SL. SNL 31.12-31.75 (31.44) in HL. Mouth slightly subterminal. Eyes anteriorly placed, 21.95-22.31 (22.13) in HL. Barbells rostral and maxillary pairs, latter longer and more than eyes. Dorsal fin equidistant between snout and caudal, upper margin concave, HD 91.52-94.64 (93.08) in HL. DB 54.86-57.55 (56.21) in HD. HP 82.89-84.10 (83.50) in HD. HV 86.58-90.60 (88.59) in HP. Caudal forked, HC 30.18-31.81 (30.49) in SL. HCPD 72.99-80.55(76.77) in LCPD. PDS 8. Metallic Silvery body with back more dark and ventral side creamy white. Fins generally red orange with Bluish sheen. Head darkly olivaceous. The colour found varying based on habitat.

\textbf{Geographical distribution:} India and Srilanka (Talwar and Jhingran, 1991; Menon, 1999; Jayaram, 1999)
Distribution in Kerala: 10 rivers of Kerala (Shaji and Easa, 2001); Travancore ((Hora and Law, 1941), High ranges, Ponnani drainage, Anamalai hills (Silas, 1951), Chaliyar river, NBR (Easa and Basha, 1995), 16 rivers of Kerala (Ajithkumar et al., 2000), 12 river systems of Kerala (Kurup et al., 2004)

Habitat: cascades, rapids, riffle-pool habitats with bedrock, cobbles and gravels as substratum.

Fishing method: Cast nets and gill nets.

Tor remadevii Kurup and Radhakrishnan

(Plate III, Fig. 12)

Tor remadevii Kurup and Radhakrishnan, J.Bombay Nat. Hist. Soc. (in press)

Holotype: Deposited in ZSI (WGRS) CLT.No. V/F 13119a, 331.82 mm TL, Chambakkad, Pambar river, Chinnar Wild Life sanctuary, 18-5-2004

Para type: 2ex. Deposited in ZSI (WGRS) CLT.No. V/F 13119b, 160.84 mm and 113.64 mm TL, Chambakkad, Pambar river, Chinnar Wild Life sanctuary, 18-5-2004

Diagnosis: An elongated species with dorsal fin equal to depth of body and with a strong osseous spine, head straight, shout pointed and with a terminal or slightly upturned mouth, head length more than body depth, a deep hump at occipit, lateral line scales 27-29. Body color greenish to metallic silvery along back and fins reddish with blackish patches.

Distinguishing characters: (Based on 19 specimens, 113.64-331.82 mm TL)

D IV, 10; P i, 15; V I 8; A i, 5; C.19 Ll. 27-29, Ltr. 4.5/2.5-3
Body elongate, HL 31.48-33.68 (32.45) in SL. BD 84.43-90.10 (83.55) in head length and 25.60-28.37 (27.09) in SL. HW 39.19-44.89 (41.02) in HL. Snout elongated and SNL form 30.45-48.17(34.33) in HL and 9.29-16.09(11.15) in SL. Eyes lie at posterior half and superiorly and its diameter form 13.21-23.55 (18.49) in HL. Dorsal profile has a moderate to prominent hump after head region, before insertion of dorsal fin. Maxillary barbells more elongated than rostral barbells. Origin of dorsal lies opposite to that of pelvics and midway between tip of snout and base of caudal fin. Dorsal spine forming 96.28-101.24 (99.02) in latter, 27.91-30.87(29.60) in SL and 88.12-96.04 (91.22) in HL. HP form 60.13-74.73 (67.10) in HD, HV 91.18-99.34 (92.51) in HP. Caudal fin is sharply divided. HC 25.87-29.49 (27.54) in SL. LCPD 14.42-17.23 (15.60) in HL. HCPD 68.29-88.67 (74.46) in its length. PDS 9-11, pre ventral scales 8 and pre anal scales 17-18. Scales between pectoral and ventral fins 8, pelvic and anal fins 9-10. circumpedunculer scales 11-16. Dorsal side of body greenish to metallic black with sides silvery and on ventral side white. Head silvery white while eyes are dark bluish. Fins are eventually reddish with blackish patches. Body uniformly silvery in colour in younger specimens, belly white and fins red orange.

Geographical distribution: India (Talwar and Jhingran, 1991, Jayaram, 1999; Menon, 1999)

Etymology: Named after the renowned freshwater fish taxonomist, Dr.K. Remadevi, Scientist, Zoological Survey of India, Chennai.

Other materials examined: Tor putitora: NElfGR, 1 ex. 186 mm TL
Habitat: Cascade and rapids at upstream of river Pambar and Chinnar.

Fishing method: Cast nets and Gill nets.

**Tor putitora** (Hamilton-Buchanan)

(Plate III, Fig. 13)

*Cyprinus putitora* Hamilton-Buchanan, *Fish Ganges*, pp.303, 388, 1822 (Type locality: Eastern part of Bengal)

*Cyprinus mosal* Hamilton-Buchanan, *Fish Ganges*, pp.306,308, 1822 (River Kosi)


**Common name:** Yellow finned mahseer  
**Local name:** Kuyil

**Distinguishing characters:** (Based on two specimens, 278.4 and 138.58 mm TL.)

D III, 9; P i, 15; V I 8; A ii, 5; C.19 Ll. 26-27, Ltr. 3.5/2.5

Body elongate, HL 30.3-35.2 (33.82) 3.03 and BD 37.2-43.16 (38.53) in SL.

Eyes lie on posterior half of head, 55.9-66.21 (59.23) in HL. Lips fleshy and continuous at corners of mouth. Both lips are hypertrophied in small specimen. Dorsal and ventral profiles are equally convex. Maxillary barbells more elongated than rostral barbells. Origin of dorsal lies opposite to that of pelvics and midway between tip of snout and base of caudal fin. Caudal fin sharply divided. Pelvic fin bears a well-developed scaly appendage. Pre dorsal scales 9-10. Dorsal side of body greenish black while ventral profile silvery. Head slightly yellowish white while eyes are dark bluish. Fins are eventually golden yellowish and paired fins are characterized with fringed red colouration. Caudal fin mottled black.

**Geographical distribution:** India (Talwar and Jhingran, 1991; Jayaram, 1999)

**Distribution in Kerala:** Kabbini river system (First report)
Habitat: Riffles and pools at upstream of river Kabbini.

Fishing methods: Cast nets and Gill nets.

Genus **Osteobrama** Heckel


**Osteobrama bakeri** (Day)

(Plate III, Fig. 14)


*Osteobrama bakeri* Jayaram, *HBFW Fish. India*, p. 113, 1981 (Kottayam, Kerala)

**Common name:** Malabar Osteobrama  
**Local name:** Mullan paval

**Distinguishing characters:** (Based on 10 specimens, 112-138 mm TL)

D. ii, 8; P. i, 15; V.i,8; A.iii,11; C.19. Li. 52-53, Ltr. 10/7.5

Body trapezoid and compressed. Abdominal edge sharp between bases of ventral and anal fins, but rounded in front of pelvic fins. BD 29.32-34.24 (31.96) in SL, 106-117.24 (110.74) in HL, HL small, 27.28-29.64(28.86) in SL.

Snot broadly pointing, SNL 25.64-27.32 (26.94) in HL. Mouth small, subinferior. Eyes large, 34.52-37.59 (34.92) in HL. Barbells small rostral and maxillary pairs. Dorsal fin inserted ahead of pelvic fins, dorsal spine weakly osseous and serrated. HD 101.2-107.26 (101.38) in HL.DB 41.65-43.98 (43.22) in HD. HP 66.32-68.95 (68.66) in HD. Caudal forked with anterior rays elongated. HC 37.65-39.42 (38.03) in SL. HCPD 93.28-98.21 (94.58) in LCPD. Scales small and deciduous. PDS 22. Body silvery with fins generally reddish.

**Geographical distribution:** India (Talwar and Jhingran, 1991; Jayaram, 1999)
Distribution in Kerala: Periyar, Chalakudy, Karuvannur, Moovattupuzha, Meenachil, Manimala, Chandragiri, Chaliyar and Bharathapuzha (Ajithkumar et al., 2000); Travancore (Hora and Law, 1941), Chaliyar river, NBR (Easa and Basha 1995), Periyar and Chalakkudy river systems (Kurup et al., 2004).

Habitat: Pools and pool-riffle habitats with sandy and muddy substratum.

Fishing methods: cast nets and gill nets.

Genus *Osteochilus* Gunther

*Osteochilus Gunther, Cat. Fishes Brit. Mus., 7, p.40, 1868 (Type, Rohita melanopleura Bleeker, by subsequent designation)*

Elongate and compressed fishes, head small to moderate, snout conical, tip obtusely round, covered with tubercles. Eyes moderate to large, mouth sub inferior. Lower lip broadly confluent with isthmus, Labial fold absent. Lower jaw forms a sharp projecting bony edge not covered by lower lip. Barbells absent. Dorsal fin elongated, dorsal spine weak or strongly osseous (sub genus *Kantaka*), caudal fin forked, lateral line complete. 23 species, 7 species in India and 3 species in Kerala

**Key to species**

1. a) Last unbranched dorsal ray osseous and strong............................................. *Osteochilus (Kantaka) brevidorsalis*
   b) Last unbranched dorsal ray weak, non-osseous.................................2

2. a) Last unbranched ray elongated, body without any colour bands.......................... *Osteochilus longidorsalis*
   b) Last unbranched ray not elongated, A dark lateral band on body and dorsal fin dark, tips, hyaline .................................. *Osteochilus nashii*
**Osteochilus (Kantaka) brevidorsalis** (Day)

(Plate III, Fig. 15)


*Scaphiodon brevidorsalis* Day, *Fish. India*, p. 552, pl. 133, fig. 2, 1878 (rivers below the Nilghirri hills in the Madras presidency)


**Common name:** Kantaka barb  
**Local name:** Kadanna

**Distinguishing characters:** (Based on a single specimen, 236 mm TL)

D. iv, 11; P. i, 14; V.i,8; A.iii,5; C.19; Li.40, Ltr. 7.5/4

Body oblong, compressed and deep, pre dorsal region distinctly elevated. BD 29.58-42.91 (38.23) in SL, 111.26-128.32 (124.23) in HL, Head small, HL 23.68-29.64 (28.62) in SL. Snout swollen, overhanging jaws, three or more rows of large pores across and SNL 31.29-38.26 (36.24) in HL. Mouth small, sub inferior. Lips thin, upper lip crenulated. Eyes large, 22.36-28.53 (26.89) in HL. Barbells absent. Dorsal fin inserted close to snout, dorsal spine osseous and strong. HD 102.34-109.26 (108.23) in HL. DB 89.16-94.23 (92.32) in HD. HP 91.26-106.23 (98.23) in HD. Caudal forked. HC 24.62-31.29 (28.48) in SL. HCPD 69.32-76.33 (72.54) in LCPD. Scales small and deciduous. PDS 15. Silvery body, darker on back, Fins grayish.

**Geographical distribution:** India (Talwar and Jhingran, 1991; Jayaram, 1999)

**Distribution in Kerala:** Kabbini (Shaji and Easa, 2001; Kurup et al., 2004).

**Habitat:** Prefers pool-run habitat with bedrock, cobbles and gravelly substratum. **Fishing methods:** Cast nets and gill nets.
Osteochilus longidorsalis Pethiyagoda & Kottelat

(Plate III, Fig. 16)


**Common name:** Long finned barb  **Local name:** Aameen

**Distinguishing characters:** (Based on 6 specimens, 112-226 mm TL)

D. iii, 10; P. i, 13; V.i,8; A.ii-iii,5; C.19; Ll.39-41, Ltr.7.5/4

Body oblong, compressed, BD 29.59-45.62 (35.63) in SL, 119.52-129.52 (119.20) in HL, head small, HL 24.45-24.76 (24.54) in SL. Snout obtusely round and covered with tubercles at tip and sides. SNL 37.23-37.64 (37.48) in HL. Mouth small, sub-inferior, lips thin. Eyes large, 24.46-27.91 (26.29) in HL. Barbells absent. Dorsal fin inserted close to snout and anterior rays are elongated (anterior rays of other fins also shown slight elongation as fish matures), dorsal spine non-osseous and weak. HD 103.44-116.76 (114.65) in HL. DB 57.69-61.21 (59.26) in HD. HP 84 62-86.32 (85.48) in HD. HV 91.30-92.55 (91.98), Caudal forked. HC 25.87-30.87 (27.64) in SL. HCPD 82.08-87.33 (84.59) in LCPD. PDS 12-14. Silvery golden body, darker on back, Fins red orange with a yellowish tinge.

**Geographical distribution:** India (Talwar and Jhingran, 1991; Jayaram, 1999)

**Distribution in Kerala:** Chalakkudy river (Shaji and Easa, 2001, Ajithkumar et al., 2000), Chalakkudy and Periyar river systems (Kurup et al., 2004).

**Habitat:** Riffle-pool habitats with bedrock, cobbles and gravel as substratum.

**Fishing methods:** Cast nets and gill nets.
Chapter 2

Systematics

Osteochilus nashii (Day)

(Plate III, Fig. 17)

Barbus nashii Day, Proc. Zoo. Soc. Lond., p. 584, 1868 (Type locality: Fraserpett river, Coorg, Karnataka)

Osteochilus malabaricus Day, J. Linn. Soc., 11: 527, 1873 (Vithiri, Wynaad)

Scaphiodon nashii: Day, Fish. India, p.552, pl.133, fig.3, 1878 (Coorg hill streams of South Canara and Wynaad)

Common name: Nash's barb Local name: Kadanna

Distinguishing characters: (Based on 7 specimens, 142-186 mm TL)

D. iv, 11; P. i, 13-14; V.i,8; A.ii,5; C.19; Ll. 42-43, Ltr. 7.5-8.5/5-5.5

Body oblong, compressed, moderately high, BD 24.95-33.53 (29.5) in SL, 95.54-112.43 (107.53) in HL, Head small, HL 25.92-29.83 (27.39) in SL.

Snout obtusely round and covered with tubercles. Mouth small, subinferior.

Lips thin. Eyes large, 21.64-26.05 (23.83) in HL. Barbells absent. Dorsal fin inserted slightly close to snout. Dorsal spine non-osseous and weak. HD 69.5-88.44(80.75) in HL. DB 85.63-113 (97.33) HD. HP 87.71-104.79 (94.26) in HD. HV 91.52-98.83 (95.36) in HP. Caudal forked. HC 26.52-31.3 (28.72) in SL. HCPD 63.81-80.89 (73.26) in LCPD. PDS 13-15. Body light to dark bluish on back and flanks, a black lateral band from eye to caudal fin. Dorsal fin with a wide dark band, edge, hyaline. A light dark band also seen on anal fin. Other fins reddish with yellowish tinge.

Geographical distribution: India (Talwar and Jhingran, 1991; Jayaram, 1999)

Distribution in Kerala: Cheenkannipuzha, Kabbini and Chaliyar (Easa and Basha, 1995; Shaji et al., 1995), Kabbini (Kurup et al., 2004).

Habitat: Riffle- pool habitats with bedrock, cobbles and gravel as substratum.

Fishing methods: Cast nets and gill nets.
Genus *Gonoproktopterus* Bleeker


Fishes with an elongate and moderate to deep body. Dorsal profile more arched than ventral. Head anteriorly tapering. Snout have a median conical pointing and two lateral projections in front of eyes and eyes appear to be slight pushed laterally which gives the head to have a distinguishable shape. Mouth sub terminal, Lower jaw never sharp but keratinized inside. Eyes large and superior. Lips fleshy. Post labial groove interrupted. Barbells one or two pairs. Dorsal fin inserted anterior to pelvic fins. Lateral line complete.

**Key to species**

1. a) Barbells one pair ........................................... *Gonoproktopterus kolus*
   
   b) Barbells two pairs....................................................... 2

2. a) Last unbranched ray osseous, strong ........................................... 3
   
   b) Last unbranched ray weak...................................................... 4

3. a) Lateral line scales 38-40 ........................................ *Gonoproktopterus dubius*
   
   b) Lateral line scales 42-43... *Gonoproktopterus micropogon periyarensis*

4. a) Lateral line scales 32-34 ........................................ *Gonoproktopterus thomassi*
   
   b) Lateral line scales more than 35 ............................................... 5

5. a) Head and snout normal, caudal tips tipped with red orange and black marks ........................................... *Gonoproktopterus curmuca*
   
   b) Head and snout comparatively larger, caudal tips without any colour marks...................................................... *Gonoproktopterus kurali*
**Gonoproktopterus kolus** (Sykes)

(Plate III, Fig. 18)

*Barbus kolus* Sykes, Trans. Zool. Soc., 2: 357, pl. 62, fig. 1, 1841 (Type locality: Mutha-Mola river, Poona)

*Hypseiobarbus kolus* Bleeker, Nat. Tijd. Dierk., 20: 275, 1860


**Common name:** Kolus

**Local name:** Kooral

**Distinguishing characters:** (Based on 8 specimens, 142-164 mm TL)

D. iii, 9; P. i, 15; V.i,8; A.ii,5; C.19; Ll. 42, Ltr. 9.5/4.5-5.5


Eyes large, 28.26-46.98 (41.94) in HL. Barbells a single pair. Dorsal fin inserted slightly close to snout, dorsal spine non-osseous and weak, 86.17-144.16(111.0) in HL. DB 56.22-75.33 (64.55) in HD. HP 78.86-99.35(83.37) in HD. HV 80.73-100.90 (84.61) in HP. Caudal forked. HC 27.79-34.59 (30.27) in SL. HCPD 56.73-71.84 (57.34) in LCPD. Scales smaller, PDS 13-14. Body silvery with a blackish tinge. Fins generally red orange, dorsal rays dusky.

**Geographical distribution:** India (Talwar and Jhingran, 1991; Jayaram, 1999)

**Distribution in Kerala:** Chalakkudy river (Kader, 1989; Vairavel et al., 1998), Chalakkudy river system( Kurup et al., 2004).

**Habitat:** Riffle-pool habitats with bedrock, cobbles and gravel or even muddy (pools) as substratum.

**Fishing method:** Cast nets and gill nets.
Gonoproktopterus dubius (Day)

(Plate III, Fig. 19)

Barbus dubius, Gunther, Cat. Fish. Brit. Mus., 7: 127, 1868
Gonoproktopterus dubius Talwar and Jhingran, Inland Fish., 1: 188,1991(Cauvery river system)

Common name: Nilgiri barb

Local name: Kadanna

Distinguishing characters: (Based on 8 specimens, 142-222 mm TL)

D. iv, 9; P. i, 16; V.i,8-9; A.iii,5; C.19; Li.38-40, Ltr.7/4-4.5

Body oblong, compressed, BD 27.54-29.42 (27.42) in SL, 97.21-100.26 (99.84) in HL, HL 26.12-29.47 (27.47) in SL. SNL 34.21-38.21(36.03) in HL.

Dorsal profile rises rather as a hump from occipt to dorsal fin. Mouth sub inferior. Lips thin. Eyes large, 25.13-27.41 (26.7) in HL. Barbells maxillary and rostral pairs, both are more in length than eyes. Dorsal fin inserted slightly close to snout, dorsal spine osseous, strong and elongated, upper margin deeply concave. HD 93.42-100.25 (98.65) in HL. DB 59.21-61.28 (60.58) in HD. HP 74.13-77.56 (76.11) in HD. HV 91.25-93.24 (92.31) in HP.

Caudal forked. HC 21.36-24.87 (23.07) in SL. HCPD 56.21-64.21 (58.22) in LCPD. Scales normal, PDS 12. Silvery golden body with fins red orange.

Geographical distribution: India (Talwar and Jhingran, 1991, Jayaram, 1999)

Distribution in Kerala: Cauveri river system (Shaji and Easa, 2001), Kabbini (Kurup et al., 2004).

Habitat: Riffle-pool habitats with bedrock, cobbles and gravel or even muddy (pools) as substratum.

Fishing methods: Cast nets and gill nets.
Gonoprokopterus micropogon periyarensis Raj

(Plate III, Fig. 20)

Barbus (Puntius) micropogon periyarensis Raj, Rec. Indian Mus., 43: 379, fig. 3 and 4 (Type locality: Periyar lake)

Common name: Periyar barb       Local name: Kariyan

Distinguishing characters: (Based on 8 specimens, 124-292 mm TL)

D. iii, 9; P. i, 14; V.i,8; A.ii-iii,5; C.19; Ll. 42-43, Ltr. 7.5/4.5

Body oblong, compressed, BD 26.86-30.35 (29.65) in SL, 109.97-130.94 (121.25) in HL, HL 23.26-25.49 (24.47) in SL. Rising of dorsal profile from occipit to dorsal fin is smooth gentle. SNL 32.31-34.8 (33.17) in HL Mouth sub inferior. Eyes large, 24.35-27.01 (25.73) in HL. Barbells maxillary and rostral pairs, both equal or more in length than eyes. Dorsal fin inserted almost equal or slightly towards snout. Dorsal spine osseous, strong and elongated, upper margin deeply concave. HD 107.99-114.98 (112.90) in HL. DB 59.41-78.61 (65.08) in HD. HP 70.69-93.23 (79.95) in HD. HV 83.53-95.85 (90.10) in HP. Caudal forked. HC 28.21-33.29 (30.17) in SL. HCPD 59.67-74.33 (67.56) in LCPD. Scales normal, PDS 18-19. Young ones are golden silvery but as fish grow, colour become slaty and even fins become dark bluish. On preservation, specimens become darker.

Geographical distribution: India., Western Ghats of Kerala (Jayaram, 1999)

Distribution in Kerala: Periyar upstream (Arun et al., 1996; Kurup et al., 2004)

Habitat: Rifle-pool habitats with bedrock, cobbles and gravel or even muddy (pools) as substratum.

Fishing methods: Cast nets and gill nets.
**Gonoproktopterus thomassi** (Day)
(Plate IV, Fig. 21)

*Puntius thomssi* Jayaram *et al.*, *Madras. J. Fish.*, 7: 5, 1976 (Cardamom hills)

Common name: Red canarese barb    Local name: Chekkali, Kadimeen

Distinguishing characters: (Based on 22 specimens, 191-286 mm TL)

D. iv, 9; P. ii, 16; V.i, 8-9; A.iii, 5; C. 19; Ll. 32-34, Ltr. 7/4-4.5

Body elongate, compressed, BD 24.65-29.65 (26.54) in SL, 99.21-101.26 (100.84) in HL, HL 26.12-29.47 (27.47) in SL. SNL 33.21-36.21 (33.03) in HL. Both dorsal and ventral profiles equally convex. Mouth sub inferior. Lips thin. Eyes moderate, 22.13-24.41 (23.7) in HL. Dorsal fin inserted equidistant between snout and caudal fin, dorsal spine weak. HD 93.42-97.25 (94.68) in HL. DB 62.21-64.28 (63.41) in HD. HP 71.13-74.36 (72.19) in HD. HV 91.25-93.24 (92.31) in HP. Caudal forked. HC 27.39-29.87 (27.97) in SL. HCPD 56.21-64.21 (58.22) in LCPD. Scales normal, PDS 11-12. Golden reddish body with fins red or red orange.

Geographical distribution: India (Talwar and Jhingran, 1991)


Habitat: Rapids and also found in deep pools.

Fishing methods: Cast nets and gill nets.

**Gonoproktopterus curmuka** (Hamilton-Buchanan)
(Plate IV, Fig. 22)

*Cyprinus curmuka* Hamilton-Buchanan, *Journ. Mysore*, 3: 344, pl. 30, 1807 (Type locality: Vedavathi river, Thungabadra drainage)

*Systematics, germplasm evaluation and pattern of distribution and abundance of freshwater fishes*
**Common name:** Curmuca barb  
**Local name:** Kooral

**Distinguishing characters:** (Based on 18 specimens, 112-284 mm TL)

- **D. iii, 9; P. i, 15; V. i, 9; A. i, 6; C. 19; L. 40-41, Lr. 8.5/3.5-4.5**

Body compressed, profiles are more or less equally convex, BD lesser, 19.28-28.39 (24.44) in SL, 76.11-100 (83.13) in HL, head larger, HL 27.15-46.1 (29.78) in SL. SNL 31.35-46.29 (37.33) in HL. Mouth sub inferior, Eyes large, 19.18-30 (24.73) in HL. Rostral barbells smaller, maxillaries equal to eyes. Dorsal fin inserted close to snout. Dorsal spine weak, HD 71.09-100 (76.59) in HL. DB 57.15-67.61 (63.88) in HD. HP 87.13-94.83 (89.53) in HD. HV 76.16-93.45 (81.81) in HP. Caudal forked. HC 25.53-29.58 (28.23) in SL. HCPD 49.89-76.0 (53.44) in LCPD. Scales moderate small, PDS 13. Body silvery golden with caudal fin tipped with red orange and black marks (This helps in distinguishing this species from others).

**Geographical distribution:** India: Western Ghats (Talwar and Jhingran, 1991, Jayaram, 1999)

**Distribution in Kerala:** All rivers of Kerala except Chinnar and Kabbini (Shaji and Easa, 2001), Chaliyar river, NBR (Easa and Basha, 1995), Bharathapuzha, Chalakkudy, Valapattanam and Bhaani rivers (Ajithkumar et al., 2000). 14 river systems in Kerala (Kurup et al., 2004).

**Habitat:** Riffle-pool habitats.

**Fishing methods:** Cast nets and gill nets

**Gonoproktoperus kurali** (Menon and Remadevi)  
(Plate IV, Fig. 23)

**Barbus curmuca** Day (nec Hamilton-Buchanan). *Fish India*, p. 566 pl. 141, fig. 1, 1878 (Type locality: South Malabar)  
Local name: Kooral

Distinguishing characters: (Based on 12 specimens, 196-275 mm TL)

D. iv, 9; P. i, 15; V.i, 9; A.ii,6; C.19; LI.4-42, Ltr. 8.5/3.5-4.5

Body compressed, profiles more or less equally arched, BD 22.96-25.48 (24.65) in SL, 71.39 (80.28) in HL, head larger, HL 31.15-35.14 (32.89) in SL. SNL 39.95-53.81 (44.33) in HL. Mouth sub inferior, Eyes large, 19.77-24.62 (22.81) in HL. Rostral barbells smaller, maxillaries equal to eyes. Dorsal fin inserted close to snout. Dorsal spine weak, HD 66.11-76.3 (72.16) in HL. DB 61.28-63.26 (62.12) in HD. HP 82.94-94.95 (91.15) in HD. HV 82.55-81.85 (79.55) in HP. Caudal forked. HC 23.49-29.0 (27.61) in SL. HCPD 52.72-65.51 (60.08) in LCPD. Scales moderate to small, PDS 13. Body silvery with fins generally grayish and tips slightly dusky.

Geographical distribution: India: Western Ghats (Menon, 1999)

Distribution in Kerala: Periyar Tiger Reserve, Kallar river (Remadevi et al., 1996, Kurup et al., 2004). Except high altitude streams, wide distribution in all major rivers (Ajithkumar et al., 2000).

Habitat: prefers rifle pool habitats with bedrock, cobbles and gravel or even muddy (pools) as substratum.

Fishing methods: Cast nets and gill nets.

Genus *Labeo* Cuvier


Fishes with sub cylindrical or almost cylindrical body, Abdomen rounded. Snout rounded or obtusely pointed, overhanging mouth. Eyes placed laterally with moderately wide interorbital area, mouth transverse and sub terminal. Lower jaw with bony edge covered by lower lip, which is continuous at angle
of mouth and usually fringed and joined with isthmus by a bridge. Barbells small, one or two pairs or sometimes absent. Dorsal fin broad, caudal fin forked and lateral lie complete.

**Key to species**

1. a) Lateral line scales more than 50......................... ..*Labeo dussumieri*
   
   b) Lateral line scales less than 50............................................... ..2
2. a) Dorsal fin rays 19-26........................................... ..*Labeo fimbriatus*
   
   b) Dorsal fin rays 11-18............................................................. ..3
3. a) Lateral line scales 36-37................................. ..*Labeo nigrescens*
   
   b) Lateral line scales 38-42........................................................ ..4
4. a) Dorsal fin inserted nearer tip of snout than base of caudal ........................................................... ..*Labeo kontius*
   
   b) Dorsal fin inserted midway between tip of snout and caudal fin........ ..5
5. a) Dorsal fin rays 15-18, anterior rays elongated, pectoral fins as long as head length........................................................... ..*Labeo calbasu*
   
   b) Dorsal fin rays 14-16, rays not elongated; pectoral fins as long as head, excluding snout........................................................... ..*Labeo rohita*

*Labeo dussumieri* (Vaenciennes)
(Plate IV, Fig. 24)

*Rohita dussumieri* Valenciennes, (in C & V), *Hist Nat. Poiss.*, 16: 258, pl.475, 1842 (Type locality: Alleppy, Kerala)
*Labeo rouxii* Gunther, *Cat. Fish. Brit. Mus.*, 7: 59, 1868

**Common name:** Malabar labeo  
**Local name:** Thooli

**Distinguishing characters:** (Based on 4 specimens, 162-238 mm TL)

D. ii, 13; P. i, 15; V. i, 8; A.iii,5; C.19; Ll.52-54, Ltr. 8.5/6.5
Body compressed, dorsal profile more convex, BD 26.36-31.26 (29.67) in SL, 66.32-73.26(71.0) in HL, head moderate. HL 22.36-28.21 (26.0) in SL. Snout overhanging mouth, mouth sub inferior, lips fleshy and both fringed. Eyes moderate, 17.86-21.39 (19.93) in HL. Barbells small rostral and maxillary pairs, dorsal fin inserted close to snout. Dorsal spine weak, HD 8.62-10.26 (9.07) in HL. HP 98.21-100.35 (100.21) in HD. HV 92.14-97.28 (95.46) in HP. Caudal forked. HC 28.72-31.59 (30.79) in SL. HCPD 62.36-72.45 (69.09) in LCPD. Scales moderate. Body grayish, lighter on abdomen, Scales on flanks has their edges tipped with black which appear as seven or more bluish lines. Fins red orange.

Geographical distribution: India: Western Ghats (Talwar and Jhingran, 1991)


Habitat: prefers pool habitats at downstream of the rivers with sandy and muddy substratum with lot of leaf litters.

Fishing methods: Gill nets.

**Labeo fimbriatus** (Bloch)

(Plate IV, Fig. 25)


Common name: Fringed lipped peninsular carp
Local name: Labeo

Distinguishing characters: (Based on a single specimen, 238 mm TL)

D. iii, 17; P. i, 16; V.i, 8; A.iii,5; C.19; Li.46, Ltr. 8.5/6.5
Body compressed, dorsal profile distinctly elevated between occipit to dorsal fin. BD 32.33 in SL, 128.92 in HL, head moderate to small, HL 25.07 in SL. Snout slightly overhanging mouth, SNL 34.68 in HL. Mouth sub inferior, lips fleshy and both fringed, labial folds distinct. Eyes moderate, 22.50 in HL. Barbells minute rostral and maxillary pairs, dorsal fin inserted close to snout. Dorsal spine weak, HD 99.74 in HL. DB 124.55 in HD. HP 91.97 in HD. HV 100.07 in HP. Caudal forked. HC 37.08 in SL. Scales moderate. Body grayish. Fins yellowish orange (Specimens collected from Kallada dam has body and fins dark in color)

Geographical distribution: India, Pakistan, Nepal and Burma (Taiwar and Jhingran, 1991; Jayaram, 1999).

Distribution in Kerala: Thenmala reservoir, Kallada river system (Kurup et al., 2004)

Habitat: Deep pools, reservoirs and dams.

Fishing methods: gill nets

*Labeo nigrescens* Day
(Plate IV, Fig. 26)


Common name: Karnataka labeo Local name: Chekida

Distinguishing characters: (Based on 4 specimens, 162-238 mm TL)

D. ii, 13-15; P. i, 18; V.i, 8; A.iii, 5; C.19; Ll.36-37, Ltr. 8.5/4.5

Body subcylindrical, abdomen rounded. BD 28.86-32.66 (30.76) in SL, 100.71-108.15 (104.43) in HL, head moderate to small, HL 28.66-30.19 (29.42) in SL. Snout swollen, is overhanging mouth, SNL 39.68-40.93 (40.31) in HL. Mouth sub inferior, lips fleshy and both fringed, two rows of papillae on
lower lip. Labial folds distinct. Eyes moderate, 20.97-23.71 (22.31) in HL. rostral and maxillary barbells in pairs, well developed, maxillaries equal to eyes. Dorsal fin inserted slightly close to snout. Dorsal spine weak, HD 80.59-86.61 (83.6) in HL. DB 108.86-118.65 (109.76) in HD. HP 101.54-108.84 (105.19) in HD. HV 91.09-94.45(92.73) in HP. Caudal forked. HC 32.9-34.49 (33.7) in SL. Fins rays generally show elongation as fish grows. HCPD 103.14-110.81 (106.98) in LCPD. Scales moderate. Body and fins grayish black in colour with eyes and lips reddish.

**Geographical distribution:** India (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Pamba river, Chalakkudy river (Shaji and Easa, 2001). **Habitat:** Deep, dark, rocky pool habitats at upstream of the rivers.

**Fishing methods:** Gill nets.

*Labeo kontius* (Jerdon)  
(Plate IV, Fig. 27)


**Common name:** Pigmouth carp  
**Local name:** Kadanna

**Distinguishing characters:** (Based on a single specimen, 364 mm TL)  
D. ii, 13; P. i, 15; V.i, 8; A.i,5; C.19; L.I.41, Ltr.6/4.5

Body subcylindrical, abdomen rounded. BD 30.54 in SL, 139.41 in HL, head moderate, HL 21.90 in SL. Snout swollen, overhanging mouth, SNL 44.85 in HL. Mouth sub inferior, lips fleshy and upper lip plain, without papillae or fimbriated, lower lip fringed. Labial folds distinct. Eyes moderate, 17.22 in HL. Barbells rostral and maxillary pairs, well developed, maxillaries longer. Dorsal fin inserted slightly close to snout. Dorsal spine weak, HD 105.41 in HL. DB
in HD. HP 82.33 in HD. HV 102.56 in HP. Caudal forked. HC 28.07 in SL.
Fin rays generally show elongation as fish grows. HCPD 86.96 in LCPD.
Scales moderate. Bluish grey along back, each scale with a red lunule, Fins
are off-white in colour.

Geographical distribution: India (Talwar and Jhingran, 1991; Jayaram,
1999)

Distribution in Kerala: Kabbini river system (Kurup et al., 2004)

Habitat: Riffle-pool habitats with sandy or gravelly substratum.

Fishing methods: Cast nets and gill nets.

*Labeo calbasu* (Hamilton-Buchanan)

(Plate IV, Fig. 28)

*Cyprinus calbasu* Hamilton-Buchanan, *Fish. Ganges*, pp. 297, 389, pl. 2, fig. 33, 1822 (Type
locality: Bengal)


Common name: Black Rohu Local name: Kakkameen

Distinguishing characters: (Based on 2 specimens, 216-218 mm TL)

D. ii,13; P. i, 18; V.i, 8; A.iii,5; C.19; Ll.43-44, Ltr. 7.5/9.5

Body compressed and rather deep. BD 27.57-33.81 (30.69) in SL, 141.45-
154.01(147.75) in HL, head moderate, more conical HL 19.49-21.95 (20.72)
in SL. snout somewhat pointed, or tip obtusely rounded. SNL 47.43-49.64
(48.54) in HL. Mouth sub inferior, lips fleshy, two rows of papillae on lower lip.
Labial folds distinct. Eyes moderate, in HL. Barbells two pairs, well
developed, rostrals more elongated than maxillaries. Dorsal fin inserted more
or less equidistantly between snout and caudal base, first few rays are
elongated and filamentous. HD 190.49-193.13 (191.81) in HL. DB 64.36-
67.47 (65.92) in HD. HP 56.52-59.34 (57.93) in HD. HV 120.42-124.42
(122.42) in HP. Caudal forked. HC 36.04-37.89 (36.96) in SL. Rays of ventral and anal fins also show elongation. HCPD 109.65-126.45 (118.05) in LCPD. Scales moderate. Body and fins deep black with eyes and lips reddish.

Geographical distribution: India, Pakistan, Bangladesh, Nepal, Burma, Thailand, China (Talwar and Jhingran, 1991)

Distribution in Kerala: Chalakkudy and Periyar rivers (Ajithkumar et al., 2000). Habitat: Riffle-pool habitats with sandy, muddy or gravelly substratum.

Fishing methods: Cast nets and gill nets.

*Labeo rohita* (Hamilton-Buchanan)
(Plate IV, Fig. 29)

*Cyprinus rohita* Hamilton-Buchanan, *Fish. Ganges*, pp. 301, pl. 36, fig.85, 1822( Type locality: Gangetic provinces)

Common name: Rohu
Local name: Rohu

Distinguishing characters: (Based on 2 specimens, 216-218 mm TL)

D. ii, 12; P. i, 18; V.i, 7; A.iii,5; C.19; Ll.40-42, Ltr. 6.5/9

Body oblong, dorsal profile more convex, abdomen rounded. BD 24.86-26.92(25.83) in SL, 91.28-94.03 (93.69) in HL, head normal, broadly round, HL 26.54-28.12 (27.57) in SL, snout projecting and overhanging mouth, SNL 32.05-34.01(33.19) in HL. Mouth sub inferior, lips fleshy, both lips fringed. Labial folds distinct. Int roar bital distance wide, Eyes moderate, 15.12-17.02 (16.87) in HL. Barbells minute maxillary pairs only. Dorsal fin inserted more or less equidistantly between snout and caudal base, rays normal. HD 76.23-78.05 (77.69) in HL. DB 95.21-96.58 (96.21) in HD. HP 99.21-100.68 (100.21) in HD. HV 81.24-63.21 (82.48) in HP. Caudal forked, HC 22.13-
23.69 (23.26) in SL. HCPD 98.03-100.56 (100.18) in LCPD. Scales normal. Body grayish on back, flanks silvery. Fins generally dusky. Scales have darker edges which give appearance of continuous lines on flanks.

Geographical distribution: India, Pakistan, Bangladesh, Nepal, Burma, Bangladesh (Talwar and Jhingran, 1991, Jayaram, 1999)

Distribution in Kerala: Many reservoirs of Kerala (Ajithkumar et al., 2000), introduced in to many rivers, Kabini, Chalakkudy puzha, Karuvannur and Malampuzha (Shaji and Easa, 2001), Achenkoil river (Kurup et al., 2004)

Habitat: moderate and deep pools

Fishing methods: gill nets.

Genus **Puntius** Hamilton-Buchanan

*Puntius* Hamilton-Buchanan, *Fish. Ganges*, pp. 310, 388, 1822 (Type, *Cyprinus sophore* Hamilton-Buchanan)

Body short to elongate, laterally compressed, moderate to deep and Abdomen rounded. Head moderate to normal, eyes normal, snout obtuse, conical or rounded, often tuberculated. Mouth arched, jaws protractile and more or less terminal. Labial folds interrupted, lips thin, jaws without any horny covering. Dorsal fin short usually, inserted nearly opposite or a head of pelvic fins. Barbells four, two or none. Lateral line complete or incomplete, caudal fin forked, body with vibrant colorations.

1. a) Barbells present ..............................................................................2
   b) Barbells absent ...............................................................................15

2. a) Barbells a single pair ..................................................................3
   b) Barbells two pairs ......................................................................10

3. a) Last unbranched dorsal fin ray some what osseous ......................4
   b) Last unbranched ray of dorsal fin non-osseous or feebly osseous ....6
4. a) Body with two dark blotches, one at gill opening, one near caudal peduncle. \( \textit{Puntius chola} \)
   b) Body with a single blotch at caudal fin base \( \textit{5} \)

5. a) Dorsal fin inserted midway between snout tip and caudal base, scales from lateral line to pelvic fin 2.5-3.5. \( \textit{Puntius parrah} \)
   b) Dorsal fin inserted nearer to caudal base. Scales from lateral line to pelvic fin 2.5. \( \textit{Puntius dorsalis} \)

6. a) A finger like oval blotch on 12-16th scales. Anterior few dorsal rays may be filamentous \( \textit{Puntius filamentosus} \)
   b) No such oval spot on caudal base. Dorsal rays not filamentous \( \textit{7} \)

7. a) Body with 3 vertical dark blotches \( \textit{Puntius arulius} \)
   b) Body without more than two black spots \( \textit{8} \)

8. a) Scales between lateral line and dorsal fin 3.5 to 4, dorsal fin with a black spot on base of third to eight rays. \( \textit{Puntius bimaculates} \)
   b) Scales between lateral line and dorsal fin 4.5 to 5, dorsal fin without any black spot on base \( \textit{9} \)

9. a) Body with a black band along lateral line, above which another scarlet stripe, caudal fin with oblique dark and orange bands. \( \textit{Puntius denisoni} \)
   b) Body only with a dark spot, at caudal base. \( \textit{Puntius amphibiopus} \)

10. a) Last unbranched dorsal ray ossous, strong \( \textit{11} \)
    b) Last unbranched dorsal ray non-osseous and weak \( \textit{13} \)

11. a) Dark finger like mark on caudal peduncle \( \textit{Puntius sarana sabnasutus} \)
    b) No such a finger like mark on caudal peduncle \( \textit{12} \)
12. a) Lateral line scales 32-33 ............................................ Puntius carnaticus 
b) Lateral line scales 24 to 26 ......................................... Puntius bovanicus 

13. a) Body with three vertical colour bands ...................... Puntius fasciatus 
b) Body without any vertical colour bands .......................... 14 

14. a) Lateral line scales 27-32, body golden silvery with first 5-6 rays of 
dorsal fin marked with a deep dark band at its distal ends 
................................................................. Puntius jerdoni 
b) Lateral line scales 44-45, body with a dark band along lateral line 
which ends in a dark blotch at caudal peduncle .... Puntius opificephalus 

15. a) Lateral line scales 20-22, dorsal spine weak, non-osseous and non- 
serrated .............................................................. Puntius vittatus 
b) Lateral line scales more than 22, dorsal spine strong, osseous and 
serrated ........................................................................ 16 

16. a) Lateral line scales 22-26, body with two spots, dorsal fin with 3-5 rows 
of spots ........................................................................ Puntius ticto 
b) Lateral line scales 24-28. Body with a single large spot near caudal 
peduncle, no spots on dorsal fin .............................. Puntius conchonius 

**Puntius chola** (Hamilton-Buchanan) 
(Plate IV, Fig. 30) 

Cyprinus chola Hamilton-Buchanan, *Fish. Ganges*, pp. 312, 389, 1822 (Type locality: North 
eastern part of Bengal) 
Barbus titius Shaw and Shebbeare, *J. roy. Asiat. Soc. Bengal*, 3(1), p. 44, 1937 (Terai and 
Duars) 
Barbus thermalis Gunther, *Cat. Fish. Brit. Mus.*, 1868 

Common name: Chola barb Local name: Paral 

Distinguishing characters: (Based on 10 specimens, 78-106 mm TL) 

D. ii,8; P. i, 14; V. i, 8; A. ii, 5; C.19; Ll. 25-26, Ltr. 5.5/5 

*Systematics, germplasm evaluation and pattern of distribution and abundance of freshwater fishes*
Body moderately deep. BD 31.13-33.95 (32.27) in SL, head moderate to small, conical, HL 26.55-27.98 (27.37) in SL, Snout tip blunt, SNL 25.90-32.22 (29.53) in HL. Eyes 24.44-30.76 (27.51) in HL. Barbells maxillary pairs only. Dorsal spine slightly osseous and smooth, HD 83.59-88.48 (85.82) in HL. DB 75.56-79.91 (78.35) in HD. HP 66-24-78.34 (73.06) in HD. Caudal forked. HC 26.3-26.46 (26.28) in SL. HCPD 72.54 - 86.09 (81.26) in LCPD. Scales normal. Reddish brown with golden reflections on back and opercula, silvery golden on flanks and white on ventral side. Two conspicuous black spots, one near gill opening and another on 21-23 scales. Anterior dorsal rays with dark bases.

**Geographical distribution:** India, Pakistan, Bangladesh, Nepal, Burma, Bangladesh (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Meenachil river (Remadevi et al., 1996), Kabbini river, Kerala pert of NBR (Easa and Basha, 1995), 22 rivers of Kerala (Ajithkumar et al., 2000), Kabbini river system (Kurup et al., 2004).

**Habitat:** Pools with thick under water vegetation and muddy or clayey substratum.

**Fishing methods:** gill nets.

**Puntius parrah** (Day)  
(Plate V, Fig. 31)

*Puntius perlee* Day, 1865  
*Barbus parrah* Day, 1878  

**Common name:** Parrah barb  
**Local name:** Paral, Parapparal

**Distinguishing characters:** (Based on 4 specimens, 90-116 mm TL)  
D. ii, 7-8; P. i, 14; V.i, 7-8; A.ii,5; C.19, Ll.25-26, Ltr. 5.5/2.5-3
Body deep, dorsal profile more arched, BD 291-38.56 (33.47) in SL, head conical, HL 25.42-28.86 (26.32) in SL, Snout tip pointed, SNL 28.3-37.09 (33.09) in HL. Eyes 19.67-26.67 (25.43) in HL. Barbells maxillary pairs only. Dorsal fin inserted equidistantly, dorsal spine osseous and smooth, HD 75.65-97.34 (91.65) in HL. DB 52-73.66 (64.31) in HD. HP 73.38-86.37 (79.85) in HD. HV 78.71-91.83 (81.89) in HD. Caudal forked. HC 23.3-30.56 (26.94) in SL. HCPD 71.88-100 (85.72) in LCPD. Scales moderate to large, PDS 9. Body silvery with a faint lateral band. Ventral side white.

**Geographical distribution:** India (Talwar and Jhingran, 1991, Jayaram, 1999)

**Distribution in Kerala:** Travancore (Remadevi et al., 1996) Chalakkudy, Meenachil, Karuvannur, Periyar and Moovattupuzha (Ajithkumar et al., 2000).

**Habitat:** Pools with muddy or sandy substratum.

**Fishing methods:** Cast nets and gill nets.

**Puntius dorsalis** (Jerdon) (Plate V, Fig. 32)


*Systemus tristis* Jerdon, *Madras J. Lit. & Sc.,* p 316, 1849 (Type locality: river Cauveri)

*Barbus tetraspilus* Gunther, *Cat. Fish. Brt. Mus.,* 7, p 142,1868

*Barbus dorsalis* Gunther, *Cat. Fish. Brt. Mus.,* 7, p 142, 1868

**Common name:** Long snouted barb  
**Local name:** Paral

**Distinguishing characters:** (Based on 6 specimens, 154-192 mm TL)

D. ii, 8; P. i, 14; V.i, 7-8; A.ii,5; C.19; LI.26, Ltr. 5.5/2.5-3

Body elongate, dorsal profile more arched, BD 25.61-34.56 (31.47) in SL, head conical, HL 26.43-32.82 (29.32) in SL, Snout tip slightly pointed, SNL 25.3-35.09 (31.09) in HL. Eyes 20.67-28.67 (24.63) in HL. Barbells maxillary pairs only. Dorsal fin inserted equidistantly, dorsal spine osseous and

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*Systenatics, germplasm evaluation and pattern of distribution and abundance of freshwater fishes*
smooth. HD 76.75-95.34 (89.65) in HL. DB 51-73.63 (63.31) in HD. HP73.38-86.37 (79.85) in HD. HV 78.71-91.83(81.89) in HD. Caudal forked. HC 23.3-30.56 (26.94) in SL. HCPD 71.88-100 (85.72) in LCPD. Scales moderate to large, PDS 9. Body uniformly silvery with ventral side white. Specimens from Nelliampathy had golden coloured body with a diffused spot at caudal peduncle.

Geographical distribution: India, Srilanka (Talwar and Jhingran, 1991)

Distribution in Kerala: Ponnani drainage, Anamalai hills (Silas, 1951), Southern Travancore (Silas, 1951) and Chaliyar rivers (Easa and Basha, 1995), Bharathapuzha, Chalakkudy, Periyar and Moovattupuzha (Ajithkumar et al., 2000), Chalakkudy river system(Kurup et al., 2004).

Habitat: Rocky pools of upstream. The substratum may be muddy or sandy with lot of leaf litter.

Fishing methods: gill nets.

**Puntius filamentosus** (Val.)

(Plate V, Fig. 33)

*Leuciscus filamentosus* Valenciennes, *Hist. Nat. Poiss.*, 17: 95, pl. 492, 1844 (Type locality: Alleppy)

*Barbus filamentosus Day, Fish. Malabar*, p 215, 1878

*Barbus muhecola* Day, *Fish India*, p. 582, 1878


**Common name:** Indian Tiger Barb  
**Local name:** Valekkodiyan paral, Kalakkodiyan, Valechuttipparal

Distinguishing characters: (Based on 16 specimens, 68-133 mm TL)

D. iii, 9; P. i, 15; V. i, 8; a.iii,6; C.19; LI.21-23, Ltr. 4.5-5.5/2.5

Body elongate, both profiles equally arched, BD 30.06-40.51(35.21) in SL, head small, HL 28.57-32.67 (29.47) in SL, snout in adult males covered with tubercles, SNL 26.09-30.77(28.27) in HL. Eyes 24.24-34.09 (28.91) in HL.
Barbells a small maxillary pairs only. Dorsal spine weak, smooth, branched rays in adult males elongated and filamentous, HD 76.05-178.26 (107.86) in HL. DB 57.16-77.77 (58.44) in HD. HP 54.55-82.44 (67.75) in HD. HV 100-122.5 (105.49) in HD. Caudal forked. HC 28.74-36.71(32.99) in SL. HCPD 66.71-100 (77.71) in LCPD. Scales large with extensive radii, PDS 7-8. Colour varying at different stages. Adults greenish golden on back and flanks silvery. A dark oval blotch on lateral line at 14-19 th scale. Caudal fin lobes tipped with orange and black, other fins red orange with dorsal fin dusky.

**Geographical distribution:** India, Sri Lanka, Burma, Thailand (Talwar and Jhingran, 1991, Jayaram, 1999)

**Distribution in Kerala:** Throughout Kerala (Silas, 1951; Easa and Basha, 1995; Ajithkumar et al., 2000; Shaji and Easa, 2001; Kurup et al., 2004).

**Habitat:** Riffle-pool and run habitats with sand, mud or gravel as substratum.

**Fishing methods:** Cast nets and gill nets.

*Puntius arulius* (Jerdon)
(Plate V, Fig. 34)

*Systomus arulius* Jerdon, *Madras J. Lit. Sci.*, 15: 137, 1849 (Type locality: Cauveri river at Srirangapatnam)

*Systomus rubrotinctus* Jerdon, 1849

*Barbus arulius*: Day, *Fish. India*, p. 575, pl. 142, 1878

*Puntius arulius arulius*: Jayaram, 1981

**Common name:** Aruli barb

**Local name:** Paral

**Distinguishing characters:** (Based on 14 specimens, 74-112 mm TL)

D. iii, 8; P. i, 15-16; V.i, 8; A.ii,5; C.19; Li.21-23, Ltr. 5-5.5/2.5

Body deeper, dorsal profile more arched, BD 32.96-35.10 (33.99) in SL, head moderate, HL 30.36-35.9 (33.25) in SL, snout plain, SNL 28.7-32.6(30.8) in HL. Eyes 21.83-29.81 (25.61) in HL. Barbells a small maxillary pairs only. Dorsal spine weak and smooth, HD 80.17-87.98 (82.87) in HL. DB 59.9-
69.04 (63.33) in HD. HP 69.02-86.63 (80.86) in HD. HV 90.67-113.97 (108.08) in HD. Caudal forked. HC 29.79-31.45 (30.94) in SL. HCPD 52.21-56.94 (54.85) in LCPD. Scales large PDS 7-8. Colour silvery green on back, flanks silvery with green iridescence. Three prominent dark vertical blotches on body. Fins generally golden yellow to red orange, caudal fin with two bright red stripes.

**Geographical distribution:** India: Tamil Nadu, Kerala and Cauveri river system (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Kottayam (Jayaram, 1981) 25 rivers of Kerala (Ajithkumar et al. 2000), Kabbini river system (Shaji and Easa, 2001; Kurup et al., 2004)

**Habitat:** Pools with under water vegetation and muddy or clayey substratum.

**Fishing methods:** Cast nets and gill nets.

**Puntius bimaculatus** (Bleeker)
(Plate V, Fig. 35)


*Barbus bimaculatus*, Gunther, *Cat. Fish. Brit. Mus.*, 7, 147, 1868 (Sri Lanka)

*Barbus puckelli*: Day, 1878

*Puntius puckelli*: Jayaram, 1981

**Common name:** Two-spot barb
**Local name:** Paral

**Distinguishing characters:** (Based on 13 specimens, 48-66 mm TL)

D. ii, 7; P. i, 10; V.i, 7; A.i-ii, 5; C.19; Ll. 24, Ltr. 3.5/2-2.5

Small fishes with elongated and lean body, BD 24.75-25.62 (25.18) in SL, head normal, HL 22.15-23.53 (22.84) in SL, snout plain, SNL 27.26-33.13 (30.20) in HL. Eyes 32.13-34.33 (33.23) in HL. Barbells a small maxillary pairs only. Dorsal spine weak, smooth, HD 88.09-91.67 (89.88) in HL. DB 66.8-77.06 (71.93) in HD. HP 88.71-88.74 (88.43) in HD. HV 84.65-91.95 (88.30)

Geographical distribution: India, Sri Lanka (Talwar and Jhingran, 1991)

Distribution in Kerala: Chalakkudy river system (Shaji and Easa, 2001; Kurup et al., 2004)

Habitat: shallow riffles with gravel and mud as substratum.

Fishing methods: Cast nets of small mesh size.

**Puntius denisoni** (Day)

(Plate V, Fig. 36)


Puntius denisonii: Day, Fish. Malabar. P. 212, pl. 16, 1865

Barbus denisonii Day, Fish. Malabar, p. 212, 1878

Barbus (Puntius) denisonii Hora and Law, Rec. Indian Mus., 43(2), p.237, 1941 (Kerala)

Common name: Denison barb  
Local name: Chenkaniyan, Chorakkaniyan, Chorakkombi

Distinguishing characters: (Based on 18 specimens, 68-198 mm TL)

D. ii-iii, 8; P. i, 14; V.i, 8; A.iii,5; C.19; Ll. 27-28, Ltr. 4.5/2.5

An elongated fish with both profiles not much arched and dorsal profile rather straight than convex. BD 25.52-30.97(28.97) in SL, head moderately elongate, conical, HL 27.32-35.21 (30.49) in SL, snout pointed, SNL 25.25-35.12 (30.82) in HL. Eyes large, 25.45-35.40 (29.69) in HL. Barbells with maxillary pairs which are equal to eyes. Dorsal spine weak, smooth, HD 73.03-110.03 (90.16) in HL. DB 55.26-66.11 (62.27) in HD. HP in 74.97-95.68 (84.58) HD. HV 91.43-101.48 (99.12) in HD. Caudal forked. HC 21.36-36.54 (24.31) in SL. HCPD 54.32-71.26 (66.82) in LCPD. Scales moderately large, PDS 11. Back golden green, flanks golden silvery with a deep dark
band from snout tip ending at caudal peduncle. Above this, a scarlet stripe which remain at anterior third of body. Caudal fin lobes with oblique dark hands bordered with orange markings, followed by black tips.

**Geographical distribution:** India: Kerala (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Travancore (Hora & Law, 1941), Chaliyar river, the NBR (Easa and Basha, 1995), Aralam WLS (Shaji et al., 1995), Chalakkudy, Periyar, Valapatnam and Chandragiri rivers (Ajith kumar et al., 2000), Achenkoil. Periyar and Chalakkudy river systems (Kurup et al., 2004)

**Habitat:** Riftle-pool habitats with sand or gravel as substratum.

**Fishing methods:** Cast nets and gill nets.

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**Puntius amphibius** (Val.)

(Plate V, Fig. 37)

_Capoeta amphibia_ Vaencienes, (in C & V), 16: 282, pl. 478, 1842 (Type locality: Bombay)

_Puntius hamiltonii_ Day, Day, _Fish. Malabar_, p. 213,1865

_Babus amphibius_, Gunther, _Cat. Fish. Brit. Mus_. , p.144, 1863 (Bombay)


**Common name:** Scarlet banded barb

**Local name:** Paral

**Distinguishing characters:** (Based on 16 specimens, 42-98 mm TL)

- D. ii, 8; P. i, 12; V.i, 8; A.ii,5; C.19; Ll.24-25, Ltr. 4.5-5/2.5-3.5

An elongated fish with both profiles more or less equally convex, BD 24.54-30.15 (28.12) in SL, head normal, HL 28.08-32.05 (30.22) in SL, snout blunt, eyes large, 26.08-32.09 (28.08) in HL. Barbells with a small pair of maxillaries, dorsal spine weak, smooth, HD 88.29-94.28 (91.16) in HL. DB 70.24 -73.08 (72.9 )in HD. HP 76.27-80.45 (78.77) in HD. HV 91.28-96.24 (94.78) in HD. Caudal forked. HC 26.28-29.48 (29.02) in SL. HCPD 50.28-52.64 (51.89) in LCPD. Scales moderately large, PDS 7. Body with back grayish green in colour, flanks silvery, ventral side white. Fins golden yellow. Caudal peduncle with an oval shaped dark blotch.
Geographical distribution: India, Sri Lanka (Talwar and Jhingran, 1991)

Distribution in Kerala: Throughout Kerala (Ajithkumar et al., 2000; Gopi, 2000; Shaji and Easa, 2001), Chalakkudy, Bharathapuzha, Kabbini, Meenachil and Kallada river systems (Kurup et al., 2004).

Habitat: shallow riffle-pools with lot of vegetation and muddy or gravelly substratum.

Fishing methods: Cast nets

*Puntius sarana subnasutus* (Valenciennes)  
(Plate V, Fig. 38)

*Barbus russelli* Gunther, *Cat. Fish. Brit. Mus.*, 7, p. 121, 1868  

Common name: Peninsular barb  
Local name: Kuruva, Kuruvarappal

Distinguishing characters: (Based on 7 specimens, 162-267 mm TL)

D. iii, 8; P. i, 14-16; V.i, 8; A. ii, 5; C.19; L.I.27-29, L.tr. 6-6.5/3.5-4

Body oblong, compressed and deep. BD 30.32-32.41 (30.89) in SL, head moderate to small, HL 25.61-25.71 (26.42) in SL, snout blunt, SNL 29.99-30.93 (30.51) in HL. Eyes moderate, 21.46-26.03 (23.09) in HL. Barbells rostral and maxillary pairs, maxillaries longer and more than eyes. Dorsal spine osseous, strong and serrated posteriorly. HD 87.17-100.17 (94.55) in HL. DB 59.75-72.29 (64.26) in HD. HP 73.31-95.76 (85.37) in HD. HV 81.01-93.10 (88.03) in HD. Caudal forked. HC 22.77-27.33 (24.52) in SL. HCPD 59.12-74.46 (69.43) in LCPD. Scales large, PDS 9-10. Back greenish silvery, flanks silvery, scales with black bases and in young specimens it appear as several continuous lines. Scales have extensive radii. A dark blotch on lateral...
line near caudal peduncle on 24th scale. Fins red orange, caudal fin edges dusky.

**Geographical distribution:** India (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Travancore (Hora and Law, 1941), Periyar Tiger Reserve (Chacko, 1948), Vembanad lake (Remadevi *et al*., 1996), Throughout Kerala (Ajithkumar *et al*., 2000), Chalakkudy, Bharathapuzha, Kallada river systems (Kurup *et al*., 2004)

**Habitat:** Low lying pool-run habitats with sandy, muddy or gravelly substratum.

**Fishing methods:** Cast nets and gill nets.

**Puntius carnaticus** (Jerdon)


**Common name:** Carnatica carp  
**Local name:** Kadanna, Pachilavetti

**Distinguishing characters:** (Based on 16 specimens, 184-384 mm TL)

D. iii-iv,8; P. i, 14; V.i, 8; A.i,5; C.19; Li.32-33, Ltr. 4.5-5.5/3.5

Body elongate, both profiles equally convex up to posterior end of dorsal base. dorsal profile straight afterwards. Body moderately deep, BD 30.32-31.59 (31.25) in SL, head moderate to small, HL 24.85-28.03 (26.44) in SL, snout blunt, SNL 28.39-28.63 (28.51) in HL. Eyes moderate, 23.63-26.26 (24.94) in HL. Barbells rostral and maxillary pairs, maxillaries longer and equal to eyes. Dorsal spine osseous, strong and smooth, 94.75-98.82 (96.79) in HL. DB 61.53-67.22 (64.37) in HD. HP 78.82-87.63 (83.23) in HD. HV 83.23-95.62 (89.42) in HD. Caudal forked. HC 27.62-33.24 (30.43) in SL.
HCPD 80.51-86.04 (83.28) in LCPD. Scales moderate to large, PDS 11-12.

Back greenish silvery, flanks silvery, fins golden yellow to red orange

**Geographical distribution:** India (Talwar and Jhingran, 1991, Menon, 1999)

**Distribution in Kerala:** Wynaad (Jayaram, 1991), Kabini, Chinnar, Parambikulam wild life sanctuary (Biju et al., 1999b), Nelliampathy hill ranges (Silas, 1951), Kabbini river, NBR (Easa and Basha, 1995), Kabbini, Bhavani, Pambar and Chalakkudy river systems (Kurup et al., 2004)

**Habitat:** Riffle-pool habitats with boulders, cobbles and gravelly substratum and also mid channel pools with sandy bottom and good riparian cover.

**Fishing methods:** Cast nets and gill nets.

**Puntius bovanicus** (Day)

(Plate V, Fig. 40)

*Barbus bovanicus* Day, *Fish. India*, p.566, pl.138, fig.1, 1878 (Type locality: Bhavani river at base of Nilgiri hills)

*Puntius bovanicus* Jayaram, *Handbk. Fw. Fish. India*, p.99, 1982 (Cauveri river, South India)

**Common name:** Bowani barb **Local name:** Paral

**Distinguishing characters:** (Based on a single specimen, 158 mm TL)

D. iii, 0; P. i, 12; V. i, 8; A. ii, 5; C. 19; Ll. 30, Ltr. 5.5/3

Body with both profiles equally arched, moderately deep, BD 31.21 in SL, head moderate to small, HL 24.95 in SL, snout blunt, covered with fine tubercles. A distinct rise over snout and interorbital region predominantly convex. eyes large, 30.14 in HL. Barbells rostral and maxillary pairs, maxillaries longer. Dorsal spine osseous, strong and smooth, 107.39 in HL. HP 81.54 in HD. HV 97.74 in HD. Caudal forked. HC 34.29 in SL. HCPD 81.90 in LCPD. Scales moderate to large, PDS 13. Back greenish silvery, flanks silvery with golden reflections, fins golden yellow to red-orange.

**Geographical distribution:** India (Talwar and Jhingran, 1991)

Habitat: Ripple-pool habitats with sand or gravel as substratum.

Fishing methods: Cast nets and gill nets.

**Puntius fasciatus** (Jerdon)
(Plate VI, Fig. 41)

*Cirrhinus fasciatus* Jerdon, Madras J. Lit. & Sci., p.305,1849 (Type locality: streams of Malabar)

*Puntius fasciatus fasciatus* Jerdon, 1849


*Babus melanampyx* Day, Fish. India, p. 570, pl. 139, fig.1, 1865

Common name: Melon barb          Local name: Vazhakkavarayan

Distinguishing characters: (Based on 18 specimens, 47-63 mm TL)

D. ii, c; P. i, 12-14; V.i, 8; A.ii,5; C.19; L.I.20, L.tr. 4-4.5/2.5-3

Body small, elongate and deep. A distinct rise from occipit to dorsal fin. BD 32.3 - 33.38 (32.89) in SL, head conical, normal, HL 33.32-37.94 (35.03) in SL, snout blunt, covered with fine tubercles in mature males. Lips fleshy. SNL 31.15-33.7(32.15) in HL. Eyes moderate to large, 22.21-26.37(23.66) in HL. Barbells two pairs, well developed. Maxillaries more than two times in eyes. Dorsal spine weak, HD 62.01-71.51(68.34) in HL. DB 75.9-107.74 (90.12) in HD. HP 73.85-108.85 (89.02) in HD. HV 91.8-98.84 (96.52) in HD. Caudal forked but not deep. HC 23.83-30.58(26.83) in SL. HCPD 105.71-180.1(132.0) in LCPD. Scales moderate to large, PDS 6-7. Deep to dull red body, with 3-4 wide black cross bands, below dorsal fin, just above anal fin or in front, just at caudal peduncle respectively. Fins pinkish with black edges. Heat. and snout dark.

Geographical distribution: Peninsular India (Talwar and Jhingran, 1991, Jaya am, 1999)
Distribution in Kerala: Throughout Kerala (Ajithkumar et al., 2000, Shaji and Easi., 2001), Chalakkudy, Kabbini, Kallada, Meenchil river systems (Kurup et al., 2004).

Habitat: Riffles and channels at middle and upstream of rivers.

Fishing methods: Cast nets and scoop nets.

**Puntius jerdoni** (Day)  
(Plate VI, Fig. 42)

*Barbodes* (Barbodes) *jerdoni* Day, *J.Linn.Soc.*, 12, p 574, 1876 (Type locality: Deccan)  
*Barbodes* (Barbodes) *dobsorni* Day, *Fish India*, p. 563, pl. 139, 1876

Common name: Jerdon’s carp  
Local name: Chuttipparal

Distinguishing characters: (Based on 8 specimens, 124-184 mm TL)

D. ii,9; P. i, 14-15; V. i, 8; A.ii,5; C.19; Ll.30-31, Ltr. 6.5/3.5

Body moderate to fairly deep. Both profiles equally arched, BD 23.59-52.09 (34.47) in SL, head small, HL24.73-33.72 (29.04) in SL, snout blunt, covered with fine tubercles in mature males. SNL 28.92-34.57 (32.42) in HL. Eyes moderate to large, 26.7- 33.03 (29.63) in HL. Barbells two pairs, Maxillaries equal to eyes. Dorsal spine weak, HD 80.21-119.01(103.11) in HL. DB 49.32-65.33 (56.58) in HD. HP 68.25-76.64 (71.95) in HD. HV 87.52-101.5 (100.57) in HD. Caudal forked. HC 29.10-43.25 (33.87) in SL. HCPD 84.37-118.41(110.2) in LCPD. Scales moderate, PDS 10-11. Body silvery golden with fins golden yellow to red orange. Caudal and anal fin rays tipped with black and dorsal fin with a prominent deep dark band along distal end of first 4 rays.

Geographical distribution: India (Talwar and Jhingran, 1991)
Distribution in Kerala: Chandragiri, Bharathapuzha, Chalakkudy and Meenachil (Ajithkumar et al., 2000), Chalakkudy river (Shalji and Easa, 2001), Achenkoil river system (Kurup et al., 2004)

Habitat: Riffle-pools with sandy or gravelly substratum.

Fishing methods: Cast nets and gill nets.

**Puntius ophicephalus** (Raj)
(Plate VI, Fig. 43)

*Barbus (Puntis) ophicephaius*, Raj, Rec. Indian Mus., 43. p.375, 1941 (Type locality: Kallar river, Pachakkanam estate, Periyar lake)

Common name: Channa barb Local name: Eeetilakkenda, Eechathalakkenda

Distinguishing characters: (Based on 8 specimens, 84-181 mm TL)
D. ii, 7; P. i, 13; V.i, 8; A.ii,5; C.19; Ll.44-45, Ltr. 6-6.5/3

Body elongate, both profiles equally arched, BD 19.54-22.36 (21.18) in SL, head normal, conical, HL 17.36-19.12 (18.56) in SL, snout somewhat blunt, interorbital region flat and slightly more wide. Eyes moderate, 33.62-37.25 (36.10) in HL. Barbells two pairs, Maxillaries longer than eyes. Dorsal spine slightly osseous or stiff. HD 121.43-124.18(124.1) in HL. DB 60.12-62.38 (61.44) in HD. HP 77.12-80.12 (79.03) in HD. HV 97.48-100.26 (99.08) in HD. Caudal forked. HC 16.48-18.4 (17.34) in SL. HCPD 60.24-63.48 (62.65) in LCPD. Scales small, PDS 18. Body golden brown on back, flanks silvery golden with fins red orange. A dark band from behind opercula, ending at caudal peduncle in a dark blotch is invariably seen.

Geographical distribution: India: Kerala (Jayaram, 1999)

Distribution in Kerala: Tributaries of Kallar and Periyar (Shaji and Easa, 2001), Periyar river (Kurup et al., 2004)
**Habitat:** Rifle-pools of small channels at upstream of Periyar, joining main stream with sandy, gravelly or muddy substratum with lot of leaf litter and good canopy cover preferably of bamboo (Eeetta = Bamboo in Malayalam)

**Fishing methods:** Cast nets and gill nets.

**Puntius vittatus** Day  
(Plate VI, Fig. 44)

*Puntius muzaffarpurensis* Srivasthava et al., p. 72, 1976  
*Puntius coorgensis* Jayaram, p. 47, 1982  

**Common name:** Kooli barb  
**Local name:** Paral

**Distinguishing characters:** (Based on 12 specimens, 28-42 mm TL)

- D. I, 7-8; P. i, 11; V.i, 8; A.ii, 6; C.19; Ll. 20, Ltr. 2.5-3.5-4

- Body small, elongate and deep. Dorsal profile distinctly rise from occipit to dorsal fin. BD29.82-34.78 (31.91) in SL, head moderate, HL 26.9-32.7(30.74) in SL, snout blunt, SNL 25.46-30.90(27.29) in HL. Eyes moderate to large, 23.61-30.07(26.85) in HL. Barbells absent, dorsal spine weak, HD 72.38-87.27 (79.71) in HL. DB 67.66-80.68 (71.84) in HD. HP 64.44-109.5 (87.61) in HD. HV 79.13-105.23 (88.69) in HL. Caudal forked. HC 23.60-28.79 (28.97) in SL. HCPD 80.75-85.59 (83.29) in LCPD. Scales moderate, PDS.7-8. Back greenish silvery, flanks silvery, fins golden yellow to hyaline. Dorsal fin marked with a straight or arched dark band in middle and a black spot at caudal peduncle.

**Geographical distribution:** India, Pakistan, Srilanka (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Most of all river systems (Ajith kumar et al., 2000; Shaji and Easa, 2001; Kurup et al., 2004)
Habitat: Slow flowing channels or small pools with sandy or muddy substratum. **Fishing methods:** Cast nets and scoop nets.

**Puntius ticto** (Hamilton-Buchanan)  
(Plate VI, Fig. 45)

_Cyprinus ticto_ Hamilton-Buchanan, _Fish. Ganges_, pp. 314, 398, pl. 8, figs. 87, 1822 (Type locality: South-east Bengal)  
_Puntius punctatus_ Day, 1865  
_Barbos stoliczkanus_ : Day, 1878  
_Barbos (Puntius) ticto_: Hora and Law, 1949

**Common name:** Ticto barb, two spot barb  
**Local name:** Paral

**Distinguishing characters:** (Based on 10 specimens, 32-52 mm TL)

D. ii, 8; P. i, 12; V.1, 7; A.i,5; C.19; Ll. 22-23, Ltr. 4.5-5/3.5

Body small, highly compressed and deep. Dorsal and ventral profiles equally arched. BD 34.82-40.04 (35.02) in SL, head conical, small, HL 29.86-38.68 (30.93) in SL, snout blunt, SNL 24.75-38.35 (30.97) in HL. Eyes large, 22.09-33.86 (29.31) in HL. Barbells absent, dorsal spine osseous, strong and serrated at its posterior end. HD 68.86-124.48 (88.25) in HL. DB 50.09-74.21(69.78) in HD. HP 55.04-88.19(74.12) in HD. HV 86.53-121.52 (107.52) in HD. Caudal forked. HC 29.77-31.38(31.30) in SL. HCPD 74.78-108.61(94.97) in LCPD. Scales moderate, PDS 9-10. Lateral line incomplete, ceases after 7th scale. Back greenish silvery, flanks silvery golden and two spots, a small one behind opercula, on fourth scale and a large one near caudal peduncle on 19-21st scales. Dorsal fin marked with 3-5 rows of spots. Other fins golden yellow.

**Geographical distribution:** India, Pakistan, Sri Lanka, Bangladesh, Burma and Thailand (Talwar and Jhingran, 1991)
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Distribution in Kerala: Almost all rivers (Shaji and Easa, 2001, Ajith kumar et al., 2000), Chalakkudy, Manimala, Bharathapuzha, Meenachil river systems (Kurup et al., 2004).

Habitat: slow flowing waters with sandy or muddy substratum.

Fishing methods: Cast nets and scoop nets.

**Puntius conchonius** (Hamilton-Buchanan)
(Plate VI, Fig. 46)

*Cyprinus conchonius* Hamilton-Buchanan, *Fish Ganges*, pp. 317, 318, 389, 1822 (Type locality: Ponds of north east Bengal)


*Puntius conchonius* khagariansis Srivasthava and Munshi, *Natural History & Syst. Fw. Fishes*, p. 179, 1988 (Khagaria district, Bihar)

Common name: Rosy barb

Local name: Vattapparal

Distinguishing characters: (Based on 12 specimens, 58-69 mm TL)

D. ii-iii, 8; P. i, 13; V. i, 7; A. ii, 5; C. 19; Ll. 26-27, Ltr. 6.5/4.5-5.5

Body small, compressed and deep, profiles equally and greatly arched. BD 37.99-46.57 (43.54) in SL, head conical, small, HL 24.33-28.5 (29.69) in SL, snout bluntly pointed, SNL 16.12-24.06 (22.5) in HL. Eyes large, 22.62-27.45 (27.04) in HL. Barbells absent, dorsal spine osseous, strong, and serrated at its posterior end. HD 56.66-88.39 (65.16) in HL. DB 76.71-94.64 (83.06) in HD. HP 82.9-117.17 (100.04) in HD. HV 76.57-108.25 (96.32) in HD. Caudal forked. HC 17.81-26.53 (21.54) in SL. Scales moderate to large, PDS 9-10. Lateral line incomplete, ceases after 12-13 th scale. Body silvery with a bluish sheen, scales at flanks have red lunules, more conspicuous in brooders. Fin rays are dusky black. A deep, black, round spot along lateral line near caudal peduncle, on 17-20 th scales.

Geographical distribution: India, Pakistan and Bangladesh (Talwar and Jhingran, 1991)
**Distribution in Kerala:** abundant in streams and rivers of Wynnaad (Shaji and Easa, 2001), Bharathapuzha, Manimala, Kariyangode and Chandragiri rivers (Ajith kumar et al., 2000), Kabbini and Bharathapuzha (Kurup et al., 2004)

**Habitat:** Riffle-pool habitats with sand or gravel as substratum.

**Fishing methods:** Cast nets and, gill nets of small mesh size

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**Sub family: Cultrinae**

Fishes with small to moderate and highly compressed body and a knife like (cultrate) abdominal edge. Mouth oblique and in some species directed upwards. Lower jaw prominent, often with a symphysial process, barbells absent. Dorsal fin short and placed behind origin of pelvic fins, normally opposite to anal fin. Lateral line curved downwards and running along lower half of body.

**Key to Genera**

1. a) Body elongate, silvery, mouth terminal and jaws with a symphysial process.............................................................................................................. *Salmostoma*
   
   b) Body deep, with stripes or spots, mouth and jaws without a symphysial process.......................................................................................... *Chela*

**Genus Chela** Hamilton-Buchanan

*Chela* Hamilton-Buchanan, 1822 (Type: *Cyprinus (Chela) cachius*)

Body small, elongate, highly compressed, abdomen partly keeled. Head moderate to small. Mouth oblique, upturned, jaws without any symphysial process. Eyes large, dorsal fin with last unbranched ray non-osseous and non-serrated, inserted behind origin of pelvic fin and nearly opposite or slightly behind origin of anal fin. Fins with their outer rays generally have a
tendency for elongation, prominently in pelvic fins. Lateral line complete, running along lower half of body. Caudal deeply forked.

1. a) Lateral band with 3-4 black dots, anal fin rays 11-12  
..................Chela dadiburjori

b) Lateral band without any spots, anal fin rays 14........Chela fasciata

**Chela dadiburjori** (Menon)

(Plate VI, Fig. 47)

Laubuca dadiburjori Menon, Rec. Indian Mus., 49: 1, 1952 (Type locality: Cochin, Kerala)
Chela dadiburjori: Talwar and Jhingran, Inland Fish., 1: 314, 1991 (Nagercoil and Goa)

Common name: Dadio  
Local name: vilanjil

**Distinguishing characters:** (Based on 6 specimens, 32-42 mm TL)

D. ii, 7; P.i,12; V.i,6; A.i,11-12; C.19; L.i,32-34, L.tr.5.5/2.

BD 19.48-22.31 (21.36) and HL 26.82-32.16 (32.15) in SL. Eyes 21.72-38.42 (32.35) in HL. INTO 33.16-39.26 (37.48) in HL. Dorsal fin inserted slightly behind origin of anal fin, HD 66.49-78.12 (73.15) in HL. Pectorals longer than head, HP 110.26-128.34 (118.42) in HL. First ray of ventral fin elongate, HV 72.64-81.29 (78.12) in HP. HC 23.12-27.26 (26.48) in SL. PDS 18. Dorsal and flanks silvery and fins yellowish orange. A dark steel blue lateral stripe along middle of body. Three-four black spots along flanks.

**Geographical distribution:** India: Nagercoil (TamilNadu) and Sanguen (Goa) (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Trivandrum (Silas, 1958), Bharathapuzha and Chalakkudy puzha (Shaji and Easa, 2001).

**Habitat:** Riffles and pools at lower streches, among thick vegetation

**Fishing method:** Scoop nets and cast nets of small mesh sizes.
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Chela fasciata Silas
(Plate VI, Fig. 48)

Chela fasciatus Silas, J. Bombay Nat. Hist Soc. p. 87, 1958 (Type locality: Anamalai river)

Common name: Malabar hatchet chela
Local name: vilanjil

Distinguishing characters: (Based on 62 specimens, 23-52 mmTL)

D. ii, 7; P.i,11; V.i,6; A.ii,14; C.19; Ll. 32-33, Ltr. 5.5/2.
BD 19.49-23.14 (21.46) and HL 27.17-32.37 (28.28) in SL. Eyes 21.86-39.11 (31.01) in HL. INTO 34.50-40.59 (37.50) in HL. Dorsal fin inserted slightly behind origin of anal fin, HD 68.39-88.09 (78.01) in HL. Pectorals longer than head, HP 107.65-130.63 (119.15) in HL. First ray of ventral fin elongate, HV 72.96-89.45 (81.59) in HP. HC 23.66-30.29 (26.84) in SL. Body with broad scales. PDS 18. Back and flanks silvery, fins yellowish orange. A dark, wide lateral band from behind opercula reaches up to caudal peduncle.

Geographical distribution: Peninsular India: Anamalai hills (Talwar and Jhingran, 1991)

Distribution in Kerala: Anamalai hills (Vannathura in Chittoor), Chalakkudy (Shaji and Easa, 2001), Bharathapuzha river (Ajithkumar et al., 2000; Kurup et al., 2004).

Habitat: Riffles and pools at lower stretches, among thick vegetation

Fishing method: Scoop nets and cast nets of small mesh sizes.

Genus Salmostoma Swainson

Salmostoma Swainson, Nat. Hist. Fish., 2: 284, 1839 (Type, Cyprinus bacaila Hamilton-Buchanan)

Body bigger than genus Chela, elongate, compressed and abdomen keeled.

Head moderate, snout slightly upturned. Mouth oblique, Jaws with symphysial process. Eyes large, dorsal with last unbranched ray non-
osseous and non-serrated, inserted behind origin of pelvic fin and nearly opposite or slightly behind origin of anal fin. Outer rays of pelvic fins not elongate. Lateral line complete, running along lower half of body. Caudal deeply forked. Body uniformly shining silver in colour, fins yellowish orange.

**Key to species**
1. a) Lateral line scales 42-44, dorsal fin inserted slightly behind origin of anal fin ........................... *Salmostoma acinaces*
b) Lateral line scales 41-43, dorsal fin inserted opposite or in advance of anal fin ........................................ *Salmostoma boopis*

*Salmostoma acinaces* (Valenciennes)  
(Plate VI, Fig. 49)

*Leuciscus acinaces* Valenciennes, *Hist. Nat. Poiss.*, 17: 347, pl. 509, 1844 (Type locality: Cauveri drainage, Mysore)  
*Chela diffusa* Gunther, *Cat. Fish. Brit. Mus.*, 7: 334, 1868 (Cauveri river)

**Common name:** Silver razor belly Minnow  
**Local name:** Mathipparal

**Distinguishing characters:** (Based on 58 specimens, 34-164 mm TL)

D. ii, 8; P.i,12; V.i,7; A. ii, 15; C.19; Ll. 42-44, Ltr. 6.5/2.

BD 19.21-19.22 (19.20) and HL 16.64-17.19 (16.92) in SL. Eyes 41.76-43.90 (42.83) in HL. INTO 38.48-39.62 (39.03) in HL. Mouth oblique. Dorsal fin inserted slightly behind origin of anal fin, HD 89.21-91.73 (90.47) in HL. Pectorals longer than head, HP 149.02-153.50 (151.26) in HL. HV 56.72-62.48 (59.60) in HP. HC 25.06-26.06 (25.56) in SL. Body with broad scales. PDS 17. Dorsal and flanks silvery and fins yellowish orange.

**Geographical distribution:** India: Cauveri river system; Bhavani river, Wynaad; Hoogly river (West Bengal) (Jayaram, 1999)
Distribution in Kerala: Kabbini, Chalakkudy puzha, Chaliyar (Shaji and Easa, 2001), Bhavani river, Wynaad (Jayaram, 1999), 7 rivers of Kerala (Ajithkumar et al., 2000; Kurup et al., 2004).

Habitat: pools of upper and middle stretches.

Fishing method: cast nets of small mesh sizes.

**Salmostoma boopis** (Day)

(Plate VI, Fig. 50)


Common name: Boopis razor belly minnow

Local name: Mathipparal, Kokkuparal

Distinguishing characters: (Based on 112 specimens, 32-96 mmTL)

D. ii, 7; P.i,11-12; V.i,7; A.ii-iii,14; C.19. Ll. 41-43, Ltr. 6-6.5/1.5-2


Geographical distribution: India: Western Ghats: South Canara and Poona (Talwar and Jhingran, 1991)

Distribution in Kerala: Kabbini, Chalakkudy, Chaliyar, Chimmoney, Bharathapuzha and Payaswini (Shaji and Easa, 2001), 28 river of Kerala (Ajithkumar et al., 2000), Achenkoil, Bharathapuzha, Kabbini river systems (Kurup et al., 2004)

Habitat: pools of upper and middle stretches.

Fishing method: cast nets of small mesh sizes.
Sub family: Rasborinae

Small or medium sized fishes with laterally compressed, elongate and silvery body. Abdomen round, always non-keeled. Mouth usually oblique and upturned. A symphysial knob on lower jaw may be present. Barbells present or absent. Dorsal fin without any osseous spine, placed behind origin of pelvic fins and with seven rays. Anal fin usually long with 6-16 branched rays. Scales small. Lateral line complete or rarely incomplete, curved downwards and running along lower half of body, caudal forked.

This subfamily is represented by fishes having great ornamental importance owing to vibrant nature and vivid colour pattern. Most fishes are surface feeders and most of the species are abundant in upper and middle reaches of river systems.

Key to Genera

1. a) Maxillary barbells very long. No symphysial knob on lower jaw

..........................................................Esomus
b) Maxillary barbells short or absent, lower jaw usually with a symphysial knob.................................................................2

2. a) Upper lip absent, lateral line incomplete..................Amblypharyngodon
b) Upper lip present, lateral line complete or incomplete or some times absent.............................................................3

3. a) Lateral line complete.........................................................4
b) Lateral line incomplete or absent.................................Brachydanio

4. a) Body with a single broad lateral band.................................Rasbora
b) Body with longitudinal bands or bluish spots..........................5
5. a) Dorsal fin with 7-10 branched rays, pectoral axillary scale with a fleshy border, body with bluish spots or blue vertical bars .......... *Barilius*

b) Dorsal fin with 8-18 branched rays, pectoral axillary scale small and without a fleshy border, body with golden longitudinal lines .......... *Danio*

Genus: *Esomus* Swainson


*Esomus thermoicos* (Valenciennes)

(Common name: Sri Lanka flying barb)  
Local name: Meesapparava

Distinguishing characters: (Based on 16 specimens, 58-74 mm TL)

D. ii, 6; P.i,14; V.i,7; A.ii,5; C.19; Ll. 34-36, Ltr. 5.5-6 / 1.5-2


Geographical distribution: India, Sri Lanka (Talwar and Jhingran, 1991)
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**Distribution in Kerala:** Chaliyar and Kabbini rivers, Nilghiri Bioreserve (Easa and Basha, 1995), Bharathapuaha (Ajithkumar et al., 2000), Chalakkudy river system (Kurup et al., 2004)

**Habitat:** Riffle-pool habitats with sand or gravel as substratum.

**Fishing method:** Cast nets.

Genus *Amblypharyngodon* Bleeker


*Amblypharyngodon microlepis* (Bleeker)  
(Plate VII, Fig. 52)

*Leuciscus pellucidus* McClelland, *Asian Res.*, 19:293, 408, 1839 (Ganga and Brahmaputra rivers)  
*Amblypharyngodon melettinus*: Bimachar and Rau, *J. Mys. Univ.*, 1:55,1941(Mysore)

**Common name:** Indian Carplet  
**Local name:** Vayambu

**Distinguishing characters:** (Based on 86 specimens, 63-96 mmTL)

- *D. ii 7; P.i,14; V.ii,8; A.ii,5; C.19; L.l., Ltr.5.5-6/1.5-2*
  - BD 22.52-30.15 (26.98) and HL 28.61-30.96 (29.68) in SL. Eyes large, 23.51-27.82(25.24) in HL. INTO 28.78-41.90 (34.18) in HL. Barbells absent.
  - Dorsal fin short, HD 73.11-80.55 (76.48) in HL. HP 74.59-79.46 (76.96) in HD. HV 79.83-92.48 (81.44) in HP. LCPD 16.05-20.77 (17.92) in SL. HCPD 56.6-76.82 (65.31) in LCPD. Caudal forked, HC 28.8-30.48 (29.81) in SL.

**Geographical distribution:** India (Talwar and Jhingran, 1991)

**Distribution in Kerala:** In low land freshwater bodies (Shaji and Easa, 2001), Chalakkudy and Bharathapuzha river systems (Kurup et al., 2004)
Habitat: Pool-run habitats with sand or mud as substratum.

Fishing methods: seine nets of small mesh size.

Genus *Brachydanio* Weber and de Beufort

*Brachydanio* Weber and de Beufort, *Fish Indo-austral Archipel*. 3, p.85, 1916 (Type *Nuria alicornata* Blyth)

*Brachydanio rerio* (Day)  
(Plate VII, Fig. 53)

*Danio rerio*: Day, *Fish. India*, pp. 595, 597, pl. 51, fig.4, 1878 (Type locality: Bengal and as low down as Coramandal coast at Masulipatnam)

Common name: Zebra danio  
Local name: Paral

Distinguishing characters: (Based on 12 specimens, 28-33 mm TL)

D. ii, 7; P. i, 12; V. i, 6; A. i, 12-13; C. 19


Dorsal fin short, HD 62.48-68.45 (64.6) in HL. HP 122.48-152.48 (146.28) in HD. HV 58.12-66.24 (61.82) in HP. LCPD 11.14-14.59 (13.31) in SL. HCPD 160.24-168.24 (165.52) in LCPD. Caudal forked, HC 26.91 in SL. Scales small, deciduous. Grayish green dorsally and flanks shining blue traversed with four shining golden stripes from head to caudal fin. Stripes are also clear on anal fin as well.

Geographical distribution: Pakistan, India: Eastern parts from West Bengal to Krishna river system; Bangladesh and Nepal (Talwar and Jhingran, 1991)

Distribution in Kerala: Wyanad (Shaji and Easa, 2001)

Habitat: slow moving channels of paddy fields or streams with sand or mud as substratum.

Fishing methods: seine nets of small mesh size.
Genus Rasbora Bleeker


Rasbora daniconius (Hamilton-Buchanan)  
(Plate VII, Fig. 54)

Cyprinus daniconius Hamilton-Buchanan, Fish. Ganges, p. 327, pl. 15, fig. 89, 1822 (Type locality: rivers of Southern Bengal)
Leuciscus anjana: McClelland, Asiatic Res., 19(2): 1839

Common name: Rasbora Local name: Kaniyan paral

Distinguishing characters: (Based on 116 specimens, 32-128 mm TL)
D. ii, 7; P.i,14; V.i,8; A.ii,5; C.19; Ll. 32-34, Ltr. 5/2

BD 25.29-25.64 (25.43) and HL 25.45-30.92 (28.08) in SL. Eyes 26.73-30.12 (28.44) in HL. INTO 33.22-43.22 (37.81) in HL. HD 67.88-91.46 (79.82) in HL. HP 81.48-94.17 (87.02) in HD. HV 79.58-84.36 (82.19) in HP. LCPD 14.61-15.52 (14.92) in SL. HCPD 80-90 (85.86) in LCPD. HC 25.02-26.38 (25.65) in SL. Silvery or greenish yellow on dorsal side and flanks. A mid-dorsal dark streak present from head to dorsal fin. A wide dark longitudinal band from snout tip through eyes up to caudal peduncle present, which is even extending to caudal fin. On preservation, band become deep dark. Fins red orange or yellowish.

Geographical distribution: Pakistan, India, Srilanka, Benglades, Burma and Mekong (Talwar and Jhingran, 1991)


Habitat: Seen in both low-lying plains and ponds and extreme high altitudes.

Fishing methods: Cast nets and gill nets.
Chapter 2

Systematics

Genus *Barilius* Hamilton-Buchanan

*Barilius* Hamilton-Buchanan, *Fish. Ganges*, p. 384, 1822 (Type, *Cyprinus barila* Hamilton-Buchanan)

Body shallow to deep, laterally compressed. Abdomen rounded. Head small to moderate or even large and snout pointed. Lower jaw shorter, with a poorly developed symphysial process. Eyes large and are lateral in position, Mouth terminal. Barbells two small pairs or absent. Dorsal fin inserted behind origin of pelvic fins and extending over anal fin, without any osseous ray and with 7-10 branched rays. Pectoral fin has a well-developed axillary scale with fleshy border. Anal fin with 9-17 rays. Lateral line complete, running along lower half of body. Caudal forked. Barline fishes usually inhabit torrential waters of upstream and middle stream of rivers and are brilliantly coloured.

Key to species

1. a) Barbells present, body with vertical bars ........................................ 2
   b) Barbells absent, body with row of spots ..................................... 3

2. a) Barbells two pairs, scales with black mottling .......... *Barilius bendelisis*
   b) Barbells single pair, scales without any black mottlings

3. a) Body with a single row of spots, Maxilla reaching below middle of orbit .............................................. *Barilius bakeri*
   b) Body with two or more rows of spots, maxilla reaching to below anterior third of orbit ................................*Barilius canarensis*

*Barilius bendelisis* (Hamilton-Buchanan)

(Plate VII, Fig. 55)

*Cyprinus bendelisis* Hamilton-Buchanan, *Journey Mysore*, 3: 345, pl. 32, 1807 (Type locality: Vedawathi stream, headwaters of Krishna river)
Cyprinus coca Hamilton-Buchanan, *Fish. Ganges*, p.272, pl. 3, fig. 77, 1822 (Northern rivers of Bengal and Bihar)  
*Barilius bendelisis*: Gunther, *Cat. Fish. Brit. Mus.*, 7:288, 1868 (Mysore and Ganges)  
*Cyprinus chedra*: Hamilton, *Fish. Gnages*, p. 273, 1822 (Northern rivers of Bengal)

**Common name:** Hamilton’s barila  
**Local name:** Pavuka

**Distinguishing characters:** (Based on 28 specimens, 54-98 mm TL)

D. ii, 7; P.i,12; V.i,7; A.ii,8; C.19; Ll. 4-43, Ltr. 6.5-7.5/2.5

Elongate and shallow body, dorsal profile smoothly round, BD 27.36-28.85(28.13) and HL 13.24-26.6(20.74) in SL. Maxilla extends to below anterior third of orbit. Eyes 19.02-20.98 (19.98) in HL. INTO 30.66-33.75 (31.76) in HL. Barbells two small maxillary and rostral pairs. Tubercles on snout minute. HD 72.78-78.01 (77.01) in HL. HP 99.78-119.46 (108.48) in HD. HV 68-72.1(71.20) in HP. LCPD 8.6-19.4 (12.8) in SL. HCPD 102.08-159.42 (104.57) in LCPD. HC 22.12-23.90 (22.97) in SL. PDS 19. Lateral line complete. Silvery on dorsal and flanks with 10-13 vertical bluish bands descending from dorsal towards lateral line. Scales especially above lateral line and dorsal profile are mottled with small dark spots. Fins yellowish to orange in colour. Outer margins of dorsal and caudal dusky.

**Geographical distribution:** Pakistan, India, Sri Lanka, Bangladesh, Nepal (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Bharathapuzha, Chalakkudy, (west flowing) and Chinnar and Pambar (east flowing) (Ajithkumar et al., 2000; Shaji and Easa, 2001, Kurup et al., 2004).

**Habitat:** run habitat at downstream with sandy bottom and riffles at upstream with rock or sandy bottom

**Fishing methods:** Cast nets and gill nets.
**Barilius gatensis** (Valenciennes)
(Plate VII, Fig. 56)

*Leuciscus gatensis* Valenciennes. Hist. Nat. Poiss., 17: 309, pl. 503, 1844 (Type locality: Peninsular India)


*Barilius gatensis* Gunther, Cat. Fish Brit. Mus., 7: 291, 1868 (Peninsular India)

**Common name:** River-carp baril  
**Local name:** Pavuka, Thuppalkothipparal

**Distinguishing characters:** (Based on 28 specimens, 54-98 mm TL)

D. ii, 8; P.i,13; V.i,8; A.ii,12; C.19; LI. 38-39, Ltr. 7.5-8.5/1.5-2

Body deep, BD 25.35-30.58 (25.96) and HL 27.81-28.79 (28.00) in SL. Eyes 25.79-31.82 (30.81) HL. INTO 29.31-34.39 (31.07) in HL. Barbells absent. Tubercles on snout minute. HD 58.07-71.41 (64.93) in HL. HP 98.59-120.0 (109.71) in HD. HV 60-79.77 (69.88) in HP. LCPD 13.15-17.69 (15.03) in SL. HCPD 61.02-74.77 (68.01) in LCPD. HC 22.12-23.90 in SL. PDS 19. lateral line complete. Metallic blue colour on back, flanks silvery with 10-12 vertical bluish bands. Dorsal and anal fins dark bluish and hyaline tips. Pectoral and pelvic fins dull white. Caudal grayish blue with tips of lobes hyaline.

**Geographical distribution:** India

**Distribution in Kerala:** Periyar, Kabbini, Chalakkudy, Chinnar, Bhavani, Payaswini, Chimmoney, Karuvannur, Bharathapuzha, Neyyar, Streams in Peppara wild life sanctuary, Pamba and Kallar (Shaji and Easa, 2001). Found in 28 rivers of Kerala (Ajithkumar et al., 2000), Chalakkudy, Achenkil, Periyar, Manimala, Bharathapuzha, Kabbini, Meenachil (Kurup et al., 2004)

**Habitat:** Riffle-pool habitats at middle and upper streches.

**Fishing methods:** Cast nets and gill nets.
Barilius bakeri Day  
(Plate VII, Fig. 57)

Pterosparion bakeri Gunther, Cat. Fish. Brit. Mus., 7:284, 1868 (Hill ranges of Travancore)

Common name: Malabar baril  
Local name: Pavuka

Distinguishing characters: (Based on 128 specimens, 46-134 mm TL)
D. ii, 10; P.i,12; V.i,7-8; A.ii,14; C.19; Li. 38-39, Ltr. 8-8.5/2-2.5

Body deep, BD 27.36-28.85 (28.13) and HL 13.24-26.6(20.74) in SL. Maxilla extends to below middle of orbit. Eyes 19.02-20.98 (19.98) in HL. INTO 30.66-33.75 (31.76) in HL. Barbells absent. Tubercles on snout are well developed. HD 72.78-78.01 (77.01) in HL. HP 99.78-119.46 (108.48) in HD. HV 68-72.1(71.20) in HP.  

Geographical distribution: India: Western Ghats of Kerala (Talwar and Jhingran, 1991)

Distribution in Kerala: Chaliyar, Chalakkudy, Bavelippuzha, Cheenkannipuzha, Uruttipuzha, Periyar, Neyyar, Kallarand Pamba (Shaji and Easa 2001), 19 rivers of Kerala (Ajithkumar et al., 2000), Periyar, Kabbini (Kurup et al., 2004).

Habitat: Riffle-pool habitats at upper stretches of river systems

Fishing methods: Cast nets, gill nets of small mesh sizes.
**Barilius canarensis** Jerdon
(Plate VII, Fig. 58)

*Opsarius canarensis* Jerdon, Madras. J. Lit. Sci. 15 p. 329, 1849 (Type locality: Canara)

*Opsarius malabaricus* Jerdon, Madras J. Lit. Sci., 15 p.329, 1849

*Barilius canarensis*: Day, Proc zool. Soc. Lond., p. 374, 1870 (Canara)

**Common name:** Jerdon's baril

**Local name:** Thuppalkothi

**Distinguishing characters:** (Based on 18 specimens, 102-118 mm TL)

D. ii, 10; P.i,12; V.i,8; A.ii,15; C.19; Ll. 39, Ltr.8-8.5/2-2.5

Body deep, BD 23.67-26.96 (24.53) and HL 24.99- 29.96 (28.06) in SL.

Maxilla extends to below anterior third of orbit. Eyes large, 21.41-28.22 (24.19) in HL. INTO 28.91-38.66 (32.87) in HL. Barbells absent. Tubercles on snout are well developed. HD 53.95-98.04 (64.82) in HL. HP 75.84-125.35 (107.94) in HD. HV 64.47-82.86 (69.96) in HP. LCPD 8.75-18.86 (14.80) in SL. HCPD 55.23-107.85 (73.63) in LCPD. Dorsal fin originating behind that of pelvic fins and extending up to 3rd – 4th anal fin ray. HC 19.48-27.51 (23.28) in SL. PDS 16-18. lateral line complete. Metallic blue on back and flanks silvery.

Generally two and rarely more rows of dark bluish spots on lateral region. Dorsal and anal fins dark bluish with tips hyaline. Pectoral and pelvic fins dull white. Caudal grayish blue with tips of lobes hyaline.

**Geographical distribution:** India: Western Ghats of Karnataka and Kerala (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Cheenkannipuruzha and Uruttipuzha of Aralam Wild Life Sanctuary, Bhavalipuruzha originating from Kottiyoor reserved forests (Shaji and Easa, 2001), Periyar(Kurup et al., 2004).

**Habitat:** Pool riffle habitats with rocky, sandy or gravelly bottom.

**Fishing method:** Cast nets.
Genus *Danio* Hamilton-Buchanan

*Danio* Hamilton-Buchanan, *Fish Ganges*, pp. 321, 390, 1822 (Type, *Cyprinus dangila* Hamilton-Buchanan)

Fishes with an elongate, strongly compressed body. Abdomen rounded. Mouth oblique, terminal or slightly turned upwards and maxilla do not extend to vertical through front margin of eye. Lower jaw with a symphysial process. Tubercles absent. Eyes large, preorbital spine present. Barbells a pair of rostral and maxillaries. Dorsal fin inserted behind origin of pelvic fins. Anal fin with 14-20 rays. Lateral line complete, running along lower half of body, Caudal forked. These small fishes thrive mainly in mountain streams, rivulets, small water courses like pools and ditches. Brightly coloured active fishes, surface feeders, well suited for aquariums.

**Key to species**

1. a) Body deep, anal fin with 14-17 branched rays........*Danio malabaricus*

   

   b) Body narrow, anal fin with 12-16 branched rays

   .................................................................*Danio aequipinnatus*

**Danio malabaricus** (Jerdon)

(Plate VII, Fig. 59)

Perlamus malabaricus Jerdon, Madras J. Lit. Sci., 15: 329, 1849 (Type locality: Malabar)
Danio micronema Bleeker, Mem. Soc. Holl. Haarlem, p. 19, pl. 4, 1864
Eustira ceylonensis: Gunther, Cat. Fish. Brit. Mus., 7: 331, 1868

**Common name:** Malabar Danio  
**Local name:** Vilanjil

**Distinguishing characters:** (Based on 79 specimens, 84-108 mm TL)

D. ii, 11; P.i,12; V.i,7; A.iii,14-17; C.19; Ll. 34-36, Ltr.8-8.5/2-2.5

Elongate, deep and strongly compressed body, dorsal and ventral profiles arched, BD 26.89-33.89 (29.97) and HL 22.50-25.66 (24.02) in SL. Eyes 25.62-28.80 (28.35) in HL. INTO 35.24-40.93 (38.14) in HL. HD 65.33-88.02
Systematics

(76.93) in HL. HP 98.78-125.09 (119.25) in HD. HV 65.17-100 (78.21) in HP. LCPD 10.59-17.12 (13.94) in SL. HCPD 62.46-110.92 (79.69) in LCPD. HC 24.15-29.77(27.53) in SL. PDS 17-18. Lateral line complete. Bluish silvery on dorsal and flanks with three or four deep blue lines separated by golden lines which on anterior sides forming a pattern of spots and curly lines. Fins yellowish to orange.


Distribution in Kerala: Throughout Kerala (Ajithkumar et al., 2000; Shaji and Easa, 2001), Achenkoil, Kabbini, Kallada and Meenachil (Kurup et al., 2004).

Habitat: Pool-riffle or run habitats with rocky, sandy or gravelly bottom.

Fishing method: Cast nets.

**Danio aequipinnatus** (McClelland)

(Plate VII, Fig. 60)

*Penilampus aequipinnatus* McClelland, *Asiat. Res.*, 19 (2): 393, pl. 60, fig. 1, 1839 (Type locality: Assam)

*Danio lineolatus* Gunther, *Cat. Fish. Brit. Mus.*, 7:282, 1868 (Sikhim)


Common name: Giant Danio

Local name: Vilanjil

Distinguishing characters: (Based on 20 specimens, 84-108 mm TL)

D. ii,11-12; P.i,12-13; V.i,7; A.ii,12-16; C.19; Li. 34-35 , Ltr. 7-8/1.5-2

Elongate and compressed body, comparatively less deep. Dorsal profile not so arched and more or less straight. BD 27.85-29.17(28.42) and HL 20.08-22.66 (21.47) in SL. Eyes in 29.09-32.51 (30.43) HL. INTO 43.85-47.55 (46.29) in HL. HD 71.5-95.31 (86.85) in HL. HP 61.77-80.27 (73.13) in HD.

HV 62.71-78.89 (69.63) in HP. LCPD 5.8-8.36 (6.89) in SL. HCPD 141.12-199.71 (173.98) in LCPD. HC 26.73-31.50 (28.55) in SL. PDS 16-17. Lateral
line complete. Brilliant bluish silvery on dorsal and flanks with three or four deep blue lines separated by thinner golden lines which on anterior sides forming a pattern of spots and lines. Fins yellowish to orange in colour.

**Geographical distribution:** India, Sri Lanka, Nepal, Bangladesh, Burma and Thailand (Talwar and Jhingran, 1991; Jayaram, 1999)

**Distribution in Kerala:** Common in rivers, streams and rivulets and low lands of Kerala (Shaji and Easa, 2001; Ajithkumar et al., 2000), Valapattanam and Chaliyar river systems (Kurup et al., 2004).

**Habitat:** Pool rifile habitats with rocky, sandy or gravelly bottom.

**Fishing method:** Cast nets.

**Sub family: Schizothoracinae**

This sub family consist of a single genus, *Lepidopygopsis* Raj and a single species, *Lepidopygopsis typus*, distributed in Kerala. This is the only member under Snow trouts which have a geographical distribution outside Himalayan area and so has great Zoogeographical significance (Arun et al., 1996).

**Genus Lepidopygopsis Raj**

*Lepidopygopsis Raj, Rec. Indian Mus., 43: 210, 1941 (Type, Lepidopygopsis typus Raj)*

**Lepidopygopsis typus Raj**

(Plate VIII, Fig. 61)

*Lepidopygopsis typus Raj, Rec. Indian Mus., 43: 210, 1941 (Type locality: Periyar lake, Kerala)*

**Common name:** Peninsular hill trout  
**Local name:** Brahmanakendai

**Distinguishing characters:** (Based on 10 specimens, 168-262 mm TL)

D. iii, 7; P.i,14; V.i,8; A.ii,5; C.19; Ll. 54-56
Elongate, BD 19.15-24.23 (23.27) and HL 21.25-24.05 (22.01) in SL. BD 91.33-114.56 (104.73) in HL. Snout conical and tip bluntly round. Eyes large, 24.04-31.27 (26.64) in HL. Barbells two pairs, rostral and maxillary. Mouth inferior, fairly broad and transverse. Dorsal fin inserted opposite to pelvic fin, last undivided ray osseous, elongate, strong and serrated behind, HD 112.58-141.34 (124.38) in HL. DB 52.45-57.61 (55.92) in HD. HP 65.44-76.94 (70.89) in HD. HV 86.69-91.49 (91.42) in HP. LCPD 19.4-23.03 (20.83) in SL. Caudal forked, HC 27.23-32.91 (29.13) in SL. No scales on head, only few scales forming a patch on scapular region, a few scattered scales at base of dorsal spine, a continuous row of scales along lateral line and elongated tile-like scales forming a sheath at base of vent and anal fin. Back olivaceous green, flanks and ventral side of body shining golden silvery, fins generally olive green with anterior part of anal, dorsal and caudal fins dusky.

Geographical distribution: India: Periyar lake and stream system (Kerala) (Talwar and Jhingran, 1991)

Distribution in Kerala: Periyar river (Shaji and Easa, 2001) and lake (Menon, 1999; Jayaram; 1999; Kurup et al., 2004)

Habitat: cascades, rapids, riffle-pool habitats with bedrock, boulders, cobbles and gravels as substratum.

Fishing methods: Cast nets and gill nets.

**Sub family Garrinae**

Fishes with Subcylindrical or laterally compressed body, mouth inferior, transverse and semicircular. Upper lip continuous with skin of snout and
crenulated. Lower lip may be modified in to a suctorial disc as in *Garra*. Barbells one or two pairs, Paired fins horizontally arranged.

**Key to genera**

1. a) Body laterally compressed, sucking disc absent .......... *Crossocheilus*
   
   b) Body sub cylindrical, lower lip modified in to a sucking disc ...... *Garra*

**Genus Crossocheilus** Kuhl et van Hesselt


*Crossocheilus periyarensis* Menon and Jacob

(Plate VIII, Fig. 62)


**Common name:** Periyar latia  
**Local name:** Karimbachi

**Distinguishing characters:** (Based on 8 specimens, 123-146 mm TL)

D. ii , 8; P.i,12-13; V.1,8; A.ii,6; C.19; LL35-36, Ltr.4.5-5/3.5

Body elongate, pre-dorsal region slightly more elevated, ventral profile normal. BD 25.20-27.62 (27.23) and HL 20.94-27.03 (24.56) in SL. Head small, snout obtusely round and overhanging mouth; covered with dense tubercles on tip and lateral sides. Mouth inferior, lips not continuous, jaws narrow with thin horny covering on inner side. Eyes large, 17.8-23.81 (19.00) in HL and placed at middle of head, not visible from ventral side. Barbells small maxillary and rostral pairs. Dorsal fin inserted distinctly near to snout. HD 105.95-129.77 (118.26) in HL, HP 68.04-84.11 (76.92) in HD, HV 92.76-107.06 (99.08) in HP, LCPD 14.10-20.84 (20.46) in SL and HCPD 43.27-76.25 (52.29) in LCPD. Caudal fin deeply forked. Lateral line complete. Body brownish green on back with golden reflections, pinkish on flanks and under surface. Fins pink, dorsal and caudal fins edged with gray.
Geographical distribution: India: Kerala (Periyar upstream)

Distribution in Kerala: Periyar river (Zacharias et al., 1996; Shaji and Easa, 2001; Kurup et al., 2004).

Habitat: Riffle-pool habitats with bedrock, cobbles and gravels as substratum. Fishing methods: Cast nets

Genus Garra Hamilton-Buchanan

Garra Hamilton-Buchanan, Fish. Ganges, pp. 343, 393, 1822 (Type, Cyprinus lamta Hamilton)

Sub-cylindrical body, Anterior portion slightly or sometimes conspicuously depressed, lower lip modified into a suctorial disc, upper lip fimbriated. Barbells two pairs, maxillary pairs usually rudimentary. A proboscis may or may not be present. Paired fins horizontally inserted, first few rays of pectoral fins often provided with fleshy, adhesive pads on distal side, shape of caudal fin forked, truncate or emarginated. Lateral line complete and equally distant from back and belly.

Key to species

1. a) Head with a proboscis ...................... Garra gotyla stenorhynchus  
   b) Proboscis absent .......................................................... 2

2. a) Lateral line scales 33-34, scales uniformly present on body .......... 3  
   b) Lateral line scales 35 to 40, scales uniformly present on body or absent on a part of body ......................................................... 4

3. a) Interorbital distance less than or about two times in head length, width of suctorial disc about 2 times in head width .................. Garra mullya  
   b) Interorbital distance more than 2 times in head length, width of sucking disc less than 2 times in width of head ........ Garra ceylonensis
4. a) Snout with a deep transverse groove, vent placed almost midway between origins of anal fin and ventral fins.................................5
   b) No transverse groove present; if present, not deep. Vent not placed midway between origins of anal fin and ventral fins .........................6
5. a) Breast and belly scale less ........................................Garra periyarensis
   b) Scales present uniformly on body..............................Garra mClellandii
6. a) Scales absent on a part of body .................................................7
   b) Scales present almost uniformly along body ..................10
7. a) body slender, scales absent on breast and belly ......................8
   b) Body robust, scales present on belly .................................9
8. a) Lateral line scales 35-36, eyes large, 22.45% in head length ..................................................Garra menoni
   b) Lateral line scales 36-38, eyes small, 19.35% in head length ..................................................Garra hughi
9. a) Lateral Line scales 37-38, body elongated, a shallow vertical groove on snout, dividing snout into two lobes ..................Garra travancoria
   b) Lateral line scales 34-36, body stout and deep, no vertical groove on head .................................................Garra nilamburensis
10. a) Body brownish green, scales on lateral sides with dark posterior edges ........................................Garra mlapparaensis
   b) Body with back blotches or minute spots .............................11
11. a) Body with black blotches and dots, eyes larger, Caudal forked .....................................................Garra surendranathani
b) Body with minute dark dots arranged on either sides of lateral line appear as a dark band bordered with yellow bands, eyes small, Caudal emarginated......................................................Garra emarginata

Garra gotyla stenorhynchus (Jerdon)
(Plate VIII, Fig. 63)

Gonorhynchus stenorhynchus Jerdon, Madras J. Lit. Sci., 15: 310, 1847 (Type locality: Bhawany river, Nilghiris)

Common name: Nilgiris garra Local name: Kallemutti

Distinguishing characters: (Based on 20 specimens, 62-158 mm TL)

D. ii , 8; P.i,14; V.1,8; A.1,5; C.19; LI. 33-34, Ltr. 4.5/2.5-3.

BD 18.46- 23.53 (21.43) and HL 27.13-36.96 (29.26) in SL. Snout with a proboscis and tuberculated. Eyes 14-24.93 (20.09) in HL and 46.61-57.45 (55.73) in INTO. INTO 30.04-40.35 (36.07) in HL. HW 82.59-91.25 (86.71) in BD. WSD 62.58 -71.29 (65.76) in HW. LSD 36.39-41.25 (37.55) in HL and 62.59-71.38 (67.27) in WSD. Dorsal fin closer to snout than caudal, HD 64.29-95.49 (86.75) in HL. HP 64.29-95.49 (86.75) in HL and 6.58-103.76 (88.57) in HD. Vt-AF 21.69-32.48 (26.43) in PF-AF. HCPD 82.76-94.62 (84.43) in LCPD. Caudal forked. Body uniformly scaled, scales larger. PDS 10. Colour olive green. Black spot at upper angle of gill opening, a row of dark spots at base of dorsal fin, Fins red orange.

Geographical distribution: India: Cauveri and Krishna drainage, Western Ghats (Talwar and Jhingran, 1991; Jayaram, 1999)


**Chapter 2**

**Systematics**


**Habitat:** Riffle-pool habitats with bedrock, cobbles and gravels as substratum. **Fishing methods:** Cast nets

*Garra mullya* (Sykes)  
(Plate VIII, Fig. 64)

**Chondrostoma mullya** Sykes, *Trans. Zool. Soc. Lond.*, 2: 359, pl. 62, fig. 3, 1841 (Type locality: Beema river at Dounde)

**Garra malabarica** Day, *Proc. zool Soc. Lond.*, p. 297, 1865 (Type locality: Karuvannur river, Malabar)


**Discognathus jerdoni** Annandale, *Rec. Indian Mus.*, 16: 132, 1919

**Common name:** Mullya Garra  **Local name:** Kallotti, Kallemutti

**Distinguishing characters:** (Based on 16 specimens, 76-182 mm TL)

- D, ii, 8; P,i,13-14; V,1,8; A,1,5; C,19 LL33-34, Ltr.4.5/2.5-3.5.
- BD 21.84-24.93 (22.40) and HL 24.8-28.71 (26.56) in SL. Snout with a transverse groove, tuberculated. Eyes 17.64-19.87(19.0) in HL and 40.68-47.01 (44.99) in INTO. Interorbitat slightly convex, 38.60-45.02 (42.34) in HL.
- HW 78.25-84.26 (82.25) in BD, WSD 61.29-71.26 (67.96) in HW. LSD 33.69-44.54 (39.56) in HL and 68.54-79.63 (76.67) in WSD. Dorsal fin closer to snout than caudal, HD 79.84-96.64 (88.75) in HL, HP 82.30-96.52 (88.93) in HL and 99.18-103.09 (100.34) in HD. Vt--AF 28.45- 42.59 (33.76) in PF-AF.
Geographical distribution: India: Throughout India except Assam and Himalayas (Talwar and Jhingran, 1991)

Distribution in Kerala: Almost all river systems of Kerala (Menon, 1964; Easa and Shaji, 1996; Ajithkumar et al., 2000), Pamba, Kallada, Meenachil, Bharathapuzha river systems (Kurup et al., 2004)

Habitat: Riffle-pool habitats with bedrock, boulders, cobbles and gravels as substratum.

Fishing methods: Cast nets and gill nets.

**Garra ceylonensis** Bleeker

(Plate VIII, Fig. 65)


*Discognathus lamta* (nec Hamilton-Buchanan) Day (partim), 1877.

Common name: Stone sucker  
Local name: Kallotti, Kalamutti

Distinguishing characters: (Based on 8 specimens, 101 mm-121 mm TL)

D.ii, 8; P.i, 12-13; V.i, 7; A.i, 5; C.19; Li. 33-34, Ltr. 4.5/2.5-3.5

BD 19.18-21.26 (19.12) and HL 19.92-22.92 (21.98) in SL. Snout with a transverse groove, tuberculated. Eyes 15.61-20.08 (17.60) in HL. Interorbital flat or concave, 31.99-41.78 (37.26) in HL. WSD 62.38-72.61 (69.51) in HW, LSD 98.41-116.94 (78.77) in WSD and 23.96-28.14 (20.41) in HL. Dorsal fin closer to snout, HD 88.42-96.29 (92.75) in HL, upper margin concave. HP 43.22-49.02 (46.56) in HL and 92.4-130.35 (106.89) in HD. HV 82.14-86.80 (85.34) in HP. Vt-AF 26.89-42.56 (34.69) in PF-AF. HCPD 84.78-104.39 (94.12) in LCPD. Caudal slightly forked. HC 24.13-26.06 (24.67) in SL. Body uniformly scaled. PDS 10-11. Olive green with a broad, dark lateral band bordered by narrow yellow bands on flanks. Black spot at upper angle of gill opening. Fins red orange.
Chapter 2 Systematics

Geographical distribution: Sri Lanka, India: Periyar river (New report)

Habitat: Riffle-pool habitats with bedrock, cobbles and gravels as substratum. Fishing methods: Cast nets and gill nets.

Garra periyarensis Gopi
(Plate VIII, Fig. 66)


Common name: Periyar Garra Local name: Kallemutti

Distinguishing characters: (Based on 12 specimens, 153-198 mm TL)

D. ii, 8; P.i,12-13; V.1,7; A.1,5; C.19; Ll. 37-40, Ltr. 4.5/3.5

Body elongate and slender, BD 13.61-15.82 (14.56) and HL 21.78-26.19 (23.27) in SL. Snout with a transverse groove, a prominent knob like protuberance at tip and is tuberculated. Eyes 20.37-26.80 (23.49) in HL and 63.2-97.18 (70.97) in INTO. Interorbitat flat, 27.58-32.02 (33.09) HL. HW 96.58-108.21 (104.12) in BD. WSD 71.26-88.21 (82.52) in HW. LSD 38.26-44.31 (39.25) in HL and 66.31-72.92 (68.8) in WSD. Dorsal fin closer to snout, HD 91.56-110.35 (97.52) in HL, HP 99.18-103.94 (100.34) in HD. Vt-AF 36.84-46.95 (41.26) in PF-AF. Caudal deeply forked. Scales absent on breast and belly. PDF 11. Brownish back, flanks yellowish brown. An indistinct mid-lateral band sometimes present. A faint black spot at upper angle of opercula. Fins dusky gray with yellowish tinge.

Geographical distribution: India: Western Ghats of Kerala (Gopi, 2001)

Distribution in Kerala: Thannikkudy, Periyar Tiger Reserve, Periyar river (Gopi, 2001); Periyar (Kurup et al., 2004)

Habitat: Riffle-pool habitats with bedrock, cobbles and gravels as substratum. Fishing methods: Cast nets and gill nets.
**Garra mcclelandi** (Jerdon)  
(Plate VIII, Fig. 67)

**Gonorhynchus mcclelandi** Jerdon, Madras J. Lit. Sci., 15: 309, 1849 (Type locality Bawani river at foot of Nilghiris)  
**Garra jerdonii** Day, Proc. zool. Soc. Lond., p.288, 1867 (very common in the Seegoor river)  
**Discognathus elegans** Annandale, Rec. Indian Mus., 19: 76, pl.9, 1919 (Nierolay stream base of the Neilgiris)  

**Common name:** Cauvery Garra  
**Local name:** Kallemutti

**Distinguishing characters:** (Based on 4 specimens, 122-212 mm TL)

D. ii, 8; P.i,14; V.1,7; A.1,5; C.19; LI. 35-38, Ltr. 4.5/3.5

Body elongate and slender, BD 14.58-18.54 (15.86) and HL 18.19-24.89 (21.39) in SL. Snout with a transverse groove, tuberculated. Eyes 22.49-26.18 (24.1) in HL Interorbitat flat, 31.08-34.19 (32.18) HL. HW 84.59-96.58 (90.08) in BD. WSD 53.49 – 62.18 (58.54) in HW. LSD 31.29-36.49 (34.23) in HL and 71.64-74.58 (72.36) in WSD. Dorsal fin closer to snout, HD 91.28-98.26 (96.29) in HL. HP 96.58-107.84 (101.59) in HD. Vt-AF 32.16-42.86 (36.86) in PF-AF. Caudal deeply forked. Scales uniformy present except on a small part of chest. PDF 8-10. Brownish back, flanks yellowish brown. An indistinct midlateral band sometimes present. A faint black spot at upper angle of opercula. Fins dusky gray with yellowish tinge.

**Geographical distribution:** India: Cauveri drainage (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Kabbini and Periyar rivers (Arun et al., 1996, Arun, 1997), Chaliyar, Periyar tiger reserve (Kurup et al., 2004).

**Habitat:** Riffle-pool habitats with bedrock, cobbles and gravels as substratum. **Fishing methods:** Cast nets and gill nets.
Garra menoni Remadevi and Indra, 1984
(Plate VIII, Fig. 68)


Local name: Kallemutti

Distinguishing characters: (Based on 6 specimens, 56-68 mmTL)

D. ii, 8; P.i,12-15; V.1,7; A.i,5; C.19; Ll. 32-36, Ltr. 4.5/3-3.5

Body slender, BD 14.12-16.57 (15.17) and HL 21.35-23.15 (22.94) in SL.

Snout broadly round and smooth, finely tuberculated in males. Eyes larger, 17.25-24.36 (22.45) in HL. Interorbital flat or slightly convex, 26.54-30.15 (29.88) in HL. HW 96.58-108.39 (106.138) in BD. WSD 81.26-86.29 (83.61) in HW. LSD 40.29-46.83 (42.25) in HL and 61.23-68.72 (66.85) in WSD.

Dorsal fin equidistant between snout and caudal base, HD 78.25-82.35 (80.24) in HL. HP 118.12-121.25 (119.12) in HD. Vt-AF 29.34-37.65 (33.50) in PF-AF. HCPD 72.16-74.21 (73.36) in LCPD, caudal deeply forked. Scales absent on chest and belly. PDS 8-10. Olive brown on back, a faint dark brown lateral band from opercula to caudal base. Fins reddish brown.

Geographical distribution: India: Western Ghats of Kerala (Jayaram, 1999)

Distribution in Kerala: Kunthi river at Silent valley (Remadevi and Indra, 1981; Kurup et al., 2004) and Chinnar river at Chinnar WLS (Easa and Shaji, 1995).

Habitat: Riffle-pool habitats with bed rock, cobbles and gravels as substratum. Fishing methods: Cast nets

Garra hughii Silas
(Plate VIII, Fig. 69)

Garra hughii Silas, Rec. Indian Mus., 52: 1, 1955 (Type locality: streams in lower Vauguvarrai Estate, High Range, Travancore)

Common name: Cardamom Garra

Local name: Kallemutti
Distinguishing characters: (Based on 11 specimens, 42-102mmTL)

D. ii, 7; P.1,13; V.i,7; A.ii,5; C.19; Ll. 35-37, Ltr. 4.5/3-3.5

Body slender, BD 11.90-24.8 (17.8) and HL 23.74-29.36 (26.63) in SL. Head slightly flat, Snout broadly round and smooth. Eyes small, 11.66-22.57 (19.35) in HL and 27.7-66.89 (54.18) in INTO. Interorbital flat, 35.24-42.07 (38.16) in HL. HW 98.24 –106.54 (102.8) in BD. WSD 71.26-79.84 (73.63) in HW. LSD 32.12- 38.49 (37.41) in HL and 58.46- 66.34 (62.33) in WSD. Dorsal fin equidistant between snout and caudal base, HD 66.86-84.56 (76.52) in HL, upper margin concave. HP 87.43-108.2 (96.43) in HD. Vt-AF 23.64 - 29.81 (25.63) in PF-AF. HCPD 80.87-126.24 (86.14) in LCPD. Caudal high, deeply forked. Scales absent on chest and belly. PDS 10-11. Grayish green on back, a conspicuous lateral band from opercula to caudal base, a light bluish mid dorsal streak. Fins dusky.

Geographical distribution: Peninsular India: Cardomon and Palani hills, Western Ghats (Talwar and Jhingran, 1991)


Habitat: Cascades and rapids with bedrock as substratum.

Fishing method: Cast net, Drag net

*Garra travancoria* Kurup and Radhakrishnan
(Plate VIII, Fig. 70)


Holotype: Deposited in ZSI, Calicut, No.ZSI/WGRS/CLTVIF/13122a,133.80 mmTL, Moolavaigae of Periyar river, Periyar Tiger Reserve, 13-2-2004
Paratype: Deposited in ZSI, Calicut, No.ZSI/WGRS/CLT/V/F/13122b, 2 ex 121.56 mm and 115.7 mm TL, Moolavaigae of Periyar Tiger Reserve, 13-2-2004.

Diagnosis: An elongated species with dorsal fin inserted close to snout than caudal base, lateral line scales 37-38, scales uniformly present except on chest region, head more wide and snout broadly round, having a shallow to deep vertical wedge or groove and the groove sometimes extends even beyond, between eyes, moderate to large eyes, interorbital region slightly concave, wide and well developed sucking disc, pectoral fin less broad and comparatively small, distance between vent to anal fin forming 32.5% in interdistance between anterior origins of anal and pelvic fins. Caudal peduncle less deep, its depth forming 72% in its length, 39% in height of caudal fin and 62.63% in head length.

Distinguishing characters: (Based on 8 specimens, 98.72-133.80 mm TL)

D.ii, 7; P.i, 12; V.i, 7; A.i, 5; C.19.L.lat.37-38; Ltr. 4.5/3.5

Body elongate and slender. BD 13.12-18.65 (16.65) in SL, 56.21-81.87 (74.25) in HL. HL 21.08-23.92 (22.47) of st. so almost equal to HW, form 73.25-104.29 (96.66). Mental disc well developed, LSD 31.99-36.72 (34.49 ) in HL, 58.81-64.54( 61.39) in WSD. WSD 68.48-81.33 (73.61) in HW. Snout broadly round and tuberculated at its tip. Barbells two pairs, rostral barbells slightly smaller than eye diameter, forming 75.65-98.97 ( 85.32) of latter. Eyes moderate to large in size and not visible from ventral side of head, diameter 18.13-20.7 (19.1) of HL, 38.43-46.67(41.67) in INTO. Interorbital region slightly concave and form 41.34-47.18 (46.95) in HL. Abdomen slightly
rounded. Vt-AF 26.18-36.58 (32.49) in PF-AF. LCPD 13.18-14.86 (14.33) in SL, 56.52-73.46 (64.01) in HL and HCPD 70.84-80.21 (72.01) in LCPD. PDS 11-12, pre ventral scales 12-14 and pre anal scales 25-26. Scales between pectoral and ventral fins 12-14, pelvic and anal fins 12-13. Circumpeduncular scales 8-11. Dorsal fin inserted closer to snout than to caudal. Pre dorsal length form 80.59-86.63 (83.18) in post dorsal length. HD more or less equal to HL, forming 92.78-107.85 (100.84) in latter and 21.64-24.46 (22.62) in SL. Pectorals shorter than dorsal and form 88.64-98.8 (92.8) in latter and 19.72-21.38 (20.97) in SL. Ventral fins form 83.71-87.62 (86.23) in pectoral height. Pectoral not reaching ventral fins whereas latter reaches or slightly overlaps vent. Pre-anal distance 71.63-78.59 (78.24), pre dorsal distance 45.16-46.41 (44.63), Pre-ventral distance 46.12-52.32 (50.06) and pre-pectoral distance 18.77-21.03 (20.26) in SL. Caudal forked. In live, ground colour is greenish brown with scales at lateral line more brownish forming a continuous faint brown lateral streak. Ventral surface pale white. Head olivaceous green. Fins generally reddish brown. In formalin, ground colour turns brown.


Etymology: Named after Travancore geographical region, to which river Periyar is a part.

Other materials examined:

Garra mulliya: ZSI/SRS F5789,1 ex. 95mm SL, Harangi reservoir; G.menoni: ZSI/SRS F553, paratypes,31-69mmSL,Silent valley; G.hughi: ZSI/SRS F5328,150 ex. 39-70 mm SL,Kilakallar; G.gotyla stenorhynchus: ZSI/SRS F4913, paratypes,110-111mm SL, Thirumoorthy dam; G.mcClellendi: ZSI/SRS
F6763, 1ex. 142 mm SL, Hassan dt. Karnataka; ZSI/SRS F5139, 1 ex. 138 mm SL, Moyar river; G. kalakadensis: ZSI/SRS F854, paratypes 26 ex. 21-60 mm SL, Kalakad wildlife sanctuary.

**Habitat:** cascades, rapids and riffle-pools with bedrock, cobbles and gravels as substratum.

**Fishing methods:** Cast net.

*Garra nilamburensis* Kurup and Radhakrishnan

(Plate IX, Fig. 71)


**Holotype:** Deposited in ZSI, Calicut, No. ZSI/WGRSI CLTN/F 13117a, 131.42 mm TL, Karimpuzha, Chaliyar river, 25-2-2004

**Paratype:** 2 ex. Deposited in ZSI, Calicut, No. ZSI/WGRSI CLTN/F 13117b, 100.54 mm and 101.46 mm TL, Karimpuzha, Chaliyar river, 25-2-2004.

**Diagnosis:** A short and stout species with dorsal fin inserted close to snout than caudal base, lateral line scales 34-36, scales absent on chest region, body depth high, forming 4.2-4.8 times in head length and less than 5 times standard length, head more or less round, convex interorbital region, small to moderate eyes, wide and well developed sucking disc, broad pectoral and pelvic fins with ventral fins overlapping vent, vent placed close to anal fin, caudal peduncle deep, forming 0.92-1.2 times in its length, 1.73-2 times in height of caudal fin and 1.5-1.8 times in head length.

**Distinguishing characters:** (Based on 6 specimens, 100.54-131.42 mm TL)

D.i, 8; P.i, 14; V.i, 7; A.i, 5; C.19.L.lat. 34-36; Ltr. 4.5/2.5
Body short and stout. BD 18.05-22.46 (20.79) in SL, 80.65-94.02 (86.69) in HL and almost equal to or slightly higher than HW, forming 96.29-106.57 (105.57) of latter. HL 23.54-26.12 (24.19) of SL. Mental disc well developed. LSD 34.23-38.36 (37.42) in HL, 50.06-67.70 (58.26) in WSD and latter 72.52-79.72 (75.40) in HW. Snout broadly round with a few tubercles at its tip. Barbells two pairs, rostral barbells equal to or slightly greater than diameter of eye. Eyes small to moderate in size and not visible from ventral side of head, diameter 17.22-21.05 (19.11) of HL, 40-45.35 (42.30) in INTO. Interorbital region slightly convex and form 43.04-47.29 (45.12) in HL. Abdomen slightly rounded. Vt-AF 21.69-29.26 (25.63) in PF-AF. LCPD 79-14.89 (13.94) in SL, 54.85-59.89 (57.64) in HL and HCPD 84.55-96.97 (90.85) in LCPD. PDS 10-11, pre ventral scales 11 and preanal scales 26. Scales between pectoral and ventral fins 11, pelvic and anal fins 13. Circumpeduncular scales 12-15. Dorsal fin inserted closer to snout than to caudal. Pre dorsal length form 82.38-95.20 (86.38) in post dorsal length. HD more or less equal to head length, forming 94.39-113.39 (106.46) in latter. Pectorals equal to dorsal and form 92.41-103.36 (100.0) in latter. Ventral fins form 76.83-84.62 (80.96) in pectoral height. Pectoral not reaching ventral fins where as latter reaches or slightly overlaps vent. Pre anal distance 67.61-80.83 (76.50), pre dorsal distance 39.73-47.74 (45.06), Pre-ventral distance 44.16-53.38 (50.41), and pre pectoral distance 19.28-22.55 (21.16) in SL. Caudal forked. In live, ground colour is greenish brown with scales at lateral line more brownish forming a continuous faint brown lateral streak. Ventral surface yellowish white. Head olivaceous green with snout and cheeks.
brownish. Fins generally reddish brown with blackish patches. In formalin, ground colour turns brown.

**Geographical distribution:** India: Karimpuzha of Chaliyar river system in Nilambur reserve forest, Kerala.

**Etymology:** Named after the locality, Nilambur reserved forests from where specimens of new species were obtained.

**Other materials examined:**

*Garra mullya:* ZSI/SRS F5789, 1 ex. 95mm SL, Harangi reservoir; *G. menoni:* ZSI/SRS F553, paratypes, 31-69mm SL, Silent valley; *G. hughi:* ZSI/SRS F5328, 150 ex. 39-70 mm SL, Kilakallar; *G. gotyla stenorhynchus:* ZSI/SRS F4913, paratypes, 110-111mm SL, Thirumoorthy dam; *G. mcclellendi:* ZSI/SRS F6763, 1ex. 142mm SL, Hassan dt. Karnataka; *Garra kalakadensis:* ZSI/SRS F5139, 1 ex. 138 mm SL, Moyar river; *G. kalakadensis:* ZSI/SRS F854, paratypes 26 ex. 21-60mm SL, Kalakad wild life sanctuary.

**Habitat:** Cascades, rapids with bedrock, cobbles and gravels as substratum.

**Fishing methods:** Cast nets.

*Garra mlapparaensis* Kurup and Radhakrishnan  
(Plate IX, Fig. 72)


**Holotype:** Deposited in ZSI (WGRS) CLT. No. VIF 13032 94.58 mm TL, Mlappara, Periyar, 18-02-2002.

**Para type:** Nil.

**Diagnosis:** A species of *Garra* having an elongated and slender body with dorsal fin having 7 branched rays, lateral line complete with 36 scales, scales on lateral sides have their posterior ends blackish, distance between vent
and anal fin 3.15 times in distance between anterior origin of anal and ventral fins.

**Distinguishing characters (Based on one specimen, 94.58 mm SL)**

D.1-II, 7; P.1, 12; V.1, 7; A. 1,5; C.19; Ll.35; Ltr. 4.5/3.5

Body elongate and slender, BD 18.64 in SL, HL 22.08 of SL, Mental disc well developed, WSD 73.22 in width of head. Snout rounded with fine tubercles. Barbells two pairs, rostral barbells slightly greater than diameter of eye and forming 106.21 of eye. Eyes moderate and not visible from ventral side of head, diameter 21.20 of HL, 43.86 in INTO. INTO 48.34 in HL. Abdomen slightly rounded Vt-AF 31.70 in PF-AF. LCPD 14.92 in SL , 65.34 in HL and HCPD 77.49 in LCPD. PDS 12, pre ventral scales 13 and pre anal scales 24. Circumpeduncular scales 12. Dorsal fin inserted closer to snout than to caudal. It is longer than HL, DB form 26.45 of height. Pectorals almost equal to head length and forms 98.70 in it. Pelvic fins smaller than head and form 89.26 in it and 90.44 in pectoral fin length. Distance between pectoral and ventral is 31.58 in SL. Distance between ventral and anal fins 24.40 in SL. Pre anal distance 77.55 in SL and pre dorsal distance 45.39 in SL. Pre-ventral distance 50.72 in SL. and pre pectoral distance forms 19.34 in SL. Caudal forked. In live, ground colour is greenish brown with ventral side pale white. Posterior edges of scales on lateral sides are blackish. Fins generally orange red and dorsal rays have blackish tips. In formalin, ground colour turns brown.

**Geographical distribution:** India: Mlappara at upstream of Periyar river, Kerala.
Etymology: Named after the locality from where the specimens were collected.

Other materials examined:

_Garra mullya_: ZSI/SRS F5789, 1 ex. 95 mm SL, Harangi reservoir; _G. menoni_: ZSI/SRS F553, paratypes, 31-69 mm SL, Silent valley; _G. hughi_: ZSI/SRS F5328, 150 ex. 39-70 mm SL, Kilakallar; _G. gotyla stenorhynchus_: ZSI/SRS F4913, paratypes, 110-111 mm SL, Thirumoorthy dam; _G. mcclellendi_: ZSI/SRS F6763, 1 ex. 142 mm SL, Hassan dt. Karnataka; ZSI/SRS F5139, 1 ex. 138 mm SL, Moyar river; _G. kalakadensis_: ZSI/SRS F854, paratypes 26 ex. 21-60 mm SL, Kalakad wild life sanctuary.

Habitat: Riffle-pool habitats with cobbles and gravels as substratum.

Fishing methods: Cast nets.

_Garra surendranathani_ Shaji, Arun and Easa (Plate IX, Fig. 73)


Common name: Nilgiri Garra  Local name: Kallotti

Distinguishing characters: (Based on 20 specimens, 62-158 mm TL)

D. ii, 8; P.i, 13; V.1, 7; A.1, 5; C.18; Ll. 36-37, Ltr. 4.5/3.

Body elongate, BD 15.05-17.0 (16.17) and HL 22.91-24.25 (23.70) in SL.

Head broad, snout elongated, without a transverse groove but a weakly developed protuberance as in adult specimens and with spinate tubercles.

Eyes 23.53-28.59 (26.7) in HL, 67.15-76.15 (73.83) in INTO. Interorbital flat, 34.48-37.69 (36.13) in HL. HW 91.68-99.23 (95.8) in BD. WSD 70.68-74.62 (72.19) in HW. LSD 32.65-44.69 (39.54) in HL and 68.19-74.26 (70.01) in WSD. Dorsal fin close to snout than caudal, HD 82.07-101.18 (82.07) in
HL. HP 103.47-118.7 (106.21) in HD. Vt-AF 39.48-44.26 (42.38) in PF-AF. 
HCPD 51.27-77.82 (62.29) in LCPD. Caudal forked. Body uniformly scaled, 
PDS 11-13. Back dark brown-black, flanks greenish brown, scales have black 
edges which appear as interrupted bands or some times patches of spots. 
Head with patches of black dots. Fins orange with black patches. 

Geographical distribution: India: Western Ghats of Kerala (Jayaram, 1999) 
Distribution in Kerala: Chalakkudy and Periyar rivers (Shaji et al., 1996; 
Ajithkumar et al., 2000; Kurup et al., 2004) 
Habitat: cascades, rapids and riffles with bedrock, cobbles and gravels as 
substratum. 

Fishing methods: Cast nets. 

*Garra emarginata* Kurup and Radhakrishnan 
(Plate IX, Fig. 74) 


Holotype: Deposited in ZSI (WGRS) CLT.No. V/F 13033, 115.26 mm TL, 
Paratypes: 2ex. 107.4 mm and 97.5 mm TL, Pooyamkutty, Periyar river, 23rd 
May, 2003 (Kept at School of Industrial Fisheries museum, Cochin University 
of Science and Technology) 

Diagnosis: An elongate and slender species possessing an emarginated 
caudal fin, eyes small and interorbital flattened, dorsal fin with 8 branched 
rays, lateral line complete with 35 scales, body with minute black spots 
arranged in series on either sides of lateral line, distance between vent and 
anal fin 2.7-3.4 times in distance between anterior origin of anal and ventral 
fins.
Distinguishing characters: (Based on 4 specimens, 97.5-115.26 mm TL)

D.1I, 8; P.1, 13; V.1, 7; A.1, 5; C.19.

Body elongate and slender. BD 15.86-18.39 in SL (17.19), HL 21.85-24.07(23.40) of SL, Mental disc well developed, LSD 70.35-74. 19 (72.27) in WSD and latter 51.38-65.12(58.35) in HW. Snout round and smooth. Barbells two pairs, rostral barbells equal to or slightly greater than diameter of eye, forming 102-112.69 (108.23) of latter. Eyes smaller and not visible from ventral side of head, diameter 17.08-18.83 (19.75) of HL, 36.0-44.85 (38.28) in INTO. Interorbital distance flattened and is 46.89-52.41 (49.2) in HL. Abdomen slightly rounded. Vt-AF 29.77-32.22 (30.33) in PF-AF. LCPD 10.91-12.48 (11.25) in SL, 44.44-50.92 (48.52) in HL and HCPD 89.38-99.63 (92.46) in LCPD. PDS 11-12, pre ventral scales 13 and preanal scales 26. Circumpeduncular scales 12. Dorsal fin inserted closer to snout than to caudal. It is shorter than HL, DB form 62.44-86.48 (75.63) of HD. Pectorals larger than head and forms 106.88-130.0 (124.29) in HL. Ventral fins almost equal or slightly larger than head and forms 89.37-106.02(100.29) in HL and 79.45-92.68(86.25) in pectoral fin length. Distance between pectoral and ventral is 33.19-35.54(34.46) in SL. Distance between ventral and anal fins 26.62-32.16(29.16) in SL. Pre anal distance 80.91-87.4 (83.61) in SL and pre dorsal distance 48.22-51.68 (49.08) in SL. Pre-ventral distance 52.06-55.39 in SL and pre pectoral distance 18.42-21.88 in SL. Caudal emarginate. In live, ground colour is grayish green with ventral side pale white. Minute dark spots are arranged on either sides of lateral line in a series. Fins generally pale orange red and dorsal rays have blackish tips. In formalin, ground colour turns brown.
Chapter 2 Systematics


Etymology: Named after the emarginated nature of caudal fin, which differentiate the species from all other related species.

Other materials examined:

Habitat: Pool-riffle habitats with bedrock, cobbles and gravels as substratum.

Fishing methods: Cast nets.

Family: Balitoridae

Fishes with greatly depressed (Balitorinae) or fusiform (Nemacheilinae) body, covered with small cycloid scales. Scales absent on ventral surface. Gill openings either restricted to above base of pectoral fins or extending to ventral surface for a short distance. Paired fins may or may not be placed horizontally with one or two simple unbranched rays. Outer rays of paired fins are provided with adhesive pads on ventral surface. Lateral line complete or in complete.

Key to sub-families
1. a) Paired fins horizontally inserted. Pectoral fins with at least two simple rays.........................................................................Balitoriane
b) Paired fins not inserted horizontally, only outermost pectoral fin ray is simple..............................................................Nemacheilinae

Sub-family: Balitorinae

Body streamlined, moderately or greatly depressed, ventrally flattened. Mouth inferior, at least with three pairs of barbells. Paired fins horizontally inserted, fan like and have adhesive pads on ventral surface of outer rays. Atleast two simple rays in pectoral and pelvic fins. No spine under or before eyes.

Key to Genera

1.  a) Two antrose papillae between angles of mouth.....................2  
    b) No antrose papillae.......................................................3

2.  a) Gill openings small, restricted above pectoral fin base........Bhavania 
    b) Gill openings extending to below pectoral base..............Travancoria

3.  a) Upper lip with labial papillae.....................................Balitora
    b) No labial papillae on lips.........................................Homaloptera

Genus Bhavania Hora

Bhavania Hora, Rec. India Mus., 39: 11, 1937 (Type, Platycara australis Jerdon)

Bhavania australis (Jerdon)  
(Plate IX, Fig. 75)

Platycara australis Jerdon, Madras J. Lit. Sci., 15: 333, 1849 (Type locality: Walliar, Nilghiris)  
Homaloptera maculata Day, Fish. India, 256, pl. 122, 1878 (Wyanad)  
Bhavania annandalei Hora, Rec. Indian Mus., 19: 200, 1920 (Travancore, Nilgiris and Malabar)  
Bhavania australis Hora, Rec. Indian Mus., 19: 205, 1920

Common name: Western Ghat loach     Local name: Kallechari, Kallepatti

Distinguishing characters: (Based on 26 specimens, 63-116 mm TL)
D. ii, 7-8; P. viii, 10-11, V.ii,7; A.i,5; C.19.Ll. 67-68. Ltr.16-17/10.

Head and anterior part of body depressed. BD 10.69-16.56 (13.21), HL 19.75-26.10 (22.70) in SL. Snout broad with trenchant margins. Rostral groove overhung by a rostral fold. Eyes moderate, 12.81-20.82 (16.12) in HL. Lips continuous, non papillated. Dorsal fin inserted close to snout and slightly behind origin of pelvic fin, margin straight or slightly concave. Pectoral fins fan like, broad, HP 88.52-130.93(98.1.38) in HL. Caudal fin forked. Ground colour dark on dorsal surface with black spots and blotches irregularly distributed, but form a regular pattern on fins.

**Geographical distribution:** India: Extreme south of Western Ghats (Karnataka, Nilgiris and Kerala) (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Travancore high ranges (Silas, 1951), Periyar Tiger Reserve (Arun et al., 1996), 13 rivers of Kerala (Ajithkumar et al., 2000), Kabbini river system(Kurup et al., 2004).

**Habitat:** Cascades, rapids and riffles at upper stretches of river systems. Depressed body, flat ventral surface, horizontally arranged and enlarged fins helps to attach itself closely to rocky substratum in fast moving waters.

**Fishing method:** Scoop nets and drag nets.

**Genus Travancoria Hora**

*Travancoria Hora, Rec. India Mus., 43: 228, 1941 (Type, Travancoria jonesi Hora)*

Head and anterior part of body depressed and ventral surface flattened. Lips are thick and continuous at corners of mouth. Lower lip interrupted and median part is separated from two lateral parts. Two antrose papillae present. Rostral groove deep, 4-7 short and stumpy rostral barbells arranged in two series and a pair of maxillary barbells at corners of mouth. Gill openings

**Key to species**

1. a) Rostral cap is not developed into barbells, distance between vent to anal origin 7-8 times in interdistance between origins of ventral and anal fin................................................................. *Travancoria elongata*
b) Rostral cap developed into barbells, distance between vent to anal origin 2-3 times in interdistance between origins of ventral and anal fin

................................................................. *Travancoria jonesi*

*Travancoria elongata* Pethiyagoda and Kottelat (Plate IX, Fig. 76)

(Type locality: Upstream of Chalakkudy river)

**Common name:** Periyar loach **Local name:** Kallepatti, Kallenacki

**Distinguishing characters:** (Based on 6 specimens, 86-112 mm TL)

D. iii, 7-8; P.7, 10; V. ii, 7; A. ii,5; C.19. Ll. 74-77; Ltr. 9-10/8

together and give appearance of a band. Ventral side creamy white. Head mottled with several small brownish spots. Fins dotted.

**Geographical distribution:** India: Western Ghats of Kerala (Jayaram, 1999; Menon, 1999)

**Distribution in Kerala:** Periyar river system (Kurup et al., 2004).

**Habitat:** Rapids and cascades of upper stretches. Depressed body, flat ventral surface, horizontally arranged and enlarged fins helps fish to attach itself closely to rocky substratum in fast moving waters.

**Fishing methods:** Scoop nets and drag nets.

**Travancoria jonesi Hora**

(Plate IX, Fig. 77)

`Travancoria jonesi` Hora, Rec. Indian Mus., 43: 230, pl. 8, figs. 5 to 9, 1941( Type locality ; stream within a radius of five miles from Pampadumpara, Peerumedu, Kerala)

**Common name:** Travancore loach  
**Local name:** Kallepatti, Kallenacki

**Distinguishing characters:** (Based on 22 specimens, 68-108mm TL)

D.ii,7 ; P. vi,9; V. ii, 7; A.i,5 C.18.LL. 76-77; L.tr. 9-10/8

Head and body depressed. BD 12.63-14.30 (13.47) and HL 22.32-23.42 (22.87) in SL. Eyes comparatively larger, 21.09-24.13 (22.61) in HL. Rostral cap developed in to barbells. Seven rostral and two maxillary barbells. HCPD 32.86-33.15 (33.01) in LCPD. LCPD 17.43-17.51(17.47) in SL upper margin of dorsal fin straight, HD in HL. Vt-AF 37.56-48.23 (42.58) in PF-AF. HC 19.3-20.32 (19.81) in SL. Ground colour dark brown. On back, a series of 8-10 saddle shaped blotches. Head and body mottled with black spots of different sizes and pattern, some of which form a black lateral band. Ventral side creamy white. Fins with a series of dots.
Geographical distribution: India: Western Ghats – High ranges of northern Travancore and Anamalai hills (Talwar and Jhingran, 1991)

Distribution in Kerala: Chalakkudy River system (Hora, 1941., Ajithkumar et al. 1999), Periyar river system (Kurup et al., 2004)

Habitat: Rapids and cascades of upper stretches. Remarkably, the species shares the same habitat of Travancoria elongata. Depressed body, flat ventral surface, horizontally arranged and enlarged fins are adaptations for its attachment to rocky substratum in fast moving waters.

Fishing methods: Scoop nets and drag nets.

Genus Balitora Gray
Balitora Gray, III, Ind. Zoo., 1: pl. 88, figs. 1, 2, 1832 (Type, Balitora brucei Gray)

Balitora mysorensis Hora
(Plate IX, Fig. 78)

Balitora brucei var. mysorensis Hora, Rec. Indian Mus., 43: 232, pl. 8, fig. 4, 1941 (Type locality: Sivasamudram, Karnataka)

Balitora mysorensis: Menon, 1977

Common name: Slender stone loach     Local name: Kallepatti

Distinguishing characters: (Based on three specimens, 68-73 mmTL)

D. ii, 9; P.ix,11; V.1,9; A. i, 5; C.19; Ll. 60-62

**Geographical distribution:** India: Westernghats-Cauvery and Tungabhadra river system (Karnataka) and Kolhapur (Maharashtra) (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Kabbini, Bhavani and Periyar (Menon, 1987, Shaji et al., 1996).

**Habitat:** Rapids and cascades of upper stretches. Depressed body, flat ventral surface, horizontally arranged and enlarged fins are adaptations to attach itself closely to rocky substratum in fast moving waters.

**Fishing method:** Scoop nets and dragnets

**Genus:** Homaloptera van Hesselt

*Homaloptera* van Hesselt in: Kuhl & van Hesselt, Algem. konst. En Letterbode, 2, p.133, 1823 (Type, Homaloptera ocellata van der Hoeven)

Body subcylindrical or depressed. Ventral surface flattened or round. Head depressed. Snout broadly round or conical. Rostral groove absent and lips are continuous. No post labial papillae. Barbells three pairs, two rostral and one maxillary. Gill openings extending to a short distance beyond pectoral base. Dorsal fin with 8 rays, anal fin short with seven rays, of which 5 are unbranched. Caudal peduncle short and stout. Caudal fin emarginated or deeply forked. Scales small and absent on head and ventral side. Lateral line complete.

**Key to species**

1. a) Origin of dorsal fin towards caudal than snout tip, ventral surface rounded, body with a distinct dark lateral band along lateral line, unbranched pectoral fin rays 5

   *Homaloptera silasi*

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b) Origin of dorsal fin equidistant between snout and caudal fin, ventral surface flat, body with irregular spots, unbranched pectoral fin rays 7-9. 

**Homaloptera pillai** Indra and Remadevi (Plate IX, Fig. 79)

**Common name:** Silent valley loach  
**Local name:** Kallenacki, Kallepatti

Distinguishing characters: (Based on 8 specimens, 33-82 mm TL)

D.i,7-9; A.i-ii,4-5; P.vii-ix,11-13; V.ii-iii, 8-9; Li. 83-93

Body depressed, ventral side flattened. BD 12.86-13.06 (12.96) in SL, Head flattened, snout broad, HL 20.74 – 22.7 (21.72) in SL. Eyes small to moderate, 14.41-14.61 (14.51) in HL. HCPD 68.19-78.23 (73.23) LCPD and LCPD 10.41-11.93 (11.17) in SL. HD 77.15-84.49 (80.02) in HL Pectorals broad almost reaching pelvics, 109.64-129.84 (119.74) in HL and 129.77-168.3 (149.04) in HD. Pelvics also broad, not reaching vent, 82.49-82.62 (82.55) in HP. Caudal emarginated, HC 17.11-19.73 (18.42) in SL. Ground colour light to dark brown, mottled with numerous irregularly placed dark dots. Head mottled with numerous irregular black dots. Fins dusky brown. Ventral side yellowish to light brown.

**Geographical distribution:** India: Western ghats of Kerala (Talwar and Jhingran, 1991),

**Distribution in Kerala:** Silent valley national park (Indra and Remadevi, 1981; Menon, 1999, Jayaram, 1999), Bharathapuzha (Kurup *et al.*, 2004).
Habitat: Rapids and cascades of higher altitudes. Depressed body, flat ventral surface, horizontally arranged and enlarged fins are adaptations to attach itself closely to rocky substratum in fast moving waters.

Fishing method: Scoop nets and dragnets

*Homaloptera silasi* Kurup and Radhakrishnan

(Plate IX, Fig. 80)


Holotype: Deposited in ZSI, Calicut, no. ZSI/WGRS/CLT/V/F 13118a, 67.92 mm TL, Chockanpetty, Periyar Tiger reserve, 12<sup>th</sup> February, 2004

Paratypes: 2ex. Deposited in ZSI, Calicut, no. ZSI/WGRS/CLT/V/F 13118b, 49.70-51.26 mm TL, Chockanpetty, Periyar Tiger reserve, 12<sup>th</sup> February, 2004

Diagnosis:

An elongate fish with a sub cylindrical body, Head depressed, small eyes, narrowly elongated snout, dorsal fin inserted close to base of caudal fin than tip of snout, small pectoral fins, its height less than length of head and not reaching pelvic fins, pelvic fins also small, not reaching vent or anal fin, 89 to 93 lateral line scales, caudal peduncle short and stout and its least depth less than two times in its length.

Distinguishing characters: (Based on 4 specimens, 46-68 mmTL)

D i, 8; P v, 9; V ii, 8; A 1, 6; C 19; Ll. 89-93.

Body sub cylindrical and covered with scales except on ventral surface. BD 14.31-17.62 (15.46) in SL. MWB 83.74-102.06 (92.05) in MDB. BD 54.44-71.93 (49.02) in HL. Scales small imbricate, covering whole body except head and ventral profile. Head depressed, snout elongated and broadly pointed. HL 49.80-58.26 (54.56) in SL and width of head form 67.01-
72.51(69.86) in length of head. Eyes small and placed at middle of head and are not visible from ventral surface of head and forming 7.76-9.84 (8.26) of HL and 22.62-60.61(41.70) in INTO. Snout 38.27-47.36 (42.85) in HL and is 92.44-105.90 (99.78) in POL. INTO form 34.32-41.31(37.73) in HL. Dorsal fin situated just behind origin of pelvic fin and its origin is closer to base of caudal fin than to snout tip. PDL 49.80-58.26 (54.56) in SL and is 108-114 (112.22) in PODL. DH 70.84-84.21 (77.82) in HL and 18.05-20.63 (19.14) in SL. Pectoral fins not reaching pectorals and PH 19.58-22.16 (21.37) in SL and 106.71-118.97 (111.75) in DH. It form 80.03-92.55 (86.81) in HL. Pelvic fins are short and not reaching vent or anal fin. VH 77.14-85.57(81.25) in PH and 64.40-79.19 (70.55) of HL. Anal fins shorter than pectoral and pelvic fins and is 42.54-68.63 (56.29%) in HL and is 11.70-16.47(13.87) in SL. Vent is situated close to origin of anal fin. Vt-AF 12.14-17.90 (15.17) in PF-AF. Caudal peduncle is short and stout and LCPD 13.72-17.53 (15.56) in SL and 58.70-71.54 (63.12) in HL. HCPD 54.58-70.63 (63.48) in LCPD. Ground colour pale yellowish green with back with irregular brown blotches appear some times as short, wide bands of 7-8 numbers. Area below lateral line and to some extend ventral surface have blackish brown patches. Head is mottled with irregular brown blotches, sometimes coalesce together to form uniform brown colour. A dark longitudinal stripe passing from behind opercula to caudal peduncle. Fins are generally dusky with blackish patches. Base of the paired and unpaired fins are marked by darkish brown spot or band which in the case of caudal fin have a well defined deep brown to black transverse band at caudal base.
**Geographical distribution:** Chokkanpetty in Periyar Tiger Reserve, Kerala, South India.

**Etymology:** Named after Dr. E.G. Silas, Renowned fishery scientist, who has made outstanding contributions to Taxonomy of freshwater fishes of Western Ghats.

**Comparative materials examined:**

*Homaloptera Pillai:* ZSI/SRS F462, Holotype, 69mm, Silent valley, river Kunthi, Kerala; *H. Pillai:* ZSI/SRS F 463, paratypes, 2 examples, 49-57mm SL, Sayvala, New Amarambalam, Kerala; *H. santhanparaiensis:* ZSI/SRS F 5322, Holotype, 6.1mm SL, Santhanparai, Panniar stream of Periyar, Kerala; *H. santhanparaiensis:* ZSI/SRS 5323, paratype, 45mm SL, Santhanparai, Panniar stream of Periyar, Kerala.

**Habitat:** Small rocky pool with mud, detritous and cobbles as substratum.

**Fishing method:** Scoopnets of small mesh size

**Sub family: Nemachilinae**

Body fusiform. Mouth small and inferior, Lips are thick and fleshy, entire or furrowed and continuous at angles of mouth. Lower lip interrupted in middle. Barbells two to four pairs. Dorsal fin is with 7-20 rays. Lateral line is complete or in complete. Pectoral and pelvic fins not inserted horizontally and only outermost ray of pectoral fin is simple.

**Key to sub genera**

1. a) Pair of well developed nasal barbells..........................*Oreonectus*
   b) No well developed nasal barbells........................................2

2. a) Caudal fin truncate, a black ocellus at upper margin of base of caudal fin.................................................................*Acanthocobitis*
b) Caudal fin truncate, emarginate or forked, no black ocellus at upper angle of base of caudal fin..........................................................3

3. a) Body marked by series of vertical bars.........................Schistura
   b) Body not marked with a series of vertical bars...............4

4. a) Body with moniliform dots which appear as dark lateral band, body without any other blotches or bands.........................Nemacheilus
   b) Body marked with irregular network of dark brownish and whitish yellow bars.........................................................Mesonemacheilus

Genus *Oreonectus* Gunther

*Oreonectus Gunther, Cat. Fish. Brit. Mus., 7, p. 369, 1868 (Type, *Oreonectes platycephalus* Gunther)

*Oreonectus keralensis* Rita and Nalbant

(Plate X, Fig. 81)


**Common name:** Kerala loach **Local name:** Koytha

**Distinguishing characters:** (Based on 16 specimens, 34-56 mm TL)

D.7; P. i, 10; V.1, 7, A. ii, 5 C.19

Body elongated with slightly flattened head. BD 14.23-16.21 (15.21) in SL.

Eyes are smaller, 14.12-15.23 (14.63) in HL. Eight barbells present. Anterior nostrils are prolonged in to a nasal barbell. Ground colour is dark green, marked with numerous ill-defined black bands and dots. Caudal peduncle with an adipose crest. Dorsal fin origin more towards caudal and is placed behind origin of pelvic fin. Lateral line short, extending only up to tip of pectoral fin. Fins generally dusky without any markings. Caudal fin truncate.

**Geographical distribution:** India: Westernghats of Kerala (Talwar and Jhingran, 1991)
Distribution in Kerala: Pampadumpara (Rita and Nalbant, 1978), Moovattupuzha river, Eravikulam National park of Periyar river (Ajithkumar et al., 2000), Periyar river system (Kurup et al., 2004); Meenachil river (Radhakrishnan and Kurup, 2006).

Habitat: small low velocity streams and channels with cobbles and muddy substratum with leaf litters.

Fishing method: Scoop nets and dragnets of small mesh sizes

Genus: Acanthocobitis Peters


Acanthocobitis botia (Hamilton-Buchanan) (Plate X, Fig. 82)

Cobitis botia Hamilton-Buchanan, Fish. Ganges, pp. 358, 395, 1822 (Type locality: Rivers of northe eastern parts of Bengal)

Cobitis botia Hamilton, Fish. Ganges, pp. 350, 394, 1822 (Type locality: Brahmaputa river)

Nemacheilus botia Gunther, Cat. Fish. Brit. Mus., 7:349, 1868

Noemacheilus botia Menon, Faun. India, Pisces, 4(1), 1987 (Ganges and Indus)

Local name: Koytha

Distinguishing characters: (Based on 8 specimens, 46-74mm TL)

D ii, 9; P. I, 10, V.i, 7; A.i, 5-6, C.19

Body larger and deeper than other most nemacheilines, BD 18.87-19.22 (19.05) of SL. Eyes moderate to large and its diameter form 17.79-20.60 (19.19) in HL. Dorsal profile is slightly arched than ventral and caudal peduncle region is compressed and deep. Head slightly compressed and snout blunt. No nasal barbells, outer margin of dorsal fin convex or straight, caudal fin straight or slightly emigrate. Lateral line incomplete, extending to base of dorsal fin. Ground color greenish yellow with varying number of wide and narrow brownish bands on flanks. Head mottled with numerous brown spots. Dorsal profile slightly brownish. Caudal fin with 5 'v' shaped rows of...
spots and dorsal fin with 4 rows of spots. Presence of a dark ocellus at upper angle of caudal base is a salient feature of species.

**Geographical distribution:** India, Pakistan (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Vythiripuzha, Kabbini river system (Easa and Basha, 1995).

**Habitat:** small riffles with gravel and pebbles.

**Fishing method:** Cast nets and dragnets of small mesh sizes are found effective for collection.

**Genus Schistura McClelland**

*Schistura McClelland, Asi. Res., 19, p. 309, 439, 1839 (Type, Schistura rupecola)*


**Key to species**

1. a) Body deep, with minute dots and bands......*Schistura semiarmatus*
   b) Body less deep, devoid of spots.................................2

2. a) Lateral line complete, clour bands are narrow and numerous .................................................................*Schistura striatus*
   b) Lateral line incomplete, bands wide and 10-12 in numbers .................................................................3

3. a) Dorsal fin with jet-black colour...............*Schistura nilgiriensis*
   b) Dorsal fin with series of dots...............................*Schistura denisoni*
Schistura denisoni (Day)

(Plate X, Fig. 83)

Nemachilus denisonii Gunther, Cat. Fish. Brit. Mus., 7:352, 1868 (Nilgiris)
Nemachilus chryseus Day, J. Linn. Soc. (Zool.), 11: 259, 1873

Common name: Denison’s loach  Local name: Koytha

Distinguishing characters: (Based on 12 specimens, 46-68 mm TL)

D. ii, 7; P. 1, 8-9, V. 1,5; A.ii,5; C.19

Body elongated and more or less of uniform depth. BD 13.03-14.88 (13.89) and HL 27.20-27.92 (27.56) in SL, eyes are moderate, 20.81-21.33 (21.06) in HL. Lateral line incomplete, ending just at origin of dorsal fin. Dorsal fin inserted midway between caudal and snout. Dorsal fin margin usually convex and caudal fin deeply emarginated. Body marked with 10-12 vertical brownish bars, which are wider than light interfaces. Dorsal and caudal fins with three rows of spots. A black patch at beginning of dorsal fin. Caudal base is marked by a prominent vertical black band.

Geographical distribution: Peninsular India, Chota Nagpur plateau (Bihar) and Bastar (Madhya Pradesh) (Talwar and Jhingran, 1991)

Distribution in Kerala: Hill ranges of Travancore (Silas, 1951); Pamba river (Menon, 1987); Bhavani river (Easa and Basha, 1995), Ajithkumar et. al (2000), Bharathapuzha, Pambar and Manimala river systems (Kurup et al., 2004).

Habitat: shallow riffles with cobbles or gravels as substratum.

Fishing method: Cast nets and scoop nets
**Schistura semiarmatus** (Day)  
(Plate X, Fig. 84)


**Common name:** Dotted finned loach  
**Local name:** Koytha

**Distinguishing characters:** (Based on 8 specimens, 36-58 mm TL)

- D. i-ii, 7-8; P. 1, 10, V. 1,7; A.i,5; C.19

Body elongated, slightly compressed laterally and deep. BD 12.29-19.62 (15.95) and HL 24.28-26.46 (25.37) in SL, eyes are moderate, 19.78-21.61 (20.69) in HL. Lips thick and furrowed. Lateral line complete. Dorsal fin inserted nearer to tip of snout than caudal. Caudal fin slightly forked. Body light greenish brown with several dark spots which extended to head region. Posterior to dorsal fin origin there are irregular narrow yellow bands which are very conspicuous in younger specimens. A black mark at origin of dorsal fin. Fins generally with multiple rows of dark spots. Patches of brownish spots in the form of a band at caudal peduncle.

**Geographical distribution:** Peninsular India: Cauveri basin in Wyanad, Nilgiris and Mysore; and Silent valley (Taiwar and Jhingran, 1991)

**Distribution in Kerala:** East flowing rivers of Kerala (Shaji and Easa, 2001), Bhavani and Kabbini rivers (Easa and Basha, 1995), Pambar river, Chinnar WLS (Ajithkumar et al. 2000) Pambar and Kabbini river systems (Kurup et al., 2004)

**Habitat:** Riffle-pool habitats with cobbles, gravel or sand as substratum.

**Fishing methods:** Cast nets or scoop nets
**Schistura striatus** (Day)
(Plate X, Fig. 85)

*Nemacheilus bhimachari* Hora, *rec. Indian Mus.*, 39 13, 1937 (Type locality: Thunga river, Shimoga)

**Local name:** Koytha

**Distinguishing characters:** (Based on 6 specimens, 34-46 mm TL)

- D. ii, 11; P. 1, 8-9, V. 1, 7; A.i, 5; C.19
- Body elongated and cylindrical. BD 23.20-28.71 (25.95) and HL 25.57-29.00 (27.29) in SL and eyes are moderate, 20.15-26.39 (23.27) in HL. Barbells long and narrow. Dorsal fin inserted nearer to tip of snout than caudal. Dorsal fin base larger and adipose fin comparatively high. Caudal fin slightly forked. Lateral line complete. Body yellowish with several narrow brownish bands across. Number of bands increases with age. Bands anteriorly are narrow, closely arranged and some times connected and those at posterior region are wider. A black band at base of caudal fin. Multiple rows of spots on dorsal fin. Caudal fin dusky and other fins hyaline.

**Geographical distribution:** India: Kerala: Wynaad; and Karnataka: Shimoga (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Wynaad (Menon, 1987; Kurup et al., 2004). Fairly common in Vythiripuzha and Vythiri (Shaji and Easa, 2001).

**Habitat:** Riffle-pool habitats with cobbles and gravel as substratum.

**Fishing methods:** Cast nets or scoop nets

**Schistura nilgiriensis** (Menon)
(Plate X, Fig. 86)

*Noemacheilus nigiriensis* Menon, *Faun. India Pisces*, 4(1): 106, pl.10, fig.8, 1987 (Type locality: Stream near Pyakara dam, Nilgri district, Tamil Nadu)
Common name: Nilgiri loach  
Local name: Koytha

Distinguishing characters: (Based on 7 specimens, 44-68 mm TL)
D. ii, 7; P. 1, 8-9, V. 1, 5; A. ii, 5; C.19

Body comparatively more elongate and cylindrical. BD 12.64-18.62 (15.82) and HL 22.61-28.64 (25.31) in SL, eyes are moderate, 17.68-21.32 (19.64) in HL. Dorsal fin inserted in middle of snout and caudal. Pelvic fins separated from anal opening by a considerable distance. Lateral line incomplete, terminating opposite to middle of pectoral fin. Body marked with 11 or 12 brown bands, broader than pale interspaces and bands are radiating in to many branches at dorsal profile. A dark band at caudal fin base. Dorsal fin has a jet black band at middle and a dark base.

Geographical distribution: India: Pyakara dam, Nigirri district (Talwar and Jhingran, 1991)

Distribution in Kerala: common in Kabbini river (Shaji and Easa, 2001)

Habitat: Riffle-pool habitats with cobbles and gravel as substratum.

Fishing methods: Cast nets or scoop nets

Genus: *Nemacheilus* Bleeker

*Nemacheilus* Bleeker, *Versl. Akad. Amsterdam*, 15, p.34, 1863 (Type, *Cobitis fasciata* Valenciennes)

*Nemacheilus monilis* (Hora)  
(Plate X, Fig. 87)

*Nemacheilus monilis* Hora, *Rec. Indian Mus.*, 22: 19, 1921 (Type locality: Bhavani river, 10 miles from Mettupalayam)


Common name: Spotted loach  
Local name: Koytha

Distinguishing characters: (Based on 6 specimens, 36-74 mm TL)
D. ii, 7-8; P. 1, 10-11, V. 1,7; A.i,5; C.19

**Geographical distribution:** India: Western Ghats: Nilgiris (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Bhavani river, NBR (Easa and Basha, 1995), Pambar river in Chinnar Wild life Sanctuary (Ajithkumar et al., 2000), Kabbini river system (Kurup et al., 2004).

**Habitat:** Riffles with cobbles, pebbles and gravel as substratum.

**Fishing methods** Cast nets and dragnets.

**Genus Mesonemacheilus** Banarescu & Nalbant


Body cylindrical, lateral line usually incomplete, ends at base of anal fin. Dorsal fin with 7-10 branched rays. Caudal fin forked. A network of bands and oval spots distributed all over body. Dorsal fin have 3-5 rows of spots and outer margin is convex or straight. Caudal, anal and ventral fins having rows of spots. Caudal fin with black spot or small dark band at its base. No nasal barbells.

**Key to species**

1. a) Dorsal fin with 10 branched rays ....... *Mesonemacheilus pambarensis*
b) Dorsal fin with less than 10 branched rays .................................. 2

2. a) Dorsal fin with nine branched rays...... *Mesonemacheilus periyarensis*
b) Dorsal fin with less than nine branched rays................................... 3

3. a) Two or three rows of rounded small to large yellow spots along body.................................................. *Mesonemacheilus guentheri*
b) Body with bands or a network of bands and spots........................... 4

4. a) Body with oblique, Y-shaped bands....*Mesonemacheilus triangularis*
b) Body with varying number of wavy bands which sometimes coalesce
together to form reticular network works.............................................. 5

5. a) Lateral line incomplete.............................................................. 6

b) Lateral line complete.............................................................. *Mesonemacheilus meroni*

6. a) Small forms, Saddle-shaped 7-8 small black bands on back, sides with varying number of bands, dorsal and caudal fins with patches of spots........................................ *Mesonemacheilus petrubanarescui*
b) Large forms, Bands on back are irregular, No colour bands on sides, dorsal and caudal fins are reddish to hyaline............ *Mesonemacheilus remadevi*

**Mesonemacheilus pambarensis** (Remadevi and Indra)

*(Plate X, Fig. 88)*

*(Type locality: Pambar river, Chinnar wild life sanctuary, Kerala)*

**Common name:** Periyar banded loach

**Local name:** Ayira

**Distinguishing characters:** (Based on 6 specimens, 29-38 mm TL)

D. ii, 8; P. 10, v. 1, 5; A. ii, 5; C. 18

Body more slender and lean. Back and flanks marked with varying number of yellow bands which often enclosing yellowish white spots, especially after
dorsal fin. A rectangular deep dark patch at middle of caudal base. Caudal fin marked with 4 rows and dorsal fin marked with two rows of black spots. Indistinct patches of spots are seen in other fins also. Origin of dorsal fin is marked with a dark coloration. Outer margin of dorsal fin concave. Lateral line complete.

Distribution in Kerala: Pambar river, Chinnar WLS (Remadevi and Indra, 1986., Ajithkumar et.al., 1999), Chinnar river (Easa and Shaji, 1995).

Habitat: Small riffles at high altitudes

Fishing method: Cast nets and dragnets of fine mesh sizes

Mesonemacheilus periyarensis Kurup& Radhakrishnan
(Plate X, Fig. 89)


Holotype: Deposited in ZSI, Chennai, No. awaited. 85.2 mm TL, Periyar Lake, 18th February, 2002.

Paratypes: 2ex. Deposited in ZSI Chennai, No. awaited. 80.6-82.0 mm TL, Periyar Lake, 18th February, 2002.

Diagnosis: An elongated and slender species, dorsal fin with 9 branched rays, lateral line incomplete, ending above anal fin, body with irregular network of bands and blotches, Dorsal and caudal fins with 4 or more rows of dark bands and a black ocellus at lower angle of caudal peduncle, very near to caudal origin.

Distinguishing characters: (Based on 12 specimens, 59-78 mm TL)

D I, 9; P I, 9; VI, 6; Al, 5; C 19.

Dorsal profile slightly arched, compared to ventral. Lateral line ending above anal origin. Eyes moderately large, nostrils close to each other, Head longer
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than broad, mouth more or less semicircular, subterminal with upper jaw slightly prolonged. Barbells well developed, 3 pairs, BD 12.5-13.69 (13.059) and HL 17.73 - 22.87 (20.3) in SL, SNL less than INTO, latter less than POL. Eyes not visible from ventral side of head, diameter 19.88-26.33 (23.10) of HL, shorter than INTO, 38.4-72.5 (55.45) of latter. Anterior nostrils flap-like. Mouth slightly pointed rather than semicircular, lips fleshy, lower lip interrupted in middle. Barbells well developed, broader at their bases and with pointed tips, outer rostral barbells longer than inner ones and are equal to or larger than maxillary barbells, not extending to anterior border of eye. LCPD 10.34-13.56 (11.95) in SL, HCPD 65.23 -79.83 (72.53) in HL. Lateral line incomplete, ending above origin of anal fin or slightly behind it and is followed by a shallow groove, which becomes deeper as it reaches caudal peduncle. Scales small, imbricate, covering whole body except ventral profile between pectoral and pelvic fins. Dorsal fin inserted closer to snout than to caudal. BD forms 63.97-84.74 of in HD. HD 89.18 in HL. Pectorals smaller than head length, HP 83.72 in HL. Pelvic fins smaller than head and pectoral fins, HV 70.92 in HL and 77.77 in HP. Ventral not reaching anal fins and latter not reaching caudal fin. Distance between pectoral and ventral is 26.32 in SL. Distance between ventral and anal fins 24.57-30.2 in SL. Pre-anal distance 70.11 -78.6 in SL, pre-dorsal distance smaller, 43-48 in SL. Pre-ventral distance 4.59 -5.01 in SL, pre-pectoral distance 19.49-25.20 in SL. Caudal forked. Ground colour light brown with irregularly descending narrow yellow bands which sometimes coalesce together to form reticular networks. Irregular yellow spots or bands dispersed between them. Bands also arise from ventral side towards lateral line. Pattern of colouration extends on to
head and snout region. Dorsal fin marked with 4 dark bands while caudal fin has 5 narrow dark bands. Bands are also seen on paired fins. Pectoral fin rays are either dusky or with well-distinguished dark band. Ventral fins have two narrow dark coloured bands. Anal fin also with two dark narrow bands. There is a dark ocellus at lower angle of caudal peduncle, close to origin of caudal rays.

**Geographical distribution:** India: Thannikkudy in Periyar Lake, Kerala.

**Etymology:** Named after water body from where the specimens were collected.

**Habitat:** Small riffles with pebbles and cobbles as substratum.

**Fishing method:** Cast nets and dragnets of small mesh sizes.

**Mesonemacheilus guentheri** (Day)


*Nemacheilus rubripinnis* Day, J. Asiat. Soc. Beng., 41(2) p. 197, 1872 (Malabar)


*Noemachelus guentheri* Menon, Faun. India Pisces, 4(1), 1987 (Western Ghats)

**Common name:** Gunther’s loach  
**Local name:** Koyma, Koytha, Ayira

**Distinguishing characters:** (Based on 16 specimens, 41-54 mm TL)

D. ii ,8; P. i, 10; V. l, 7; A. ii, 5; C.18

Body fusiform, BD 16.48-17.01(16.52) in SL, Lateral line incomplete, ending at base of anal fin. Ground colour dark brown with 7-10 yellow, small, saddle shaped bands on back which some times coalesce together and one to three rows of small to large yellow spots on flanks. Dorsal fin with two rows of spots with a black dot at origin, Pecoral and anal fins with indistinct rows of spots, pelvic fins hyaline. Caudal fin deeply forked, with a black vertical bar at its base and with 3-4 rows of spots.
**Geographical distribution:** Peninsular India: Western Ghats (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Travancore (Hora and Law 1941), High ranges of Travancore (Silas, 1951), Periyar Tigr Reserve (Arun et al., 1996), Chinnar Wild life sanctuary (Easa and Shaji, 1996), Silent valley NP (Remadevi and Indra, 1986), Kallar, Pambar, Periyar and Bharathapuzha river systems (Menon, 1999), Bharathapuzha, Achenkoil, Pambar and Kabbini river systems (Kurup et al., 2004)

**Habitat:** Riffles of middle and upstream.

**Fishing method:** Scoop nets, drag nets and cast nets of small mesh sizes.

*Mesonemacheilus triangularis* (Day)  
(Plate XI, Fig. 91)


**Common name:** Triangular banded loach  
**Local names:** Koytha, Koyma, Varayanparal

**Distinguishing characters:** (Based on 18 specimens, 36-72 mm TL)  
D. ii, 7; P.1, 10-12; V.1, 7; Ai ,5, 0.19

Body comparatively large, lateral line almost complete, reaching up to caudal peduncle. Ground colour brownish with 7-9 oblique, 'Y'-shaped yellow bands descending from back to ventral surface. 3 rows of spots on caudal fin and 3-4 rows on dorsal fin. Other fins have patches of dark colouration. A deep dark spot or a small band is present at caudal base. Outer margin of dorsal fin is convex or straight.

**Distribution in Kerala:** High ranges of Travancore (Hora and Law, 1941., Silas, 1951), Kerala part of Nilgiri biosphere (Easa and Basha, 1995), Silent
valley (Remadevi and Indra, 1986), Kallar, Periyar, Chaliyar, Cheenkannipuzha, Karivannurpuzah, Neyyar, Achencoil and Bharathapuzha (Arunachalam and Sankaranarayana, 1999., Ajithkumar et. al., 1999), Periyar, Bharathapuzha, Chalakkudy, Kallada, Meenachil (Kurup et al., 2004).

**Geographical distribution:** Peninsular India: Western Ghats of Kerala and Tamil Nadu (Talwar and Jhingran, 1991)

**Habitat:** Riffle-pool habitats of middle to upstream.

**Fishing method:** scoop nets, dragnets and cast nets of less than 5 mm mesh size.

*Mesonemacheilus menoni* Zacharias and Minimol (Plate XI, Fig. 92)


*Type locality:* Mlappara, Periyar Tiger Reserve, Thekkadi, Kerala)

**Common name:** Periyar blothed loach

**Local names:** Koyma, Koytha

**Distinguishing characters:** (Based on 16 specimens, 36-64 mm TL)

D.i, 7-8; P.9-10, V. 1,7; A.1,5; C.19

Body elongated and slender, BD 16.47-16.91(16.59) in SL, Eyes are moderate and 19.21-20.68 (19.73) in HL. Lateral line complete. Lower half of body with numerous yellowish square or partly rounded yellow markings enclosing brown areas. Some times instead of rounded or square structures, there is wavy yellowish band parallel to ventral profile. On back, there are 8-9 broad brownish bands. Region above lateral line is characterised by curly yellow bands and spots. Caudal fin with 3-4 rows of spots and dorsal fin with 3 rows of spots. Caudal base is marked with a dark small band or spot.

**Geographical distribution:** India: Western Ghats of Kerala (Jayaram, 1999)
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Distribution in Kerala: Periyar river at Mlappara (Zacharias and Minimol, 1999), Periyar upstreams (Kurup et al., 2004).

Habitat: Riffle-pools with cobbles and gravelly substratum.

Fishing method: Dragnets and cast nets of small mesh size.

Mesonemacheilus petrubanarescui (Menon) (Plate XI, Fig. 93)

Noemacheilus petrubenarescui Menon, Cybium, 8(2): 45, 1984 (Type locality: Netravati river, Dharmasthala, Karnataka)

Common name: Carnatic banded loach Local name: Koytha

Distinguishing characters: (Based on 12 specimens, 28-43 mm TL)

D .ii,8; P.1,10; V.i,7; A.i, 5; C.19

Body small, more or less cylindrical of uniform depth. BD 15.21-16.10 (15.58) in SL. Eyes comparatively larger, its diameter forms 19.78-21.24 (19.49) in head length. Lateral line incomplete, ending just before origin of anal fin.

Back with 7-8 broad saddle shaped brownish bands and flanks especially posterior to dorsal fin is with varying number of bands without any regular fashion. Scales along lateral line is darkened which give appearance of continuous dark line. A small black band along caudal base. A row of dark spots present on dorsal fin and two rows on caudal fin.


Distribution in Kerala: Kabini river system (Shaji and Easa, 1995b).

Habitat: Riffles with cobbles and gravel as substratum.

Fishing method: Dragnets and cast nets of small mesh size.
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Mesonemacheilus remadevi Shaji and Easa
(Plate XI, Fig. 94)

Mesonemacheilus remadevi Shaji and Easa, Indian J. Fish., 49 (2): 217-221, 2002 (Type locality: Kunthi river, Silent valley, Kerala)

Local names: Koyma, Koytha

Distinguishing characters: (Based on 7 specimens, 58-81 mm TL)

Body large, elongate and slender, BD 13.91-14.28 (14.13) in SL, HL 20.16-21.28 (21.05) of SL, length of snout greater than inter orbital width, latter less than postorbital length. Eyes not visible from ventral side of head, 7.8-11.54 (9.46) of HL, shorter than INTO, 46.66-66.30 (54.47) of latter. LCPD 12.64-15.55 (13.97) in SL, HCPD 53.21-64.23 (58.98) in HL. Lateral line incomplete, ending above middle of anal fin or slightly beyond it. Dorsal fin inserted slightly closer to caudal fin. Ground colour yellowish green with irregularly descending brownish bands on back. Head and snout greenish with minute dark spots. A very faint greenish lateral band from head to caudal fin and 3-4 black blotches appear along band, which is more or less restricted to anterior 3/4th of body. A blackish narrow band is usually seen at base of caudal fin. Fins are generally reddish to hyaline and without any colour bands.

Geographical distribution: India: Western ghats of Kerala

Distribution in Kerala: Silent valley, Kunthi river (Shaji and Easa, 2001).

Habitat: Riffle-pools with boulders cobbles and gravelly substratum. It prefers substratum with lot of leaf litters.

Fishing method: Dragnets or cast nets of small mesh size.
Family: Cobitidae

Subfamily: cobitinae

Genus *Lepidocephalus* Bleeker

*Lepidocephalus* Bleeker, Nat. Tijdschr. Ned. Inde. 16, p. 303, 1868 (Type, *Cobitis macrohir* Bleeker)

*Lepidocephalus thermalis* (Valenciennes) (Plate XI, Fig. 95)

*Cobitis thermalis* Valenciennes (in C&V), Hist. Nat. Poiss., 18, 78, 1846 (Type locality: Hot springs of Kanniya, E.P., Sri Lanka)
*Cobitis camalicus* Jerdon, Madras J. Lit. Sci., 15: 331, 1849
*Cobitis rubripinnis* Jerdon, Madras J. Lit. Sci, 15: 133, 1849

Common name: Malabar loach  
Local names: Koyma, Koytha

Distinguishing characters: (Based on 12 specimens, 38-66 mm TL)

D.i, 6-7; P.5-7, V.i-i,5; A.i,5; C.16

Head and body compressed. BD 15.52-18.69 (16.81) and HL 23.76-27.40 (24.87) in SL. Eyes moderate, 13.76-23.27 (17.47) in HL. An erectile spine present infront of eye. Mouth inferior, lips thick, fleshy and papillated. Three pairs of barbells present, rostral barbells only one pair. Caudal fin emarginated. Mental lobes with barbell like prolongations present. Dorsal fin inserted nearer to caudal fin than snout tip, slightly anterior to pelvic fins. Lateral line absent. Back with numerous brownish spots forming a reticular pattern which extend to head as scattered spots. A brownish line from eye to snout tip. Flanks dirty white to yellowish with dark 8-12 irregular blotches, which are connected by a narrow brownish line. A small black spot on upper half of base of caudal fin. Fins gereally with rows of spots.

Geographical distribution: Coastal districts of Maharashtra, Kerala and Karnataka; and Sri Lanka (Talwar and Jhingran, 1991)
Distribution in Kerala: Fairly common and recorded from many rivers (Shaji and Easa, 2001; Ajithkumar et al., 1999). Periyar, Kallada and Chalakkudy (Kurup et al., 2004).

Habitat: Riffle-pools with cobbles gravelly or sand substratum. Some times also found in ponds with muddy bottom.

Fishing method: Dragnets or scoop nets of small mesh size.

ORDER: SILURIFORMES

Family: Bagridae

Fishes with an elongate and more or less compressed body. Teeth on pre maxillaries, mandible and vomer. Nostrils widely separated, Anterior tubular at tip of mouth and posterior nearer eye than tip of snout and with nasal barbell. Barbells well developed, six or eight. Gill membranes free from isthmus. Rayed dorsal fin inserted above pectoral fins. Adipose fin not confluent with dorsal or caudal fins. Pectoral fins with a strong spine and generally serrated. Caudal fin forked. Lateral line present, usually complete.

Key to genera

1. a) Anal fin base long with 23-28 branched rays..................Horabagrus
   b) Anal fin base short to moderate with 8-16 branched rays..........2

2. a) Maxillary barbells short, not extending beyond head, ventral side of head with sensory pores, eyes with free orbital rim.......................Batasio
   b) Maxillary barbells elongate, longer than head, ventral surface of head without any pores, eyes normal.................................Mystus
Genus *Horabagrus* Jayaram


Elongate and compressed fishes, abdomen rounded. Head large, anteriorly depressed. Snout broad and obtusely round, mouth subterminal, transverse and wide. Eyes large, inferior and placed along angle of mouth. Teeth uniformly villiform on jaws and palate. Four pairs of barbells, one each of maxillary, nasal and two of mandibular. Gill membranes free from each other and also from isthmus. Anal fin long and with 23-29 rays, lateral line complete.

**Key to species**

1. a) A round, large black spot on shoulder with a light yellow ring, body deep .......................................... *Horabagrus brachysoma*

   b) A saddle shaped black band extending from humeral region each side over nape, bordered in paled yellow, body comparatively less deep and elongate .................................. *Horabagrus nigricollaris*

**Horabagrus brachysoma** (Gunther)

(Plate XI, Fig. 96)

*Pseudobagrus brachysoma* Gunther, *Cat. Fishes Br. Mus.*, 5: 86, 1864 (Type locality: Cochin)

*Pseudobagrus chryseus* Day, *Fishes of Malabar*, 185, pl. 13, 1865 (Karivunnur river, Kerala)

*Macrones chryseus* Day, *Fishes of India*, 443, pl. 99, 1878


**Common name:** Gunther's catfish  **Local name:** Manjakkoori, Manjaletta

**Distinguishing characters:** (Based on 16 specimens from 73-630 mm TL)

D. I, 5; P.I, 7; V. I, 5; A.IV, 21-23; C.17.

Body elongate. Predorsal region slightly elevated. BD 18.16-21.23 (19.12), HL 27.64-29.25 (28.63) in SL. Occipital process extends to basal bone of
dorsal fin. Eyes ventrolateral, 17.60 in HL. Mouth sub terminal, teeth in villiform bands on jaws. Maxillary barbels reach up to base of pectoral fins, others shorter. Dorsal spine strong and feebly serrated, Pectoral spine strong and strongly serrated. Adipose fin short and low. Greenish yellow above, flanks golden, belly white. A large round black mark on shoulder surrounded by a light yellow ring. Dorsal and anal fins yellowish orange with gray margins. Caudal fin yellow with a semilunar thick black ring at caudal fin base occasionally present.

**Geographical distribution:** India: Kerala (Talwar and Jhingran, 1991)

**Distribution:** Vembanad lake (Remadevi et al., 1996), 8 rivers of Kerala (Ajithkumar et al., 2000), abundant in Vembanad lake, Sasthamkotta lake, Chalakkudy, Kannur, Trichur, Karuvannur puzha and Periyar. Rarely occurs in rivers and low lands (Shaji and Easa, 2001), Chalakkudy, Kallada, Achenkoil and Pamba (Kurup et al., 2004).

**Habitat:** Pool-run habitats of both middle streches and low land salinity incurring areas with sandy or muddy bottom.

**Fishing method:** Gill nets

*Horbagrus nigricollaris* Pethiyagoda and Kottelat

(Plate XI, Fig. 97)

*Horbagrus nigricollaris* Pethiyagoda and Kottelat, *J. South Asian nat. Hist.*, 1, No. (1), 110, 1994 (Type locality: Chalakkudy river near Vettilyapara)

**Common name:** Periyar catfish **Local name:** Manjakkoori

**Distinguishing characters:** (Based on 12 specimens from 164-228 mm TL)

D. I, 5; P.I, 7; V. I, 5; A.IV, 21-22; C.17

**Geographical distribution:** India: Kerala (Talwar and Jhingran, 1991)

**Distribution:** Chalakkudy river at Vettilappara (Shaji and Easa, 2001; Ajithkumar *et al.*, 2000; Shaji and Easa, 2001), Chalakkudy nd Periyar river systems (Kurup *et al.*, 2004)

**Habitat:** This species prefers a specific habitat of torrential streams with large boulders and bedrock, which is totally different from its closely allied species, *Horabagrus brachysoma*.

**Fishing method:** Gill nets

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**Genus Batasio Blyth**


**Batasio travancoria** Hora and Law

(Plate XI, Fig. 98)

*Batasio travancoria* Hora and Law, *Rec. Indian Musc.*, 43: 40, pl.2, fig.7-9, 1941 (Type locality: Perumthenaruvi, a tributary of Pamba river at Edakadathy, Kerala)

**Common name:** Travancore batasio

**Local name:** koori
Distinguishing characters: (Based on 10 specimens from 170-178 mm TL)

D. II, 7; P.I, 7; V.1,5; A.II,11; C.17

Body small, head small with many pores on ventral and lateral sides. BD 17.10-22.08 (18.86) and HL 25.99-26.04 (26.19) in SL. BD 65.86-81.92 (71.96) in HL. Median longitudinal groove on head reaching occipital process while occipital process not reaching basal bone of dorsal fin. Snout conical with smoothly rounded tip. Mouth inferior and small. Lips fleshy and fimbriated. Eyes larger, 16.29-30.32 (23.00) in HL, moderate with free orbital rim, not visible from ventral side. INTO short, 20.82-28.4 (26.69) in HL. Jaws subequal. Four pairs of barbells, all not extending beyond head. Adipose dorsal fin low, broad based, inserted after an inter space from dorsal fin. Lateral line complete and caudal forked. Uniformly grayish green in colour with fins dusky.

Geographical distribution: India: Western Ghats of Kerala (Talwar and Jhingran, 1991; Menon, 1999)

Distribution in Kerala: Kalikayam stream, Travancore (Silas, 1949), Ponnani drainage system, Anamalai hills (Silas, 1951), South and Central Travancore, (Hora and Law, 1941), Chaliyar river, Kerala part of NBR (Remadevi et al., 1996), Cheenkannipuzha, Chalakkudy (Shaji and Easa, 1996), Neyyar (Easa et al., 2000), Pamba, Manimal and Periyar rivers (Ajithkumar et al., 2000) Achenkoil and Chaliyar (Shaji and Easa, 2001), Pamba, Achenkoil, Periyar, Chalakkudy (Kurup et al., 2004)

Habitat: Pool rifle habitats with cobbles, gravels or sandy substratum

Fishing method: Cast nets
Genus *Mystus* Scopoli

*Mystus* Scopoli, *Introductio ad historiam naturalem*, p. 151, 1777 (Type, *Bagrus halepensis Valenciennes*)


**Key to species**

1. a) Occipital process reaching basal bone of dorsal fin.......................2  
   b) Occipital process not reaching basal bone of dorsal fin.................8  

2. a) Adipose dorsal fin long and inserted immediately after rayed dorsal fin ..................................................................................................3  
   b) Adipose dorsal fin short or moderate, its origin after an interspace from rayed dorsal fin........................................................................4  

3. a) Body with longitudinal bands, Maxillary barbells reach anal fin  
   .............................................................................................................*Mystus bleekeri*  
   b) Body without bands. Maxillary barbells reach caudal fin base or even beyond.....................................................................................*Mystus cavasius*  

4 a) Adipose dorsal fin base longer than anal fin base. A black ocellus at origin of dorsal fin..................................................*Mystus oculatus*  
   b) Adipose dorsal fin base shorter than anal fin base, no black ocellus at origin of dorsal fin........................................................................5  

5 a) Body without any colour bands.....................................................6
b) Body with longitudinal colour bands ..................................................7

6. a) Occipital process smooth. A dark blotch at base of caudal fin. Median longitudinal groove on head extending to base of occipital process ................................................................. Mystus armatus

b) Occipital process rugose. No blotch at base of caudal fin. Median longitudinal groove short, extending to slightly beyond posterior border of orbit ............................................................. Mystus guli

7. a) Body with a single longitudinal silvery band and a dark spot at caudal base................................................................................... Mystus montanus

b) Body with 3-4 longitudinal colour bands above and below lateral line, No spot at caudal base ..................................................................... Mystus vittatus

8. a) Median longitudinal groove on head reaching base of occipital process. Several clusters of small spots along and also vertical to lateral line ........................................................................... Mystus menoda

b) Medial longitudinal groove on head not reaching base of occipital process, a dark band only along lateral line, ending with a dark blotch at base of caudal fin ................................................ Mystus malabaricus

Mystus bleekeri (Day) (Plate XI, Fig. 99)

Macrones bleekeri Day, Fishes of India: 451, pl. 101, 1877
Mystus (Mystus) bleekeri Misra, Fauna of India, 3:85, 1976

Common name: Bleeker’s Mystus
Local name: Chillankoori

Distinguishing characters: (Based on 3 specimens, 90-108 mm TL)
D. i, 6-7; P.I, 10; V.i, 5; A.i, 8-9; C.17.
Body elongate and compressed. BD 21.46-23.9 (22.68) and HL 23.96-27.78 (25.67) in SL. Head depressed, Occipital process extends to basal bone of dorsal fin. Median longitudinal groove on head reaches base of occipital process. Eyes 22.67-24.73(23.70) in HL. Barbells four pairs, maxillary barbells extends to posteriorly to anal fin. Dorsal spine weak and without serrations. Adipose fin long, inserted just behind rayed dorsal fin. Pectoral spine moderately strong and serrated. HCPD 62.91-69.91(66.41) in LCPD. Brownish back, whitish ventrally. Two light coloured longitudinal bands one above and other below lateral line. A dark round shoulder spot, a small spot at beginning of dorsal fin and a triangular spot at caudal peduncle present.

**Geographical distribution:** India, Pakistan, Bangladesh, Burma, Sumatra (Talwar and Jhingran, 1991, Jayaram, 1999)

**Distribution in Kerala:** Neyyar river and its tributaries, Thiruvananthapuram district (Ajithkumar et al., 2000), Puzhayakkal river (Kurup et al., 2004).

**Habitat:** Pool run habitat sandy or muddy bottom.

**Fishing method:** Gill nets

*Mystus cavasius* (Hamilton-Buchanan) (Plate XI, Fig. 100)

*Pimelodus cavasius* Hamilton-Buchanan, *Fish. Ganges*, pp. 203, 379, pl. 11, fig. 67, 1822 (Type locality: Gangetic provinces)

*Macrones cavasius* Day, *Fishes of India*: 447, 1877


**Common name:** Gangetic mystus  
**Local name:** Chillankoori

**Distinguishing characters:** (Based on 12 specimens, 86-228 mm TL)

D. I, 6-7; P.I, 8; V.i,5; A.ii,8; C.17.

Body elongate and compressed. BD 20.55-26.88 (23.39) and HL 23.65-25.20 (24.47) in SL. Head depressed, Occipital process extends to basal bone of dorsal fin. Median longitudinal groove on head reaches base of occipital process. Eyes 22.67-24.73(23.70) in HL. Barbells four pairs, maxillary barbells extends to posteriorly to anal fin. Dorsal spine weak and without serrations. Adipose fin long, inserted just behind rayed dorsal fin. Pectoral spine moderately strong and serrated. HCPD 62.91-69.91(66.41) in LCPD. Brownish back, whitish ventrally. Two light coloured longitudinal bands one above and other below lateral line. A dark round shoulder spot, a small spot at beginning of dorsal fin and a triangular spot at caudal peduncle present.

**Geographical distribution:** India, Pakistan, Bangladesh, Burma, Sumatra (Talwar and Jhingran, 1991, Jayaram, 1999)

**Distribution in Kerala:** Neyyar river and its tributaries, Thiruvananthapuram district (Ajithkumar et al., 2000), Puzhayakkal river (Kurup et al., 2004).

**Habitat:** Pool run habitat sandy or muddy bottom.

**Fishing method:** Gill nets

*Mystus cavasius* (Hamilton-Buchanan) (Plate XI, Fig. 100)

*Pimelodus cavasius* Hamilton-Buchanan, *Fish. Ganges*, pp. 203, 379, pl. 11, fig. 67, 1822 (Type locality: Gangetic provinces)

*Macrones cavasius* Day, *Fishes of India*: 447, 1877


**Common name:** Gangetic mystus  
**Local name:** Chillankoori

**Distinguishing characters:** (Based on 12 specimens, 86-228 mm TL)

D. I, 6-7; P.I, 8; V.i,5; A.ii,8; C.17.

Body elongate and compressed. BD 20.55-26.88 (23.39) and HL 23.65-25.20 (24.47) in SL. Head depressed, Occipital process extends to basal bone of dorsal fin. Median longitudinal groove on head reaches base of occipital process. Eyes 22.67-24.73(23.70) in HL. Barbells four pairs, maxillary barbells extends to posteriorly to anal fin. Dorsal spine weak and without serrations. Adipose fin long, inserted just behind rayed dorsal fin. Pectoral spine moderately strong and serrated. HCPD 62.91-69.91(66.41) in LCPD. Brownish back, whitish ventrally. Two light coloured longitudinal bands one above and other below lateral line. A dark round shoulder spot, a small spot at beginning of dorsal fin and a triangular spot at caudal peduncle present.

**Geographical distribution:** India, Pakistan, Bangladesh, Burma, Sumatra (Talwar and Jhingran, 1991, Jayaram, 1999)

**Distribution in Kerala:** Neyyar river and its tributaries, Thiruvananthapuram district (Ajithkumar et al., 2000), Puzhayakkal river (Kurup et al., 2004).

**Habitat:** Pool run habitat sandy or muddy bottom.

**Fishing method:** Gill nets

*Mystus cavasius* (Hamilton-Buchanan) (Plate XI, Fig. 100)

*Pimelodus cavasius* Hamilton-Buchanan, *Fish. Ganges*, pp. 203, 379, pl. 11, fig. 67, 1822 (Type locality: Gangetic provinces)

*Macrones cavasius* Day, *Fishes of India*: 447, 1877


**Common name:** Gangetic mystus  
**Local name:** Chillankoori

**Distinguishing characters:** (Based on 12 specimens, 86-228 mm TL)

D. I, 6-7; P.I, 8; V.i,5; A.ii,8; C.17.

Body elongate and compressed. BD 20.55-26.88 (23.39) and HL 23.65-25.20 (24.47) in SL. Head depressed, Occipital process extends to basal bone of
dorsal fin. Median longitudinal groove on head reaches base of occipital process. Eyes 25.26-27.89 (26.20) in HL. Maxillary barbells extend beyond base of caudal fin base. Dorsal spine not so strong and with fine serrations. Adipose fin long, inserted just behind rayed dorsal fin. Pectoral spine moderately strong and serrated. HCPD 44.91-88.28 (62.10) in LCPD. Brownish gray on back, an oval or round shoulder spot, a small spot surrounded by white area at beginning of dorsal fin, a narrow light midlateral longitudinal stripe.

**Geographical distribution:** India, Pakistan, Bangladesh, Burma, Sri Lanka, Nepal and Thailand.

**Distribution in Kerala:** 6 rivers of Kerala (Ajithkumar et al., 2000), Chalakkudy, Kabbini and Chaliyar (Shaji and Easa, 2001), Kabbini (Kurup et al., 2004).

**Habitat:** Pool-riffle habitats with gravelly or sandy bottom

**Fishing method:** Cast nets

*Mystus oculatus* (Valenciennes)  
(Plate XII, Fig. 101)

Macrones oculatus Day, *Fishes of India*: 448, pl. 98, 1877  

**Common name:** Malabar mystus  
**Local name:** Chillankoori

**Distinguishing characters:** (Based on 9 specimens, 82-148 mm TL)  
D. 1,6-7; P.I, 8; V.i,5; A.ii,8; C.17.

Body elongate and compressed. BD 22.30-25.64 (24.30) in SL. Head depressed, occipital process extends to basal bone of dorsal fin. Median longitudinal groove on head reaches base of occipital process. Eyes 25.54-28.62 (26.30) in HL. Maxillary barbells reaches almost middle of anal fin.
Dorsal spine moderately strong and finely serrated. Adipose fin short, interdorsal distance 1.1-1.2 times in adipose base. Pectoral spine strong and serrated. HCPD 59.37-62.54 (61.23) in LCPD. Silvery gray on back, a dark spot at beginning of dorsal fin at its base, an oval or round shoulder spot, dorsal fin, adipose fin, anal and caudal fins banded with dark at their distal ends. Two light longitudinal bands one above and another faint one below lateral line.

**Geographical distribution:** India: Kerala and Tamil Nadu

**Distribution in Kerala:** Chaliyar, Travancore, Achenkoil, Deviyar and Vembanadu lake (Remadevi et al., 1996).

**Habitat:** Pool-riffle habitats with gravelly or sandy bottom.

**Fishing method:** Cast nets

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*Myctrus armatus* (Day)

(Plate XII, Fig. 102)


*Macrones armatus* Day, *Fishes of India* 450, pl. 101, 1877

*Myctrus (Myctrus) armatus* Misra, *Fauna of India. Pisces*, 3: 84


**Common name:** Kerala mystus **Local name:** Chillankoori

**Distinguishing characters:** (Based on 12 specimens, 128-134 mm TL)

D. I, 7; P.I, 8; V.i, 5; A. ii, 8; C.17.

longer than anal base, latter form 2.3 times former. Pectoral spine strong and serrated. HCPD 116.23-135.75 (129.55) in LCPD. Back brownish gray, lighter below. A brownish midlateral streak on flanks which ends at caudal peduncle in a triangular diffused spot. Fins yellowish to hyaline.

**Geographical distribution:** India: Wynaad hill ranges, Westernghats, Nagaland, Lower Burma (Talwar and Jhingran, 1991, Jayaram, 1999) 
**Distribution in Kerala:** 30 rivers of Kerala (Ajithkumar et al., 2000) Karuvannur river (Shaji and Easa, 2001), 18 river systems (Kurup et al., 2004) 
**Habitat:** Pool-riffle habitats with gravelly or sandy bottom. 
**Fishing method:** Cast nets.

*Mystus gulio* (Hamilton-Buchanan)  
(Plate XII, Fig. 103) 

*Pimelodus gulio* Hamilton-Buchanan, *Fish. Ganges*, pp. 201, 379, pl. 23, fig. 66, 1822 (Type locality: Higher parts of Gangetic Estuary)  
*Macrones gulio* Day, *Fishes of India*: 445, pl. 99, 1877  

**Common name:** Long whiskered catfish 
**Local name:** Chillankoori

**Distinguishing characters:** (Based on 7 specimens, 134-184 mm TL)  
D. I, 7; P.I, 7; V.i,5; A.ii,10; C.17.  

Body elongate and compressed. BD 20.56 - 22.48 (21.63) and HL 24.79-31.8 (27.71) in SL. Head depressed, upper surface of head rough and granulated. 
Occipital process extends to basal bone of dorsal fin. Median longitudinal groove on head short, not very conspicuous and not reaching base of occipital process. Eyes 16.56-23.88 (19.24) in HL. Maxillary barbells extend to base of pelvic fins. Dorsal spine strong and weekly serrated. Adipose fin small, inserted almost or just behind origin of anal fin and its base shorter.
than anal base. Pectoral spine strong and serrated. HCPD 57.43-85.99 (70.68) in LCPD. Head and back grayish brown, dull white below. Maxillary barbells black. Fins brownish especially outer half.

**Geographical distribution:** India, Pakistan, Bangladesh and Burma

**Distribution in Kerala:** Estuaries and Backwaters of Major rivers (Ajithkumar *et al.*, 2000), Periyar (Kurup *et al.*, 2004).

**Habitat:** Salinity incurring low-land Pool or run habitats of rivers with muddy or sandy bottom.

**Fishing method:** Gill nets

*Mystus montanus* (Jerdon)

(Plate XII, Fig. 104)


*MACRORIES montanus* Day, *Fishes of India*; 449, pl. 101, 1877


**Common name:** Wynaad mystus  
**Local name:** Mullikkottil

**Distinguishing characters:** (Based on 4 specimens, 152-165 mm TL)

D. i, 8; P.I, 6-7; V.i, 5; A.ii, 10; C.17.

Body elongate and moderately compressed. BD 18.64 – 20.16 (19.79) and HL 30.54-36.48 (32.44) in SL. Head depressed, Occipital process extends to basal bone of dorsal fin. Median longitudinal groove on head short, not reaching base of occipital process. Eyes 12.64-14.21(13.94) in HL. Maxillary barbells extend to base of anal fin. Dorsal spine week and its inner edge weekly serrated. Adipose fin moderate, inserted before origin of anal fin and its base longer than anal base. Pectoral spine strong and serrated on inner side. HCPD 45.39-51.28 (47.52) in LCPD. Head and back 'brownish green,
dull white below. Maxillary barbells black. A dark bluish streak along midlateral line, ends in a triangular spot at caudal fin base. Fins brownish.

**Geographical distribution:** India: Wynnaad (Kerala), Karnataka, Maharashtra, Madhya Pradesh, and Assam (Jayaram, 1999)

**Distribution in Kerala:** Nilgiri biosphere, Travancore, Achenkoil river (Remadevi et al., 1996); Periyar river (Ajithkumar et al., 2000), Kabbini river (Kurup et al., 2004)

**Habitat:** Deep pools at higher altitudes with sandy or muddy substratum.

**Fishing method:** Gill nets

*Mystus vittatus* (Bloch)

(Plate XII, Fig. 105)

Silurus vittatus Bloch, Ichth. Hist. Nat., 11: 40, pl. 1371, fig. 2, 1797 (Type locality: South India)

Macrones vittatus Day, Fishes of India: 448, pl. 98, 1877

*Mystus (Mystus) vittatus* Misra, Fauna of India, Pisces, 3: 105

**Common name:** Striped dwarf catfish **Local name:** Chillankoori

**Distinguishing characters:** (Based on 12 specimens, 112-124 mm TL)

D. I, 7; P.I, 9; V. i, 5; A. ii, 8; C.17.

Body elongate and moderately compressed. BD 23.95-24.3 (23.9) and HL 24.58-24.98 (24.78) in SL. Head depressed, occipital process extends to basal bone of dorsal fin. Median longitudinal groove on head not reaching base of occipital process. Eyes 24.77-27.81 (26.29) in HL. Maxillary barbells extends posteriorly beyond pelvic fins. Dorsal spine weak and finely serrated. Adipose fin short, inserted after a long interspace from rayed one. Pectoral spine strong and serrated. HCPD 116.23-135.75 (129.55) in LCPD. Body silvery gray on back with several deep brown longitudinal bands on flanks. A dusky shoulder spot present.
Geographical distribution: India, Pakistan, Bangladesh, Nepal, Sri Lanka, Burma and Thailand (Talwar and Jhingran, 1991)

Distribution in Kerala: Travancore (Hora and Law, 1941); Periyar Tiger Reserve (Chacko 1948), Periyar river system (Kurup et al., 2004)

Habitat: Pool-riffle habitats with gravelly or sandy bottom.

Fishing method: Cast nets

*Mystus menoda* (Hamilton-Buchanan) (Plate XII, Fig. 106)

*Pimelodus menoda* Hamilton-Buchanan, *Fish Ganges*, pp. 203, 379, pl. 1, fig. 72, 1822 (Type locality: Kosi river and river Mahananda)

*Macrones corsula* (Valenciennes) Day, *Fishes of India*: 446, 1877


Common name: Menoda catfish

Local name: koori

Distinguishing characters: (Based on a single specimen, 207 mm TL)

D I, 7; P I, 8 VI, 5; A 2, 8; C 16

Body elongate, compressed, BD 19.79 and HL 32.44 in SL. Head depressed.

SNL 27.88 in HL, eyes with free orbital margins, 13.94 of HL, 50.0-52 of INTO. Mouth terminal and transverse, upper jaw longer. Maxillary barbells reaching middle of pelvic fins. Dorsal fin as high as body with a strong spine, twice of its distance slightly shorter than head length, serrated internally in its upper half; origin nearer to snout than to caudal peduncle. Adipose dorsal fin extended up to last ray of anal fin. HCPD 47.52 in LCPD. Greyish brown above, dull white below. Clusters of small spots along lateral line and several vertical bluish spots form these spots arranged vertically; appears as indistinct lines across body which is very characteristic of this species. Fins brownish yellow in colour.

Distribution: India: Bombay, Maharashtra, Orissa, Bihar, West Bengal, Assam, Kerala, Bangladesh, Nepal, Kosi river, Burma

Systematics, germplasm evaluation and pattern of distribution and abundance of freshwater fishes
Distribution in Kerala: Achenkoil river (New report)

Habitat: Pool-run habitats with sandy or muddy substratum.

Fishing method: Gill nets

*Mystus malabaricus* (Jerdon)  
(Plate XII, Fig. 107)

Bagrus malabaricus Jerdon, *Madras J. Lit. Sci.*, 15  338, 1849 (Type locality: Mountain streams in Malabar)  
Macrones malabaricus  Day, *Fishes of India* 450, 1877  
*Mystus* (Mystus) malabaricus Misra, *Fauna of India, Pisces*, 3:95

Common name: Jerdon's mystus  
Local name: Chillankoori

Distinguishing characters: (Based on 12 specimens, 121-186 mm TL)  
D. i 7; P.1, 9; V. i,5; A. ii,10; C.17.

Body elongate and compressed. BD 20.7-27.2 (23.9) and HL 11.33-12.29 (11.81) in SL. Head depressed. Occipital process not extends to basal bone of dorsal fin. Median longitudinal groove on head not reaching base of occipital process. Eyes 11.56-13.89 (12.73) in HL. Maxillary barbells extend to end of pelvic fins. Dorsal spine weak and finely serrated. Adipose fin moderately long, inserted after a considerably long interspace. Its base form 188.32-204.59 (198.45) in interdorsal distance. Pectoral spine strong and serrated. HCPD 79.60 –86.11 (81.55) in LCPD. Head and back brownish black and dull white below. A dark shoulder spot present. A dark brown band along mid lateral line which ends in a dusky triangular blotch at caudal peduncle. Fins brownish especially outer half.

Geographical distribution: India: Western Gnts (Jayaram, 1999)

Habitat: Pool-riffle habitats with gravelly or sandy bottom.

Fishing method: Cast nets

Family: Siluridae

Fishes with an elongate and highly or moderately compressed (sheet like) body. Teeth on pre maxillaries, mandible and vomer. Nostrils separated from each other by a short distance, anterior tubular at tip of snout and posterior situated just before eyes. Nasal barbells absent. Barbells well developed, four or six. Gill openings wide, membranes free from each other and also from isthmus. Rayed dorsal fin short with four or five rays and without a spine. No adipose fin. Pectoral fins with a strong or weak spine and generally serrated. Anal fin long, extending from anal opening to caudal fin. Caudal forked, rounded or deeply emarginate. Lateral line present, usually complete.

Key to genera

1. a) Gape of mouth wide, extending beyond eyes.................Wallago
   b) Gape of mouth not extending beyond eyes..........................2

2. a) Caudal fin rounded or weakly emarginate, eyes not visible from under side of head..................................................Silurus
   b) Caudal fin forked, eyes visible from ventral side of head........Ompok

Genus Wallago Bleeker

Wallago Bleeker, Nat. Tijdschr. Nederl. Inde, 2, p. 265 (Type, Silurus mulleri Bleeker)

Wallago attu (Schneider)
(Plate XII, Fig. 108)

Silurus attu Schneider, Syst. Ichth., p. 378, pl 75, 1801 (Type locality: Malabar)
Silurus wallago Valenciennes, Hist. Nat. Poiss. 14:354,1839 (Bengal)

Common name: Boal  
Local name: Attuvala, Vala

Distinguishing characters: (Based on 8 specimens from 225-689 mm TL)
D. 5; P.I, 13-15; V.1, 7-9; A. iii 74-93; C.17

Body elongate and laterally compressed. Mouth wide, gape extends beyond eyes. Barbells two pairs, maxillary barbells extends slightly beyond origin of anal fin and mandibular pair short, slightly more than eye diameter. Dorsal fin short with a few rays, inserted just in advance of pelvic fins. Pectoral spine weak and poorly serrated at inner edge. Caudal fin deeply forked. Back uniformly silvery with golden reflections, sides dull white, a faint yellow band along lateral line, fins generally yellowish.


Distribution in Kerala: 24 rivers of Kerala (Ajithkumar et al., 2000), Downstreams of rivers of Kerala (Shaji and Easa, 2001), 8 river systems in Kerala (Kurup et al., 2004).

Habitat: Pool-run habitats with sandy or muddy bottom.

Fishing method: Gill nets

Genus Ompok Lacepede

Ompok Lacepede, Hist. Nat. Poiss., 5, p. 49, 1803 (Type, Ompok siluroides Lacepede).

Fishes with a strongly compressed body, head depressed. Mouth oblique and gape not reaching eyes. Lower jaw longer than upper jaw. Eyes visible from ventral side of head. Barbells maxillary and mandibular pairs, mandibulars
short and narrow. Dorsal fin small and with 3-5 rays. Anal fin very long with 52-75 rays. Pectoral spine weak and feebly serrated. Caudal forked.

Key to species

1. a) Anal fin with 68-69 branched rays, tips of caudal lobes pointed

                        ....................................................................... Ompok malabaricus

b) Anal fin with 57 or 58 branched rays, tips of caudal lobes rounded

                        ....................................................................... Ompok bimaculates

Ompok malabaricus (Valenciennes) (Plate XII, Fig. 109)

Silurus malabaricus Valenciennes, Hist. Nat. Poiss., 14: 353, 1839 (Type locality: Malabar)
Calichromus malabaricus Day, Fish. India, p. 478, 1877

Common name: Goan Catfish       Local name: Ambattanvala, Thonnivala

Distinguishing characters: (Based on 23 specimens from 157-284 mm TL)

D. 3; P. I, 13; V. 1, 7; A. iv, 68-69; C. 17.

Body elongate, maxillary barbells extend slightly beyond pelvic fin origin, manidibular pair short, extending just up to posterior boarder of eyes. Pectoral spine weak and poorly serrated inner edge. Grayish brown shot with purple becoming paler beneath black shoulder spot present colour may vary some times with body silvery white shot with purple. Fins dusky.

Geographical distribution: India: Kerala and Goa (Talwar and Jhingran, 1991)
Distribution in Kerala: Chalakkudy and Karuvannur rivers (Ajithkumar et al., 2000), downstream of rivers of Kerala (Shaji and Easa, 2001), Chalakkudy, Bharathapuzha, Periyar and Chaliyar river systems (Kurup et al., 2004)

Habitat: Pool habitats with muddy or sandy bottom.

Fishing method: Gill nets

**Ompok bimaculatus** (Bloch)

(Plate XII, Fig. 110)

Silurus bimaculatus Bloch. *Hist. Nat. Pisces*, Par 2, 17, pl. 364, 1767 (Type locality: Malabar)


Ompok sindensis Day, *Fisch. India*, p.476, 1877 (Type locality: Sind)

Common name: Indian Butter catfish  
Local name: Ambattanvala

Distinguishing characters: (Based on 33 specimens from 136-276 mm TL)

D. 3-4; P.I, 13; V.1, 7; A. iv, 57-58; C.17.

Body elongate and laterally compressed. Maxillary barbells extends slightly beyond anal fin origin, mandibular pair very short. Pectoral spine weak and poorly serrated at inner edge. Grayish brown shot with purple becoming paler beneath. Black shoulder spot present. Body silvery white shot with purple (colour found to be varying based on the habitat conditions from purplish to dark brown). Fins dusky.

Geographical distribution: India, Pakistan, Afghanistan, Sri Lanka, Bangladesh, Burma, Thailand, Java, Sumatra, Borneo and China (Talwar and Jhingran, 1991).

Distribution in Kerala: Throughout all major rivers of Kerala (Ajithkumar et al., 2000), downstream of rivers of Kerala (Shaji and Easa, 2001), Periyar, Bharathapuzha, kabbini and Kallada river systems (Kurup et al., 2004).
Habitat: Pool habitats with muddy or sandy bottom. The species is often found at the upstream of rivers in the crevices of huge boulders and bedrock.

Fishing method: Gill nets

Genus: Silurus Linnaeus

Silurus Linnaeus, Syst. Nat. Ed. 10, p. 301, 1758 (Type, Silurus glanis Linnaeus)

Silurus wynaadensis (Day)  
(Plate XIII, Fig. 111)

Silurus cochinchenesis Binachar and Rau, J. Mys. Univ., 1(16), 1941 (Mysore)  

Common name: Malabar silurus  
Local name: Thonnivala

Distinguishing characters: (Based on 8 specimens from 84-192 mm TL)  
D. i, 3; P. i, 8;V.i, 7; A. ii, 54-65; C.17.

Body elongate and laterally compressed, BD 11.51-18.18 (16.09) and HL 17.14 -20.92 (19.46) in SL. Head broad and depressed. Upper jaw slightly longer than lower jaw, mouth slightly subterminal, gape of mouth reaching up to posterior border of eyes. Eyes small, 8.27-13.76 (99.83) in HL, not visible from ventral side of head and with a free orbital rim. Barblles two pairs, Maxillaries and mandibulars, Maxillary barbells extend beyond tip of pectorals and mandibulars shorter, extending up to gill openings. Dorsal fin short with 3 rays, anal fin long and pectoral spine weak and smooth. LCPD 1.56-5.74 (3.64) in SL and HCPD124.56-244.97 (167.24) in LCPD. Caudal fin round or slightly truncate. Body brownish, purplish below with numerous dark dots scattered over entire body. Fins generally brownish with anal fin rays tips lighter in colour.

Distribution in Kerala: Wynaad (Shaji and Easa, 2001, Kurup et al., 2004).

Habitat: Rocky pools of uplands.

Fishing method: Gill nets.

Family: Schilbeidae

Genus *Pseudeutropius* Bleeker


*Pseudeutropius mitchelli* Gunther

(Plate XIII, Fig. 112)

*Pseudeutropius mitchelli* Gunther, *Cat. Fish. Brit. Mus.*, 5: 59, 1864 (Type locality: Madras presidency)

*Pseudeutropius sykesii* (nec Jerdon) Day, *Fish. India*, p. 473, 1877 (West coast of India)

Common name: Malabar Patashi Local name: Vellivala

Distinguishing characters: (Based on 12 specimens, 125-160mm mm TL)

D. i, 6-7; P. i, 8; V.i, 5; A. 33-34; C.19

Medium sized fishes with an elongate and laterally compressed body. BD 20.41-20.86 (20.63) and HL 20.83-23.75 (22.29) in SL. Head short and snout pointed, tip blunt. Mouth sub inferior, transverse, moderate and overhung by snout. Eyes large, 24.45-31.56 (28.00) in HL and ventrolateral in position and with broad circular adipose eyelids. Barbells four well developed pairs, one each of maxillary, nasal and two of mandibular. Dorsal fin small, inserted above last quarter of pectoral fins and with a weak spine. Pectoral spine weak and serrated. Adipose fin very small. Anal fin long and separated from

Geographical distribution: India: Kerala (Talwar and Jhingran, 1991)

Distribution in Kerala: Travancore (Hora and Law (1941), Periyar river (Ajithkumar et al., 2000; Kurup et al., 2004).

Habitat: Rapids or pool riffles with boulders, cobbles, gravel as substratum.

Fishing method: Cast nets

Family: Sisoridae

Genus *Glyptothorax* Blyth

*Glyptothorax* Blyth, J. Asiat. Soc. Bengal, 21, p. 151 (Type, *Glyptosternum striatus* McClelland)

Body elongate, cylindrical and posteriorly compressed, ventrally more or less flat. Head depressed. Skin of head and body granulated. Snout conical with broad tip. Eyes minute and placed on dorsal side of head, not visible from ventral side. Mouth inferior. Jaws sub equal, upper jaw longer. Ventral side of body at thoracic region provided with an adhesive apparatus with or without a central pit. Four pairs of barbells; one pair each of maxillary and nasal and, two mandibulars. Maxillary pairs longest with broad bases, reaches beyond pectoral fin origin. Adipose fin moderate. Gill membranes united with each other and also with isthmus. Lateral line complete, caudal forked. Most of the species are nocturnal and found living under crevices of big boulders and bedrocks of cascade, rapids and Riffle-pool habitats of upstream of rivers. Gill nets used should be set at night around crevices of bedrocks or boulders.
so as to catch these rare fishes. Adhesive apparatus is an adaptation to attach closely to substrata in torrential waters of upstream.

Key to genera

1. a) Adhesive apparatus on thorax broader than long and feebly developed..............................................*Glyptothorax anamalaiensis*  
 b) Adhesive apparatus on thorax longer than broad and well developed

2. a) Body dark, dorsal and caudal fins tipped with orange yellow colouration..............................................*Glyptothorax annandalei*  
 b) Body with transverse bands or without any bands or coloration ……3

3. a) Paired fins plaited, body without any bands……... *Glyptothorax Ionah*  
 b) Paired fins non-plaited, body with transverse bands

*Glyptothorax anamalaiensis* Silas

(Plate XIII, Fig. 113)


**Common name:** Anamalai sucker catfish  
**Local name:** Neykkoori

**Distinguishing characters:** (Based on 3 specimens from 68-93 mm TL)  
D. i, 6; P.I, 10; V.i, 5; A.i,11; C.17.

BD 14.33-20.84 (17.72) and HL 25.45-28.81(27.55) in SL. Head longer than broad. Maxillary barbells extend beyond base of pectoral fin. Adipose fin comparatively long based, ADB 118-124 (122) of AB. Paired fins non-plaited. Dorsal fin inserted closer to snout. HD 75.61-80.99 (77.41) in HL and HP 56.5-80.34 (71.42) in HL. LCPD 17.87-19 50 (18.52) in SL and HCPD 40.40-
48.26 (43.06) in LCPD. Body brownish, mottled with numerous dark spots on head and body and with three broad white transverse bands; one below dorsal fin, second between rayed dorsal and adipose fins, third between adipose and caudal fin base. Fins tipped with white. A broad transverse band at bifurcation of caudal fin.

Geographical distribution: India: Base of Anamalai hills (Talwar and Jhingran, 1991)

Distribution in Kerala: Anamalai Hills, Kerala (Shaji and Easa, 2001), Kabbini (Kurup et al., 2004)

Habitat: Cascade, rapids or Riffle-pool habitats with bedrock and boulders as substratum.

Fishing method: Gill nets and cast nets

_Glyptothorax annandalei_ Hora
(Plate XIII, Fig. 114)

_Glyptothorax annandalei_ Hora, Rec. India Mus., 25: 14, pl.1, fig.3, 1923 (Type locality: Nierolay stream, Bhavani river)

Common name: Annandale’s sucker catfish  
Local name: Parakkoori, Neykkoori

Distinguishing characters: (Based on 28 specimens from 98-194 mm TL)

D. i, 7; P.i, 10-12; V.i, 5; A.i, 10; C.17

BD 15.26-19.22 (17.74) and HL 23.06-27.35 (25.00) in SL. Head longer than broad. Maxillary barbells extend to anterior third of pectoral fins. Adipose fin short based, ADB 87-94 (96.02) of AB. Paired fins plaited ventrally. Dorsal fin inserted closer to snout. HD 72.8-89.49 (72.67) in HL and HP 78.17-102.79 (98.24) in HL. LCPD 12.98-21.8 (18.52) in SL and HCPD 44.52-57.58 (53.21)
in LCPD. Body dark brown, with a narrow yellow stripe along lateral line reaching base of caudal fin. Fins dark brown with tips orange yellow.

**Geographical distribution:** India: Western Ghats and Windhyas; Nepal (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Kunthi, Kabbini and Periyar river (Remadevi and Indra, 1986; Easa and Basha, 1995; Arun et al., 1996; Gopi, 2001), Silent valley and Moovattupuzha rivers (Ajithkumar et al., 2000), 7 river systems of Kerala (Kurup et al., 2004).

**Habitat:** Cascade, rapids or Riffle-pool habitats with bedrock and boulders as substratum.

**Fishing method:** Gill nets and Cast nets

**Glyptothorax Ionah** (Sykes)  
(Plate XIII, Fig. 115)

_Bagrus Ionah_ Sykes, _Proc. Zool. Soc. Lond._, p. 164, 1838 (Type locality: Deccan)  
_Glyptothorax Ionah:_ Hora, _Rec. Indian Mus._, 25:30, 1923

**Common name:** Deccan sucker catfish  
**Local name:** Neykkoori

**Distinguishing characters:** (Based on 2 specimens from 110-124 mm TL)  
D. i, 6; P. i, 9; V. i, 5; A. i, 11; C. 17.

BD 14.25-19.56 (16.90) and HL 21.13-26.95 (24.04) in SL. Head as long as broad. HW 96.29-107.56 (101.97) in HL. Maxillary barbells extend to middle of pectoral fins. Adhesive thoracic apparatus longer than broad and well developed. Dorsal fin inserted closer to adipose fin. Adipose fin short based, ADB 87.26-91.25 (89.255) of AB. Paired fins plaited ventrally. HD 81.2 84.26 (82.73) in HL and HP 101.26-106.24 (101.25) in HL. LCPD 18.94-19.03
(18.99) in SL and HCPD 47.59- 53.29 (50.44) in LCPD. Brownish body and fins, ventral side light yellow.

**Geographical distribution:** India: Mula Muthu river at Poona, Maharashtra (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Chalakkudy river (Hora, 1938; Ajithkumar *et al.*, 1999; Shaji and Easa, 2001; Kurup *et al.*, 2004).

**Habitat:** Cascade, rapids or riffle-pool habitats with bedrock and boulders as substratum.

**Fishing method:** Gill nets

**Glyptothorax madraspatanum** (Day)

(Plate XIII, Fig. 116)

Glyptosternum madraspatanum Day, *J. Linn. Soc. Lond.*, 11, 1873 (Type locality: Bhavani river)


**Common name:** South Indian sucker catfish  
**Local name:** Parakkoori

**Distinguishing characters:** (Based on 2 specimens from 112-114 mm TL)

D. l, 6; P.l, 9-10; V.1, 5; A.l, 8-9; C.17.

BD 18.50-18.55 (18.53) and HL 23.8-26.87 (25.34) in SL. Head longer than broad. Adhesive thoracic apparatus longer than broad and well developed. Maxillary barbells extend to base of pectoral fins. Dorsal fin inserted closer to adipose fin, dorsal spine strong and serrated near apex on both sides. Adipose fin long based, ADB 142-148 (146) of AB. Paired fins non plaited. HD 87.10-95.65 (91.35) in HL and HP 86.38-105.26 (95.86) in HL. Caudal fin deeply forked. LCPD 19.05- 19.38 (19.21) in SL and HCPD 49.39-50.53 (49.96) in LCPD. Body brownish with yellowish transverse bands.
Geographical distribution: India: Western Ghats: Anamalai and Nilgirris, Cauveri river (Talwar and Jhingran, 1991)

Distribution in Kerala: Mettupalayam in Coimbatore district (Hora, 1923) Nulpuzha, NBR (Easa and Basha, 1995), Periyar, Chaliyar and Kabini rivers (Easa and Basha, 1995; Arun, 1997) Muvattupuzha and Periyar rivers (Ajithkumar et al., 1999), Bharathapuzha (Kurup et al., 2004).

Habitat: Cascade, rapids or riffle-pool habitats with bedrock and boulders as substratum.

Fishing method: Gill nets

Family: Clariidae

Genus Clarias Scopoli
Clarias Scopoli, Introductio ad Naturalam, p. 445, 1777 (Type, Silurus anguillaris Linnaeus)

Clarias dussumieri Valenciennes
(Plate XIII, Fig. 117)

Clarias dussumieri Valenciennes (in C& V), Hist. Nat. Poiss., 15: 382, 1840 (Type locality: Pondichery, Malabar)


Common name: Valenciennes claridi Local name: Mushi, Musu

Distinguishing characters: (Based on 4 specimens from 222-272 mm TL)

D. 66-69; P.I, 10-11; V.i, 5; A. 45-49; C.17

Body elongate and cylindrical, posteriorly compressed. BD 10.16 –11.21 (11.91) and HL 18.88-20.01 (19.61) in SL. Head broad and flattened. Distance from dorsal base to occipital process 34.6 - 42.13 (39.14) in HL. Nostrils widely separated, anterior nostrils tubular, behind upper lip and posterior nostrils behind nasal Barbells. Mouth slightly sub-terminal. Eyes small, 7.89-8.94 (8.37) in HL, widely separated and dorsolateral in position.
Barbells four well developed pairs. Maxillary barbells with broad bases and extends beyond pectoral fin base. Dorsal fin base very long. No adipose fin, anal fin long and caudal fin rounded. HCPD 378.24-388.23 (383.72) in LCPD. Body naked. Dark brown above and lighter ventrally. Fins and barbells brownish.

**Geographical distribution:** Peninsular India: Goa, Karnataka, Kerala and Pondicherry (Talwar and Jhingran, 1991)

**Distribution in Kerala:** common in rivers of Kerala (Shaji and Easa, 2001), 14 river systems (Kurup et al., 2004).

**Habitat:** Pools of lower stretches of rivers with muddy substratum and stagnant water ponds.

**Fishing method:** Hook and line.

**Family:** Heteropneustidae

**Genus Heteropneustes** Muller

*Heteropneustes* Muller, Arch. Anat. Physio., p. 115 (Type, *Silurus fossilis* Bloch)

**Heteropneustes fossilis** (Bloch)

(Plate Xlll, Fig. 118)

*Silurus fossilis* Bloch, Ichth. Hist. Nat. Poiss., 11: 36, 370, fig. 2, 1798 (Type locality: Bengal)

*Silurus singio* Hamilton-Buchanan, Fish. Ganges, pp. 147, 1822 (Bengal)

*Saccobranchus fossilis* Jerdon, Madras, J. Lit. Sci., 15(2): 342, 1849 (South India)

*Heteropneustes microps* Misra, Faun. India Pisces, 3:137, 1976 (Ceylon)

**Common name:** Stinging catfish **Local name:** Kari, Kadu

**Distinguishing characters:** (Based on 12 specimens from 162-198 mm TL)

D. 6-7; P.I,7;V.i,5; A. 60-70; C.17

Body elongate and cylindrical, posteriorly compressed. BD 14.06-15.96 (15.30) and HL 14.07-17.27 (16.16) in SL. Head broad and depressed.
Occipital process does not reach basal bone of dorsal fin. Nostrils more or less close to each other. Mouth moderate and terminal. Eyes small, 11.16-14.45 (12.31) in HL, widely separated and dorsolateral in position. Barbells four well developed pairs. Dorsal fin small, inserted slightly behind pectoral fins. Pectoral spine strong and serrated. No adipose fin, anal fin long and separated from caudal fin. Caudal fin rounded and body naked. Dark brown above and lighter ventrally. Fins and barbells light brown.

**Geographical distribution:** Pakistan: Indus Basin; India, Nepal, Bangladesh, Sri Lanka, Burma, Thailand and Laos (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Common in low lands of Kerala (Shaji and Easa, 2001), Chalakkudy, Bharathapuzha, Kabbini river systems (Kurup et al., 2004).

**Habitat:** Pool habitats where water velocity is low, stagnant waters, ponds and ditches.

**Fishing method:** Hook and line.

**ORDER: BELONIFORMES**

**Family: Belonidae**

**Genus Xenentodon Regan**


*Xenentodon cancila* (Hamilton-Buchanan)

(Plate XIII, Fig. 119)

*Esox cancila* Hamilton-Buchanan, *Fish. Ganges*, pp. 213, 215, 380, pl. 27, fig. 70, 1822 (Type locality: Ponds and small rivers of Gangetic provinces)

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Belone cancila Day, *Fish Malabar*, p. 166, 1865
Xenantedon cancila Jayaram, *HBFW Fish India*, p. 292, 1981

**Common name:** freshwater gar fish  
**Local name:** Kola, Kolan

**Distinguishing characters:** (Based on 12 specimens from 120-282 mm TL)

- D. iii, 12; P.i,9;V.i,5; A.i,12; C.15.

Body elongate and more or less cylindrical, abdomen rounded. Head moderate, both jaws elongated as a beak armed with sharp teeth. A moderate to deep longitudinal groove on upper side of head present. BD 6.28-7.79 (7.04) HL 40.37-42.86 (41.76) in SL. Eyes moderate to large, visible from ventral side of head, located at anterior part of head, 8.07-10.96 (9.18) in HL. Mouth terminal, Dorsal fin inserted above anal fin. Pectoral fins small, pelvic fins abdominal in position and inserted far back. Caudal fin truncate. Scales present on head and are deciduous in nature. Greenish yellow above, flanks silvery, belly white. A wide silvery lateral band on flanks present. Fins generally yellowish to hyaline with dorsal and anal fins dark edged.

**Geographical distribution:** India, Bangladesh, Myanmar, Nepal, Pakistan, Sri Lanka and Thailand (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Present in almost all river systems (Ajithkumar et al., 2000, Shaji and Easa, 2001; Kurup et al., 2004).

**Habitat:** Pool-run habitats with sandy or muddy bottom.

**Fishing method:** Cast net and gill net.
ORDER: CYPRINODONTIFORMES

Family Aplochilidae

Genus *Aplocheilus* McClelland


Small fishes with an elongate and posteriorly compressed body. Upper surface of head and nape broad and depressed. Snout spatulated. Mouth terminal, directed slightly upwards, moderately wide, eyes prominent, superior. Upper jaw protractile, lower jaw attenuated, barbells absent. Dorsal fin inserted far backwards, above posterior end of anal fin, pelvic fin bases inserted close together, Caudal rounded, scales cycloid and lateral line absent. A pearly white spot on occipit invariably present.

**Key to species**

1. a) Lateral line scales 26-29 .................. *Aplocheilus blocki*

b) Lateral line scales 32-36 .................. *Aplocheilus lineatus*

*Aplocheilus blocki* (Arnold)

(Plate XIII, Fig. 120)

*Haplocheilus panchax* var. *blocki* Arnold, *Wochenschr. Aquarein und Terrainkunde*, 8: 672, 1911 (Type locality: Cochin, Kerala)

*Panchax panchax* blochii (sic) Munro, *Marine and freshwater Fishes of Ceylon*: 85


**Common name:** Dwarf Panchax   **Local name:** Manathukanni, Nettipottan

**Distinguishing characters:** (Based on 8 specimens, 36-68 mm TL)

D.ii, 6; P.13-14; V.6; Aiii, 11

Body elongate and compressed. BD 17.21-19.21 (18.44) and HL 24.54-28.15 (27.76) in SL. Eyes prominent, 18.21-21.31(19.31) in HL. INTO in HL. HD
48.21-51.29 (50.77) in HL. DB 54.21-61.83 (59.7) in HD. In males, 4-5 ray of dorsal fin and 11-12 ray of anal fin elongated. HP 131.26-138.2 (134.6) in HL. Pelvic fins without any prolonged ray. HV 183.54-189.39 (185.31) in HP. LCPD 11.29-14.68 (12.7) in SL. HCPD 98.21-102.32 (100.00) in LCPD, HC 30.14-32.54 (31.19) in SL. Body yellowish green with a metallic sheen and alternating rows of brass yellow red spots. Belly shining blue green. A black spot at base of dorsal fin. Vertical fins yellowish with red dots in male.

Geographical distribution: India: Tamilnadu, Kerala and Kutch; Sri Lanka (Talwar and Jhingran, 1991)

Distribution in Kerala: present in almost all river systems (Ajithkumar et al., 2000, Shaji and Easa, 2001), Valapattanam river system (Kurup et al., 2004).

Habitat: water logged shallow areas of streams, ditches, pools, channels, canals, etc. with thick vegetation.

Fishing method: Scoop nets.

**Aplocheilus lineatus** (Valenciennes)
(Plate XIV, Fig. 121)

*Panchax lineatum* Valenciennes, *Hist. Nat. Poiss.*, 18: 381, 1846 (Type locality: Bombay)
*Haplocheilus lineatus* Day, *Fish. India*, p. 522, 1877 (Malabar coast of India)

Common name: Malabar Killie Local name: Manathukanni,Nettipottan

Distinguishing characters: (Based on 10 specimens, 32-62 mm TL)

D.ii,6; P.12-14; V.6; Aiii,12-13

Body elongate and compressed posteriorly. BD 20.45-21.79 (21.12) and HL 28.86-30.31 (29.49) in SL. Eyes prominent, 25.52- 29.42 (27.47) in HL. DB 57.21-60.29 (59.23) in HD, HP 117.33-134.37 (125.90) in HD, Pelvic fins with its second ray elongated, HV 137.12-138.32 (138.06) in HP. LCPD 15.37-15.86 (15.60) in SL. HCPD 71.43-80.26 (75.84) in LCPD, HC 30.42-34.53
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(32.47) in SL. Males olive brown, flanks paler, belly yellowish, rows of metallic golden green and red spots on body. Females darker than males with 7-11 black transverse bars.

Geographical distribution: India: Western and South Eastern region (Talwar and Jhingran, 1991)

Distribution in Kerala: Fairly common in Kerala (Shaji and Easa, 2001); Throughout all rivers of Kerala (Ajithkumar et al., 2000), Chalakkudy, Periyar, Bharathapuzha and Kallada river systems (Kurup et al., 2004).

Habitat: Water logged shallow areas of streams, ditches, swamps, pools, channels, canals, etc. with thick vegetation.

Fishing method: Scoop nets.

Family: Poeciliidae

Genus: **Poecilia** Bloch and Schneider

*Poecilia* Bloch and Schneider, *Syst. Ichth.*, 2, p. 412, 1801 (Type, *Poecilia vivipara* Bloch and Schneider)

*Poecilia reticulata* Peters

(Plate XIV, Fig. 122)

*Poecilia reticulata* Peters, *K. Preussischen Akad. Wiss.*, Berlin: 412, 1859 (Type locality: Venezuela)


Common name: Guppy                  Local name: Guppy

Distinguishing characters: (Based on 12 specimens, 28-48 mm TL)

D. 1, 5; P. i, 10-11; V. i, 5; Aii, 7; C. 14; L. i, 28-30, Ltr. 2.5/3.

Small fishes with a cylindrical and posteriorly compressed body. Upper jaw protrusible, lower jaw projecting. Gill membranes free from each other and also from isthmus. BD 23.84 -24.62 (24.23) and HL 23.78-24.11 (23.95) in SL. Eyes prominent, 28.27-28.95 (28.61) in HL. INTO 42.13- 62.63 (52.38) in
HL. Dorsal fin short, inserted in front of anal fin, HD 59.21-86.67 (72.94) in HL, HP 96.62-139.11 (117.86) in HD, HV 74.52-75.08 (74.80) in HP. In males, anal fin modified to serve as a gonopodium. LCPD 26.19-27.09 (26.64) in SL, HCPD 57.84-60.05 (58.95) in LCPD, HC 32.17-34.81 (33.49) in SL. Young males easily distinguished from females by their orange, red and black dots all over body and fins. Females are olivaceous; fins hyaline.

Geographical distribution: Netherlands, The Venezuelan Islands, Trinidad and British Guiana; Introduced to India (Talwar and Jhingran, 1991).

Distribution in Kerala: Nilgiri biosphere reserve (Easa and Basha, 1995), Periyar (Ajithkumar et al., 2000), Chaliyar (Shaji and Easa, 2001), Chalakkudy river (Kurup et al., 2004)

Habitat: Water logged shallow areas of small streams, ditches, channels, canals etc. It is also found in riffle-pools at high altitudes.

Fishing method: Scoop nets.

ORDER: SYNGNATHIFORMES

Family: Syngnathidae

Genus Microphis Kaup

Microphis Kaup, Arch. Naturg., 19, pl. 1, p. 234, 1853 (Type, Syngnathus deocata Hamilton-Buchanan)

Microphis cuncalus (Hamilton-Buchanan) (Plate XIV, Fig. 123)

Syngnathus cuncalus Hamilton-Buchanan, Fishes of Ganges: 12, 362, 1822 (Type locality: Estuaries of north Calcutta)
Doryichthys cuncalus Day, Fauna Br. India, Fishes, 2: 465, 1889

Common name: Crocodile tooth pipefish
Local name: Pullumeen
Distinguishing characters: (Based on 16 specimens, 82-126 mm TL)

Rings (16-18) + (24-27); D 47-56; P 16-19; Sub dorsal rings (3.5-2.0)+(5.75-7.5)


Geographical distribution: India: West Bengal, Orissa, Tamil Nadu, Maharashtra, Goa and Kerala; Bangladesh and Sri Lanka (Talwar and Jhingran, 1991)

Distribution in Kerala: Chaliyar river system (Easa and Shaji, 1996), Nilgiri Biosphere Reserve (Easa and Basha, 1995), Aralam wild life sanctuary (Shaji et al., 1995) Uppala, Periyar, Moovattupuzha and Periyar (Ajithkumar et al., 2000), Valapattanam and Chalakkudy river systems (Kurup et al., 2004).

Habitat: shallow areas of low-lying plains with thick grassy vegetation.

Fishing method: Scoop nets

ORDER: SYNBRANCHIFORMES
Family: Mastacembelidae
Subfamily: Mastacembelinae
Body eel-like, compressed and elongate, covered with minute scales. Mouth non-protractile. Snout elongate, supported by a cartilaginous rod and ending in a sensitive tip flanked by tubular nostrils. Dorsal fin long with depressible detached dorsal spines; anal fin with 1-3 spines. Pelvic fins absent. Caudal fin short, either confluent with dorsal and anal fins or narrowly separated; homocercal.

Key to Genera

1. a) Rostrum relatively large, ventral surface lined with tooth plates, rim of anterior tubular nostril with six finger-like projections........... Macrognathus  
   b) Rostrum relatively small, no rostral tooth plate, rim of anterior tubular nostrils with two broad based flaps.................. Mastacembelus

Genus Macrognathus Lacepede

Macrognathus Lacepede, Hist. Nat. Poiss., 2, 283. 1800 (Type, Ophidium aculeatum Bloch)

Macrognathus aral (Bloch and Schneider) (Plate XIV, Fig. 124)

Rhynchobdella aral Bloch and Schneider, Syst. Ichth., p. 478, 1801 (Type locality: Tranquebar, Tamil Nadu)
Macrognathus aculeatus Hamilton, Fish. Ganges, p. 29, 1822 (Gangetic provinces)
Rhynchobdella aculeata (nec Bloch) Day, Fish. India, p. 338, 1876

Common name: One stripe spiny eel  Local name: Aaron, Aral, Aarakan

Distinguishing characters: (Based on a single specimen, 182 mm TL)
D. XVI, 37; P.i, 18; A.ii, 46; C.14.

Elongate and compressed body, head conical, snout elongate, pointing. Rostral appendage with concave ventral surface lined with tooth plates on either sides. BD 12.34 and HL 21.99 in SL. Pre orbital and postorbital bones thin and smooth edged. Eyes small, 6.75 in HL. Mouth small, inferior. Dorsal fin inserted far behind origin of pectoral fins. HD 13.11 in HL. Caudal rounded...
and distinctly separated from dorsal and anal fins, HC 8.02 in SL. Body greenish brown on back and abdomen yellowish. Two broad pale greenish bands, one above and second below lateral line. Four dark ocelli at base of rayed dorsal fin each surrounded by a yellow halo. Dorsal and caudal fin with several dark streaks.

**Geographical distribution:** Pakistan, India, Sri Lanka, Bangladesh, Nepal and Burma (Talwar and Jhingran, 1991).

**Distribution in Kerala:** rivers of Kerala (Jayaram, 1981), Periyar and northern rivers (Shaji and Easa, 2001), Periyar river system (Kurup et al., 2004)

**Habitat:** Shallow riffles at upland and middle strecthes. The substratum consist of a mixture of cobbles and pebbles.

**Fishing method:** Cast nets and gill nets

**Genus: Mastacembelus** Scopoli

*Mastacembelus Scopoli, Introd. Hist. Nat., p. 458, 1777 (Type, Ophidium mastacembelus Banks and Solander)*

**Mastacembelus armatus** (Lacepede)

(Plate XIV, Fig. 125)


**Common name:** Tire-track spiny eel  
**Local name:** Aaron, Aral, Aarakan

**Distinguishing characters:** (Based on 11 single specimen, 181-358 mm TL)

D. XXXII-XXXVIII, 67-71; P.i, 17-20; A.ii, 64-74; C.13-14.

Elongate and compressed body, head conical, snout elongate, pointing. BD 6.21-10.25 (7.23) and HL 16.52-19.21 (17.86) in SL. Eyes moderate to small, 9.52-11.25 (10.22) in HL. Mouth small, inferior. Dorsal fin inserted above...
posterior third of pectoral fins. HD 14.23-17.43 (15.89) in HL. HP 191.02-198.73 (196.11) in HD. Caudal fin confluent with dorsal and anal fins, HC 4.18-7.24 (5.77) in SL. Ground colour greenish brown with a network of large brownish patches and blotches surrounded by narrow yellow halo on back, head and flanks. Pattern of blotches extend to fins. Ventral side reddish white. A dark line passing through eye ending at tip of snout.

Geographical distribution: Pakistan, India, Sri Lanka, Bangladesh, Nepal, Burma, Thailand and Southern China (Talwar and Jhingran, 1991)

Distribution in Kerala: 24 rivers of Kerala (Ajithkumar et al., 2000; Kurup et al., 2004), Fairly common in rivers of Kerala (Shaji and Easa, 2001).

Habitat: Riffles and runs with cobbles, pebbles and sandy substratum.

Fishing method: Cast nets.

ORDER: PERCIFORMES

Family: Ambassidae

Small fishes with oblong, elevated or slightly elongated, highly compressed and slightly translucent body. Moderate to small, deciduous, cycloid scales on body and head. Preopercle, interopercle and opercular bones are variously serrated. Dorsal fin deeply notched before last spine. Mouth moderate to large, eyes moderate to large, caudal fin forked. A forwardly directed spine in front of dorsal fin present. Lateral line complete. These fishes are a "fishermen's puzzle" as fish with procumbent and other sharp spines or dorsal fin entangled in cast nets and gillnets are very difficult to remove. Fishes with very low food value.
Chapter 2

Systematics

Key to genera

1. a) Supra orbital edge smooth or with two spines posteriorly, ventral margin of interoperculum serrated, body oblong and elevated, Jaws more or less equal........................... ...Parambassis

b) Supra orbital edge finely serrated, ventral margin of interoperculum smooth, body more elongate and lower jaw prominent and projecting..........................Pseudambassis

Genus **Parambassis** Bleeker


Key to species

1. a) Supra orbital edge smooth, lateral line scales 40-48 ................................................................. Parambassis dayi

b) Supra orbital edge with two spines, lateral line scales 80-83 .......................................................... Parambassis thomassi

**Parambassis dayi** (Bleeker)

(Plate XIV, Fig. 126)


*Ambassis nalua* Day (nec Hamilton-Buchanan), Fish. Malabar, p. 15, 1878

*Parambassis dayi* Talwar and Jhingran, Inland Fish, 2:801, 1991 (Western Coasts of Kerala)

Common name: Day's Glassy perchlet   Local name: Arinjil, Chakkamullan

Distinguishing characters: (Based on 18 specimens, 68-133 mm TL)

D.VIII-IX+I, 10-11; P.i,11-12; V.i,5; A.III,8-9; C.17-19; Ll. 40-48, Ltr. 4.5-5/11-12.5

Body oblong and compressed. Head moderate, Snout conical, pointed, mouth large. Jaws more or less equal. BD 35.46 - 44.07 (40.67) and HL 29.82-41.30 (36.90) in SL. Eyes large, 31.35 - 40.49 (35.93) in HL. HD 60.95-

Geographical distribution: Western Ghats of Kerala and Karnataka

Distribution in Kerala: All along Western Ghats of Kerala (Shaji and Easa, 2001, Kurup et al., 2004) Almost all rivers in south of Palakkad gap (Ajithkumar et al., 2000), Chalakkudy, Chaliyar, Pamba, Periyar and Bharathapuzha (Kurup et al., 2004)

Habitat: low land plains, pool and run habitats with sandy and muddy bottom. Also found in middle streams with sandy and gravelly substratum, however very rare at upstream.

Fishing methods: gill nets and cast nets.

Parambassis thomassi (Day)
(Plate XIV, Fig. 127)


Chanda thomassi Tilak, Rec. Zool. Surv. India. 67: 90, 1972 (Goa)

Common name: Western ghat glassy perchlet

Local name: Arinjil, Chakkamullan, Mullan

Distinguishing characters: (Based on 12 specimens, 38-59 mm TL)

D. VII + I, 10-11; P. i, 14-15; V.i, 5; A.iii, 9; C.17-19; LI. 80-83, Ltr. 8.5-9/13.5-14

Body rather stout, deep and compressed. Head moderate to large, Snout conical, pointed, mouth large, jaws equal. BD 40.25-44.16 (42.36) and HL 31.56-42.36 (34.21) in SL. Eyes large, 31.65-41.22 (36.26) in HL. HD 69.87-

**Geographical distribution:** Western Ghats of Kerala and Karnataka

**Distribution in Kerala:** All along Western Ghats of Kerala (Shaji and Easa, 2001). Almost in all rivers (Ajithkumar et al., 2000), Kabbini river system (Kurup et al., 2004).

**Habitat:** Middle streams with sandy and gravelly substratum and riffle-pool habitats at upstream.

**Fishing methods:** gill nets and cast nets.

**Genus Pseudambassis** Bleeker


*Pseudambassis baculis* (Hamilton-Buchanan) (Plate XIV, Fig. 128)

*Chanda baculis* Hamilton-Buchanan, *Fish. Ganges*, pp. 112, 371, 1822 (Type locality: North-east Bengal)

*Ambasis baculis* Day, *Fish. India*, p. 51, 1875


**Common name:** Himalayan Glassy Perchlet  **Local name:** Nandan, Mullan

**Distinguishing characters:** (Based on 12 specimens, 61-78 mm TL)

D.VI-VII+I, 13; P.i,11-12; V.i,5; A.III,12-13; C.17-19; L.I. 88-92

Body rather slender and elongated. Head moderate, Snout conical, pointed, mouth moderate to normal. Jaws sub equal, lower jaw distinctly prominent and elongate. BD 34.56-41.29 (38.34) and HL 31.29-39.54 (33.12) in SL.
Eyes moderate, 28.56-38.49 (32.59) in HL. HD 68.59-76.58 (73.67) in HL. HP 99.16-112.57 (108.16) in HD. HV 78.39-84.16 (81.23) in HP. LCPD 9.58-12.58 (11.26) in SL. HCPD 80.29-96.58 (84.52) in LCPD. Caudal forked, HC 30.59-38.59 (32.54) in SL. Back yellowish green, flanks and belly silvery white. Tips of dorsal fin rays deep dark. Fins generally hyaline.

**Geographical distribution:** Pakistan, India, Bangladesh, Thailand, Myanmar and Malaysia (Talwar and Jhingran, 1991)

**Distribution in Kerala:** Fairly common in Kerala (Shaji and Easa, 2001).

**Habitat:** middle streams with sandy and muddy substratum.

**Fishing methods:** gill nets and cast nets.

**Family: Nandidae**

Body deep, oblong and strongly compressed. Head covered with scales. A single dorsal fin, long and with spinous and soft parts. Height of soft part greater than spinous part. Lateral line interrupted. Caudal peduncle deep, caudal fin rounded. Members of this family show high salinity tolerance where some of members are also inhabit in brackish waters.

**Key to subfamilies**

1. a) Mouth very large and highly protractile.......................Nandinae
   b) Mouth relatively small and only slightly producible.....Pristolepidinae

**Sub family: Nandinae**

**Genus Nandus** Valenciennes

**Nandus nandus** (Hamilton-Buchanan)  
(Plate XIV, Fig. 129)

*Colius nandus* Hamilton-Buchanan, *Fish. Ganges*, pp. 96, 370, pl. 30, fig. 32, 1822 (Type locality: Gangesic provinces)  
*Bengula hamiltonii* Gray, *Ill. Ind. Zool.*, 2: pl. 88, fig. 3, 1834

**Common name:** Mottled Nandus  
**Local name:** Muthukkila

**Distinguishing characters:** (Based on 12 specimens, 67-103 mm TL)  
D. XIII-XIV, 11-12; P. i, 13-14; V.i, 5; A.III, 7-8; C.14; Ll. 41-46, Ltr. 5-5.5/12-13

- Body fairly deep, oblong and compressed. Head large, snout pointed and conical, mouth large, lower jaw strong and longer and maxilla reaching to hind border of eye. BD 36.29-38.00 (37.22) and HL 31.65-41.21 (37.89) in SL. Eyes 18.50-24.12 (21.14) in HL. HD 32.29 - 44.82 (37.75) in HL. Pectoral fins broadly rounded. HP 45.08-56.53 (49.80) in HL and 126.12-147.99 (132.96) in HD. HV 99.62-105.20 (102.02) in HP. LCPD 10.77-13.81 (13.35) in SL. HCPD 85.61-124.32 (107.11) in LCPD. Caudal rounded, HC 20.53-27.20 (23.98) in SL. Body with ctenoid scales. PDS 12-14. Greenish brown with brassy reflections. Three irregular, brown bands across body. A dusky blotch on caudal base which often appear as a band. Fins greenish brown with soft parts of dorsal, anal and caudal fins mottled with numerous dark spots. Some dark narrow bands radiate from eyes which also found on spinous dorsal fin.

**Geographical distribution:** Pakistan: Indus plain; India, Nepal, Bangladesh, Burma and Thailand (Taiwar and Jhingran, 1991)  
**Distribution in Kerala:** All major rivers and associated wet lands, except seven rivers such as Manjeswaram, Uppala, Shiriya, Mogral, Ayroor.
Ithikkara and Mamom (Ajithkumar et al., 2000), Achencoil, Pamba, Manimala and Chaliyar river systems (Kurup et al., 2004).

**Habitat:** Pool-run habitats with sandy or muddy substratum.

**Fishing methods:** Gill nets.

### Sub family: Pristolepidinae

**Genus Pristolepis Jerdon**


**Pristolepis marginata** Jerdon

(*Plate XIV, Fig. 130*)

*Pristolepis marginatus* Jerdon, *Madras J. Lit. Sci.*, 15: 141, 1848 (Type locality: Manantoddy river)


*Nandus maiabaricus* Day, *Fish. Malabar*, p. 130, pl. 8, 1865

*Pristolepis maiabarica* Day, *Fish. India*, p. 131, pl. 32, 1889

**Common name:** Malabar Catopra

**Local name:** Andivalli, Chemballi

**Distinguishing characters:** (Based on 10 specimens, 58-124 mm TL)

D. XV, 12; P.i,11; V.i,5; A.iii, 8; C.14; Ll. 30-31, Ltr.4.5/10

Body fairly deep, oblong and compressed. BD 44.43-46.29 (45.28) and HL 38.71-40.71 (39.23) in SL. Snout slightly pointing or blunt. Mouth small to moderate, Maxilla ends before anterior border of eye. Eyes moderate to large, 26.02-31.42 (29.78) in HL. HD 38.54-88.43 (55.7) in HL. DB 181.19-418.7(318.54) in HD. HP 89.2-210.08 (155.78) in HD. HV 40.24-85.75 (73.07) in HP. LCPD 6.55-8.68 (7.68) in SL. LCPD. Caudal rounded, HC 32.58-34.79 (33.28) in SL. Scales cycloid. PDS 9. Greenish body with brown reflections. Fins red orange or greenish orange. Membranes between dorsal and anal spines blackish.

**Geographical distribution:** India: Western Ghats of Kerala (Jayaram, 1999)
Distribution in Kerala: Recorded from 10 rivers of Kerala (Ajithkumar et al., 2000), All rivers of Kerala (Shaji and Easa, 2001), 13 rivers of Kerala (Kurup et al., 2004).

Habitat: Pool-run or pool-riffle habitats with sandy or muddy substratum.

Fishing methods: gill nets or cast nets.

**Family: Cichilidae**

Body deep and compressed. Abdomen more or less round. Mouth terminal, eyes moderate to large, placed in middle of head. A single nostril on each side of head. Dorsal fin single, long, inserted above base of pectoral fin, with a spinous and soft parts, spinous portion longer than soft one. Spines on dorsal fin usually more than ten. Anal fin also with spinous and soft parts. Lateral line abrupt and interrupted. Caudal truncate or lunate. Scales may be cycloid or weakly ctenoid.

**Key to Genera**

1. a) Anal fin with 3-4 spines........................................... **Oreochromis**

   b) Anal fin with 12-16 spines........................................... **Etroplus**

**Genus Oreochromis** Gunther


*Oreochromis mossambica* (Peters) (Plate XV, Fig. 131)

Chromis (Tilapia) mossambicus Peters, Montab. Akad. Wiss., Berlin: 681, 1852 (Type locality: Mozambique)


*Oreochromis mossambica* Trewavas, Tilapiine fishes: 292, 1983

Common name: Tilapia
Local name: Philoppy, Tilappia

Distinguishing characters: (Based on 16 specimens, 102-165 mm TL)
Elongate, deep and compressed body, BD 40.59-47.40 (44.00) and HL 41.02-45.13 (43.07) in SL. Head with a slight concavity on upper profile. Snout conical, mouth terminal and large. Eyes 17.59-20.60 (19.09) in HL. Dorsal fin has its soft portion with a filamentous tip. HD 33.43-39.68 (36.55) in HL. DB 334.54-370.31 (352.42) in HD. HP 111.28-229.52 (170.40) in HD. HV 90.8-148.88 (119.84) in HP. LCPD 12.07-15.74 (13.91) in SL. HCPD 100.36-118.36 (109.53) in LCPD Caudal truncate, HC 30.37-31.47 (30.92) in SL. Body with cycloid scales. Lateral line incomplete. In females and non-breeding males, body grayish with 3-4 botches along flanks. Body of males during breeding season become deep black. Dorsal fin black with red margin, pectoral fins translucent red, caudal fin with red margin.

Geographical distribution: East Africa. Introduced to India, Pakistan and Sri Lanka etc. (Talwar and Jhingran, 1991)

Distribution in Kerala: Throughout Kerala (Ajithkumar et al., 2000; Shaji and Easa, 2001), Upstream of Chalakkudy, Pambar, Kallada and Bharathapuzha river systems and low land areas of almost all river systems (Kurup et al., 2004).

Habitat: It is found rarely in cascade, rapids and riffles of upstream but common in run and pool habitats of low-lying plains.

Fishing method: Gill nets and cast nets.

Genus *Etroplus* Cuvier

Body deep, highly compressed, snout spout like, mouth terminal and small. Members of this genus have their anal fin with 12-16 spines, caudal fin lunate or emarginate, scales weakly ctenoid. Inhabits brackish and freshwaters. Body covered with pearly or deep golden spots.

Key to species

1. a) Body with three round black blotches
   
   Etroplus maculatus

   b) Body deep bluish, with oblique bands
   
   Etroplus suratensis

Etroplus maculatus (Bloch)
(Plate XV, Fig. 132)

Chaeiodon maculatus Bloch, Syst. Ichth., pl. 427, fig. 2, 1785 (Type locality not given)
Etroplus corutchi Cuvier, Hist. Nat. Poiss., 5: 491, 1828
Glyphisodon koruschi Cuvier, Hist. Nat. Poiss., p. 5, pl. 136, 1828

Common name: Orange chromid
Local name: Pallathi, Choottachi

Distinguishing characters: (Based on 22 specimens, 68-82 mm TL)

D. XVIII-XIX, 9; P. ii, 10-11; V. I, 5; A. XII-XIII, 7-9; C.15; Li.41, Ltr. 5.5/16.5

Both profiles equally and prominently arched, body disc like, deep and strongly compressed. BD 50.39-59.24 (55.52) and HL 41.46-49.8 (45.10) in SL. Head moderate to small, Eyes 22.30-24.03 (23.15) in HL. HD 33.43-39.68 (36.55) in HL. DB 407.49-528.74 (472.85) in HD. HP 216.63-249.29 (226.69) in HD. HV 63.24-72.07 (69.38) in HP. LCPD 6.89-8.04 (7.05) in SL. HCPD 194.52-235.29 (217.76) in LCPD. Caudal lunate, HC 28.97-35.69 (31.41) in SL. Ground colour may be yellowish orange or grayish green with several horizontal lines of golden spots. Three large round black blotches on flanks, middle one darkest. Anal fin with a black boarder and dorsal with rows of black spots.
Geographical distribution: India: Tamil Nadu, Kerala and South Karnataka; Sri Lanka (Talwar and Jhingran, 1991)

Distribution in Kerala: Throughout all rivers (Ajithkumar et al., 2000; Shaji and Easa, 2001), Bharathapuzha, Kabbini, Achenkoil, Pamba, Meenachil and Kallada river systems (Kurup et al., 2004).

Habitat: Riffle-pools and pool-run habitats of middle stream and downstream plains.

Fishing method: Cast nets and Gill nets.

**Etroplus suratensis** (Bloch)

(Plate XV, Fig. 133)

*Chaetodon suratensis* Bloch, *Syst. Ichth.*, pl. 217, fig. 3, 1785 (Type locality: Surat, Gujarat)


Common name: Banded pearl spot

Local name: Karimeen

Distinguishing characters: (Based on 12 specimens, 11-19 mm TL)

D. XVIII-XIX, 9; P. ii, 10-11; V.I, 5; A.XII-XIII, 7-9; C.15; Li. 41, Ltr. 5.5/16.5

Ovate, deep and strongly compressed body. BD 53.54-58.7 (55.76) and HL 32.92-39.18 (35.62) in SL. Mouth small, terminal. Eyes 23.8 - 30.07 (26.71) in HL. HD 29.56-42.26 (36.41) in HL. DB 479.76-565.06 (519.14) in HD. HP 196.11-246.47 (213.01) in HD. HV 72.5i-82.48 (78.07) in HP. LCPD 7.09-8.14 (7.80) in SL. HCPD 179.78-216.76 (198.88) in LCPD Caudal fin emarginate, HC 23.7-27.56 (25.16) in SL. Bluish green body with six to seven oblique vertical bands. Most of scales above lateral line have central white pearly spot. Some irregular black spots on abdomen. Fins generally dirty green. Pectoral fins with a deep blue blotch at its base.

Geographical distribution: India: Orissa, Andhra Pradesh, Tamilnadu, Kerala and Sri Lanka (Talwar and Jhingran, 1991)
Distribution in Kerala: Recorded from 29 rivers of Kerala (Ajithkumar et al., 2000) Common in fresh and brackish waters of Kerala (Shaji and Easa, 2001), Chalakkudy and Bharathapuzha river systems (Kurup et al., 2004).

Habitat: pool-run habitats at low land areas of river systems and reservoirs.

Fishing method: Gill nets and Cast nets

**Family: Blennidae**

**Genus *Salarias* Beaufort and Chapman**

*Salarias* Beaufort and Chapman, *Fish Indo-austral Archipel.* Vol. 9, pp. 484, 1951 (Type, *Salarias marmoratus*)

*Salarias reticulates* Kurup and Radhakrishnan

(Plate XV, Fig. 134)


Paratype:-None

Diagnosis: Elongated, body with irregular reticulations and circular interspaces, oblong mouth, strong pectoral girdles and leathery skin. Ventral jugular having two flexible spines. A moderately long fringed supraorbital cirrus and a simple cirri at nape and another short one at posterior rim of nostril, with 6 filaments at its base. No crest on head and pre-opercle has a posterior projection.

Distinguishing characteres: (based on a single specimen with 103.62 mm TL.)

D.XII, 15; P.14; V.2; A.18; C.12.

Body cylindrical. Ventral profile of body slightly convex than dorsal. Head globular, HL 48.4 and BD 49.2 in SL. Eyes high up with diameter 52.31 in HL.
and 20.61 in SL. Diameter of eye less than SNL (99.23) and HL (52.09). Width of snout little higher than post- orbital length (106.23). Head depth 98.35 in HL. A single row of incisor- like movable teeth on each jaw and a strong posterior canine on each side of lower jaw. Gill openings continuous from one side of head to other across ventral surface of head. Branchiostegal rays six. Dorsal fin deeply notched, first lower than second, which is nearly half of body height, while posteriorly it does not extend to caudal fin. HD 62.13 in SL, HP 38.36 in SL 97.23 and in HL. HV 60.06 in SL. Origin of anal fin opposite to origin of second dorsal fin. Caudal fin with middle rays posteriorly branched. Lateral line complete, forming an angle beyond 8\textsuperscript{th} dorsal spine. Scales totally absent. Head blackish, body and fins, except ventral, reticulated with brown lines enclosing circular or irregularly formed spaces. Reticulation more prominent on lateral and ventral sides. Ventral side from snout tip to origin of anal fin whitish without any prominent markings. Ventral fin hyaline with blackish tinge.

**Geographical Distribution**: India: Vettillappara, Chalakudy river, Kerala

**Etymology**: The species name is derived from its reticulated colour pattern.

**Habitat**: Small riffles with pebbles and cobbles as substratum.

**Fishing method**: Cast nets

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**Sub order: Gobioidae**

**Key to Families**

1. a) Pelvic fins separate and not forming an adhesive disc
   
   ...............................................................................................................

   \textit{Eleotrididae}

   b) Pelvic fins united, usually forming an adhesive disc...........

   \textit{Gobiidae}
Family: Eleotrididae

Genus: Eleotris Bloch & Schneider

Eleotris Bloch & Schneider, Syst. Ichth., p. 85, 1801 (Type, Gobius pisonis Gmelin)

Eleotris fusca (Schneider) (Plate XV, Fig. 135)

Poecilia fusca Schneider, Syst. Ichth., 453, 1801 (Type locality: Pacific islands)
Eleotris cavifrons Blyth: Day, 1876, Fishes of India: 313, pl. 65, fig. 7; Day, 1889

Common name: Dusky sleeper Local name: Poozhon

Distinguishing characters: (Based on 2 specimen, 132-156 mm TL)

D1 vi, D2 I, 8-9; P.15-18; V.i, 5; A.i, 8; C.19; Li. 60-68

Body elongate, anteriorly cylindrical and compressed slightly posteriorly. Head oblong, slightly depressed and scaled above from between eyes and partly on sides. BD 21.30-24.60 (23.50) and HL 31.26-34.62 (33.56) in SL. Snout blunt, mouth obliquely directed upwards, lips thick, cleft extending up to anterior 1/3 of eyes. Gill openings restricted to pectoral fin bases and gill membranes united with isthmus. Eyes small, 12.35-15.96 (14.36) in HL. Dorsal fin separate, HD 42.36-47.85 (46.53) in HL. HP 131.06-139.25 (133.00) in HD, HV 71.28-74.56 (73.23) in HP. LCPD 29.56-32.35 (30.58) in SL. Scales ctenoid. HCPD 46.26-52.36 (49.04) in LCPD. Caudal lanceolate, HC 31.24 – 36.24 (32.67) in SL. Head, body and fins dark brown to black, numerous horizontal dark lines on body.

Geographical distribution: Indo-West Pacific (Talwar and Jhingran, 1991)

Distribution in Kerala: Chalakkudy river system (Kurup et al., 2004).

Habitat: Lowland areas of rivers with sand or mud as substratum.

Fishing method: Gill nets.
Family: Gobiidae


Key to subfamilies

1. a) Eyes placed dorsally, interorbital distance greater than six times and body depth 1.75 times in head length, pelvic fin disc longer than broad

..............................................................................................................Gobiinae

b) Eyes placed laterally, interorbital distance less than 2.5 times and body depth 1.3 times in head length, pelvic fin disc broader than long

..............................................................................................................Sicyidiaphiinae

Sub family: Gobiinae

Key to genera

1. a) Shoulder girdle under opercula with one to three finger like projections, head oblong.................................................................Awaous

b) Shoulder girdle without such finger like projections, head depressed...................................................................................Glossogobius

Genus: Glossogobius Gill

Glossogobius Gill, Proc. Acad. Nat. Sc. Philad., p. 46,1859 (Type, Gobius platycephalus Richardson)

Glossogobius giuris (Hamilton-Buchanan)

(Plate XV, Fig. 136)

Gobius giuris Hamilton-Buchanan, Fish. Ganges, pp. 51, 366, pl. 33, 1822 (Type locality: Gangetic provinces)

Gobius unicolour Gunther, Cat. Fish. Brit. Mus., 3:23, 1861

Gobius spectabilis Gunther, Cat. Fish. Brit. Mus., 3 45, 1861

Gobius gutum Hamilton-Buchanan, Fish. Ganges; pp 50, 366, 1822 (Lower part of Padma river)
Common name: Tank goby
Local name: Poozhan, Poolon

Distinguishing characters: (Based on 16 specimens, 132-156 mmTL)

D. vi + i, 8-9; P.i,16-21; A.i,8; C.17

Body elongate, anteriorly cylindrical and posteriorly compressed. Head depressed and scaled behind eyes, other parts of head naked. BD 14.73 - 22.54 (17.49) and HL 33.18-34.36 (33.64) in SL. Gill openings extend from rear end of preopercle to below eyes, gill membranes united with each other and also with isthmus. Snout elongate and straight, lower jaw prominent, mouth terminal or slightly upturned. Eyes 15.27-15.95 (15.06) in HL. Dorsal fin separate, HD 47.32-58.12 (52.12) in HL. DB 64.45-110.34 (84.33) in HD. Pectoral fins larger, HP 116.36-149.38 (130.4) in HD. Pelvic fins form a disc and HV 81.24 - 92.30 (86.32) in HP. LCPD 9.27-15.02 (10.72) in SL. Scales ctenoid. HCPD 74.74 -125.75 (101.30) in LCPD. Caudal lanceolate, HC 25.54-30.26 (27.10) in SL. Body yellowish brown with several patches of blotches on flanks. Sides of head with irregular violet spots. Dorsal, Pectoral and caudal fins mottled with dark spots.

Geographical distribution: Indo-West Pacific (Talwar and Jhingran, 1991)

Distribution in Kerala: 11 rivers of Kerala (Shaji and Easa, 2001). Throughout Kerala in all major rivers (Ajithkumar et al., 2000), Chalakkudy and Bharathapuzha river systems (Kurup et al., 2004).

Habitat: Pool-run and sheet type habitats with sandy bottom at downstreams of rivers.

Fishing method: Cast nets

Genus: Awaous Valenciennes

**Awaous gutum** (Hamilton-Buchanan)
(Plate XV, Fig. 137)

_Gobius giuris_ Hamilton-Buchanan, _Fishes of Ganges_: 50, 366, 1822 (Type locality: Padma river)
_Gobius striatus_ Day, _Fauna Brit. India, Fishes_, 2: 262, 1876

**Common name**: Tank goby  
**Local name**: Poozhan, Poolon

**Distinguishing characters**: (Based on 16 specimens, 132-156 mm TL)

D. vi + i, 10; P.15-17; A.i, 10-11; C.17

Body elongate, anteriorly cylindrical and posteriorly compressed. Head more or less oblong and scaled behind eyes, other parts of head naked. BD 22.31-26.54 (25.21) and HL 31.26-36.54 (34.18) in SL. Gill openings extend from rear end of pre opercle to below eyes and gill membranes united with each other and also with isthmus. Snout curved downwards, mouth terminal or even slightly subterminal. Eyes 14.25-16.54 (15.13) in HL. Dorsal fin separate, HD 45.23-47.26 (46.75) in HL. HP 132.54 -136.48 (134.12) in HD. Pelvic fins form a disc. HV 81.24-86.54 (84.91) in HP. LCPD 9.24-11.24 (10.92) in SL. Scales ctenoid. HCPD 101.25-104.58 (103.79) in LCPD. Caudal rounded or lanceolate, HC 22.68-28.54 (27.39) in SL. Body olive green or yellowish, head and body with scattered brownish spots. Pectoral fins yellowish or greenish brown. Other fins mottled with rows of brownish spots.

**Geographical distribution**: India and Bangladesh (Talwar and Jhingran, 1991)

**Distribution in Kerala**: rivers of Kerala (Shaji and Easa, 2001) In all major rivers (Ajithkumar _et al._, 2000), Achenkoil and chalakkudy river systems (Kurup _et al._, 2004).

**Habitat**: Sheet type habitats with sandy bottom at downstreams.
Fishing method: Cast nets

Sub family: Sicydiaphiinae

The subfamily is represented by a single genus, *Sicyopterus* and a single species, *Sicyopterus griseus* (Day)

Genus *Sicyopterus* Gill


*Sicyopterus griseus* (Day)  
(Plate XV, Fig. 138)


Common name: Clown goby  
Local name: Manal poozhon

Distinguishing characters: (Based on 10 specimens, 64-111 mm TL)

D I, vi ; D2 I, 10; P. I, 6

Body elongate, anteriorly cylindrical and slightly compressed posteriorly.  
Head flat above and snout round. Scales behind eyes, other parts of head naked.  
BD 14.23-16.25 (15.48) and HL 34.32-38.96 (37.76) in SL. Gill membranes united with each other and also with isthmus. Isthmus broad.  
Mouth slightly sub terminal, lips thick and lower margin of upper lip with short papillae. Eyes slightly bulging,10.26-12.54 (11.81) in HL. Dorsal fin separate, first few spines of dorsal fin filiform, HD 62.53-66.32 (65.79) in HL. DB 194.26-202.03 (200.98) in HD. HP 81.24-84.52 (83.73) in HD. Pelvic fin disc closely attached to belly, HV 61.29-64.58 (63.69) in HP. LCPD 11.28-13.54 (12.74) in SL. Scales cycloid. HCPD 84.52-90.24 (88.56) in LCPD. Caudal rounded, HC 22.35-26.34 (25.26) in SL. Brownish body with eight to nine dark brown bands encircle body which is wider than interspaces. Fins dark brown with pale edges.
Geographical distribution: India and Bangladesh (Talwar and Jhingran, 1991)

Distribution in Kerala: 7 rivers of Kerala (Shaji and Easa, 2001) Throughout Kerala in all major rivers (Ajithkumar et al., 2000), Periyar, Chaliyar and Valapatanam river systems (Kurup et al., 2004).

Habitat: Sheet or run type of habitats with sandy bottom at downstreams.

Fishing method: Cast nets

Family: Anabantidae

Genus Anabus Cuvier

Anabus Cuvier, Le Regne Animal., 2, p. 339, 1816 (Type, Perca scandens Daldorf)

Anabas testudineus (Bloch)

Anabas testudineus Bloch, Nat. Aus. Fish., 7: 121, pl. 322, 1795 (Type locality: mentioned Japan. Menon (1999) opined that this species does not occur in Japan)


Amphirion testudineus Schneider, Syst. Ichth., p. 204, 1801


Common name: Climbing perch Local name: Karuvappu, Kallurutty

Distinguishing characters: (Based on 20 specimens, 74-147 mmTL)

Body elongate, oblong and posteriorly compressed. Suprabranchial organ (labarynth) present. Head broad, covered with scales. Operculum serrated, two spines well developed, mouth moderate and terminal. BD 35.59-44.85 (39.79) and HL 33.15-41.32 (37.72) in SL. BD 93.28-114.75 (105.63) in HL.

Eyes moderate, placed laterally and anteriorly, 18.87-22.05 (22.59) in HL.

INTO 29.52-34.40 (31.10) in HL. Barbells absent. Gill membranes broadly united. Dorsal fin elongated with spinous and soft parts. HD 26.42-41.90 (36.44) in HL. Pectoral fins broadly rounded. HP 56.32-79.91 (64.42) in HL.
Chapter 2

Systematics


Distribution in Kerala: Throughout all rivers of Kerala except nine rivers (Ajithkumar et al., 2000), Achenkoil and Chalakkudy river systems (Kurup et al., 2004).

Habitat: Pool-run habitats with sandy or muddy substratum.

Fishing methods: Gill nets.

Family: Belontidae

Genus *Macropodus* Lacepede


*Macropodus cupanus* (Valenciennes) (Plate XV, Fig. 140)

*Polycanthus cupanus*: Valenciennes, *Hist. nat. Poiss.*, 7:357, 1831 (Type locality: Anancoupan river at Pondicherry)  
*Polycanthus cupanus dayi* Kohler, Bl. Aquarienkunde, Stuttgart, 20: 517, 1909 (Type locality: India)

Common name: Spike tailed paradise fish  
Local name: Karimkana

Distinguishing characters: (Based on 10 specimens, 24-32 mm TL)

D. XVII-XX, 7; P. i, 10; V.i,5; A.XVI,11-13; C.12; L1.31-32, Ltr.3.5-4/6.5-7
Body small, obovate and compressed. Suprabranchial organ present. Mouth small, slightly protrusible, snout blunt. BD 31.56-31.36 (31.46) and HL 31.75-34.77 (33.26) in SL. Eyes 20.62-21.44 (21.03) in HL. Lower margin of preopercle serrated. Dorsal fin elongated, placed above anal fin. HD 26.85-98.15 (62.50) in HL. HP 52.71-75.69 (64.20) in HL. First ray of pelvic fin produced into a filament. HV 82.13-110.9 (96.55) in HP. Anal fin long. Caudal lanceolate, HC 40.06-45.64 (43.23) in SL. Dark olive green, darker on back, brown spots on head, brown stripe from eye to corner of opercula, A dusky blotch on caudal peduncle. Fins pale green, soft dorsal and caudal fin with rows of spots.

Geographical distribution: India, Sri Lanka, Burma, Malay Peninsula and Sumatra (Talwar and Jhingran, 1991)

Distribution in Kerala: Throughout all rivers at low land areas (Ajithkumar et al., 2000, Shaji and Easa, 2001), Valapatnam (Kurup et al., 2004).

Habitat: Pool-run habitats with sandy or muddy substratum at low land areas, ditches, canals etc.

Fishing methods: Scoop nets

Family: Channidae

Body elongate, cylindrical, anteriorly and laterally compressed posteriorly. Head large, gape wide and cleft extend beyond eyes. Lower jaw slightly protruding beyond upper. Eyes moderate, anterior and dorso-lateral in position. Dorsal side of head more or less flat and have plate like scales which are larger than that of body. Snout conical and tip blunt. Gill membranes united with each other beneath isthmus. A suprabranchial organ

Scales cycloid and moderate. Lateral line complete.

Genus *Channa* Scopoli


**Key to species**

1. a) 4-5 rows of scales between orbit and angle of preopercle, pre dorsal scales 12-13 .......................... *Channa orientalis*
   b) 8-17 rows of scales between orbit and angle of pre opercle, pre dorsal scales 15-22 ........................................ 2

2. a) 16-17 scales between orbit and angle of pre opercles, body bluish gray marked with numerous dark spots scattered.....*Channa micropeltes*
   b) 8-10 rows of scales between orbit and angle of pre opercle.............. 3

3. a) Several dark white striations/bands on body and fins ................................................................. *Channa striatus*
   b) No striation on body and fins, body marked with 5-6 dark blotches along flanks, a distinct ocellus at upper angle of caudal fin base ................................................................. *Channa marulius*

*Channa orientalis* Bloch & Schneider

(Plate XVI, Fig. 141)

*Channa orientalis* Bloch & Schneider, *Syst. Ichth.*: 496, pl.90, fig.2, 1801 (Type locality: India)

Ophiocephalus gachua Hamilton-Buchanan, *Fishes of Ganges*: 68, 367, 1822

Ophiocephalus Harcourt-butleri Annandale *Rec. Indian Mus.*, 14(1): 54 (Burma)


**Common name:** Asiatic snakehead  
**Local name:** Vatton

**Distinguishing characters:** (Based on 6 specimens, 80-160 mm TL)

D. I, 33; P.i, 13; V.i, 5; A.i, 20-21; C.12; L.I. 42-44, Ltr. 4/8
Elongate, BD 17.24-17.88 (17.61) and HL 30.75-34.40 (33.07) in SL. BD 51.96-56.07 (53.34) in HL. Eyes moderate, more anterior in position, 12.53-16.53 (14.68) in HL. HD 27.6-32.73 (30.70) in HL. HP 176.03-218.52 (197.42) in HD. Pelvic fins less than half length of pectoral fins, HV 40.52-52.84 (47.22) in HP. Most of scales on head are larger and that on body moderate. PDS 12-13. Dark brownish green, ventrally pale yellowish brown. Pectoral fins with a series of distinct alternating brown and pale orange vertical bands. Other fins dark brownish.

Geographical distribution: Afghanistan, Iran, Pakistan, India, Nepal, Sri Lanka, Bangladesh, Burma and East Indies

Distribution in Kerala: Throughout Kerala (Easa et al., 1996; Shaji and Easa, 2001), 17 rivers of Kerala (Ajithkumar et al., 2000), Kadalundi and Chaliyar river systems (Kurup et al., 2004).

Habitat: Small pools and shallow water logged areas with lot of leaf litters.

Fishing methods: Gillnets, Cast nets.

Channa micropeites (Cuvier)  
(Plate XVI, Fig. 142)

Ophiocephalus micropeites Cuvier, Histnat. poiss. 7:427, 1831 (Type locality: Java)

Common name: Malabar Snake head  
Local name: Vakavarai

Distinguishing characters: (Based on 12 specimens, 182-424 mmTL)  
D. 40-41 P.i-ii, 16; V.i, 5; A.27; C.14; L.I.93-97, Ltr. 6.5-7.5/16.5-18.5

Elongate, BD 15.37-18.23 (16.54) and HL 28.12-30.48 (29.48) in SL. BD 53.92-64.52 (56.82) in HL. Eyes moderate, 18.55-21.78 (19.52) in HL. HD 29.86-32.56 (27.83) in HL. HP 176.03-218.56 (188.63) in HD. Pelvic fins more than half-length of pectoral fins, HV 71.52-85.81 (78.26) in HP. Scales
on body are smaller. PDS 24. Colour varies in young and adults. Adults bluish gray with numerous blackish brown spots scattered on all over. Fins grayish. In younger specimens, back and dorsal side of head light brownish, flanks and ventral side yellowish white. Two scarlet bands, one through eye to upper half of caudal fin and another from angle of mouth to lower half caudal fin.

**Geographical distribution:** India, Burma, Thailand, Malay Peninsula, Sumatra and Java (Jayaram, 1999)

**Distribution in Kerala:** Pamba (Kurup, 1990), Kallada river system (Kurup et al., 2004)

**Habitat:** Pool-run habitats of rivers at middle stretches and deep pools with sandy or muddy substratum

**Fishing method:** Gill nets.

**Channa marulius** (Hamilton-Buchanan)

(Plate XVI, Fig. 143)

Ophiocephalus marulius Hamilton-Buchanan, *Fish. Ganges*, pp. 65, 367, pl. 17, fig. 9, 1822 (Type locality: river Ganges)

Ophicephalus grandinosus Cuvier, *Hist. nat. Poiss.*, 7: 43, pl. 203, 1831


Ophiocephalus pseudomarulius Day, *Fishes of India*, 374, 1889

**Common name:** Giant snake head

**Local name:** Cherumeen

**Distinguishing characters:** (Based on 3 specimens, 241-412 mm TL)

D. 38-42; P.i, 14-15; V.i, 5; A.21-22; C.14; 51-52, Ltr. 4.5/8

Elongate, BD 16.21-19.23 (17.10) and HL 28.12-30.45 (29.87) in SL. BD 57.26-59.02 (57.54) in HL. Eyes 17.25-21.24 (19.56) in HL. HP 172.32-191.23 (189.23) in HD. Pelvic fins more than half-length of pectoral fins, HV 71.26-80.26 (79.21) in HP. Body greenish with 5-6 prominent dark spots above lateral line, surrounded by red and white rings. Distinct white spots
scattered on body. White spots on dorsal and anal fins also, more distinct towards their distal ends. A distinct pale edged ocellus at base of caudal fin, towards upper side.

**Geographical distribution:** Pakistan, India, Sri Lanka, Bangladesh, Nepal, Burma, Thailand and China (Jayaram, 1999)

**Distribution in Kerala:** 23 rivers of Kerala (Ajithkumar et al., 2000), low lands and rivers (Shaji and Easa, 2001), Pamba, Kallada and Achenkoil river systems (Kurup et al., 2004).

**Habitat:** Pools and riffle pools with sandy bottom

**Fishing method:** Gill nets.

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**Channa striatus** (Bloch)

(Plate XVI, Fig. 144)


*Ophiocephalus chena* Hamilton-Buchanan, *Fish. Ganges*, p. 62, 1822 (Assam)


**Common name:** Striped or banded snakehead

**Local name:** Varal, Kaichal

**Distinguishing characters:** (Based on 8 specimens, 192-271 mm TL)

D. 38-42; P.i, 14-15; V.i, 5; A.21-22; C.14; 51-52, Ltr. 4.5/8

Elongate, BD 17.60-19.36 (18.20) and HL 31.26-35.25 (33.15) in SL. BD 52.13-56.98 (54.90) in HL. Eyes 10.26-12.48 (11.91) in HL. HP 192.56-199.36 (197.20) in HD. Pelvic fins more than half-length of pectoral fins, HV 62.39-66.95 (64.54) in HP. Adults greenish brown on back with several dark oblique striations, flanks lighter and below lateral line marked with several oblique and whitish striations, which even extend to ventral side. Belly more or less pure white or yellowish white. Anal and dorsal fins are also
distinctively marked with whitish striations. Narrow concentric striations are
also seen on caudal fin. A dark brown band runs obliquely upwards from
snout to edge of gill cover.

Geographical distribution: Pakistan, India, Sri Lanka, Bangladesh, Nepal,
Burma, Malay archipelago, Thailand and south China (Jayaram, 1999)

Distribution in Kerala: Common in rivers, paddy fields and Kole wet lands of
the state (Easa and Shaji, 1996; Kurup et al., 2004), 15 rivers of Kerala
(Ajithkumar et al., 2000), Chalakkudy, Achenkoil, Kabbini, Kallada,
Bharathapuzha river systems (Kurup et al., 2004).

Habitat: stagnant pools with sand or mud as substratum.

Fishing method: Gillnets and Hook and line.

Order: Tetradontiformes

Genus: Tetradon Linnaeus

Tetradon Linnaeus, Systema naturae, Ed. 10, p. 332, 1758 (Tetradon lineatus
Linnaeus)

Tetradon travancoricus Hora & Nair

(Plate XVI, Fig. 145)

Tetradon (Monopterus) travancoricus Hora & Nair, Rec. India Mus., 43: 391, 1941 (Type
locality: Pamba river, Central Travancore)

Common name: Malabar puffer fish Local name: Thavalapottan, Attunda

Distinguishing characters: (Based on 11 specimens, 22-34 mm TL)

D. 7-8; A. 8; P.16-17

Body rounded or broad, inflatable. Caudal peduncle compressed. Head oval
shaped, snout blunt, mouth terminal, directed upwards. BD 37.84-38.11
(37.98) in SL, 100.48-108.7 (104.59) in HL, HL 34.82-37.93 (36.37) in SL.
Eyes large, 30.40 - 38.32 (34.36) in HL. Lips thick and fleshy. Nostrils in the
form of an elevated short, round tube. Gill openings narrow, immediately in
front of pectoral fins. Jaws equal, with a cutting edge and with a hard bony covering. Dorsal fin without spines, inserted far back, slightly in front of anal fin. HD 47.03 - 53.13 (50.08) in HL. HP 76.21-86.38 (82.30) in HD and 40.49-41.75 (41.03) in HL. Pelvic fins absent. Caudal fin emarginated. HC 26.77-28.56 (27.67) in SL. Body partially covered with hard dermal spines. Upper lateral line not reaching end of tail. Body interspersed with black patches and spots on back on a yellowish orange back ground. Ventral side white. Two black patches on dorso-lateral surface, in front of dorsal fin. Posterior to these, a dark broad band running to caudal fin. Other dark patches are seen behind pectoral fin and just behind eyes. Fins yellowish.

Geographical distribution: India: Kerala (Talwar and Jhingran, 1991)

Distribution in Kerala: 13 rivers of Kerala (Ajithkumar et al., 2000) South of Chaliyar river (Shaji and Easa, 2000). Pamba river, Kerala (Jayaram, 2000), Pamba, Bharathapuzha, Chalakkudy and Periyar river systems (Kurup et al., 2004).

Habitat: Shallow bank sides of downstream of rivers among thick vegetation with sand or muddy substratum.

Fishing methods: Scoop nets.

2.4. Discussion

Precise identification of a species is an essential pre-requisite for any type of study related to biodiversity conservation. Rainboth (1996) also emphasized that the correct species identification is the fundamental starting point for any type of biological studies particularly on wild population. Menon (1967) stressed the necessity for intensive taxonomic work in the tropical...
areas due to the rapid rate of speciation. Rivers of south India constitute one of the most fertile fields for ichthyological discoveries and so any intensive investigation on fishes could help to locate new species or to find out new facts regarding the status or distribution of species already described (Menon, 1999).

Early ichthyologists had the disadvantage of having only a very few and poorly preserved specimens. With the then prevailing species concept, they usually conservatively concluded the observed variability for intraspecific rather than ontogenic, geographic or interspecific (Ng and Kottelat, 2000). Menon (1999) commented about the then state of Ichthyological studies in the country as “Paucity of specimens made it difficult to ascertain the specific differences existing amongst freshwater fishes of the country. This lead to several fundamental gaps. Some species have not been able to collect since the time of Hamilton-Buchanan (19th century) while some species are still buried in synonymy whereas some species do have the invalid species status due to constant misidentification. Rare species with restricted distribution seldom turned up in general collections. Subsequent collections having low species representation almost invariably caused authors to synonymise species, which had similarity in descriptions. Early field workers undoubtedly observed many more species than are observed today in areas subjected to extensive human modifications and therefore, quite a number of species might have already vanished due to serious habitat alterations and modifications”.

It is very exciting to report that Systematics have a remarkable renaissance during recent years. The reasons for this change are diverse.
There is a strong feeling among taxonomists that they have to play a leading role in the new syntheses of evolutionary theory and they have demonstrated that the study of organic diversity, the main concern of systematics, is a major and integral branch of biology (Mayr, 1942). With the signing of Convention on Biological diversity in 1992, considerable attention is being paid all over the world on species identification, listing and prioritization of species which are basic pre-requisites for ecosystem conservation. Nowadays, there is a strong enthusiasm among ichthyologists in undertaking surveys of unexplored regions and little known habitats, analyzing and comparing more number of samples from varied habitats, filling the gaps of taxonomic ambiguities, validating and standardizing the species names, unraveling the status of the rare and extinct species and cataloguing their fish germplasm resources. More taxonomic revisions and examining wider scope of characters through sophisticated technologies are also gaining importance. Menon (1999) rightly pointed out that the studies of the Indian fish systematics can be expected to yield interesting and possible dramatic results with this pace. The present effort to consolidate the list of freshwater fishes of Kerala got its vital encouragement mostly from earlier sturdy movements.

145 fish species belonging to 12 orders, 28 families and 66 genera were collected, identified, classified and described in this study with illustrations. 8 fish species were found new to science. Kurup et al. (2004) finalized the list of 175 freshwater fish species from Kerala. While comparing with this, 31 fish species were found missing in the present study. The drastic reduction in population size or even complete eradication of some of these
species due to the recent spurt in anthropogenic activities evokes strong anxiety. Family Cyprinidae represented by 69 species has emerged as the group having highest species strength in the river systems of Kerala. Cyprinids comprising carps and minnows are the most dominant family of freshwater fishes in Asia accommodating more genera and species than any freshwater fish family (Roberts, 1989). The family Cyprinidae also represents as world’s largest primary freshwater fish family (Nelson, 1994). The Cyprinidae is followed by family Balitoridae with 20 species, Bagridae with 11, Siluridae, Sisoridae and Channidae with 4 species each. Ambassidae, Cichilidae and Gobiidae having 3 species each; Anguillidae, Aplocheilidae and Mastacembelidae with 2 species each while the rest of the families are represented only by a single species each.

While scanning of the literatures on taxonomic studies on freshwater fishes of India, it became obvious that there exist a number of examples which show ambiguous and overlapping taxonomic descriptions and merging, splitting and erection of new species, genera and new families. The nomenclature used in the present description are the most revalidated and widely accepted by most of the taxonomists. Strengthening of some of the genera was possible by the addition of species new to science. Some of the taxa still implicates serious taxonomic bias and require further sophisticated studies for resolving and updating the systematic status.

There had been inconsistency and confusion in using the names *Barbus* Cuvier and or *Puntius* Hamilton-Buchanan. Hamilton-Buchanan placed some species under the genus *Puntius* while a few others under *Cyprinus*. Gunther (1868), Day (1878, 1879) and Weber and Beufort (1916)
used the genus name *Barbus*. De Witt (1960) and Myers (1990) were of the opinion that the name *Barbus* be retained in its broad sense while Smith (1945) and Misra (1962) used the genus name *Puntius*. Hora (1939 & 1942) and Hora and Law (1941) treated *Puntius* as a subspecies of *Barbus*. It is now widely accepted that the name *Barbus* be used to represent the Barbs of European continent and *Puntius* for Asiatic, especially for Indian fishes (Talwar and Jhingran, 1991, Jayaram, 1999 and Menon, 1999). The usage of the genus name *Puntius* in the present study is fully concurring with the recent descriptions and literatures.

Instances of taxonomic ambiguities were also encountered during this study. Under the genus *Puntius*, Yazdani *et al.* (2001) reported the fishes from Nilgiri biosphere reserve which included two species, *P. mahecola* and *P. filamentosus*. While Day (1878) treated them as two species on the basis of prominent maxillary barbells present in *Barbus mahecola*, Hora (1937) was of the opinion that *P. mahecola* is the females of *P. filamentosus*. Selvaraj and Abraham (1987), based on several morphomeristic studies, treated them as such while Thobias (1974) based on detailed morphomeristic studies undoubtedly stated that *Puntius mahecola* and *Puntius filamentosus* are one and the same. Talwar and Jhingran (1991), Jayaram (1999) and Menon (1999) were also of the opinion that only *P. filamentosus* do exists. The results of the present study also strongly concur with the above observations and therefore *Puntius filamentosus* was only treated as a valid species.

Interestingly, the specimens of *Puntius filamentosus* collected from Kallada river system had three black blotches on body. Senanayake (1982) described *Puntius arulius srilankensis*, a variety of *Puntius arulius* on the
basis of filamentous dorsal rays in addition to the blotches. The specimens collected form Kulathupuzha showed remarkable similarity with the above in terms of colour pattern, however it resembles *P. filamentosus* in terms of its morphomeristic characters. According to Jayaram (1991), the three spots on the back often perisist in the adults of *P. filamentosus*. During the present study also, the specimens were identified as *Puntius filamentosus*. *Puntius arulius* is one of the rare and endangered barbs in Kerala which is very much endemic to Pookkode lake of Kabbini river in Wynnaad (Shaji and Easa 2001). On the contrary, according to Ajithkumar et al. (2000) this species is found in 25 river systems of Kerala and is also very common in Periyar and Moovattupuzha river systems. However, the latter observation requires further clarification. It is strongly doubted that the authors might have misidentified the fingerlings of *P. filamentosus* having spots on body as *P. arulius*.

Menon (1999) described the new species, *Puntius chalakkudiensis* from Chalakkudy river which shows very close resemblance with *P. denisoni*, however, it differs from the latter in having an inferior mouth and a black blotch on its dorsal fin. There was no report on the rediscovery of this species from anywhere in India. Chalakkudy river system is one of the water bodies in Kerala where *Puntius denisoni* is available in moderate numbers and the presence of a light shade of blackish tinge (the salient character of *P. chalakkudiensis*) and inferior mouth position have also been observed in a number of specimens of *P. denisoni* both collected from Chalakkudy and other river systems of Kerala. Infact, Day (1865) initially placed the species under *Labeo*, which might be due to the sub-inferior lips. Thus the validity of
*P. chalakkudiensis* and so evokes strong confusion during the present study. The specimens collected from different river systems sharing the above said characters were identified only as *P. denisoni*.

Members of the genus *Tor* had been subjected to serious discussion for their taxonomic ambiguities. Jerdon (1849) described *Barbus khudree malabaricus* from the mountain streams of Malabar and reported it as the only *Tor* species found in Kerala. Day (1878) also treated *T. khudree malabaricus* as a valid species on the basis of elongated snout and osseous dorsal spine. However, Menon (1992) after conducting several biometric analysis on the populations of *Tor khudree* collected from Western Ghat river systems such as Krishna, Godavari and Cauveri and comparing it with the populations of *Tor khudree malabaricus* came to the conclusion that the characters of these two species were highly overlapping and therefore both of them are same. However, Arunachalam (2000) validated the status of *Tor khudree malabaricus* based on the specimens of *Tor* collected from Tambraparni river, Western Ghats. Shaji and Easa (2001) reported the populations of *Tor khudree malabaricus* from Poringalkuthu and Pooyamkutty tributaries of Periyar river system. It was Jayaram (1997) who confirmed the occurrence of *Tor mussullah* in Kerala based on specimens from Karimpuzha, a tributary of Chalayar river system with distinct hump over the occipit, distinctly separating the species from *T. khudree*. Hora (1942) was initially of the opinion that *T. mussuliah* is not different from *Puntius carnaticus*. However, Menon (1992) on the basis of comparisons of standard deviation and standard errors concluded that *Tor mussulla* and *Tor khudree* are the same. Later Raju Thomas et al. (2000) registered the occurrence of
Tor tor from the upstream of Chandragiri river system, thus raising the numerical strength of species under the genus Tor in to 3. Though a number of ambiguous specimens (especially of morphomeristic in nature) have been observed in Tor khudree collected from diverse river systems of Kerala as part of the present study, all of them were treated as Tor khudree since no distinct variation in salient characters were observed to be treated as another species. However, a new species, Tor remadevii described from Pambar river system as a new species which showed remarkable variation from Tor khudree and Tor mussullah due to the presence of a strong and osseous spine in the dorsal fin and an elongate head which is more than body depth. The species, however, shows close similarity with the Himalayan Yellow fin Mahaseer, Tor putitora; however, strongly differs from the latter due to the presence of a characteristic hump at the occipit, presence of straight head and snout and possession of a terminal or slightly upturned mouth in the new species.

In the present study, six species were described under the genus Gonoproktopterus from Kerala. This is inclusive of rare species, such as G. micropogon periyarensis and G. kolus. Silas (1951), Talwar and Jhingran (1991) and Jayaram (1981,1991) have treated Gonoproktopterus curmuca and G.kolus as two distinct species based on the morphomeristic characters. In contrast, Menon and Remadevi (1995) restored the Bleekerian name, Hypselobarbus and synonymised these two species by ignoring the number of barbells and also erected a new species Hypselobarbus kurali from the collection made from the Western side of Western ghats from Dakshina Kannada and Travancore on the basis of possession of four barbells, a weak
last undivided dorsal ray and presence of 41-43 lateral line scales. The specimens of *G. kurali* were collected from the torrential streams of Periyar river system in the present study which confirms with the views made by many scientists that the species is usually seen in torrential streams. The identity of *G. kurali* has also been well established in this study which distinctly differs from its related species on the basis of colour pattern on the body and fins, possession of more elongated head and snout and slender body shape. The taxonomic identity of this species was subjected to serious discussions since many have synonymised the species with the widely distributed *G. curmuca*. *G. kolus* can easily be diagnosed from its related species in the group by noting its shorter body with uniform silvery colour, presence of a single pair of barbells and dusky gray fins. *G. micropogon micropogon* reported (Easa and Basha, 1995) from Nilgiri biosphere is having high resemblance with *G. micropogon periyarensis* in morphomeristic characters. However, the two species were described from the two different drainages (east flowing and west flowing). Jayaram (1991) accommodated this species under the genera *Puntius* and named as *Puntius micropogon periyarensis* and also differentiated it from *P. micropogon micropogon*. Shaji and Easa (2001) separated these two species on the basis of colour pattern (Slaty in *G. micropogon periyarensis* and silvery in *G. micropogon micropogon*) and reported it as fairly abundant in Kabbini river. However, in the present study, only *G. dubius* could be collected from Kabbini river system with fairly good abundance. *G. dubius* also has strong, osseous and elongated dorsal spine similar to that of *G. micropogon micropogon* and there is every reason to suspect that the earlier workers might have misidentified...
the former with that of latter. Jayaram (1991) is of the opinion that *P. kolus* has remarkable affinity towards *B. mussullah* and they possess certain common features such as deep body, conical snout and horny tubercles on snout of males. In contrast, there are very distinct characters which can be used for the separation of these species (Jayaram, 1999).

It was Howes (1980) who erected the genus *Parlusciosoma* to accommodate his species *Parlusciosoma daniconius*. Menon (1999) and Shaji and Easa (2001) reported the occurrence of two separate genus, *Parlusciosoma* and *Rasbora* in Western Ghats based on the morphometry and colour pattern. The former has a larger body with a broad lateral band which is continuous from snout to caudal, while the latter has a lean body with upwardly directed mouth and the lateral band on body restricted to posterior portion only. Ajith kumar *et al.* (2000) also followed the same generic name, *Parlusciosoma*. However, Kottelat and Vithayanon (1993) have clarified the distinct identity of the species *Rasbora daniconius* which is followed in this thesis. None of the characters described above were discussed in the present study and therefore all the specimens were accommodated under the genus *Rasbora*.

The taxonomic identity of the two species of *Danio, Danio malabaricus* and *D. aequipinnatus* is showing high degree of ambiguity. Day (1878) differentiated *D. malabaricus* from *D. aequipinnatus* on the basis of number of lateral line scales and number of anal fin rays. Deraniyagala (1930) followed Day in treating *D. malabaricus* as a separate species in his list of fishes of Sri Lanka. Hora and Mukerji (1934) differentiated *D. malabaricus* by the presence of a black mark near the upper angle of gill opening. The
authors also reported the lateral line scale counts as 32-34. Hora and Law (1941) are of the view that *D. malabaricus* is a probable synonym of *D. aequipinnatus* without assigning any reason. Hora and Nair (1941) confirmed this synonymy by saying that south Indian specimens grow large size than its counterpart in the north India. Many of the subsequent workers (Silas, 1951; Menon, 1951; Rajan, 1955; Jayaram et al., 1976; Jayaram, 1981) did not report *D. malabaricus* and treated all of their specimens as *D. aequipinnatus*. Barman (1984) in his work on the Danio of Indian region, not at all discussed any type of variations in *D. aequipinnatus*. Kottelat and Pethiyagoda (1990) used the specific name *D. malabaricus* for the common Sri Lankan Danio without giving much effort to make a thorough identification of the specimens. However, Jayaram (1991) distinctly separated these two species on the basis of morphometric characters in a sizable number of specimens and affirmed that in *D. malabaricus* body is more deep, with more number of lateral line scales and more branched dorsal rays. Conversely, in the present study, the two species were distinguished on the basis of body depth and number of rays on anal fin. Also, the number of anal fin rays were found more in *D. malabaricus* than in *D. aequipinnatus* besides its deep body In the present study.

The genus *Garra* (Hamilton) is represented by 24 species in Indian subcontinent (Jayaram 1999) among them 19 species are distributed in India, including the new species reported in the past two decades. The Genus is so far represented by seven species in Kerala. Recently Kurup and Radhakrishnan (2001 and 2003 in press) described four more new species viz. *Garra emarginata, Garra mlapparaensis, G.travancoria* from Periayr river.
and *G. nilamburensis* from Chaliyar river and also reported *Garra ceylonensis*, a Sri Lankan species under the genus *Garra* from Periyar river (Radhakrishnan and Kurup, 2004 in press). Thus the total species known from Kerala is 12. While classifying species under the genus *Garra* collected from different drainages in Kerala, it appears that the chances of misidentification are invariably high. *Garra mullya* being a widely distributed species, exhibit high disparity in morphometric characters between different drainages and micro and macro habitats, thus leading to great confusion and misidentification with some other species. Hora (1921) opined that there exists wide controversy on the systematic position of *Garra mullya* as this species is still in the process of ecological adaptation. The newly recorded Sri Lankan species, *Garra ceylonensis* has great resemblance with *Garra mullya* in body stature and in the colour pattern. But according to Menon (1964), the two species strongly differs in the interorbital width to head length ratio i.e., 2 times or less than 2 times in head length in *Garra mullya* but greater than 2 times on *Garra ceylonensis*. Also, the width of suctorial disc to head width ratio is lesser in *Garra ceylonensis* when compared to *Garra mullya*. Majority of the species under the genus *Garra* have a fold or ridge at the snout but in varying degrees of depth, shape and size which are also subjected to a great deal of regional variations. This arouse strong dilemma in determining the acceptable limit of such morphometric variation for species segregation. However, the ridge, cut or protuberance on the snout is still considered as valid characters to distinguish the majority of species under the genus *Garra*.

The newly described species, *Garra travancoria*, shows some resemblance with *Garra mcClellandii* in its broad sucking disc, lateral line
scale count and placement of vent. However, unlike in *Garra mcclellandii*, the new species has a shallow vertical groove on the snout wherein in some mature specimens, the groove apparently divide the snout into two lobes. In *G. mcclellandii*, there is a horizontal cut at the snout, forming a protuberance at the tip of the snout. Unlike in *G. hughii*, the new species is more robust and uniformly scaled except on the chest region. The species differs from *G. periayarensis* mainly in the complete absence of scales on the ventral profile as in the latter and in the absence of a snout protuberance. Dorsal fin inserted close to snout than caudal in new species while in *Garra menoni* it is close to caudal. The new species also differ from *Garra mullya* and *Garra surendranathani* in a variety of characters such as body morphometry, head shape, width of sucking disc, eye diameter, colour pattern on body, etc.

The second new species, *Garra nilamburensis* shows some resemblance with *Garra menoni*, in its broad and well developed sucking disc, lateral line scale count, placement of vent and the colour pattern. However, the new species can be differentiated from *Garra menoni* in the body form i.e, *Garra nilamburensis* is a short and stout species with a more deep body while as *Garra menoni* is a more elongate and slender species. The head is more or less round or semicircular with swollen cheeks and the ratio of head length in standard length is smaller in the new species while in *Garra menoni*, the head is more elongate and the length of head in SL ratio is relatively high. Body depth is almost equal or higher than the head width in the new species where as in *Garra menoni*, it is lesser than head width. Dorsal fin inserted closer to snout than caudal in the new species while in the latter it is close to caudal. Further, the new species has its caudal peduncle
deep and its least depth form 1.5-1.8 times in head length while in *Garra menoni*, it is less deep and form 2 or more than 2. The new species show resemblance with *Garra hughi* in colour pattern and dimensions of sucking disc but differs from the latter in the position of insertion of dorsal fin, which is equidistant in *Garra hughi* and in the scale pattern i.e., scales present uniformly on body except on chest region in the new species whereas it is absent on breast and belly in *Garra hughi*. The new species differ from *Garra mullya* and *Garra surendranathani* in respect of body morphometry, head shape, sucking disc width and length ratio, eye diameter, colour pattern on body, etc.

The third new species, *Garra mlapparaensis* is closely related to *Garra hughi* in the number of lateral line scales, wide and well developed sucking disc, however, differs from the latter in the presence of larger eyes and also in the position of insertion of dorsal fin *i.e.*, dorsal fin placed close to snout than the caudal fin in the new species and is equidistantly between snout and caudal fin in *Garra hughi*. It can be differentiated from *Garra periyarensis* in the absence of deep cut at the snout, presence of scales on the breast and belly regions and placement of the vent, which is almost midway between the anterior origins of anal fin and ventral fins in the latter.

*Garra emarginata* is different from its closely related species *Garra hughi*, *Garra surendranathani* and *Garra periyarensis* in many respects. Unlike in *Garra hughi*, the new species is having prominent scales on the predorsal, breast and belly regions and presence of lesser number of lateral line scales. The new species also differs from *Garra periyarensis* in the absence of a deep cut and a knob like protuberance in the snout and also
due to the presence of scales on the breast and belly region. The species do not have any black blotches, unlike in *Garra surendranathani* in which the presences of blotches are characteristic. It is also different from *Garra mullya* in the presence of more lateral line scales, broad and round head and snout, more flattened and wide interorbital region and smaller eyes when compared to head length. The new species can easily be differentiated from *Garra menoni* in the presence of more number of lateral line scales, presence of scales in the breast and belly regions, wide interorbital distance and in its colour pattern *i.e.*, the new species possess minute dark spots arranged on either sides of the lateral line in a series. The emarginated nature of caudal fin differentiates the species under the Genus *Garra* inhabiting Western ghat region, however this character is found shared with *G. manipurensis* recorded from Manipur. Nevertheless, *G. emarginata* can be differentiated from *G. manipurensis* by observing the morphometric characters such as presence of scales on the chest region, width of mental disc in relation to width of head, difference in lateral line scale counts, shape of head, colour pattern, etc.

The identity of *Garra periyarensis* (Gopi, 2001) has been distinctly confirmed in the present study which totally disagrees with the views of some of the scientists that the species is same as *Garra mcclellandi* described from Periyar lake and Nigiris. Arun *et al.*, 1996 and Arun (1997) are of the opinion that the deep vertical cut at the snout and elongate body are the characters of *Garra mcclellandi* and therefore, the specimens of *Garra* species collected from Periyar lake and upstream are *G. mcclellandi*. However, the presence of protuberance on snout, absence of scales on...
ventral region, the larger anus to anal distance, greater number of gill rakers and more lateral line scales are enough to justify the erection of a distinct species. However, there exist a strong dilemma on the report of Garra mcClellandi in Kerala waters. However, the specimens collected from east flowing Bhavani river system during the present study showed much affinity towards G. mcClellandi. Menon (1964) was of the opinion that the species is restricted to the headwaters of Nilgiris. It is worth reporting that the specimens examined as G. mcClellandi from ZSI, Madras (Reg. No. F. 6763, Hassan district, Karnataka (1ex.) and Reg. No. F. 5139, Moyar river (1ex.) showed close affinity to G. mullya. It would thus appear that the taxonomic identity G. mcClellandi is still ambiguous and requires molecular level investigations.

The identity of Garra menoni (Remadevi and Indra, 1981) has also been confirmed in the present study. Although the authors who had erected the species have clearly shown the differences, Shaji and Easa (2001) and Talwar and Jhingran (1991) synonymised the species with Garra mullya. Later, Easa and Shaji collected G. menoni from Chinnar river at Chinnar WLS (Easa and Shaji, 1995) and confirmed its taxonomic validity. By general appearance, the two species have close similarity, however, G. menoni can easily be distinguished by the absence of scales on chest and belly, absence of deep cut at snout and have a smaller body. The species can be easily differentiated from Garra hughi Silas in the lesser number of lateral line scales, larger eyes and smaller interorbital width.

Silas (1951) while describing the new species, Garra hughi clearly stated that the scales are absent on chest, belly and also on the dorsum of
the species and these features have been considered as the main diagnostic characters to distinguish this species from other related species, both scaled and scaleless. Subsequently, Remadevi and Indra (1999) collected specimens both with a few ill-defined scales on the ventral surface and rudimentary scales on the pre dorsal area from Anamalai hills (where the type specimens were collected) and asserted that there exist high variation in squamation in this species and therefore this character can not be relied upon for species distinction. In the present study, this species have been invariably collected from various drainages and on examination of scales, it was found that the scales were generally absent on chest and belly, however, the scales were either present or absent along the pre dorsal area. These findings concur with Remadevi and Indra (1999). Shaji and Easa (2001) reported that all specimens of *G. hughi* collected by the authors were having scales on mid dorsal streak. Paradoxically, they distinguished the species from others based on absence of scales. Talwar and Jhingran (1991) and Jayaram (1999) still consider the absence of scales as a valid character to distinguish the species. Thus the group remains to be one of the most notorious group sharing high degree of taxonomic ambiguity.

The genus *Horalabiosa* is represented by a single species, *Horalabiosa joshuai* Silas in Kerala. This genus had been considered as a hybrid between *Garra* and *Rasbora*. The record of 598 specimens of this species from the type locality (Silent valley) by Remadevi (1992) confirmed its validity. Surprisingly, not even a single specimen of this species was encountered during the present study from the same area. Interestingly, this species was not listed in the list of fishes from Silent valley (Remadevi and
Indra, 1986). Shaji and Easa (1996) reported *Puntius melanampyx* from Silent valley, but not examined any of the species for its affinity with *Horalabiosa*. It can, therefore, be inferred that the populations of *H. joshuai* might have undergone drastic decline in Silent valley or even might have disappeared from this unique ecosystem. Later Raju Thomas et al. (1998a) recorded the species from Eravikulam National park, thus confirming the presence of this species in Kerala waters.

It was Hamilton-Buchanan (1822) who first described the Nemacheilinae species from India. Subsequently, McClelland (1839), Gunther (1868), Day (1878), Hora (1949) and Menon (1987) described a number of new species, under this group. According to Menon (1987), the species under this group are similar in general morphology, however, they lack spines, scutes and various other processes and features of taxonomical interest, thus making this group as the most difficult group to distinguish and differentiate. The variation in colour pattern is largely used to separate the species under this subfamily along with the nature of lateral line and number of branched rays on the dorsal fin. Menon (1999) accommodated a large number of loach species under a single genus, *Noemacheilus*. He argued that this generic name couldn’t be changed until and unless International Commission-on Zoological Nomenclature has decided to do so. According to him, *Noemacheilus* is the widely used name and is not preoccupied by a senior synonym. Kottelat (1984) claims that *Noemacheilus* van Hesselt is a Nomen nudum, therefore the name should be rejected. Talwar and Jhingran did not mention any of these genera proposed by Menon (1999) and all the species of the subfamily have been placed under a single genus,
Chapter 2

Systematics

Nemacheilus. Later, Jayaram (1999) erected 5 genera under the subfamily Nemacheilinae viz. Oreonectes, Acanthocobitis, Nemachilus, Schistura and Mesonemacheilus. In the present study, the generic classification of Jayaram (1999) was followed to distinguish the various species under the sub family Nemacheilinae in view of the fact that there is marked variation in morphometry and colour pattern among the species.

Practically, no attempt has so far been made to revise the Nemacheilinae species inhabiting Indian waters barring the partial revision of the genus from Eastern Himalayas and the revision of the Cobitoid fishes by Menon (1987). More than 450 species have been described under the subfamily Nemacheilinae (Kottelat, 1990) of which seventy-nine Nemacheiline species are known from Indian waters (Menon 1987). Ten species have so far been described under the genus Nemacheilus in Kerala waters (Jayaram 1999). The new species, Mesonemacheilus periyarensis Kurup and Radhakrishnan (2005) described during the present study shows close resemblance to Nemacheilus pulchellus (Day 1873) described from Northern India in its colouration and body characteristics. However, the new species can easily be distinguished from Nemacheilus pulchellus by the presence of 9 branched rays on the dorsal fin against 10 branched rays observed in the latter. Further, unlike in N. pulchellus, only the lower lip is interrupted in the middle and the lateral line is not complete in the new species. The new species also shows similarity with Nemacheilus petrubanarescui (Menon 1984) in colour pattern and ratio of body depth to standard length. However, the dorsal fin is not inserted equidistantly between
the snout and caudal fin in *Nemacheilus periyarensis*. Also, in the former, the dorsal fin has only 8 rays.

The taxonomic status of the three recently described new species, *Mesonemachelus remadevi* (Shaji and Easa, 2001), *Mesonemacheilus pambarensis* (Remadevi and Indra, 1994) and *Mesonemacheilus menoni* (Zacharias and Minimol, 1999) were confirmed beyond doubt during the present study with the help of adequate number of specimens collected from their type localities. *Noemacheilus sinuatus*, a rare loach which was described from Wynnaad streams (Easa and Basha, 1995) could not be collected in the present study. *N. petrubenarescui* (Menon, 1984) was described based on specimens collected from Karnataka streams. Subsequently Shaji reported this species from Noolpuzha of Kabbini river system. However, the affinity of this species with it closely related ones could not be worked out properly due to the dirth of adequate number of specimens and therefore the validity of this species was questionable. With the collection of adequate specimens of this species in the present study, the erection of this species is fully justified. Hora and Law (1941) reported *N. evezardi* from Periyar river and remarked on the marked variations exhibited in colour pattern in this species. Subsequently Rita et al. (1978) described *Oreonectes keralensis* from Periyar river by differentiating it from *Oreonectes evezardi* based on differences in colour pattern and relative lengths of nasal barbells. However, it is worth reporting that the length of nasal barbells can vary depending on the life stages of the fish and the available description on colour pattern of the two species are highly overlapping. Rita et al. (1978) also remarked on the probability of Hora and Law’s specimens being *O.
keralensis. It appears that, *O. evezardii* collected from Periyar by Chacko (1948) and Zacharias *et al.* (1996) can also be of *O. keralensis*. However, Biju *et al.* (2000) recently reported the occurrence of *O. evezardii* from Eravikulam national park. The taxonomic ambiguity seen between these two species need to be resolved by conducting detailed studies.

Homalopterinae loaches inhabit fast flowing water of the hill streams and are endured with morphological adaptations such as flattened head and body, horizontally oriented enlarged paired fins bearing adhesive pads covered with urculi on the ventral surface which helps them to live in mountain streams and rivulets (Kottelat, 1989). The Genus *Homaloptera* van Hasselt is so far known by four species in Kerala viz. *Homaloptera montana* Herre, (Menon 1987), *Homaloptera pillai* Indra and Remadevi (1981) and *Homaloptera menonii* (Shaji and Easa, 1995c) besides a new species, *Homaloptera santhamparaiensis*, described from the Panniar tributary of Periyar river at Santhanparai (Arunachalam *et al.*, 2002). The rare Balitorid fish, *Homaloptera montana* Herre reported from Anamalai and Nelliampathy hills were not obtained during the present study. Menon (1987) synonymised *H. montana* and *H. pillai* without any justification. Talwar and Jhingran (1991) also treated *H. pillai* as a synonym of *H. montana*. However, Pethiyagoda (1991) separated the above two species based on the number of lateral line scales (83-93 in *H. pillai* and 72 in *H. montana*), shape of the snout (broadly round in *H. pillai* and pointed in *H. montana*) and colour pattern (Uniform dark brown with conspicuous blotches in *H. pillai* and prominent blotches in yellowish background in *H. montana*). In the present study, adequate number of specimens of *H. pillai* were collected besides erecting new species, *H.*
silasi from Periyar Tiger reserve. Homaloptera silasi can be differentiated from the other three closely related species such as H. montana, H. pillai and H. menoni by observing the position of insertion of dorsal fin, small eyes, small pectoral and pelvic fins and characteristic colour pattern. The new species shows some similarity with H. santhamparaiensis in the lateral line scale counts and also in the smaller eyes but totally disagrees in the shape of head and snout, pectoral fin counts, colour pattern etc.

H. silasi was found to inhabit in a peculiar microhabitat unlike the general cascade habitats with high water velocity where the Homalopterid fishes are seen closely attached to bedrocks. In contrast, the specimens of the new species were collected from a small rocky pool near a cascade with abundant leaf litters where the members of Nemacheilinae usually seen abundant. The new species also showed various morphometric relations with loaches by possessing a conical and pointed head, deep body which is oval in cross section, round belly, small paired fins with lesser number of simple and branched rays which are invariably disagree with the morphology of Homalopterids (Homalopterids have a depressed body, flattened belly, broad and much flattened paired fins with large number of simple and branched rays). According to Hora (1932), the body of Homalopterids is usually sub cylindrical shows close similarity with loaches of the genus Nemacheilus. While comparing the new species with the other closely related species of Western Ghats, it become evident that there exist two different morphological forms under the same genera. H. menoni and H. santhamparaiensis showed high resemblance to H. silasi in having a deep body and conical snout whereas H. montana and H. pillai have a much flattened body with broad and
round snout like the genus *Bhavania*. The great diversity of form and structure seen among the members of the genus *Homaloptera*, has resulted in attempts to split in to several subgenera (Silas, 1952). Silas also observed two different morphometric forms, with pointed snouts (*Helgia*) and broad snout (*Bhavania* like) in the genus *Homaloptera*. According to him, the habitudinal variations between the different drainages might have brought about repeated divergence or convergence in the family and geographical and ecological isolation might have played a great role in the evolutionary divergence of the species. However, it should be stated that further intensive, phylogenetic studies are necessary to resolve all the ambiguities relating to this rare group of fishes. Application of sophisticated genetic and molecular technologies are highly in need to support these types of attempts.

Much confusion has come across while identifying the specimens under the genus *Clarias* since the literatures are giving overlapping morpho- meristic characters for *Clarias batrachus* and *C. dussumeiri*. *Clarias dussumeiri* has been wrongly identified as *C. batrachus* in many of the literatures. Cherian et al. (2001) while studying the ichthyofauna of Trivandrum district reported *C. batrachus*. Jayaram (1980) distinguished the two species based on the distance between the occipital process and base of dorsal fin (larger in *C. dussumeiri* than *C. batrachus*). Silas (1952) while discussing the species composition of the genus pointed out that *C. dussumeiri* is the south Indian form while *C. batrachus* is widely distributed all over India. Day (1877) collected a single specimen of *Clarias dayi* from Wynaad hills of Kerala. But he misidentified it as *Clarias dussumeiri*. Hora (1936) re-examined the specimens and described it as the new species, *C.
dayi. According to IUCN (1994), C. dayi is almost extinct as it has not been reported anywhere in India. Though many faunestic studies have been carried out in Western Ghats of Nigiri and Wynnaad hills (Hora, 1937, 1938, 1942, Silas, 1951, Rajan, 1955, Jayaram, 1981, Jayaram et al., 1982, Remadevi and Indra, 1984, Easa and Basha, 1995 and Easa and Shaji, 1997), the species, C. dayi has not been reported again. According to Menon (1999), Clarias batrachus, C. dussumieri dayi and C. dussumieri dussumieri are the three Indian species among them C. dussumieri dussumieri is only have a geographical distribution in Kerala. Talwar and Jhingran (1991) also reported the restricted distribution of C. dussumieri dussumieri to Kerala waters. In the present study, only C. dussumieri was collected from various freshwater bodies in Kerala following the descriptions of Jayaram (1980, 1999).

The taxonomic identity of the two species under the genus Ompok viz. O. malabaricus and O. bimaculates remain to be ambiguous due to want of adequate descriptions and contradictions seen in the available literatures. Hora and Law (1941) treated O. bimaculates and O. malabaricus as synonyms while Parameswaran (1967) treated them as two separate species. According to Talwar and Jhingran (1991), O. bimaculates has 57-58 anal fin rays (in the Plate I, fig. for the species they have shown 76 anal fin rays). According to Jayaram (1999) the anal fin rays of O. bimaculates is 60-75. Jayaram (1999) reported that the species with the caudal lobes rounded and lower boarder of eye on level with cleft of the mouth are O. malabaricus while O. bimaculates is having caudal lobes pointed, eye below level of the cleft of the mouth. He did not take the anal fin ray count as a valid character
for species segregation. Shaji and Easa (2001) distinguished the two species mainly based on barbell length, anal fin ray count and shape of caudal fin (Barbells Short, anal fin rays 68-69 and caudal lobes rounded in O. malabaricus, barbells long, ray count 57-58 and lobes pointed in O. bimaculates). The authors also considered colour pattern as a valid character to segregate the two species. However, the length of the maxillary barbells found varying based on the life stage of the fishes besides perceptible variation in the shape of caudal lobes are also observed in a large number of specimens, in contrast, the colour pattern of both the species are found highly unstable from dirty white to brown, grayish and even black in the different drainage and habitats. Anal fin ray count and shape of the caudal fin were used for identifying the two species in the present study. The taxonomic ambiguities exist in this group deserves immediate attention.

The members of the genus Glyptothorax are relatively rare especially with regard to G. anamalaiensis and G. lonah. Hora (1938) reported that Glyptothorax annandalie might be considered as a race of G. lonah since both have their outer rays of paired fins plaited below. According to Menon (1999), the species are closely allied except in the much longer and narrower caudal peduncle seen in G. annandalie. He added that the plaited condition and its development depend upon the rapidity of water in which the fish lives and could not be considered as a valid character. In the present study, the two species were distinguished mainly based on colour pattern (Body brownish, the fins tipped with orange yellow in G. annandalie and body without any colour bands in G. lonah) since all the other salient characters were found overlapping. Manimekalan and Das (1998) described a new fish
species, *Glyptothorax davissinghi* based on five specimens collected from Karimpuzha (Chaliyar river system) and its tributaries. No other report of this species is seen anywhere from India. While comparing the present collection of *G. annandalie* from Karimpuzha with the type specimens of *G. davissinghi* (ZSI Chennai, (3 ex. 89-114mm, Karimpuzha, Chaliyar, 7th April 1995, without any reg. no.) the morpho-meristic characters were found highly overlapping between the two species. It appears that the taxonomic validity of the species is very much suspicious.

Day (1875-78) in his description on the rare species, *Silurus wynaadensis* has reported that the species has two pairs of mandibular barbells. Bhimachar and Rao (1941) observed variation in number of mandibular barbells, some specimens with two and others with one pair. They opined that the variability found in the number of mandibular barbells in *S. wynaadensis* is due to the atrophy of one of the pairs during the growth and development of the fish and, therefore it has no taxonomic significance. Gopi and Radhakrishnan (2001) in their collection of *S. wynaadensis* from Chandragiri river found two juvenile specimens with two pairs of mandibular barbells and all other specimens with single pairs. Interestingly, Jayaram (1999) considered the number of mandibular barbells as a salient character to classify species under the genus *Silurus* and only those with two pairs of barbells strictly are treated as *S. wynaadensis*. According to Talwar and Jhingran (1991), the number of mandibular barbells can vary based on the life stage of this species and the adult fishes generally have two pairs of mandibular barbells. In the present study, the specimens of *Silurus* collected from rapid habitats of Kabbini, Karyangod and Chandragiri river systems
were all with single pair of mandibular barbells and were identified as *S. wyanaadensis* following Gopi and Radhakrishnan (2001).

Hitherto there is no report on the occurrence of *Salarias* species in freshwaters of India (Day, 1889). The description of a new species of blenny, *Salarias reticulates* Kurup et al. (2006) from the Vettilappara region of Chalakudy river in the present study increases the number of species of this family from 98 to 99 and also supports Day's (1878) view that some blennies can even extend their geographical range of distribution to freshwater. According to him, this peculiar distribution pattern happens due to the migration undertaken by these species upstream during heavy floods against the floodwaters, in the monsoon months, and a sudden subsidence thenceforth may result in their being trapped in isolated pools on the mainland. Those, which can survive in the new habitat, will later reach their original habitat along with subsequent floodwaters.

The nomenclature and systematic status of many species solely based on morphometric and meristic characters are making serious confusions (Gopalakrishnan and Basheer, 2000). The systematic information in fish, including endangered and exotic species is still based on measurements and counts of comparable body parts and characters. It has already been accepted that morphological characters upon which systematics are based, may be influenced by environmental conditions and also, the same morphometric measurements within different populations of a species can produce different results. This often presents a dilemma to systematics while determining acceptable limits for variation in morphological character within a taxonomic unit (Srivastava, 2000). This is attributed to the reason why a lot of
taxonomic ambiguities are reported and still exist in many of the Indian freshwater fishes, especially of Western Ghats. There is an urgent requirement for resolving the taxonomic disputes by making use of sophisticated biochemical and molecular genetic tools. The paucity of specimens for comparisons further magnifies the problem. There are still a lot of species entrapped in synonymy and a number of invalid species as well. Even the agencies like Zoological Survey of India does not have a full collection of all of the type specimens of new species described and new reports and most of the new species described just remain buried in the published manuscripts without the material become available to the researchers for comparison and future studies. A strong step towards these problems and collective and honest efforts from different sides of ichthyological studies are inevitable for the time being for resolving the ambiguities exist in systematics of freshwater fishes of Kerala.
Fig. 2.1. Map of Kerala showing river systems

LEGEND

- Rivers and Streams
- Basin Boundary
- River Code Number
- District Headquarters

* River system surveyed

1. MANJESHWAR
2. UPPALA
3. SIHRVA
4. MOGRAL
5. CHANDRAGIRI
6. CHITTAI
7. NILESWAR
8. KARINGODE
9. KAVVAYI
10. PERUVANAM
11. RAMAPURAM
12. KUPPAM
13. VALAPATTANAM
14. ANAJARAKANDY
15. TELlicherry
16. MAHE
17. KUTTIYADI
18. KORAPUZHA
19. KALLAI
20. CHALIYAR
21. KADALUNDI
22. TIRUR
23. BHARATHAPUZHA
24. KEECHERI
25. PUZHAKKAL
26. KARUVANNUR
27. CHALAKUDY
28. PERIYAR
29. MUVATTUPUZHA
30. MEENACHIL
31. MANIMALA
32. PAMBA
33. ACHENCOIL
34. PALLIJAL
35. KALLADA
36. ITHIKKARA
37. AVROOR
38. VAMANAPURAM
39. MAMOM
40. KARAMANA
41. NEYYAR
42. KABBI
43. BHAVAN
44. PAMBAR

76°0' 77°0'
Plate I

Cast netting

Drag netting

Cast netting

Scoop netting

Gill netting

Traditional Trap (Koodu)

Gill netting

Collection from landing centre
Plate II

Fig. 1. *Notopterus notopterus* (Pallas)

Fig. 2. *Megalops cyprinoides* (Broussonet)

Fig. 3. *Anguilla bicolor bicolor* McCleland

Fig. 4. *Anguilla bengalensis bengalensis* (Gray)

Fig. 5. *Dayella malabarica* (Day)

Fig. 6. *Cirrhinus reba* (Hamilton-Buchanan)

Fig. 7. *Cirrhinus mrigala* (Hamilton-Buchanan)

Fig. 8. *Cyprinus carpio* Linnaeus

Fig. 9. *Catla catla* (Hamilton-Buchanan)

Fig. 10. *Neolissochilus wynaadensis* (Day)
Fig. 21. *Gonopropterus thomassi* (Day)

Fig. 22. *Gonopropterus curmuca* (Hamilton-Buchanan)

Fig. 23. *Gonopropterus kurali* (Menon and Remadevi)

Fig. 24. *Labeo dussumieri* (Valenciennes)

Fig. 25. *Labeo fimbriatus* (Bloch)

Fig. 26. *Labeo nigriscens* Day

Fig. 27. *Labeo kontius* (Jerdon)

Fig. 28. *Labeo calbasu* (Hamilton-Buchanan)

Fig. 29. *Labeo rohita* (Hamilton-Buchanan)

Fig. 30. *Puntius chola* (Hamilton)
Fig. 31. *Puntius parrah* (Day)

Fig. 36. *Puntius denisoni* (Day)

Fig. 32. *Puntius dorsalis* (Jerdon)

Fig. 37. *Puntius amphibius* (Val.)

Fig. 33. *Puntius filamentosus* (Val.)

Fig. 38. *Puntius sarana subnasutus* (Val.)

Fig. 34. *Puntius arulius* (Jerdon)

Fig. 39. *Puntius carnaticus* (Jerdon)

Fig. 35. *Puntius bimaculates* (Bleeker)

Fig. 40. *Puntius bovanicus* (Day)
Fig. 51. *Esomus thermoicos* (Valenciennes)

Fig. 56. *Barilius gatensis* (Valenciennes)

Fig. 52. *Amblypharyngodon microlepis* (Bleeker)

Fig. 57. *Barilius bakeri* Day

Fig. 53. *Brachydanio rerio* (Day)

Fig. 58. *Barilius canarensis* (Jerdon)

Fig. 54. *Rasbora daniconius* (Hamilton-Buchanan)

Fig. 59. *Danio malabaricus* (Jerdon)

Fig. 55. *Barilius bendelisis* (Hamilton-Buchanan)

Fig. 60. *Danio aequipinnatus* (McClelland)
Plate IX

Fig. 71. *Garra nilamburensis* Kurup and Radhakrishnan

Fig. 76. *Travancoria elongata* Pethiyagoda and Kottelat

Fig. 72. *Garra mlapparaensis* Kurup and Radhakrishnan

Fig. 77. *Travancoria jonesi* Hora

Fig. 73. *Garra surendranathani* Shaji, Arun and Easa

Fig. 78. *Baltora mysorensis* Hora

Fig. 74. *Garra emarginata* Kurup and Radhakrishnan

Fig. 79. *Homaloptera pillai* Indra and Remadevi

Fig. 75. *Bhavania auatralis* (Jerdon)

Fig. 80. *Homaloptera silasi* Kurup and Radhakrishnan
Fig. 101. *Mystus oculatus* (Valenciennes)

Fig. 106. *Mystus menoda* (Hamilton-Buchanan)

Fig. 102. *Mystus armatus* (Day)

Fig. 107. *Mystus malabaricus* (Jerdon)

Fig. 103. *Mystus gulio* (Hamilton-Buchanan)

Fig. 108. *Wallago attu* (Schneider)

Fig. 104. *Mystus montanus* (Jerdon)

Fig. 109. *Ompok malabaricus* (Valenciennes)

Fig. 105. *Mystus vittatus* (Bloch)

Fig. 110. *Ompok bimaculatus* (Bloch)
Fig. 111. *Silurus wynaadensis* (Day)

Fig. 116. *Glyptothorax madraspatnam* (Day)

Fig. 112. *Pseudotropius mitchelli* Gunther

Fig. 117. *Clarias dussumieri* Valenciennes

Fig. 113. *Glyptothorax anamalaensis* Silas

Fig. 118. *Heteropneustes fossilis* (Bloch)

Fig. 114. *Glyptothorax annandalei* Hora

Fig. 119. *Xenentodon cancila* (Hamilton-Buchanan)

Fig. 115. *Glyptothorax lonah* (Sykes)

Fig. 120. *Aplochilus blocki* (Arnold)
Plate XV

Fig. 131. Oreochromis mossambica (Peters)

Fig. 132. Etroplus maculates (Bloch)

Fig. 133. Etroplus suratensis (Bloch)

Fig. 134. Salarias reticulates Kurup and Radhakrishnan

Fig. 135. Eleotris fusca (Schneider)

Fig. 136. Glossogobius giuris (Hamilton-Buchanan)

Fig. 137. Awaous gutum (Hamilton-Buchanan)

Fig. 138. Sicyopterus griseus (Day)

Fig. 139. Anabas testudineus (Bloch)

Fig. 140. Macropodus cupanus (Valenciennes)
Plate XVI

Fig. 141. *Channa orientalis* Bloch and Schneider

Fig. 142. *Channa micropeltes* (Cuvier)

Fig. 143. *Channa marulius* (Hamilton-Buchanan)

Fig. 144. *Channa striatus* (Bloch)

Fig. 145. *Tetradon travancoricus* Hora and Nair