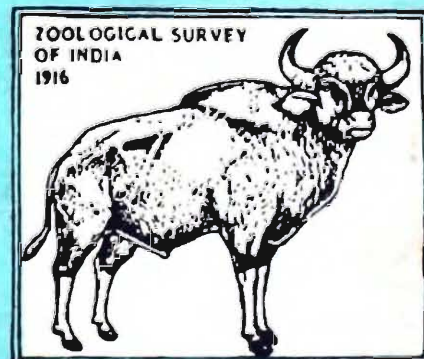


STATE FAUNA SERIES 5

Fauna OF Andhra Pradesh

PART-1

**ZOOLOGICAL SURVEY OF INDIA
1993**



STATE FAUNA SERIES : 5

FAUNA OF ANDHRA PRADESH

PART I (Reptilia, Amphibia, Fishes)

Edited by

The Director, Zoological Survey of India, Calcutta



ZOOLOGICAL SURVEY OF INDIA
1993

© Copyright, 1993, Government of India

Published : August, 1993

Project Co-ordinator : Dr. A. K. Ghosh
Director, Zoological Survey of India

Price

Inland : Rs. 350·00

Foreign : £ 15·00 \$ 24·00

Published by
The Director, Zoological Survey of India, Calcutta

Printed by
A. K. Chatterjee at JNANODAYA PRESS
55B, Kabi Sukanta Sarani, Calcutta-700 085.

FOREWORD

Zoological Survey of India, a premier national institution entrusted with survey, collections, identification and publication of inventories of faunal resources has taken up a systematic survey of States of the Republic of India since 1987-88. Under this programme the present volume designated as Part I of Fauna of Andhra Pradesh, brings out for the first time a total account of reptilia, amphibia and fishes so far recorded from the State. The varied ecological conditions of the State and its significant biogeographical location offer a rich faunal resources. The present work indicates a part of the same and it is strongly believed that it will stimulate further exploration of the resources of the States in the eastern India. Fauna of Andhra Pradesh will be published in a series in coming years under the State Fauna Series No. 5 and when completed, the total profile of faunal biodiversity is expected to emerge. I would like to put on record my deep sense of appreciation to my colleagues, who have contributed the papers for the present volume and to Mr. G. Sivagurunathan, Publication Production Officer of ZSI and his associates for bringing out the volume in the desired manner. I hope that the volume will be of use for the policy planners of the biodiversity and for researchers and students engaged in the studies relevant to such areas.

Calcutta, 2nd August, 1993

DR. A. K. GHOSH
Director
Zoological Survey of India

FAUNA OF ANDHRA PRADESH

PART I

CONTENTS

REPTILIA

**D. P. Sanyal, B. Datta Gupta
& N. C. Gayen**

... 1

AMPHIBIA

**A. K. Sarkar, P. K. Chandra
& S. Ray**

... 65

PISCES : FRESHWATER FISHES

R. P. Barman

... 89

REPTILIA

D. P. SANYAL, B. DATTAGUPTA AND N. C. GAYEN

Zoological Survey of India, Calcutta

1. INTRODUCTION

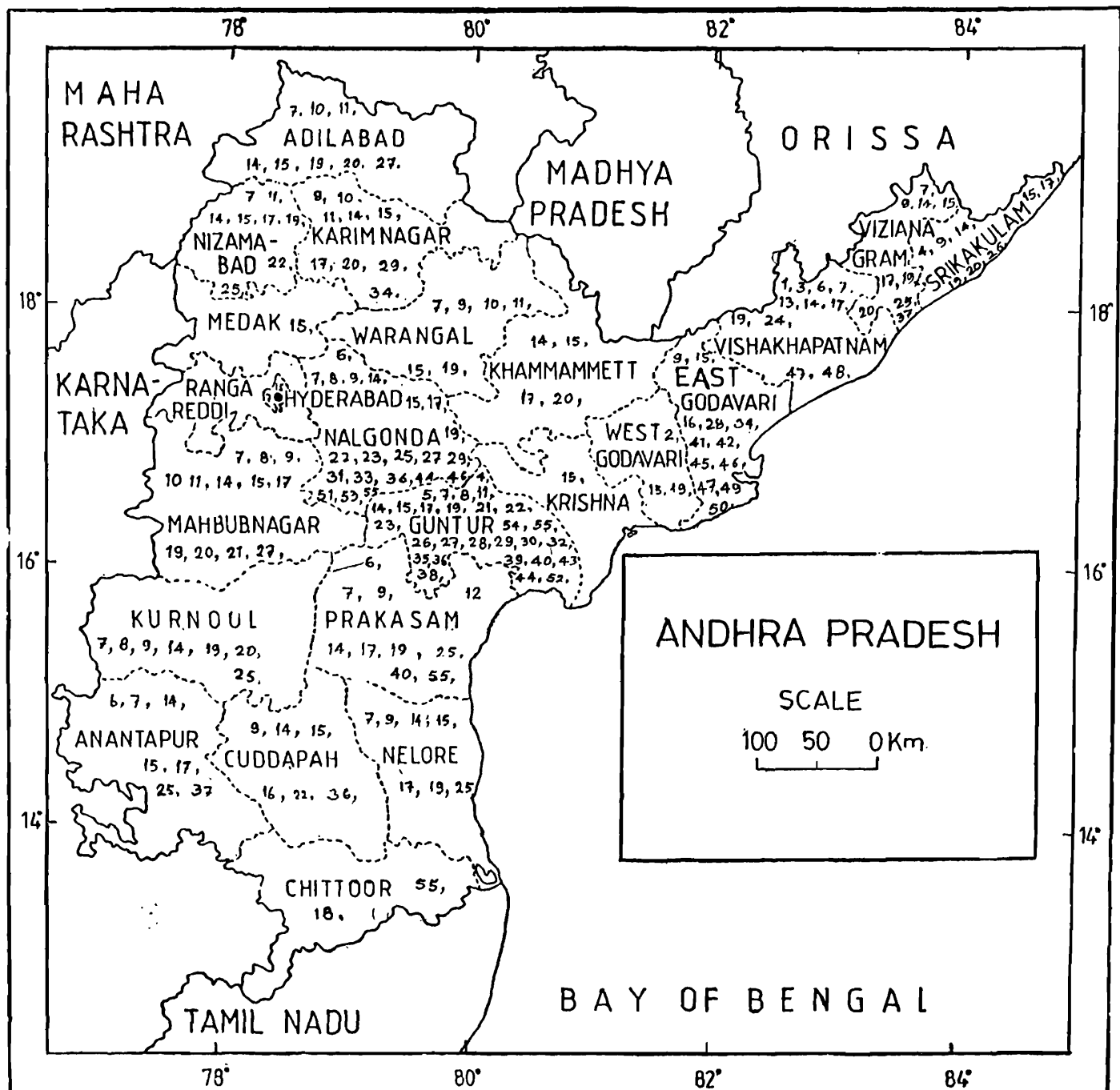
There is very little information about reptilian fauna of Andhra Pradesh. Sharma (1971) recorded 34 species of reptiles from Nagarjunasagar of Andhra Pradesh and besides some scattered records by Annandale (1906, 1912, 1915), Beddome (1870), Bhaskar (1982), Biswas (1984), Boulenger (1890), Constable (1949), Daniel et. al. (1983, 1985, 1986), Das (1991), Dutt (1979), Ganapati et. al. (1952), McCann (1945), Moll et. al. (1986), Murthy (1980, 1986), Sharma (1969, 1976), Rao (1991) and Smith's works on the reptile fauna of India (1931, 1935, 1943), no other consolidated faunal account on the reptiles from the state as a whole is available. So, this will be first detailed account on the reptilian fauna from the state as a whole is available. The present work on Andhra Pradesh reptiles is based largely on the extensive collections in the Zoological Survey of India made during faunistic surveys between the years 1962 to 1988. A few examples collected prior to that and available with the named collections of Reptilia Section have also been utilized. It comprises 837 examples belonging to 78 species, 56 genera and 18 families. Out of which 55 species have actually been collected from the above region by the various survey parties of the Zoological Survey of India, and the rest 23 species are known otherwise from adjacent region and are likely to occur in the state have also been included in this paper.

Physiogeographically, Andhra Pradesh is situated between latitude $12^{\circ} 14'$ and $19^{\circ} 54'$ N and longitudes $76^{\circ} 50'$ and $86^{\circ} 50'$ E. It lies on the Eastern sea board of the peninsula and south-eastern part of Indian subcontinent. The total land area of the state is 2,76,814 square kilometers bounded on the north by Madhya Pradesh and Orissa, on the west by Maharashtra and Karnataka, on the south by Tamil Nadu, on the east by the bay of Bengal. It has a coastline of 1000 kilometers. The lakes and tanks cover an area of 8,00,000 hectares, and the river system of the state is more than 1,500 kilometers. Two major river systems namely Godavari and Krishna along-with their several tributaries drains the state.

There are three main mountain chains in the state.

1. Eastern Ghats fringing the east coast line, with at some places a very narrow coastal plain. 2. The Deccan plateau with Sahyadri range of Adilabad district at the north border of the state. 3. The Horseley and the other hills of the Chittor, Anantapur districts at the south border. The Eastern Ghats and their southern continuation taken by the Nallamalais run through the entire state.

Evergreen, semi-evergreen and moist deciduous forests are found in the state and occupy about 23.8% of the states total area. The state is divided into 23 districts with Hyderabad as its state capital. There is a large natural swampy area (c. 250



Map showing locality-wise distribution of the species.

NAME OF SPECIES: 1. *Lepidochelys olivacea* (Eschscholtz) 2. *Kachuga tentoria tentoria* (Gray) 3. *Geochelone eligans* (Schoepff) 4. *Lissemys punctata punctata* (Lecepede) 5. *Aspideretes leithi* Gray 6. *Hemidactylus triedrus* (Daudin) 7. *Hemidactylus brooki* Gray 8. *Hemidactylus reticulatus* Beddome 9. *Hemidactylus leschenaulti* Dum. & Bib. 10. *Hemidactylus frenatus* Schlegel 11. *Hemidactylus giganteus* (Stoliczka) 12. *Hemidactylus bowringi* (Gray) 13. *Hemiphyrodactylus typus aurantiacus* (Beddome) 14. *Sitana ponticeriana* Cuvier 15. *Calotes versicolor* (Daudin) 16. *Psammophilus dorsalis* (Gray) 17. *Psammophilus blanfordianus* (Stoliczka) 18. *Chamaeleo zeylanicus* Laurenti 19. *Mabuya carinata* (Schneider) 20. *Mabuya macularia* (Blyth) 21. *Mabuya nagarjuni* Sharma 22. *Lygosoma punctata* (Gmelin) 23. *Riopa ashwamedhi* Sharma 24. *Barkuda insularis* Annandale 25. *Cabrita jerdoni* Beddome 26. *Cabrita leschenaulti* Milne-Edwards 27. *Ophisops jerdoni* Blyth 28. *Varanus bengalensis* (Daudin) 29. *Ramphotyphlops braminus* (Daudin) 30. *Typhlops acutus* Dum. & Bib. 31. *Eryx conicus* (Schneider) 32. *Eryx johni johni* (Russell) 33. *Ahaetulla nasutus* (Lacepede) 34. *Amphiesma stolata* (Linn.) 35. *Xenochrophis piscator* (Schneider) 36. *Ptyas mucosus* (Linn.) 37. *Lycodon aulicus aulicus* Smith 38. *Elaphe helana* (Daudin) 39. *Oligodon travancoricus* Beddome 40. *Oligodon taeniolatus* (Jerdon) 41. *Macropisthodon plumbicolor* (Cantor) 42. *Sibynophis sagittarius* (Cantor) 43. *Argyrogena bholanathi* (Sharma) 44. *Boiga trigonata* (Schneider) 45. *Gerardia prevostiana* (Eydxou and Gervias) 46. *Cerberus rhynchops* (Schneider) 47. *Hydrophis spiralis* (Shaw) 48. *Lapemis curtus* (Shaw) 49. *Enhydrina schistosa* (Daudin) 50. *Microcephalophis gracilis* (Shaw) 51. *Bungarus caeruleus* (Schneider) 52. *Naja naja* (Linn.) 53. *Calliophis melanurus* (Shaw) 54. *Vipera russelli* (Shaw) 55. *Echis carinatus* (Schneider).

Sq. km.) known as Kolleru Lake which is regarded as one of the largest wetland in India is situated partially in the coastal districts namely Krishna and West Godavari.

Colouration of specimens described is of specimens preserved in formalin and stored in alcohol.

II. MATERIAL AND METHOD

Reptiles are either aquatic, terrestrial or arboreal. Aquatic form has been collected by the help of water net, cast net and fishing hook. Both terrestrial and arboreal forms have been collected by hand or long survey forceps. The reptiles reported in this paper have been collected by parties of Zoological Survey of India from different ecological niches of Andhra Pradesh. In the field, notes have been taken regarding the habits and habitats of reptiles. For collection, aquatic vegetations, bushes, scraby jungles, heap of rotten leaves or straw burrows, dark corners of village huts, undersurface of barks of trees, soil under stones etc. are explored. Nocturnal fauna has been explored by the help of lamps. The collected material are first chloroformed and then put into 5% formalin solution at least for 24 hours for fixation. Before putting in the formalin, an incision on the abdomen for the bigger specimens, and injection of 10% formalin solution inside abdomen for smaller specimen are given for the fixation of viscera. The fixed material alongwith labels containing the data of locality, altitude, habitat, date of collection and name of collector, are packed properly and kept in 5% formalin solution again. The material collected in the field are brought to laboratory. After unpacking the material, they are washed thoroughly in water and placed them in 95% rectified spirit. The materials are studied and identified with the help of literature in the laboratory.

III. ABBREVIATIONS USED

Collector (Coll.), Example (Ex.), Kilometre (Km.), Milimetre (mm.), Station (Stn.), A. K. Mondal (AKM), A. K. Sarkar (AKS), B. Dattagupta (BDG), B. Nath (BN), D. P. Sanyal (DPS), H. S. pruthi (HSP), I. N. Maligi (INM), K. Reddia (KR), N. Majumder (NM), N. V. Suba Rao (NVSR), P. N. Ganapati (PNG), R. C. Sharma (RCS), R. Hodgard (RH), R. Role (RR), R. V. Sherard (RVS), S. S. Saha (SSS), T. S. N. Murthy (TSNM), Dr. Goffney (G), G. Rama Krishna (GRK), Dr. A. Danial (AD) W.T. Blanford (WTB).

IV. SYSTEMATIC LIST

(*Species likely to occur ; not yet recorded)

Class : REPTILIA

Order I. : CROCODYLIA

Family I. : CROCODYLIDAE

*1. *Crocodylus palustris* Lesson*2. *Crocodylus porosus* Schneider

Order II. : TESTUDINES

Suborder (i) : CRYPTODIRA

Family 2. : CHELONIIDAE

3. *Lepidochelys olivacea* (Eschscholtz)

Family 3. : EMYDIDAE

*4. *Melanochelys trijuga trijuga* (Schweigger)5. *Kachuga tentoria tentoria* (Gray)

Family 4. : TESTUDINIDAE

6. *Geochelone elegans* (Schoepff)

Family 5. : TRIONYCHIDAE

7. *Lissemys punctata punctata* (Lacepede)*8. *Chitra indica* (Gray)9. *Aspideretes leithi* Gray

Order III. : SQUAMATA

Suborder (ii) : SAURIA

Family 6. : GEKKONIDAE

*10. *Cyrtodactylus nebulosus* (Beddome)*11. *Calodactylodes aureus* (Beddome)12. *Hemidactylus triedrus* (Daudin)*13. *H. subtriedrus* Jerdon14. *H. brooki* Gray15. *H. reticulatus* Beddome16. *H. leschenaulti* Dumeril & Bibron17. *H. frenatus* Schlegel18. *H. giganteus* Stoliczka19. *H. bowringi* (Gray)

- *20. *H. gracilis* Blanford**
- 21. *Hemiphyllodactylus typus aurantiacus* (Beddome)**

Family 7. : AGAMIDAE

- 22. *Sitana ponticeriana* Cuvier**
- 23. *Calotes versicolor* (Daudin)**
- 24. *Psammophilus dorsalis* (Gray)**
- 25. *P. blanfordanus* (Stoliczka)**

Family 8. : CHAMAELEONIDAE

- 26. *Chamaeleo zeylanicus* Laurenti**

Family 9. : SCINCIDAE

- 27. *Mabuya carinata* (Schneider)**
- 28. *M. macularia* (Blyth)**
- 29. *M. nagarjuni* Sharma**
- 30. *Lygosoma punctata* (Gmelin)**
- *31. *Rlopa albopunctata* Gray**
- 32. *R. ashwamedhi* Sharma**
- *33. *Sepsophis punctatus* Beddome**
- 34. *Barkudia insularis* Annandale**

Family 10. : LACERTIDAE

- 35. *Cabrita jerdoni* Beddome**
- 36. *C. leschenaulti* Milne-Edwards**
- 37. *Ophisops jerdoni* Blyth.**

Family 11. : VARANIDAE

- 38. *Varanus bengalensis* (Daudin)**

sudorder (iii) : SERPENTES

Family 12. : TYPHLOPIDAE

- 39. *Ramphotyphlops braminus* (Daudin)**
- 40. *Typhlops acutus* Dumeril and Bibron**
- *41. *Typhlops beddomei* (Boulenger)**

Family 13. : UROPELTIDAE

- *42. *Uropeltis elioti* (Gray)**

Family 14. : BOIDAE

- *43. *Python molurus* (Linnaeus)**
- 44. *Eryx conicus* (Schneider)**

45. *Eryx johni johni* (Russell)

Family 15. : COLUBRIDAE

Subfamily (i) : COLUBRINAE

- 46. *Ahaetulla nasutus* (Lacepede)
- 47. *Amphiesma stolata* (Linnaeus)
- 48. *Xenochrophis piscator* (Schneider)
- 49. *Ptyas mucosus* (Linnaeus)
- 50. *Lycodon aulicus aulicus* Smith
- *51. *Lycodon striatus* (Shaw)
- *52. *Lycodon travancoricus* Beddome
- 53. *Elaphe helena* (Daudin)
- 54. *Oligodon travancoricus* Beddome
- 55. *Oligodon taeniolatus* (Jerdon)
- *56. *Oligodon arnensis* (Shaw)
- 57. *Macropisthodon plumbicoler* (Cantor)
- 58. *Sibynophis sagittarius* (Cantor)
- *59. *Dryocalamus gracilis* (Gunther)
- *60. *Psammophis condanarus* (Merrem)
- 61. *Argyrogena bholanathi* (Sharma)
- 62. *Boiga trigonata* (Schneider)

Subfamily (ii) : HOMALOPSINAE

- 63. *Gerardia prevostiana* (Eydoux and Gervais)
- *64. *Enhydris enhydris* (Schneider)
- 65. *Cerberus rhynchops* (Schneider)

Family 16. : HYDROPHIIDAE

- 66. *Hydrophis spiralis* (Shaw)
- *67. *Hydrophis mamillaris* (Daudin)
- 68. *Lapemis curtus* (Shaw)
- 69. *Enhydrina schistosa* (Daudin)
- 70. *Microcephalophis gracilis* (Shaw)

Family 17. : ELAPIDAE

- 71. *Bungarus caeruleus* (Schneider)
- *72. *Bungarus fasciatus* (Schneider)
- 73. *Naja naja* (Linnaeus)
- *74. *Ophiophagus hannah* (Cantor)
- 75. *Calliophis melanurus* (Shaw)

Family 18. : VIPERIDAE

76. *Vipera russelli* (Shaw)
 77. *Echis carinatus* (Schneider)
 *78. *Trimeresurus gramineus* (Shaw)

V. SYSTEMATIC ACCOUNT

Class : REPTILIA

Order : CROCODYLIA

Family : CROCODYLIDAE

Genus : 1. *Crocodylus* Gronovius, 1763

Key to the species of the genus CROCODYLUS

A strong ridge in front of the eye snout $1\frac{2}{3}$ to $2\frac{1}{6}$ time as long as broad at the base	...	...	...	...	...	...	<i>Porosus</i>
No ridge in front of eye snout $1\frac{1}{8}$ to $1\frac{1}{2}$ times as long as broad at the base	...	...	...	...	...	...	<i>Palustris</i>

* 1. *Crocodylus palustris* Lesson
 (Mugger or Marsh crocodile)

1834. *Crocodylus palustris* Lesson, in *Belang. Voy. Ind. or., Zool.* : 305.1890. *Crocodylus palustris* Boulenger, *Fauna Brit. Ind.* : 5.*Material examined* : Material not available. Description based on the literature.

Description : Snout broad, and without distinct ridges in front of the eyes. Snout $1\frac{1}{8}$ to $1\frac{1}{2}$ times as long as broad of the base. A row of 4 distinct, sharply raised, scales just behind the head called post occipitals, dorsal scutes in 16 or 17 transverse and 4, sometimes 6, longitudinal series of bony plates embedded in the skin. Ventrally the skin lacks armour. Fingers webbed at the base.

Distribution : Inhabits rivers, lakes and other large bodies of water throughout the Indian subcontinent, from Baluchistan in the west to Assam in the east, and from Nepal in the north to Tamil Nadu in the south. Also Srilanka and Iran.

Remarks : Formerly this species was available abundantly in most states of the

Status : Placed under schedule I of Indian Wildlife Protection Act, 1972.

(Estuarine or salt water crocodile)

- Material examined:** Material not available. Description based on the literature.

Distribution : Inhabits tidal estuaries of the larger continental rivers, marine swamps and coastal brackish water lakes from the Cochin area of Kerala on the west coast, south ward around the tip of the Peninsula, and north ward along the east coast to the Sunderbans in West Bengal. Also present in Andaman and Nicobar Islands.

Status : Placed under Schedule I of Indian Wildlife Protection Act, 1972.

Suborder (i) : CRYPTODIRA

Family 2. : CHELONIIDAE

Key to the families of the order TESTUDINES

1.	Digits elongated	...	...	...	...	...	CHELONIIDAE
	Digits not elongated	...	...	...	...	...	2
2.	Forelimbs semi-paddle shaped with 3 claws ; carapace covered with smooth skin ; edge of carapace flexible	...	...	...	...	...	TRIONYCHIDAE
	Forelimbs paddle-shaped with more than 3 claws ; Carapace covered with horny shields	...	...	...	...	...	3.
3.	Limbs paddle shaped but more or less flattened ; digit webbed ; top of head covered with smooth skin or with the posterior part of it divided into shields ; claws 4-5 ; carapace covered with horny shields	...	...	...	...	...	EMYDIADAE
	Limbs more or less cylindrical, the hind limbs clubshaped or elephantine, digits not webbed ; upper portion of the head shielded ; plastron with 12 shields,	...	...	...	...	...	TESTUDINIDAE

Genus 2. *Lepidochelys* Fitzinger, 1843.3. *Lepidochelys olivacea* (Eschscholtz)
(Olive Ridley Turtle) Teluguname, Samudram tabelu1829. *Chelonia olivacea* Eschscholtz, *Zool. Atlas* : 2, Pl. 3.1843. *Lepidochelys Olivacea* Fitzinger, *Syst. Rept.* : 30.

Material examined : Visakhapatnam Dist. : 1 ex., Visakhapatnam sea shore, 4. xi. 1980 (coll. SB).

Measurements : Carapace length 200 mm.

Diagnostic character : Carapace broad, almost heart-shaped, fairly raised but with a flat top; posterior marginals serrated; 5-9 pairs of pleurals and 12-14 pairs of marginals; a broad cervical, touching the first pleural; five or more costal shields on carapace. Marginal shields on carapace 27, rarely 25. Carapace of the young with three distinct keels. Distinct pores present on the inframarginal region. Head small, triangular; four prefrontal scales on forehead; upper jaw hooked but without a ridge. Adult olive brown above, yellowish below.

Distribution : Andhra Pradesh as mentioned in the material. The olive ridley is widely distributed in the tropics and subtropics, especially along shallow coastal waters with muddy bottom, high in detritus and low in salinity.

Remarks : It is the commonest turtle along the Indian coasts.

Status : Protected under schedule I of Indian Wild Life Protection Act, 1972.

Family 3. EMYDIDAE

Key to the genera of the family EMYDIDAE

Vertebral shields short sided anteriorly	...	...	...	...	<i>Kachuga</i>
Vertebral shields short sided posteriorly	...	...	...	...	<i>Melanochely</i>

Genus 3. *Melanochelys* Gray, 1869.*4. *Melanochelys trijuga trijuga* (Schweigger)
(Peninsular black turtle) Telugu name : Nuiye tabelu1814. *Emys trijuga* Schweigger, *Prodr. Monog. Chel.* : 41.1869. *Melanochelys trijuga* Gray. *Proc. Zool. Soc. London*, : 187.

Material examined : Material not available. Description based on the literature.

Description : Four well defined and perfectly established subspecies of *Melanochelys trijuga* are found in India. These races are mainly recognised on the basis of head

and shell colouration. The head is moderately small, snout shorter than the orbit, slightly projecting beyond the lower jaw ; Upper jaw notched at the middle. Vertebral shields short sided posteriorly. Carapace elongated, fairly elevated in adults, depressed in the young, tricarinate ; posterior marginals feebly serrated ; cervical small, triangular in shape. Head is greyish or olivaceous with yellow or pink reticulations which are more prominent on the sides.

Distribution : The subspecies is available in Andhra Pradesh, Maharashtra, Tamil Nadu, Karnataka and Gujarat.

Remarks : It is mainly aquatic and completely vegetarian in habits.

Status : Indeterminate, possibly vulnerable. The main threat is due to large scale exploitation of eggs and adults for food.

Genus 4. *Kachuga* Gray, 1869.

5. *Kachuga tentoria tentoria* (Gray) (Indian tent turtle)

1834. *Emys tentoria* Gray, *Proc. Zool. Soc.*, 54.

Material examined : 1 ex., Godavari river (Coll. WTB)

Diagnostic character : Carapace elevated, oval with distinct vertebral keel that is spiked, especially on vertebral 3 ; vertebrals 3 and 4 longer than wide, vertebrals 5 wider than long, vertebrals 1 and 2 longer than wide or wider than long ; plastron truncated anteriorly, notched posteriorly ; snout pointed, the skin at the back of forehead with irregular scales ; upper jaw unnotched, vertebral shields short sided anteriorly. Limbs are with fully and broadly webbed digits and have transversely enlarged scales.

Distribution : *Andhra Pradesh* as stated in the *material*. Elsewhere : Orissa, Madhya Pradesh, Maharashtra.

Remarks : The species is absolutely aquatic and inhabits the slow running water near the banks and still water pools on the river side. It is an active swimmer and is mainly herbivorous.

Status : Species become vulnerable on account of large scale river pollution and habit destruction.

Family 4. TESTUDINIDAE

Genus 5. *Geochelone* Fitzinger, 1835

6. Geochelone elegans (Schoepff)
(Indian Star Tortoise) Telegu name : Meta tabelu

1792. *Testudo elegans* Schoepff, *Hist. Test.* 1 : 111.

1835. *Geochelone elegans* Fitzinger, *Ann. Wien Mus.* 1 : 111.

Material examined : Visakhapatnam Dist : 3 ex., Visakhapatnam (Coll. RR); 1 ex. (Juv) Visakhapatnam (Coll. WT).

Diagnostic character : Carapace viewed from above oblong in adult to almost round in young. Cervical absent; all vertebrals, except the first, which is as long as broad, are broader than long; 12th marginals united; bridge with a single axillary and inguinal scute on each side. The head is of moderate size, its anterior portion is bulged and somewhat convex. The upper jaw is slightly tricuspid. The skin at top of head is divided into small irregular shields. Tail is moderately long and terminating into a spur-like scute. Shell is black above, each vertebral and costal shield is with a yellow areols from which radiate as many as eight streaks, ultimately producing a starred pattern which is continuous over the marginals to plastron. Head and limbs are yellow, more or less spotted with dark brown or black.

Distribution : Andhra Pradesh as stated in the *material*. Elsewhere : Peninsular India and offshore islands like Karadura and Rameswaram. Also Sri Lanka, extending upto Sind.

Remarks : The species inhabits rocky, grassy arid areas with plenty of other vegetation. Its feeds on grass, flowers, vegetables, fruits and all other available vegetable material.

Status : Indeterminate, suspected to be threatened by habitat loss.

Family 5. TRIONYCHIDAE

Key to the genera of the family TRIONYCHIDAE

1. Marginal bones are present. Snout short	...	...	...	...	<i>Lissemys</i>
Marginal bones are not present. Snout long	...	...	...	...	2.
2. Orbit nearer the temporal than the nasal fossa ; postorbital arch narrower than the diameter of the orbit	...	...	...	...	<i>Aspidereters</i>
Orbit nearer the nasal than the temporals fossa ; Postorbital arch twice as broad as the diameter of the orbit	...	...	...	...	<i>Chitra</i>

Genus 6. *Lissemys* Smith, 1931.

7. *Lissemys punctata punctata* (Lace'pe'de)
(Indian Flap-shell Turtle) Telegu name : Neeti tabelu

1788. *Testudo Punctata* Lace'pe'de, *Hist, Quad. Ovip.* 2 : 446.

1931. *Lissemys punctata punctata* Smith, *Funa Brit. Ind.* 1 : 157.

Material examined : Guntur Dist : 1 ex., (juv) Pullareddygudem vill., 2. ix. 1962, (Coll. BN & IMN) Srikakulam Dist. I ex., Stn. 6 Samarilli, ca 20 km. north of Palkonda, 19. ix. 1986 (Coll. DPS).

Description : Carapace viewed from above broadly oval in adult to circular in young. Head is moderately large, the snout is short, its length is less than the length of the eye opening. The carapace and plastron covered by a continuous sheet of soft skin and their callosities are finely granulated. The lateral and the hinder portions of the carapace are most flexible. Plastron is with soft, semicircular flaps, which accommodate the retracted hind feet to be totally concealed. Plastron is with seven callosities in the adult. Limbs are fully webbed, with only three claws on each foot. Tail is very short. Olive brown above. Carapace is grey-green, with numerous blackbordered yellow spots, irregularly arranged and with a light yellow marginal rim.

Distribution : *Andhra Pradesh* as stated in the *material*. Elsewhere : Tamil Nadu, Orissa, Goa, Bihar, Gujrat, West Bengal, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Andamans. Also Sri Lanka, Bangladesh, Myanmar (Burma), Nepal, Pakistan,

Remarks : Three subspecies of *Lissemys* are recognised : *Punctata* (Lacepede), *andersoni* Webb and *scutata* (Peters), the first two occuring in the Indian subcontinent, the third restricted in Myanmar (Burma). The subspecies prefers to live in shallow, muddy ditches, lakes and marshes. It is a carnivorous turtle and feeds mainly on frogs, fishes, shrimps and snails.

Status : The species is protected under schedule I of the Indian Wild life (Protection) Act, 1972.

Genus 7. *Chitra* Gray 1844.

* 8. *Chitra indica* (Gray) (Narrow-headed Softshell Turtle)

1831. *Trionyx indicus* Gray, *Syn. Rept.* : 47,

1844. *Chitra indica* Gray, *Cat. Tort. etc., Brit. Mus.* : 49.

Material examined : Material not available. Description based on the literature.

Description : Shell oval and depressed ; shell bones prominently pitted ; orbit nearer the nasal than the temporal fossa ; postorbital arch twice as broad as the diameter of the orbit. The head is quite small in comparison to the body, somewhat elongated ; snout is rounded. The alveolar surfaces of jaws are slightly expanded, and the edges of the jaws are extremely sharp. The eyes are situated close to the nostrils. Carapace

is remarkably pitted and vermiculated. The basic colour is dull olive or bluish-grey dorsally, with a pattern of wavy reticulations, carapace pattern continuing up to the neck and the outer surface of the forelimbs; a 'V'-shaped mark commencing from the nape and extending to the carapace; juveniles sometimes with 4 eye-like markings on the carapace or with numerous black elongated spots; plastron cream or pale pink.

Distribution : The turtle is widespread in the oriental region, from the Indian subcontinent, eastwards to Thailand, in the rivers Indus, Ganga, Godavari, Padma, Mahanadi, Coleroon and Ratburi, of Pakistan, Nepal, Bangladesh and Thailand.

Remarks : This species is most agile and prefers to live in shallow rivers with sandy bottoms and banks. Its food mainly fish, gastropod molluscs and other small animals.

Status : Indeterminate, suspected to be threatened on account of excessive killing of adults and over exploitation of eggs for foods.

Genus 8. *Aspideretes* Gray, 1872.

9. *Aspideretes leithii* (Gray) (Leith's softshell Turtle)

1872. *Trionyx Leithii* Gray, *Ann. Mag. Nat. Hist.* (4) 10 : 334.

Material examined : Gunter Dist. ex., Pedaavagu river, near Rayaram vill, Nagarjuna, Sagar, 20. x. 1963. (Coll. BN).

Diagnostic character : Carapace low and oval; a preneural with one or two neurals separating the first pair of costals; eight pair of costals meet at carapace midline eight neurals; plastral callosities large, five in number. Orbit nearer the temporal than the nasal fossa; postorbital arch narrower than diameter of the orbit. Alveolar surface of upper jaw is flat and with a fairly well defined median maxillary groove between them. Dorsal colouration is olivegreen with lighter vermiculations. Ventrums are whitish. Head is greenish with black longitudinal lines from between the eyes and two oblique black streaks emerge on either side and one streak starts behind the eye.

Distribution : Andhra Pradesh as stated in the material. Elsewhere, Ganga river system and all the rivers of Peninsular India as far south as Madras.

Remarks : The species is perfectly aquatic and is frequently seen basking on sandy banks or resting in shallow water with its head sticking out of water. It is completely omnivorous and is also a scavenger.

Status : This species endangered on account of excessive killing of the adults for flesh, and over exploitation of eggs for food.

Order III : SQUAMATA

Suborders (II) : SAURIA

Key to the families

1. Tongue slender, forked	...	...	...	...	...	<i>Varanidae</i>
Tongue neither slender nor forked	...	...	...	...	...	2.
2. Top of head with symmetrical shields	...	...	...	...	...	3.
Top of head without symmetrical shields	...	...	...	...	...	4.
3. Body covered with osteodermal plates, femoral pores absent	...	...	...	...	...	<i>Scincidae</i>
Body covered with osteodermal plates, femoral pores present	...	...	...	...	...	<i>Lacertidae</i>
4. Eyes with movable eyelids ; digits free	...	...	...	...	...	5.
Eyes without movable eyelids ; digits clawed	...	...	...	...	...	<i>Gekkonidae</i>
5. Tongue club-shaped	...	...	...	...	...	<i>Chamaeleonidae</i>
Tongue not club-shaped	...	...	...	...	...	<i>Agamidae</i>

Key to the genera of the family GEKKONIDAE

1. Digits strongly dilated	...	...	...	...	...	2.
Digits not dilated	...	...	...	...	...	<i>Cyrtodactylus</i>
2. Digits dilated as the apex only	...	...	...	...	...	<i>Calodactylodes</i>
Digits dilated at the base only	...	...	...	...	...	3.
3. Inner digit well developed, with free terminal phalange	...	...	...	...	...	<i>Hemidactylus</i>
Inner digit vestigial, without free terminal phalange	...	...	...	...	...	<i>Hemiphyllodactylus</i>

Family 6. GEKKONIDAE

Genus 9. *Cyrtodactylus* Gray, 1827.*10. *Cyrtodactylus nebulosus* (Beddome)
(Rock Gecko)

1870. *Gymnodactylus nebulosus* Beddome, *Madras Month. J. Med. Sc.* 2 : 174.

Material examined : Material not available. Description based on the literature.

Description : Head moderate ; snout longer than the distance between the eye and the ear opening ; 10-12 upper and the same number of lower labials. Back with small granular scales, intermixed with numerous larger, rounded, keeled tubercles. The toes are short, the tail is shorter than the head and body, and is more or less swollen in the basal part. A conspicuously and handsomely coloured gecko.

Distribution : Golconda Hills, Godavery valley (Andhra Pradesh) ; Hills of Southern India.

Remarks : Mainly a forest species where it is found under stones or bark of trees,

Status : Indeterminate.

Genus 10. *Calodactylodes* Strand, 1926.

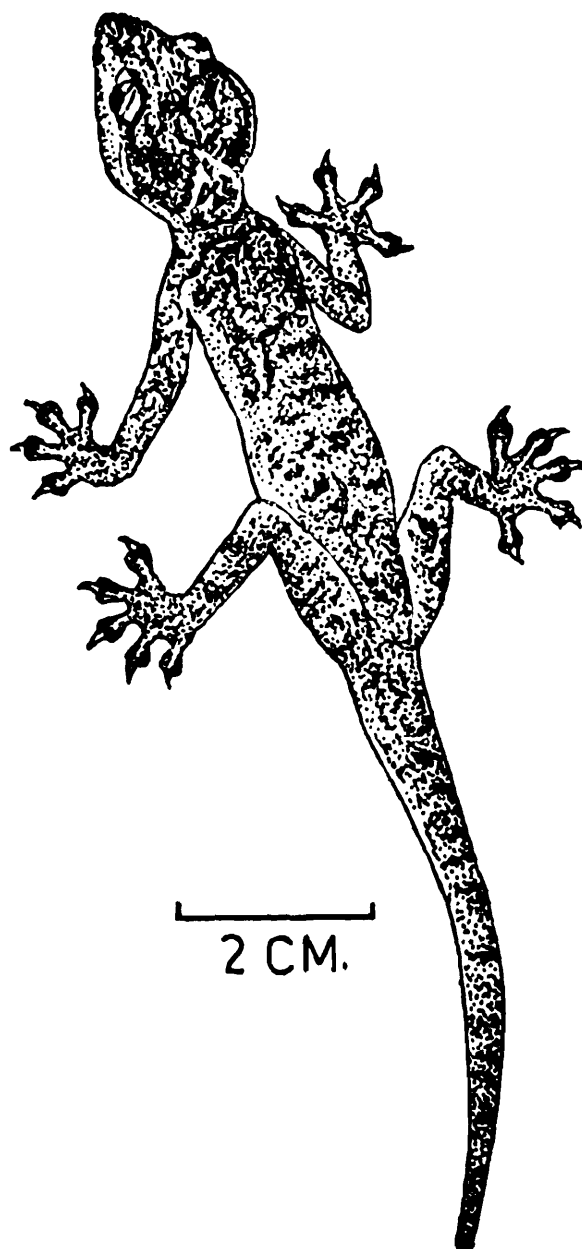
*11. *Calodactylodes aureus* (Beddome)
(Golden gecko) Text figure with plate

1870. *Calodactylus aureus* Beddome, *Madras Month. J. Med. Sci.* 1 : 31.

1926. *Calodactylodes aureus* Strand, *Arch. Nat. Berlin*, 92 A : 54.

Material examined : Material not available. Description based on the literature.

Description : Head moderate ; snout broad and rounded, distinctly longer than



Calodactylodes aureus
(Golden Gecko)

the distance between the eye and the ear opening, which is an oblique slit, its length about half of that the eye. 12 or 13 upper and as many as lower labials, Head

covered above with small granular scales. Back with small granular scales intermixed with numerous larger rounded tubercles. The terminal phalange of the slender digits with two plate-like expansions. Pupil vertical. The colour in life is said to be a brilliant golden yellow.

Distribution : Reported from rocky ravines in the Eastern Ghats.

Remarks : Beddome (1870) described as a new genus and species. The Gecko was apparently forgotten thereafter Daniel and Bhushan (1985) collected the species from Venkateswara Wildlife Sanctuary in Tirumalai Hills after a gap of 115 years.

Status : Rare.

Key to the species of genus HEMIDACTYLUS

1. Enlarged dorsal tubercles numerous, strongly keeled, arranged in regular longitudinal series	...	...	...	...	2.
Enlarged dorsal tubercles not numerous, feebly keeled, not regular. by arranged	...	...	...	...	6.
2. Free distal phalanx of inner digit half as long as the dilated portion	...	...	...	...	3.
Free distal phalanx of inner digit not half as long as the dilated portion	...	...	...	...	5.
3. Dorsal tubercles very large, back with dark cross bars	...	...	...	...	4.
Dorsal tubercles large, back with dark spots	...	...	...	...	<i>Brooki</i>
4, 7 to 10 lamellae under fourth toe	...	...	...	...	<i>Triedrus</i>
12 lamellae under fourth toe	...	...	...	...	<i>Subtriedrus</i>
5. Dorsal granules mixed with oval tubercles ; back with rectangular spots	...	...	...	...	<i>Gracilis</i>
Dorsal granules mixed with erect conical tubercles ; back with reticulated spots	...	...	...	...	<i>Reticulatus</i>
6. Free distal phalanx of inner digit half as long as the dilated portion ; males with femoral pores only	...	...	...	...	7.
Free distal phalanx of inner digit not half as long as the dilated portion ; male with continuous series of preano-femoral pores	...	...	...	...	<i>Frenatus</i>
7. Tail swollen of the bases ; femoral pores separated by 6 scales	...	...	...	...	8.
Tail not swollen at the base ; femoral pores separated by 2 to 4 scales	...	...	...	...	<i>Bowringii</i>
Tail with enlarged tubercles above ; 9 to 11 lamellae under the fourth toe	...	...	...	...	<i>Leschenaulti</i>
Tail without tubercles above ; 13 to 15 lamellae under the fourth toe	...	...	...	...	<i>Giganteus</i>

Genus 11. *Hemidactylus* Oken, 1817.

12. *Hemidactylus triedrus* (Daudin) (Termite Hill Gecko)

1802. *Gecko triedrus* Daudin, Nat. Repr. 4 : 155.

1832. *Hemidactylus triedrus*, Lesson, in Belang., Voy. Ind. Or. : 311.

1906. *Hemidactylus triedrus*, Annandale, Mem. Asiat. Soc. Beng. (n. s.) 1 : 186

Material examined : 12 ex., collected from different districts as follows :

Annatapur Dist : 4 ex., Bukapatnum, Kalasamudram. *Nalgonda Dist.* 1 ex., Vijaypuri, Nagarjunkonda. *Prakasam Dist* : 5 ex., Erryandaputen, Shrisailam. *Visakhapatnam*

Dist : 2 ex., In and around Visakhapatnam all collected during the period 31. vii. 1962 to 5. xi. 1986. Collected by BN and INM ; AKS ; DPS and BDG.

Measurements : Snout to vent 45-70 mm, Tail 35-70 mm.

Diagnostic character : Head rather large, snout obtusely pointed. 8 to 10 upper and 7 or 8 lower labials, nostril between the rostral and several small scales. 7 to 10 lamellae under the fourth toe. Back of head with minute granules intermixed with larger keeled tubercles. Back with three white edged olive green crossbars ; greenish above eye. Belly white to pale flesh colour.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : The range extends from Sri Lanka through much of Peninsular India to West Pakistan.

Remarks : A nocturnal form and emerges from crevices, termite hills and rodent burrows. It takes crickets, grasshoppers, spiders.

Status : *Common*.

*13. *Hemidactylus subtriedrus jerdon*

1853. *Hemidactylus subtriedrus* Jerdon, *J. Asiat. Soc. Beng.* 12 : 467.

Material examined : Material not available. Description based on the literature.

Description : 10 to 12 upper and 10 lower labials. 8 lamellae under the first toe, 12 under the fourth. Back of head with minute granules intermixed with larger keeled tubercles.

Distribution : The type of the species was collected from Nellore district. (Smith, 1935).

Remarks : It is chiefly found among rocks.

Status : *Indeterminate*.

14. *Hemidactylus brooki* Gray (Brook's Gecko)

1845. *Hemidactylus brooki* Gray, *Cat. Liz. Brit. Mus.* : 153.

1906. *Hemidactylus brooki* Annandale, *Mem. Asiat. Soc. Beng.* 1 : 183.

Material examined : 45 ex. ; collected from different districts as follows. : *Adilabad Dist.* : 4 ex. Birsai pet. *Anantpur Dist.* : 8 ex. collected from Dharmavaram and Kalasumurdam. *Guntur Dist.* : 3 ex. collected from Nagarjuna hill and puttegudem and Ashwamedh site *Hyderabad Dist.* : 1 ex. Mohemnedabad. *Kurnool Dist.* 3 ex. west of Mahanadi. *Mahbubnagar Dist.* : 5 ex. Mannanur Vill. *Nalgonda Dist.* : 8 ex. collected from Tiger hill ; Nandikonda valley ; Deverkonda valley ; Madhavram Vill. and Nidigul. *Nellore Dist.* : 5 ex. collected from Bata ; Kashmir Vill ; and Satrapaly Vill. *Nizamabad Dist.* : 1 ex., Armur. *Prakasam Dist.* : 2 ex. collected from Kanigiri

town and Podile. *Srikakulam Dist.* : 1 ex., Srikakulam. *Visakhapatnam Dist.* : 1 ex. Annantagiri. *Vizianagram Dist.* : 1 ex. Chipurapalli. *Warangal Dist.* : 2 ex. collected from mulug and Edungram. All collected during the period from 1962 to 1986. Collected by AKM ; KR ; BN and INM ; DPS ; SSS ; AKS.

Measurement : Snout to Vent 18-48 mm ; Tail 20-65 mm.

Diagnostic character : Head moderate large, snout obtusely pointed. 8 to 10 upper and 7 to 9 lower labials. Back with conical tubercles arranged in regular rows colour brown or varying shades of grey with brown spots, whitish below. Femoral and preanal pores vary from 15 to 27.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere occurring throughout the Indian subregion. It also occurs from Borneo and South China through much of tropical Asia and the northern half of Africa.

Remarks : Although it is characteristically a domestic gecko over much of its range, this house lizard is often found quite away from human buildings. It lives in a variety of habitats, on trees, rocks, under stones and on buildings. Its loud chuck chuck chuck call is often heard after dusk.

Status : *Common*.

15. *Hemidactylus reticulatus* Beddome (Reticulate Gecko)

1870. *Hemidactylus reticulatus* Beddome, *Madras Month. J. Med. Sci.* 1. : 33.

1890. *Hemidactylus reticulatus* Boulenger, *Fauna Brit. Ind.* 84.

Material examined : 71 ex., collected from different districts as follows ; *Guntur Dist.* : 34 ex., collected from Ashwamedh site ; Eddenmotu and Fringimotu hills ; Macherla town ; Nandikonda valley ; Nagarjunkonda valley ; Pullaredygudem. *Mahbubnagar Dist.* : 7 ex., collected from Mahbubnagar town ; Lengal ; Marik. *Nalgonda Dist.* : 18 ex. collected from Choutuppal ; Madhavram ; Tellesawarm ; Vijaypuri ; Suryaropet ; Nidigul Vill ; Yelleshwarm. All collected during the 1962-88. Collected by KR ; BN and INM ; DPS. Murthy (1986) collected 12 ex. from *Kurnool Dist.* during 1982-83.

Measurements : Snout to vent 25-30 mm. Tail 24-26 mm.

Diagnostic character : Head rather short and high, snout broadly rounded. 9 to 10 upper and 7 or 8 lower labials. Back with erect keeled granules and enlarged, pointed and keeled tubercles ; lamellae on the fourth toe 10. Male with 11 preanal pores. The colour is brown above with a characteristic pattern of darker lines arranged in a network on the back. The belly is whitish and the throat is speckled with brown. Most of the dorsal tubercles are whitish.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : Madura and Shevaroy, Tamil Nadu ; Palnis, Western Ghats ; Karnataka.

Remarks : They are found under loose, small stones in the open hill country.

Status : Indeterminate.

16. *Hemidactylus leschenaulti* Dumeril and Bibron (Bark Gecko)

1836. *Hemidactylus leschenaulti* Dum & Bibr. *Erp. Gen.* 3 : 364.

Material examined : 32 ex., collected from different districts as follows : *Adilabad Dist. : 3 ex.*, Kotapally, *Cuddapah Dist. : 1 ex.*, Razampeta, *East Godavari Dist. : 2 ex.*, Rajmundri, *Karimnagar Dist. : 4 ex.*, Dharmapally. *Mahbubnagar Dist. : 3 ex.*, collected from Mannanur and Kornangal. *Nalgonda Dist. : 1 ex.*, Devakonda fort. *Nellore Dist. : 4 ex.*, Sitarampurams. *Prakasam Dist. : 10 ex.*, collected from Podili ; Erragandaperta ; Kanigiri ; Pameru and Shrisailam ; *Srikakulam Dist. : 2 ex.*, collected from Antikonda and Telneelapuram. *Vizianagram Dist. : 1 ex.*, Babbili. *Warangal Dist. : 1 ex.*, Mulug. All collected during the year 1960-1988. Collected by AKM ; NM ; HSP ; DPS. Murthy (1986) collected 1 ex. from *Kurnool Dist.* during 1982-83.

Measurements : Snout to vent 33-80 mm. Tail 30-90 mm.

Diagnostic character : Body stout with a lateral fold ; upper labials 10 to 12 and 8 to 10 lower labials. Dorsally head and body covered with fine granules intermixed with small tubercles irregularly scattered ; scales on the underside small and imbricate. Digits rather long ; 9 to 11 lamellae under fourth toe. Tail strongly depressed with enlarged tubercles above. Males with 10 to 17 femoral pores on each side. Grey above and silvery white below. Back with conspicuous wavy cross bars. A dark line from the eye to ear on each side of the head.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : The range is from Sri Lanka and Peninsular India north and west to Rajasthan and eastern Las Bela.

Remarks : This is a sylvatic and arborreal gecko found on large trees such as mango and banyan trees and it lies concealed under bark of these trees situated several feet above the ground.

Status : Common.

17. *Hemidactylus frenatus* Schlegel (South Asian waif Gecko)

1836. *Hemidactylus frenatus* Schlegel. *Erp. Gen.* 3 : 366.

Material examined : 6 ex. collected from different district as follows : *Adilabad Dist. : F 3*

1 ex., Kotapally. *Karimnagar Dist.* : 1 ex. Mahadevpur. *Mahbubnagar Dist.* : 3 ex., collected from kothakolag ; kowakarat and Mannanur. *Warangal Dist.* : 1 ex. Mulug. All collected during the year 1978 to 1988. Collected by NM ; DPS ; AKM.

Measurements : Snout to vent 26-45 mm. Tail 25-47 mm.

Diagnostic character : Habitus and scalation similar to those of *H. leschenaulti*. It is a smaller lizard and differs in the following particulars : first toe less than half of length of second ; male with a continuous series of 23 or more preano-femoral pores ; dorsal tubercles scattered or partly in linear arrangement or absent. Dark brownish dorsally and dirty whitish below. A dark stripe through the eye to the sides and groin. Flanks with dark spots.

Distribution : *Andhra Pradesh* : (First record) as mentioned in the *material*. Elsewhere : widely distributed in South India, Sri Lanka, Southern Indo-China.

Remarks : Although it is a common house-gecko in south India, this species is found quiet often in the bark of coconut trees, beneath debris in outdoor locations. The species is recorded for the first time from Andhra Pradesh.

Status : Common.

18. *Hemidactylus giganteus* Stoliczka (Giant Tree Gecko)

1871. *Hemidactylus giganteus* Stoliczka, *P. Asiat. Soc, Beng.* : 193.

Material examined : 15 ex. collected from different districts as follows : *Adilabad Dist.* : 3 ex. collected from Ilkial and Kotapally. *Guntur Dist.* : 2 ex. collected from Nagarjuna hill and Siddler hill. *Karimnagar Dist.* : 2 ex. Manthani *Mahbubnagar Dist.* : 3 ex., Armur. *Warangal Dist.* : 4 ex. Mulug. All collected during the year 1963-1988. Collected by NM ; BN ; DPS ; AKM.

Measurements : Snout to vent 65-125 mm. Tail 55-125 mm.

Diagnostic character : Size large 12 to 15 upper labials and 10 to 12 lower labials. Mental large subtriangular. Back with more or less uniform small granules ; no enlarged tubercles ; belly with smooth, rounded, imbricate scales ; 13 to 15 lamellae under the fourth toe. Male with 40 preano-femoral pores. Greyish dorsally and whitish on the undersides. Back with prominent large W-shaped cross-bars.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : Malabar, Palkonda Hills.

Remarks : Found on trees, crevices.

Status : Indeterminate

19. *Hemidactylus bowringi* (Gray)

1845. *Doryura bowringii* Gray, *Cat. Liz. Brit. Mus.* 156.

1890. *Hemidactylus bowringii* Boulenger, *Fauna Brit. Ind.* : 93.

Material examined : *Prakasam Dist.* : 1 ex., Dorsi, ca. 26 Km. N. of Poddile. 2. ix. 1986 (Coll. DPS).

Measurements : Snout to vent 38 mm. Tail 23 mm.

Diagnostic character : 9 to 11 upper and 7 to 9 lower labials ; mentals large, subtriangular, rostral broader than high. Back with small more or less uniform granules, no enlarged tubercles. Belly with smooth, rounded, imbricate scales. 10 lamellae under the fourth toe. Male with 15 femoral pores on each side separated by 4 scales mesially. Light brown above with darker spots arranged to form four longitudinal streaks down the back. A dark streak along the side of the head.

Distribution : *Andhra Pradesh* : (First record) as mentioned in the *material*. Elsewhere : Darjeeling (W. Bengal), Sikkim. Also found in Chittagong (Bangladesh) ; Myanmar (Burma) ; Hongkong ; S. China.

Remarks : Smith (loc. cit.) gives the range of this gecko as Godavari valley. The specimens under study are, therefore, the specific records for the first time from Andhra Pradesh.

Status : Indeterminate.

*20. *Hemidactylus gracilis* Blanford

1870. *Hemidactylus gracilis* Blanford, *J. Asiat. Soc. Beng.* 39 : 362.

Material examined : Material not available. Description based on the literature.

Description : Body slender ; back with small scales series of oval, keeled tubercles ; upper labials 9, lower labials 7 ; lamellae on the fourth toe. Male with 6 preanal pores. The dorsum is grey with rectangular spots arranged in two longitudinal rows which are separated by a thin streak. The underside is whitish.

Distribution : Murthy (1986) collected 14 ex. from *Kurnool dist.* during the year 1982-83. Smith (1935) gives the range of this species as "S. E. Berar and Raipur, Central Provinces ; Bombay Presidency". Its record from Andhra Pradesh extend the distribution of this species to South India.

Status : Indeterminate.

Genus 12. *Hemiphyllodactylus* Blecker, 1860.21. *Hemiphyllodactylus typus aurantiacus* (Beddome)1870. *Hemidactylus aurantiacus* Beddome, *Madras Month. J. Med. Sci.* 1. : 33.1860. *Hemiphyllodactylus typus* Blecker, *Nat. Tijdschr. Ned. Ind.* 20 : 327.1935. *Hemiphyllodactylus typus aurantiacus* Smith. *Fauna. Brit. Ind.* 2 : 108.

Material examined : Visakhapatnam Dist. : 6 ex. Madhugulu, ca. 40 km. S. of Pederu, 14. x. 1984 ; 1 ex. Araku valley (Alt. 975mt.), 1. x. 1985 (Coll. DPS).

Measurements : Snout to vent 15-35 mm. Tail 18-38 mm.

Diagnostic character : Head shorter and less depressed. Body covered above with numerous, minute granular scales and belly with rows of small, rounded scales ; tail without spines, upper labials 10 to 12, lower labials 9 to 11. Inner digit vestigial. Toes are dilated having ventral lamellae. Chin devoid of shields. Pupil elliptic, erect. 5-7 femoral and 7-9 preanal pores. Brown above with black streaks on the neck and anterior region of the body are flecked with black on the middle of the back and posteriorly ; whitish beneath. Tail orange in colour with black blotches.

Distribution : Andhra Pradesh : (First record) as mentioned the *material*. Elsewhere : Shevaroy, Tamil Nadu ; Anaimalais & Nilgiris, Western Ghats.

Remarks : The species is recorded for the first time from Andhra Pradesh.

Status : A widely distributed SE. Asian species occurs as a ground gecko in the hill forest of South India.

Family 7. : AGAMIDAE

Key to the genera of the family AGAMIDAE

1. Body depressed	...	...	...	...	<i>Psammophilus</i>
Body not depressed	...	...	...	...	2.
2. Dorsal crest present, five toes only	...	...	...	...	<i>Calotes</i>
Dorsal crest absent, four toes only	...	...	...	...	<i>Sitana</i>

Genus 13. *Sitana* Cuvier, 1829.22. *Sitana Ponticeriana* Cuvier
(Fan-Throated lizard)1829. *Sitana ponticeriana* Cuvier, *Regne Anim* 2nd ed. 2 : 43

Material examined : 165 ex. collected from different districts as follows : Adilabad Dist. : 3 ex. Idkal ; Birsai pet. Anantapur Dist. : 2 ex., In and around Anantapur. Cuddapah Dist. : 2 ex., Rajampeta. Guntur Dist. : 29 ex., collected from Pullareddygudam ;

Eddenmotu hills, and Fringimotu, Macherla ; *Khammam Dist.* : 1 ex., in and around *Khammam*, *Karimnagar Dist.* : 12 ex., collected from Cincela ; Manthani ; Mahadevpur ; Malapalli. *Kurnool Dist.* : 2 ex., Mahani. *Mahbubnagar Dist.* : 13 ex., collected from Macharam ; Mannanur ; Kowakart ; Kargi ; Korangal ; Manik. *Nalgonda Dist.* : 53 ex., collected from Deverkonda ; Nandi Konda Valley ; Vijaypuri South ; Madhavram Vill ; Nagarjuna Sagar ; in and around Nalgonda town. *Nellore Dist.* : 15 ex. collected from Bata and in and around Nellore town. *Nizamabad Dist.* : 5 ex., Melapalli ; in and around Nizamabad town. *Prakasam Dist.* : 18 ex., collected from Darsi ; in and around Poddile. *Srikakulam Dist.* : 4 ex., collected from Razam ; Donubai ; in and around Srikakulam town. *Visakhapatnam Dist.* : 1 ex., in and around Visakhapatnam town. *Vizianagram Dist.* : 5 ex. collected from Parbatipuram ; Bhadrakiri ; in and around Vizianagram town. All collected during the year 1962 to 1988 collected by BN and INM ; AKM ; HSP ; RH ; RR.

Measurements : Snout to vent 15-43 mm. Tail 30-100 mm.

Diagnostic character : A small lizard, easily distinguished by the presence of only four as against five toes in all other agamids. No dorsal crest. Tail very long. Male with a gular pouch. Dark brown dorsally with a vertical series of dark brown, black edged, rhomboidal spots on the back. Majority of the specimens under study have a distinct vertebral line which divides the spots on the back. The ventral side is whitish.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : The whole of India and Sri Lanka.

Remarks : It inhabits all biotopes except the heavy rainfall forests and deserts. The preferred habitat is rocky terrain, scrubby jungles and sandy country.

Status : Common.

Genus 14. *Calotes* Rafinesque, 1815.

23. *Calotes versicolor* (Daudin)

(Common Garden Lizard or Blood Sucker) Telegu name : Thota balli

1802. *Agama versicolor* Daudin, *Hist. Nat. Rept.* 3 : 395.

1853. *Calotes versicolor*, Jerdon, *J. Asist. Soc. Beng.* 22 : 470.

Material examined : 154 ex., collected from different districts as follows : *Adilabad Dist.* : 13 ex., collected from Birsepet ; Mamid ; Kotapally ; Kaddam. *Anantapur Dist.* : 2 ex., collected from Goly ; in and around Anantapur town. *Cuddapah Dist.* : 31 ex., collected from Razempeta ; Kangumadugh ; Bolapalli. *East Godavari Dist.* : 2 ex., in and around East Godavari town. *West Godavari Dist.* : 4 ex., collected from Elura ; Koyyalagudem. *Guntur Dist.* : 10 ex., collected from Pullareddygudem ; Macherla town, *Hyderabad Dist.* : 1 ex., Ibrahimpalam. *Karimnagar*

Dist. : 2 ex., collected from Sircella ; Metapally. *Khammam Dist.* : 6 ex., collected from Kottagudem ; in and around Khammam town. *Krishna Dist.* : 2 ex., collected from Mylararam ; Machilipatnam. *Mahbubnagar Dist.* : 9 ex., collected from Macharm ; Mannanur. *Medak Dist.* : 2 ex., Pocharam Wild Life Sanctuary. *Nalgonda Dist.* : 48 ex., collected from Tiger valley ; Deverkonda town ; Vijaypuri South ; Azampur vill. ; Rayaram vill. ; Suryaraopet vill. ; Madhavram vill. ; Nidigul vill. ; Yelleshwaram vill. ; Nandikonda valley and Choutuppal. *Nellore Dist.* : 4 ex., collected from Bata and in and around Atmakur town. *Nizamabad Dist.* : 1 ex., Komarredi ; *Prakasam Dist.* : 4 ex., in and around Podili town. *Srikakulam Dist.* : 3 ex., collected from Dunubali ; Rezam. *Vizianagram Dist.* : 8 ex., collected from Bhadrageiri ; Sehanipalla ; Babbuli. *Warangal Dist.* : 6 ex., collected from Mulug ; Pallimppalli ; Rangaradpalli. All collected during the year 1929 and 1962-88. Collected by AKS ; DPS ; AKM ; BN ; INM ; NM ; HSP.

Measurements : Snout to vent 25-110 mm. Tail 45-250mm.

Diagnostic character : Head is oval and body is laterally compressed. Dorsal scales strongly keeled and more or less larger than ventrals. Two distinct spines on each side of head behind tympanum. Dorsonuchal crest well developed extending from nape to above vent in the male. Tail long and rounded. Juveniles with light dorsolateral stripes which enclose transverse black spots. Adult greyish brown above with dark transverse bars, Belly whitish, with dark streaks. Tail with dark brown cross bars. Head and shoulders of males turn orange or scarlet red. It exhibits considerable colour variation.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : widely distributed throughout the Indian subcontinent and most of SE Asia.

Remarks : An arboreal, diurnal lizard of gardens, hedges, scrubland and forest.

Status : The commonest lizard of India.

Genus 15. *Psammophilus* Fitzinger, 1843.

Key to the species of genus PSAMMOPHILUS

115 to 150 scales round the middle of the body	...	...	...	<i>Dorsalis</i>
80 to 100 scales round the middle of the body	...	...	...	<i>Blanfordianus</i>

24. *Psammophilus dorsalis* (Gray) (Peninsular Rock Agama)

1831. *Agama dorsalis* Gray, in Griffith's *Anim. King.* 9 : 56.

1935. *Psammophilus dorsalis* Smith, *Fauna Brit. Ind.* 2 : 210.

Material Examined : 7 ex., collected from different districts as follows : *Anantapur Dist.* : 1 ex., Kolasamurdamkadri. *East Godavari Dist.* : 3 ex., Muredemully. *Cuddapah Dist.* ;

2 ex., Kutteryela giri. Nalgonda Dist. : 1 ex. Vijaypuri South. All collected during the year 1929, 1962 and 1986. Collected by AKS ; HSP ; BN ; INM.

Measurements : Snout to vent 65-85 mm. Tail 125-146 mm.

Diagnostic Character : Body depressed and covered, with small, feebly keeled scales ranging in count from 115 to 150. Head rather large, elongate and depressed. A deep fold on either side of the neck which unite across the throat. Tail long and slender. Young and females are olive brown above with a distinct series of white elongated spots on the back. Adult male brownish retaining only the traces of whitish spots. The underside is yellowish.

Distribution : Andhra Pradesh : as mentioned in the material, Elsewhere : Hills of Southern India.

Remarks : It is an agile and wary diurnal lizard, darting into rock crevices of the least sign of danger. It lives upon insects.

Status : Common.

25. *Psammophilus blanfordanus* (Stoliczka)

1871. *Chersasia blanfordana* Stoliczka, *P. Asiat. Soc. Beng.* : 194.

1935. *Psammophilus blanfordanus* Smith, *Fauna Brit. Ind.* 2 : 210.

Material examined : 66 ex., collected from districts as follows : Anantapur Dist. : 2 ex., collected from Kolasomudram ; Kodri. Guntur Dist. : 2 ex., Nagarjuna hill. Karimnagar Dist. : 4 ex., collected from Manthani. Khammam Dist. : 1 ex., in and around Khammam town. Mahbubnagar Dist. : 23 ex., collected from Kargi ; Korangal ; Mannanur ; Marik, in and around Mahbubnagar town. Nalgonda Dist. : 11 ex., collected from Deverkonda. ; Mirialuguda. Nellore Dist. : 5 ex., collected from Kashmur ; Sarbapally ; in and around Atmakur town. Nizamabad Dist. : 2 ex., Armur. Prakasam Dist. : 1 ex., Doranala. Srikakulam Dist. : 7 ex., collected from Antigonda ; Dhonubai ; in and around Srikakulam town. Visakhapatnam Dist. : 5 ex., collected from Anantagiri ; Mudhugulu ; in and around Visakhapatnam town. Vizianagram Dist. : 1 ex., Bhadravari. All collected during the year 1962-88. Collected by AKS ; BN ; DPS ; SSS.

Measurements : Snout to vent 22-85 mm. Tail 55-160 mm.

Diagnostic character : Size small. Dorsal scales slightly larger, keeled and imbricate, arranged in 80 to 100 rows round the midbody ; flank with a few scattered and a little larger series of scales. Young and females olive-brown marbled or with flecks of brown ; a series of large, lozenge-shaped dark brown spots on the back and tail which fade out with age. Adult coloured like *dorsalis*.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : Bihar, Orissa, Madhya Pradesh, Eastern Ghats and Kerala.

Status : Common.

Family 8. CHAMAELEONIDAE

Genus 16. *Chamaeleo* Laurenti, 1768.

26. *Chamaeleo zeylanicus* Laurenti (Indian Chameleon)

1768. *Chamaeleo zeylanicus* Laurenti, *Syn. Rept.* : 46.

Material examined : *Chittor Dist.* : 2 ex., collected from Panapakkam and Palamanthur, 15, 30.viii. 1964 (Coll. KR).

Measurements : Stout to vent 160 mm. Tail 200 mm.

Diagnostic character : Body laterally compressed. A conical casque on top of the head. Body covered with granular scales. A prominent canthal and supraorbital crest, the latter continued backwards as a ridge of enlarged tubercles along the side of the head and then curved upwards to meet the parietal crest ; no rostral appendages. Eyes large and except for a small aperture for the pupil, covered by the granular, scaled, lid. Tympanum absent. Tongue very extensile and club-shaped at the tip. The digits of the hand in two opposed sets, two directed away from and three towards the body. The number is reversed in the arrangement in the foot. Tail prehensile. The colour in life is green, varying in shade from very pale green to almost black. Tail often banded.

Distribution : *Andhra Pradesh* : (First record) as mentioned in the *material*. Elsewhere : Distributed throughout the Indian Peninsula south and west of the Ganges. The western distribution extends upto to Peshawar in Pakistan. Also Sri Lanka.

Remarks : It is arboreal and prefers wooded areas and is uncommon in very heavy rainfall regions. The species is recorded for the First time from Andhra Pradesh.

Status : Uncommon.

Family 9, SCINCIDAE

Key to the genera of the family SCINCIDAE

1. Palatine bones meeting on the mid-line of the palate	...	...	...	2.
Palatine bones not meeting on the mid-line of the palate	...	...	...	4.
2. Pterygoid bones separated from one another, the palatal notch reaching forwards to the level of the centres of the eyes	...	...	...	...
Pterygoid bones not separated from one another, the palatal notch reaching forwards to the	...	...	...	<i>Mabuya</i>

	level of the centres of the eye	...	...	...	...	...	3,
3.	Supranasals present	...	...	...	...	...	<i>Rtopa</i>
	Supranasals absent	...	...	...	...	...	<i>Lygosoma</i>
4.	Limbs vestigial ; top of head with 4 azygous shields	...	...	...	...	...	<i>Sepsophis</i>
	Limbs absent ; top of head with a large azygous shields	...	...	...	...	...	<i>Barkudia</i>

Genus 17. *Mabuya* Rafinesque, 1815

Key to the species of genus MABUYA

1.	Fronto-nasal broader than long	...	...	...	...	...	2.
	Fronto-nasal not broader than long	...	...	...	...	...	<i>Macularia</i>
2.	One pair of nuchals	...	...	...	...	...	<i>Carinata</i>
	Three pair of nuchals	...	...	...	...	...	<i>Nagarjuni</i>

27. *Mabuya carinata* (Schneider) (Common or Brahminy Skink)

1801. *Scincus carinatus* Schneider, *Hist. Amph.* 2 : 182.

1935. *Mabuya carinata* Smith, *Fauna Brit. Ind.* 2 : 266-268.

Material examined : 27 ex. collected from different districts as follows : *Adilabad Dist.* : 5 ex., collected from Birsapet ; Itkal ; in and around Adilabad town. *Guntur Dist.* : 3 ex., collected from Pollareddygudem ; Eddenmotu hills. *Kurnool Dist.* : 1 ex., Mahanadi temple. *Mehbubnagar Dist.* : 1 ex., Mannanur. *Nalgonda Dist.* : 4 ex., collected from Vijaypuri South ; Pindlipakula vill., *Nellore Dist.* : 1 ex., In and around Atmakur town. *Nizamabad Dist.* : 1 ex., in and around Nizamabad town. *Prakasam Dist.* : 5 ex., collected from Darsi ; Srisailam ; in and around Podile town. *Srikakulam Dist.* : 2 ex., in and around Srikakulam. *Visakhapatnam Dist.* : 1 ex., in and around Visakhapatnam town. *Vizianagram Dist.* ; 1 ex., in and around Vizianagram town. *West Godavari Dist.* : Machilipatnam. *Warangal Dist.* : 1 ex., Mulug. All collected during the year 1962-88. Collected by AKS ; AKM ; BN & INM ; DPS & BDG.

Measurements : Snout to vent 23-100 mm ; Tail 33-135 mm.

Diagnostic character : Head with enlarged scales arranged symmetrically one pair of nuchals. Dorsal and lateral scales subequal, with 3 or 5 distinct keels, the three median keels are strongly marked. 30-34 scales round the middle of the body. Digits moderately long, with smooth or obtusely keeled lamellae, from 14-18 under the fourth toe. Young dark bronze above with a yellow lateral band from snout to base of tail. Adults light bronze above with four to six rows of black dots on the back. Flanks darker. A light band from behind the eye to the base of the tail. Upper lip white. Lower parts white or yellow.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : Widely distributed in the Indian Peninsula but rare or absent in NW. India.

Remarks ; A diurnal lizard and almost a commensal of man.

Status : This is the commonest and best known of Indian skinks.

28. *Mabuya macularia* (Blyth) (Bronze Grass Skink)

1853. *Euprepes macularius* Blyth, J, *Asiat. Soc. Beng.* 22 : 652.

1887. *Mabuia macularia* Boulenger, *Cat. Liz. Brit. Mus.* 3 : 182.

1935. *Mabuya macularia* Smith, *Fauna Brit. Ind.* 2 : 264-266.

Material examined : 26 ex. collected from different districts as follows : *Adilabad Dist.* : 5 ex., collected from Itkal. *Karimnagar Dist.* : 1 ex., collected from Manthani. *Khammam Dist.* : 5 ex., collected from Tellandu ; in and around Kuttagudem town. *Kurnool Dist.* : 1 ex., 2 Km west of Mahanadi. *Mahbubnagar Dist.* : 1 ex., Mannur. *Srikakulam Dist.* : 5 ex., collected from Rajam ; Donubai. *Vizianagram Dist.* : 8 ex., collected from Bhadravari ; Bobbili. All collected during the year 1979 to 1987. Collected by AKM ; DPS.

Diagnostic character : Head small snout short, not depressed ; eye small. Fronto-nasal not broader than long ; ear opening oval, slightly smaller than eye. 6 or 7 upper and 7 lower labials. 28 to 30 rows of scales round the body. Dorsal scales with 5 to 7 low keels ; lateral scales smooth, 12 to 17 lamellae under the fourth toe. Tail round. The colour pattern of this species varies. The general body-colour is brown with or without spots.

Mesurements : Snout to vent 22-58 mm, Tail 35-88 mm.

Distribution : *Andhra Pradesh* : (First record) as mentioned in the *material*. Elsewhere : Its range of distribution from Laos and Cambodia to northern Malaya and west through most of Myanmar (Burma), India and Sri Lanka to southern Baluchistan.

Remarks : It is a shy and sinuous lizard and inhabits grassland and edges of cultivated fields. The species is recorded for the first time from Andhra Pradesh.

Status : It is common in the forested areas of the Peninsula.

29. *Mabuya nagarjuni* Sharma (The Nagarjuni lizard)

1969. *Mabuya nagarjuni* Sharma, *Bull. Syst. Zool.*, Calcutta, 1 (2) : 71-75.

Material examined : *Guntur Dist.* : 4 ex., Vijayapuri South, 23-28. vii. 1962 (Coll. BN & INM). *Mahbubnagar Dist.* : 2 ex., Kowakurt ca. 40 km East of Mahbubnagar, 23.1.1988 (Coll. DPS).

Measurements : Total length 120-172 mm. Standard length 21-73 mm.

Diagnostic character : Supranasals not in contact with one another, being separated by fronto nasal ; frontonasal square in shape ; Prefrontal not in contact with one another ; three pairs of nuchals : postnasal present ; Dorsal scales with 5 to 7 keels ; 16-22 lamellae beneath fourth toe.

Distribution : *Andhra Pradesh* : as mentioned in the *material*.

Remarks : Sharma (1969) described it as a new species from the material collected in the years 1962-63 from Nagarjunasagar project area. Some material was collected from Mahbubnagar dist. So, the present range of its distribution extends further south of its known range.

Status : Indeterminate

Genus 18. *Lygosoma* Hardwicke & Gray, 1827

30. *Lygosoma punctata* (Gmelin) (Dotted Garden Skin)

1799. *Scincus punctatus* Gmelin, *Hist. Amph.* : 197.

1835. *Riopa punctata* Smith, *Fauna Brit. Ind.* 2 : 318-319.

1977. *Lygosoma punctata* Green, *J. Nat. Hist.* 11 : 515.

Material examined : 8 ex. collected from different districts as follows : *Guntur Dist.*, : 3 ex., Eidenmotu Hill ; Macherla town. *Nalgonda Dist.* : 2 ex., Nandikonda valley. *Nizamabad Dist.* : 1 ex., Stn. 3 in and around Nizamabad town. *Cuddapah Dist.* : 2 ex., Razampeta. All collected during the year 1929 ; and 1962-1983. Collected by BN & INM ; KR ; DPS ; HSP.

Diagnostic character : A small and slender skink. Snout obtuse ; supranasals entire, in contact with one another behind the rostral : frontal longer than the fronto-parietals and interparietal together ; a pair of nuchals, rarely absent. legs vestigial. Lower eyelid with a transparent disc. Young with two prominent yellowish dorso-lateral streaks. The dark basal spots on the back are united with each other and from 6 longitudinal lines down the back. The pattern, however, breaks up with age. Tail scarlet red in young which also fades with age.

Measurements : Total length, 47-92 mm. Standard length 25-28mm.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : Widely distributed in India ; found usually in hilly country at low altitude.

Remarks : It spends most of its life underground. Its habits are little known,

Status : Common.

Genus. 19. *Riopa* Gray, 1839.Key to the species of genus *RIOPA*

Ear opening with 1 or 2 minute lobules on anterior margin	...	...	<i>Albopunctata</i>
Ear opening with 3 or 4 minute lobules on anterior margin	...	...	<i>Ashwamedhi</i>

*31. *Riopa albopunctata* Gray

1846. *Riopa albopunctata* Gray, *Ann. Mag. Nat. Hist.* 18 : 430.

1935. *Riopa albopunctata* Smith, *Fauna Brit. Ind.* 2 : 316.

Material examined : Material not available. Description based on the literature.

Description : An elongated, snake-like slender skink with feeble five-toed limbs. Lower eyelid scaly, two or three central scales often much larger than the others; nuchals indistinct. Ear opening with 1 or 2 minute lobules on anterior margin. Bodyscales subequal or the dorsals a little larger than the laterals. 12 to 15 lamellae under the fourth toe. Tail thicker at the base. Brown or reddish-brown above, each scale with a distinct dark spot, forming longitudinal series. Yellowish white below.

Distribution : *Andhra Pradesh* : Godavari district. Elsewhere : Bihar, Madhya Pradesh ; Orissa ; Uttar Pradesh, West Bengal ; Assam. Also Nepal.

Status : Indeterminate.

32. *Riopa ashwamedhi* Sharma
(Ashwamedhi Lizard)

1969. *Riopa ashwamedhi* Sharma, *Bull. Syst. Zool.* Calcutta, 1 (2) : 71-75.

Material examined : 7 ex., as follows ; *Guntur Dist.* : Pullareddygudem, 30. vii. 1962 ; Eddenmotu and Fringimotu Hills, 1. ix. 1962 ; Macherla town, 15. ix. 1962 (Coll. BN & INM) *Nalgonda Dist.* : Vijaypuri North 8. vii. 1962, Vijayapuri South, 22 and 23. vii. 1962. (Coll. BN & INM).

Diagnostic character : Distance between axilla and groin $1\frac{1}{2}$ times the distance between tip of snout and fore-limb. Lower eyelids scaly, central scales of the lid much enlarged and thin. Frontal scale shorter than fronto-parietals and interparietal together. Scales bordering outer margins of parietals equal. Ear opening with 3 or 4 minute lobules on anterior margin. 28 to 32 scales round the body. 13 to 15 lamellae under fourth toe.

Measurements : Total length, 52-91 mm. ; Standard length, 20-32 mm.

Distribution : *Andhra Pradesh* : as mentioned in the material.

Remarks : Sharma (1969) described as new species from the material collected in the years 1962-63 from Nagarjunasagar Project area.

Status : Indeterminate.

Genus 20. *Sepsophis* Beddome, 1870.

*33. *Sepsophis punctatus* Beddome

1870. *Sepsophis punctatus* Beddome, *Madras Month. J. Med. Sci.* : 172.

1835. *Sepsophis punctatus* Smith, *Fauna Brit. Ind.* 2 : 353-354.

Material examined : No material was available. Description based on the literature.

Description : Snout bluntly pointed, rostral large ; laterally in contact with nostril ; supranasals large, in contact with one another and with the first and second labials ; fronto-nasal broader than long. Limbs vestigial ; top of head with 4 azygous shields. Lower eyelid composed of 3 or 4 opaque scales. 6 upper labials, the 4th below the eye. smooth scales round the middle of the body. Light brown above, with two series of black spots which about the middle of the body are continued as lines ; on the tail there are four lines. Sides of head and body black, whitish below, more or less thickly spotted with dark brown.

Distribution : *Andhra Pradesh* : Godavari valley.

Status : Rare.

Genus 21. *Barkudia* Annandale, 1917.

34. *Barkudia insularis* Annandale

1917. *Barkudia insularis* Annandale, *Rec. Ind. Mus.*, 13 : 20.

Material examined : *Visakhapatnam Dist.* : 1 ex., Waltair, 17. viii, 1954. (Coll. PNG).

Diagnostic character : Body much elongate, snout depressed, obtusely pointed. 21 smooth scales round the middle body, limbs absent ; top of head with 3 large azygous shields. 3 supraoculars, nasal shield comparatively large. 1 large loreal. Lower eyelid having 2 or 3 opaque scales. Upper lid vestigial. 4 upper labials, the 3rd below the eye. Colour light brown above with a central dot on each dorsal scale. Lower parts whitish. Top of head coloured with brown.

Distribution : *Andhra Pradesh* : as mentioned in the material.

Remarks : It lives buried in the sub-soil.

Status : Rare.

Family 10. LACERTIDAE

Key to the genera of the family LACERTIDAE

Lower eyelid distinct from the upper	...	...	...	...	<i>Cabrita</i>
Lower eyelid fused with the upper	...	...	...	...	<i>Ophisops</i>

Genus 22. *Cabrita* Gray, 1838.

Key to the species of genus CABRITA

Anterior labials ridged ; occipital scale present ; 42-50 scales round the middle of body	...	...	...	...	<i>Leschenaulti</i>
Anterior labials not ridged ; occipital scale absent ; 26-30 scales round the middle of body	...	...	...	...	<i>Jerdoni</i>

35. *Cabrita jerdoni* Beddome

(Beddome's cabrita lizard)

1870. *Cabrita jerdoni* Beddome, *Madras Month. J. Med. Sci.* : 34,

Material examined : 29 ex., collected from different districts as follows : *Anantapur Dist.* : 1 ex., Stn. 10. Gooty. *Kurnool Dist.* : 1 ex., Stn. 13. Forest ca. 3 km. W. of Mahanadi temple. *Nalgonda Dist.* : 10 ex., collected from Vijaypuri South. *Nellore Dist.* : 1 ex., in and around Atmakur town. *Nizamabad Dist.* : 1 ex., Stn. 4. Kamarpally 40 km. E. of Armur. *Prakasam Dist.* : 6 ex., collected from Darsi, in and around Podili town. *Vizianagram Dist.* : 9 ex., collected from Tummalabirilu ; Bobbile ; in and around Vizianagram town. All collected during the year 1929 and 1962 to 1986. Collected by AKS ; DPS ; BN & INM ; HSP.

Measurements : Snout to vent 16-40 mm. Tail 25-70 mm.

Diagnostic character : Upper head-shields coarsely striated. Nostril between a large anterior and two small posterior nasals. Anterior labials not ridged ; occipital scale absent ; 26-30 scales round the middle of body. 11-15 femoral pores. Colour brownish or golden above with two lateral stripes, the upper much more conspicuous than the lower and is bordered with a longitudinal series of black spots, lips and throat speckled with black.

Distribution : *Andhra Pradesh* : as mentioned in the material. Elsewhere : Northern and Central India.

Status : Common.

36. *Cabrita leschenaulti* Milne-Edwards
(Leschenaulti's cabitra)

1829. *Cabrita leschenaultii* Milne-Edwards, *Ann. Sci. Nat. Paris*, 16 : 80 & 86.

1935. *Cabrita leschenaulti* Smith, *Fauna Brit. Ind.* 2 : 374-375.

Material examined : Guntur Dist. : 4 ex. Pullareddyguddem village, 28. vii. 1962. (Coll. BN & INM). Nagarjuna Hill, 2. x. 1963. (Coll. BN). Srikakulam Dist. : 2 ex., Tummalabailu, Palkonda Hill. Collected in the year 1933. (Coll. HSP).

Measurements : Total length, 129-150 mm ; Standard length, 41-45 mm.

Diagnostic character : Head covered with symmetrical shields ; dorsal scales keeled and imbricate while the ventrals are smooth and imbricate. Anterior labials ridged ; occipital scale present ; 42-50 scales round the middle of body. Lower eyelid large and distinct from the upper eyelid. Tail cylindrical. 12 to 16 femoral pores on each side. Dorsally colour is brownish yellow and whitish ventrally. The dorsum is having two white lateral bands, the interval between the two bands being black or green.

Distribution : Andhra Pradesh : as mentioned in the material. Elsewhere : The Peninsula of India and Sri Lanka.

Remarks : Murthy (1986) recorded 7 examples first time from Kurnool district.

Status : Common in the open dry jungles of the Peninsula.

Genus 23. *Ophisops* Menetries, 1832

37. *Ophisops jerdoni* Blyth
(Snake-Eyed Lacerta)

1853. *Ophisops jerdoni* Blyth, *J. Asiat. Soc. Beng.* 22 : 653.

1935. *Ophisops jerdoni* Smith, *Fauna Brit. Ind.* 2 : 377-378.

Material examined : 52 ex., collected from different districts as follows : Adilabad Dist. : 1 ex., Mamid. Guntur Dist. : 30 ex., collected from Pullareddygudem village ; Edlenmotu Hill ; Nagarjuna Hill ; Macherla town. Mahbubnagar Dist. : 5 ex., collected from Mannanur ; Marik. Nalgonda Dist. : 16 ex., collected from Tiger valley ; Nandikonda valley ; Deverkonda town ; Vijaypuri South. All collected during the year 1962-1988. Collected by BN & INM ; DPS.

Measurements : Snout to vent 18-28 mm. Tail 25-48 mm.

Diagnostic character : Ear opening oval, a little smaller than eye ; gular fold weakly developed, bordered by scales of irregular size ; scales of crown rugose : occipital well developed, in contact with interparietal ; dorsal scales keeled, imbricate 28 to 35 scales round the middle of the body. Preanal plate is large. 7 to 12 femoral pores on each

side. Colour dark olive above and whitish below. Two lemon coloured stripes on the flanks which enclose dark transverse bars in the middle zone of the back.

Distribution : Andhra Pradesh : as mentioned in the *material*. Elsewhere : The range extends from the Northwest Frontier Provinces in Pakistan and through most of Northern and Central India to Southern India.

Remarks : It is secretive and diurnal in habits. It is an extremely agile creature and very difficult to catch one.

Status : A widely distributed species.

Family 11. VARANIDAE

Genus 24. *Varanus* Merrem, 1820.

38. *Varanus bengalensis* (Daudin)

(Common Indian Monitor) Telegu name : Ooder.

1802. *Tupinambis bengalensis* Daudin, *Hist. Nat. Rept.* 3. : 67,

1835. *Varanus bengalensis* Boulenger, *Cat. Liz. Brit. Mus.* 2 : 310.

Material examined : 4 ex., collected from different districts as follows : *Godavari Dist.* : 1 ex., Godavari, 10. xi. 1971. (Coll. WTB). *Guntur Dist.* 1 ex., Nagarjuna Hill, 2. ix. 1962 (Coll. BN). 2ex., Pullareddygudem village. 7. ix. 1963. (Coll. BN & INM).

Measurements : Total length, 76-135 mm ; Standard length 33-40 mm.

Diagnostic character : Head long and narrow ; snout pointed. Head covered with small scales ; body scales granular ; limbs strong ; neck long and mobile ; tail laterally compressed ; midbody scale rows 132-176 ; no femoral pores. Young and adult differ in colouration. Young dark olive above with numerous light spot or ocelli alternating with dark bars and whitish on the undersides with narrow dark transverse bars sometimes broken up into spots. Adult brownish or olive above with blackish dots on the back ; lower parts yellowish molted with black.

Distribution : Andhra Pradesh : as mentioned in the *material*. Elsewhere : Throughout India, Myanmar (Burma), Nepal, Pakistan, Iran and Southern Uzbekistan.

Remarks : A diurnal lizard and more active in the mornings and evenings. Found both in the remote forests as well as on the outskirts of the villages.

Status : Protected under Schedule I of Indian Wild life Act, 1972.

Suborder (iii) SERPENTES

Family 12. TYPHLOPIDAE

Key to the genera of Family TYPHLOPIDAE

Nasal suture terminating at the edge of preocular	...	...	...	<i>Ramphotyphlops</i>
Nasal suture not terminating at the edge of preocular	...	...	...	<i>Typhlops</i>

Genus 25. *Ramphotyphlops* Fitzinger, 1943.39. *Ramphotyphlops braminus* (Daudin)
(Common Blind Snake)1803. *Eryx braminus* Daudin, *Hist. Nat. Rept.* 7 : 279.1890. *Typhlops braminus* Boulenger, *Fauna Brit. India.* : 236,1943. *Ramphotyphlops braminus* Fitzinger, *Bull. Zool. Nomencl.* (3/4) : 204-207.

Material examined : 41 ex., collected from different districts as follows : *Guntur Dist.* : 20 ex., collected from Nagarjuna Hill, 5 and 28. vii. 1962. (Coll. BN). Pullareddygudem village, 27. viii-14. xi. 1963 ; Eddenmotu and Fringimotu Hills, 2-8. ix. 1962 ; Macherla town, 12. ix. 1962, (Coll. BN & INM). *Karimnagar Dist.* : 1 ex., Manthani, 7. ix. 1984. (Coll. DPS & BDG) *Nalgonda Dist.* 20 ex., collected from Nandikond valley, 7-11. viii. 1962, (Coll. BN & INM). Madhavram village, 10. x. 1963 ; Yelleswharam village, 2. xi. 1963. (Coll. BN).

Measurements : Total length, 128-133 mm ; Standard length 125-130 mm.

Diagnostic character : Head bluntly rounded. Eyes indistinct. Rostral large, snout rounded ; 4 upper labials, last two in contact with ocular. Nasal suture terminating at the edge of preocular. Body uniformly cylindrical. Tail very short ending in a small sharp stiff point. Scales lightly polished. 20 scales round the body. Colour brown or blackish brown above lighter below ; snout, anal region and end of tail pale.

Distribution : *Andhra Pradesh* : as mentioned in the material. Elsewhere : Throughout the Oriental region, Africa, Mexico, and New Guinea. Introduced by human agency in several island of the Pacific.

Remarks : Lives beneath the soil, or stones or debris. They have also been found in floodplain forest under logs and stones. Often seen inside houses.

Status : The most widespread species of the genus.

Genus 26. *Typhlops* Dumeril and Bibron, 1844.

Key to the species of the genus TYPHLOPS

Snout rounded, nostril lateral, 18 scales round the body	...	...	...	<i>Beddmei</i>
Snout pointed, nostril not lateral, 28-34 scales round the body	...	...	...	<i>Acutus</i>

40. *Typhlops acutus* Dumeril and Bibron.
(Beaked worm or Blind snake)

1844. *Onychocephalus acutus* Dum. & Bibr. *Erp. Gen.* 6 : 333.

1890. *Typhlops auctus* Boulenger, *Fauna Brit. Ind.* : 241.

Material examined : Guntur Dist. : 1 ex., Nagarjuna Hill, 9. ix. 1962. (Coll. BN)

Measurements : Total length 345 mm ; Standard length 342 mm.

Diagnostic character : Snout pointed and hooked, projecting with sharp horizontal edge ; nostril inferior. Rostral very large, covering most of the head above. 23-34 scales round the body. colour brownish above, paler below, each scale with a paler centre.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : Peninsular India, south of the Gangetic plain and south of Rajasthan, west to Gujarat and east to Calcutta (West Bengal), but rarer south of latitude 16° N.

Remarks : The largest of all the Oriental species of *Typhlops*.

Status : Indeterminate.

*41. *Typhlops beddomei* Boulenger

1890. *Typhlops beddomei* Boulenger, *Fauna Brit. Ind.* 237,

1943. *Typhlops beddomei* Smith, *Fauna Brit. Ind.* 3 : 54-55,

Material examined : Material not available. Description based on the literature.

Description : Snout rounded, strongly projecting ; nostril lateral. Nasal divided ; posterior nasal very large ; supraocular twice as broad as long. Eye distinct ; tail ending in a point. 18 scales round the body ; 190-200 transverse rows of scales. Colour brown above, pale below ; snout and anal region whitish.

Distribution : *Andhra Pradesh* : (Likely to occur). Elsewhere : Hills of Southern India.

Remarks : Smith (1943) mentioned that 4 specimens collected by Col. Beddome from the Kimeddy Hills, Visakhapatnam district.

Status : Indeterminate.

Family 13. UROPELTIDAE

Genus 27. *Uropeltis* Cuvier, 1829.

*52. *Uropeltis ellioti* (Gray)
(Elliot's shield tail)

1858. *Siluboura ellioti* Gray, *Proc. Zool. Soc. Lond.*, 262.

1890. *Siluboura ellioti* Boulenger, *Fauna Brit. Ind.* : 265.

1943. *Uropeltis ellioti* Smith *Fauna Brit. Ind.* 3 : 75-76.

Material examined : Material not available. Description based on the literature.

Description : Snout acutely pointed ; rostral separating the nasals for most of their length. 17 scales round the body. Ventrals 144-176, subcaudals 5-11. Tail obliquely truncate, not perfectly flat. Terminal scute large and depressed, with small tubercles above. Colour dark brown with or without small yellow spots above and larger ones below ; a yellow line on each side of the neck ; tail with a yellow stripe on each side united together with a cross bar in the anal region.

Distribution : *Andhra Pradesh* : (likely to occur). Elsewhere : Hills of Peninsular India. Western Ghats south of the Goa Gap to Tinnevely. Eastern Ghats.

Remarks : Inhabits the moist soft soils of dense forests.

Status : Indeterminate.

Family 14. BOIDAE

Key to the genera of Family BOIDAE

A supraorbital bone ; teeth on the premaxilla ; head covered with large shields ; labials pitted...	<i>Python</i>
No supraorbital bone ; No teeth on the premaxilla ; head covered with small shields ; labials not pitted	 <i>Eryx</i>

Genus 28. *Python*, Daudin, 1803.

*43. *Python molurus molurus* (Linnaeus)

(Indian Python ; Rock Python) Telegu name Pedda poda.

1758. *Coluber molurus* Linnaeus, *Syst. Nat.* 10th ed., : 225,

1890. *Python molurus* Boulenger, *Fauna Brit. Ind.* : 246.

1943. *Python molurus molurus* Smith, *Fauna Brit. Ind.*, 3 : 106-109.

Material examined : Material not available. Description based on literature.

Description : Head flattened with a long snout ; neck distinct. Head covered with large shields ; labials pitted. Nostrils large, directed upwards and situated high on the snout. Rostral and first two labials with sensory pits. Eyes small, pupil vertical, iris flecked with gold. Chin with mental groove. Tail short and prehensile tapering abruptly. Colour greyish, whitish or yellowish in adults and in the young often a very pretty shade of pink. A dark streak from eye to nostril in young may or may not be present in adult. A conspicuous dark, oblique band, from eye to nape. On the back of head and the nape is a large lance shaped mark with a pale centre often fading

anteriorly in adult. The body with a series of large, roughly quadrate patches from neck to tail dorsally.

Distribution : *Andhra Pradesh* : (Likely to occur). Elsewhere : The range of the nominate subspecies is confined to Peninsular India to the extreme limit of Sind and the Punjab in the north-west and to Bengal in the north-east. Also Sri Lanka.

Remarks : These big snakes inhabit in dense as well as in open forests with rocky outcrops near to marshes or streams.

Status : Protected under Schedule I of India Wild life Act., 1972.

Genus 29. *Eryx*, Daudin, 1803.

Key to the species of the genus ERYX

Mental groove present ; tail blunt	...	...	...	...	<i>Johni Johni</i>
Mental groove absent ; tail pointed	...	...	...	...	<i>Conicus</i>

44. *Eryx conicus* (Schneider)

(Russell's Sand Boa) Telegu name : Mondhi Ponda.

1801. *Boa conica* Schneider, *Hist. Amphib.* 2 : 268.

1893. *Eryx conicus* Boulenger, *Cat. Sn. Brit. Mus.* 1 : 124.

Material examined : *Nalgonda Dist.* 1 ex., Tiger valley ca. 4 km. SE of project house, Nagarjuna Sagar 5. vii. 1963. (Coll. BN).

Measurements : Total length 380 mm. Standard length 345 mm.

Diagnostic Character : Head slightly distinct from neck. Rostral about twice as broad as high, visible from above, without angular horizontal edge. Mental groove absent. Nostril slit like, between the two nasals and the internasals ; only these scales enlarged, the rest of the head covered with small, obtusely keeled scales, 8 to 10 scales across the forehead between the eyes ; 10 to 15 scales round the eye. Upper labials 11-13 ; lower labials 14-17 ; Body robust, cylindrical tapering abruptly just anterior to vent ; tail very short and bluntly pointed ; dorsal scales keeled. Colour yellowish, brownish or greyish above, with a dorsal series of large, dark brown, black edged spots, usually confluent with one another to form a zigzag stripe ; lower parts yellowish or whitish, the outer scale-rows parts with small brown spots.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : Occurs from the base of the Himalayas to the extreme south of India and from Sind and Baluchistan in the west to Bihar and Bengal in the east ; North of Sri Lanka.

Remarks : It is a dull, phlegmatic creature, but of uncertain temper.

Status : Common

45. *Eryx johni johni* (Russell)
(John's Sand Boa)

1801. *Boa johni* Russell, *Ind. Serp.* 2 : 18 & 20. Pls. 16 & 17.

1890. *Eryx Jonni* Boulenger, *Fauna Brit. Ind.* : 248.

1943. *Eryx Johi Johi* Smith, *Fauna Brit. Ind.* 3 : 113-114.

Material examined : *Guntur Dist.* : 1 ex., Eddenmotu Hill, 3. ix. 1962. (Coll. BN & INM). 1 ex., Nagarjuna Hill, 27. viii. 1962. (Coll. BN).

Measurements : Total length 325 mm 770 mm. Standard length 270 mm.

Diagnostic character : Head not distinct from neck ; snout broad, edge-shaped, rostral shield wide and heavy ; nostril slit like between enlarged nasals ; upper labials 9 to 12 ; lower labials 13-18 ; mental groove present ; no chin shields ; eye completely surrounded by 9 to 12 small scales ; body robust, cylindrical, with very little taper ; tail completely blunt. Body scale small, smooth. Head scales a little larger than back scales. Eye small ; pupil vertically elliptical ; iris spotted with ruddy gold. Tail short, stumpy, rounded at its end and in general form very similar to the head. Colour sandy grey or yellowish above, the scales edged with dark brown, or entirely brown above ; uniform or with more or less distinct dark transverse bands ; these bands usually distinct on the tail ; lower parts whitish, spotted with dark brown, or almost entirely brown.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : Widely distributed in the plains of the Indian subcontinent. In hills upto about 600 m elevation.

Remarks : That the snake has two heads is belief held all over the country due to its stumpy rounded short tail and in general form very similar to the head.

Status : Recorded as common in some areas.

Family 15. 'COLUBRIDAE

Sub-family (i) COLUBRINAE

Key to the genera of sub-family COLUBRINAE

1. All the teeth solid	...	...	...	...	2.
All the teeth not solid, last 2 or 3 maxillary teeth grooved	...	...	...	...	11.
2. Hypapophyses present throughout the vertebral column	...	...	...	...	3.
Hypapophyses absent on the posterior dorsal vertebrae	...	...	...	...	6.
3. Dentary bone freely movable on the articular ; 30 to 50 maxillary teeth present	...	...	...	...	<i>Sibynophis</i>
Dentary bone not freely movable on the articular ; usually less than 30 maxillary teeth	...	...	...	...	4.
4. Scales in 15 to 19 rows	...	...	...	...	5.
Scales in 25 to 27 rows	...	...	...	...	<i>Macropisthodon</i>
5. Inter nasal distinctly narrowed anteriorly	...	...	...	...	<i>Xenochrophis</i>
Inter nasal broadly truncate anteriorly	...	...	...	...	<i>Amphiesma</i>

6. Posterior maxillary teeth longest	...	...	...	7.
Posterior maxillary teeth not longest	...	...	...	10.
7. Pupil round	...	...	...	...
Pupil vertically elliptic	...	...	...	8.
8. Head elongate, distinct from neck	...	...	...	...
Head short, not distinct from neck	...	...	...	9.
9. Maxillary teeth 13-18	...	...	...	...
Maxillary teeth 20-28	...	...	...	...
10. All the maxillary teeth subequal	...	...	...	...
Some of the maxillary teeth elongated and fang-like	...	...	...	...
11. Pupil round	...	...	...	...
Pupil vertical	...	...	...	...
Pupil horizontal	...	...	...	...

Dryocalamus

Oligodon

Argyrogena

Ptyas

Elaphe

Lycodon

Psammophis

Boiga

Ahaetulla

Genus 30. *Ahaetulla* Link, 1807.46. *Ahaetulla nasutus* (Lacepede)

(Common Green Whip Snake). Telegu name : Pasarika pamboo.

1789. *Coluber nasutus* Lacepede, *Hist. Nat. Serp.* 1 : 100 and 2 : 227.1933. *Ahaetulla nasuta* Stejneger, *Copeia* : 203.

Material examined : Nalgonda Dist. : 1 ex., on way to Hyderabad 20. iii, 1962.
(Coll. BN).

Measurements : Total length 951 mm. Standard length 605 mm.

Diagnostic character : Snout acuminate, terminating in a pointed dermal appendage, variable in length, shorter than the eye ; it has a median groove above, and is formed usually entirely by the rostral. Eyes large, iris powdered with gold, pupil horizontal. No loreal, the internasals and prefrontals in contact with the labials ; 1 large preocular in contact with the frontal ; 2 postoculars. 8 supralabials, 3rd and 4th or one only divided to from 1 or 2 presuboculars, 5th touching the eye. Colour above verdant green. Belly of an equally intense but lighter shade of green, adorned on each side by a well-defined, narrow, white stripe situated on the ventral shields. Chin and throat white with light shy blue and yellow mottlings.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : The whole of Peninsular India, Sri Lanka, Myanmar (Burma), Thailand and Cambodia.

Remarks : It is diurnal and usually reclines on the topmost boughs of bushes and escapes notice by its cryptic colouration.

Status : Common.

Genus 31. *Amphiesma* Dumeril & Bibron, 1854.47. *Amphiesma stolata* (Linnaeus)
(Striped keelback)1758. *Coluber stollatus* Linnaeus, *Syst. Nat.* 10th Ed. : 219 and 12th Ed. 1766 : 379.1854. *Amphiesma stolatum* Dumeril & Bibron, *Erp. Gen.* 7 : 724.

Material examined : *Godavari Dist.* : 1 ex., 10. xi. 1871. (Coll. WTB). *Karimnagar Dist.* : 1 ex., Kaliswher, 8. ix. 1984. (Coll. DPS).

Measurements : Snout to vent 130 mm. Tail 45 mm.

Diagnostic character : Internasal broadly truncate anteriorly ; nostrils slightly directed upwards. 8 upper labials, 3rd, 4th and 5th touching the eye. Nasals not touching the 2nd upper labials, rostral touching 6 shields, a single anterior temporal. Scales in 19 rows, strongly keeled, except the outer row, which is smooth. Colour olivaceous-brown. A pair of conspicuous buff stripes covering one whole or two half rows of scales front neck or forebody to tip of tail. Head olivaceous-brown, whitish, yellowish or orange on tips. Belly white with some small scattered black spots.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : The whole of India.

Remarks : A remarkably inoffensive and gentle snake, common in fields, grassy and cultivated areas of open country during the rainy season.

Status : A common snake in the plains.

Genus 32. *Xenochrophis* Gunther 1864.48. *Xenochrophis piscator* (Schneider)
(Checkered keelback)1799. *Hydrus Piscator* Schneider, *Hist. Amph.* 1 : 247.1935. *Natrix piscator* Pope, *The reptiles of China. Natural History of Central Asia, Vol. 10* : 120.1935. *Xenochrophis piscator* Malnate, *Proc. Acad. Nat. Sci. Philadelphia*, 112 : 41-71.

Material examined : *Hyderabad Dist.* : 1 ex., Mohemmedabad, 1985 (Coll. AKS). *Guntur Dist.* : 2 ex., Pullareddygudem village, 13. xi. :1963. (Coll. BN & INM). *Nalgonda Dist.* : 3 ex., Madhavram village, 10. x. 1963. (Coll. BN).

Measurements : Total length 555-580 mm ; Standard length 450-470.

Diagnostic character : Head slightly flattened, distinct from neck ; snout bluntly pointed ; rostral wider than high. Internasal distinctly narrowed anteriorly ; nostril between nasals ; single large loreal ; eye moderate size, with round pupil, 9 supralabials, 4th and 5th touching the eye, the 6th excluded by the lowest postocular. Body stout :

scales in 19 rows, more or less distinctly keeled, except the outer one or two rows which are smooth. Colour yellowish or olivaceous above with black spots quincuncially arranged; belly uniform whitish or yellowish; head olive-brown above, with two oblique black streaks, one below, the other behind the eye. The dorsal spots are arranged in five series, namely, a vertebral, 2 dorso-lateral and 2 lateral. Together they form a chess-board pattern.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : It is found throughout the Indian subcontinent from Baluchistan to Assam into upper Myanmar (Burma).

Remarks : Frequent water and is very common in tanks, paddy fields, pools and rivers.

Status : The commonest freshwater snake.

Genus 33. *Ptyas* Fitzinger 1843.

49. *Ptyas mucosus* (Linnaeus)

(Dhaman ; Rat Snake) Telegu name : Jeri Potoo.

1758. *Coluber mucosus* Linnaeus, *Mus. Ad. Frid.* 1 : 37. and *Syst. Nat.* Ed. 10, 1758 : 226.

1864. *Ptyas mucosus* Gunther, *Rept. Brit. India* : 249.

1943. *Ptyas mucosus* Smith, *Fauna Brit. Ind.* 3 : 159-162.

Material examined : *Cuddapah Dist.* : 1 ex., Chitvit, 30. vii. 1929. (Coll. HSP). *Guntur Dist.* : 2 ex., Pullareddygudem village, 14. ix. 1963 and 9. xi. 1963. (Coll. BN & INM). *Nalgonda Dist.* : 1 ex., Tiger valley, 3. x. 1963. (Coll. BN & INM). 1 ex., Nidigul village, 23. x. 1963. Coll. BN.)

Measurements : Total length. 1845-1875 mm. Standard length 1290-1335 mm.

Diagnostic character : Maxillary teeth 20 to 28. Head long, distinctly wider than neck, snout bluntly pointed; rostral higher than wide; nostril between nasals and first upper labial; 3 loreals, 2 preocular, upper about four times size of lower, 2 postocular 8 upper labials, 4th and 5th touching eye; 9 or 10 lower labials. Eyes large and lustrous. Scale rows at midbody 17 and 14 to 12 two head-lengths before vent. Body robust, compressed, tapering towards both ends. Tail cylindrical about one-fourth total length. Colour olivaceous brown or dull tan to dark olive brown. Scales on the posterior part irregularly margined with black forming a reticulate pattern to form crossbars. Lips and ventral scales margined with black. Belly greyish white.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : Throughout the Indian subcontinent, Sri Lanka and Myanmar (Burma). In the west extends to Afghanistan and Turkestan. In the east to south China.

Remarks : Diurnal in habits but in populated areas may not be commonly seen out during the day.

Status : A common snake in all parts of the country.

Genus 34. *Lycodon* Boie, 1826.

Key to the species of genus LYCODON

1. Loreal extensively in contact with the internasal	...	...	...	2.
2. Ventrals angulate laterally ; 9 supralabials	...	...	...	<i>Aulicus</i>
Ventrals not angulate laterally ; 8 supralabials	...	...	...	<i>Striatus</i>

50. *Lycodon aulicus aulicus* (Linnaeus) (Common Wolf Snake)

1754. *Coluber aulicus* Linnaeus, *Adolph. Frider.* 1 : 29.

1864. *Lycodon aulicus* Gunther, *Report, Brit. Ind.* : 316.

1943. *Lycodon aulicus aulicus* Smith, *Fauna Brit. Ind.* 3 : 265

Material examined : *Anantapur Dist.* : 1 ex., Kalasamudram, 23. ix. 1986. (Coll. AKS). *Vizianagram Dist.* : 1 ex., 3 km. South of Vizianagram town, 27. ix. 1985. (Coll. DPS & BDG).

Measurements : Snout to vent 280-350 mm ; Tail length 45-125 mm.

Diagnostic character : Snout more or less spatulate and projecting beyond the lower jaw ; anterior and posterior nasals subequal ; loreal in contact with the internasal not touching the eye ; 1 preocular. 17 scales at midbody ; angulate laterally 9 supralabials. Head depressed and pear-shaped. Neck slightly constricted. Two races are recognised. In race *Lycodon aulicus aulicus* the colour is brown or greyish-brown above, with from 12-19 white cross-bars which expand laterally or bifurcate, enclosing triangular patches. A triangular whitish blotch on each side of the occiput. Upper lip white or spotted with brown. Specimens without any markings and uniform brown in colour occur.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : The whole of Indian subcontinent, Sri Lanka, Maldives-Islands, Myanmar (Burma) to Indochina, South China, Malaya, Indonesia, Phillipines.

Remarks : The snake most often seen near and in human habitations.

Status : One of the commonest snakes of the Indian plains.

* 51. *Lycodon striatus* (Shaw) (Shaw's Wolf Snake)

1802. *Coluber Striatus* Shaw, *Gen. Zool.* 3 : 527.

1870. *Lycodon striatus* Stoliczka, *J. Asiat. Soc. Beng.* 29 : 200.

Material examined : Material not available. Description based on the literature.

Description : Snout projecting beyond the lower jaw ; anterior nasal usually larger than the posterior ; loreal in contact with the internasal, not touching the eye ; a preocular. 8 supralabials. 17 scales round mid-body not angulate laterally, colour dark brown or black above with 11 to 18 white or yellowish crossbars on body which divide on the sides to enclose triangular spots of the body colour, Belly and upper lip white.

Distribution : *Andhra Pradesh* : (Likely to occur) Elsewhere : Peninsular India, Westwards to Iran and to the east upto Chota Nagpur. Also Sri Lanka.

Remarks : A timid snake which hides its head beneath its coil if disturbed.

Status : Indeterminate.

***52. *Lycodon travancoricus* (Beddome)**
(Travancore Wolf Snake)

1870. *Coreaspis travancoricus* Beddome, *Madras Month. J. Med. Sci.* 2 : 169.

1890. *Lycodon travancoricus* Boulenger, *Fauna Brit. Ind.* 293.

1943. *Lycodon travancoricus* Smith, *Fauna. Brit. Ind.* 3 : 259.

Material examined : Material not available. Description based on the literature.

Description : Snout broad ; anterior and posterior nasals subequal : loreal not or but slightly in contact with the internasal ; a preocular ; 9 supralabials. Scales in 17 rows, smooth. The colour is purplish brown or blackish above with pale yellow crossbars.

Distribution : *Andhra Pradesh* : (Likely to occur). Elsewhere Western Ghats, South Arcot (Tamil Nadu), Visakhapatnam and Jubbalpore (Madhya Pradesh).

Status : Indeterminate.

Genus 35. *Elaphe* Fitzinger, 1833.

53. *Elaphe helena* (Daudin)
(Trinket Snake)

1803. *Coluber helena* Daudin *Hist. Nat. Rept.* 6 : 277.

1943. *Elaphe helena* Smith, *Fauna Brit. Ind.* 3 : 149-150

Material examined : *Guntur Dist.* : 1 ex., Eddenmotu Hill, 3. ix. 1962. (Coll. BN & INM).

Measurements : Total length, 835 mm ; Standard length 640 mm ;

Diagnostic character : Snout twice as long as the eye ; prefrontals twice as long as the internasals ; loreal little longer than high. 9 supralabials. Scales in 25 rows

at midbody, more or less distinctly keeled on the posterior part of the body and tail. Colour brown above of varying degrees of intensity. Yellowish or whitish on lips. An oblique streak from eye to lip. Forebody for a variable length beautifully ornamented with ocellated crossbars of a pattern peculiar to this snake. There are two black stripes on the nape and another black stripe on the hindpart of the body. The belly is white.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : Peninsular India and from Sind in the west to Assam in the east Himalays, Sri Lanka.

Remarks : Usually found in or at the periphery of forests. Truculent when annoyed.

Status : Common between 500 m. and 2000 m. Rarer in the plains.

Genus 36. *Oligodon* Boie, 1827.

Key to the species of genus OLIGODON

1. 6-7 maxillary teeth present	...	...	...	...	2.
8-11 maxillary teeth present	...	...	...	...	<i>Arnensis</i>
2. Hemipenis 2/5 forked ; loreal present	...	...	...	...	<i>Taeniolatus</i>
Hemipenis not forked ; loreal absent	...	...	...	...	<i>Travancoricus</i>

54. *Oligodon travancoricus* Beddome (Kukri Snake)

1877. *Oligodon travancoricum* Beddome, *Proc. Zool. Soc. London* : 685.

1890. *Oligodon travancoricus* Boulenger, *Fauna Brit. Ind.* 318 and *Cat. Sn. Brit. Mus.* 1 : 236.

1943. *Oligodon travancoricus* Smith, *Fauna Brit. Ind.* 3 : 233.

Material examined : *Guntur Dist.* : 2 ex., Pullareddyguden village, 28. vii. 1962. (Coll. BN).

Diagnostic character : 7 supralabials, 3rd and 4th touching the eye : loreal absent ; posterior nasal elongate. Scales in 17 rows. Colour greyish-brown above with large irregular oval blackish spots edged with lighter are narrower and from more or less distinct transverse bars. Head with characteristic markings, the outlines of which are more or less crenate.

Distribution : *Andhra Pradesh* : (First record) as mentioned in the *material*. Elsewhere : Western Ghats, South of the Palghat Gap.

Status : Indeterminate.

55. *Oligodon taeniolatus* (Jerdon)
(Variegated Kukri Snake)

1853. *Coronella taeniolata* Jerdon, *J. Asiat. Soc. Bengal.*, 22 : 528.

1921. *Oligodon taeniolatus* Wall, *Sn. Ceylon.* : 239.

1943. *Oligodon taeniolatus* Smith, *Fauna Brit. Ind.* 3 : 223-225.

Material examined : Guntur Dist. : 4 ex., Pullareddygudem village, 28. vii. 1962. and 6-11. xi. 1963. (Coll. BN & INM). Prakasam Dist. : 1 ex., Podile, 2. xi. 1986. (Coll. DPS).

Measurements : Total length 357-525 mm ; Standard length 300-450 mm.

Diagnostic character : Head barely distinct from neck ; snout blunt ; rostral large, higher than wide and extending posteriorly, almost separating internasals ; nostril between nasals ; loreal present, one preocular ; two occasionally three postoculars ; 7 upper labials, 3rd and 4th touching eye ; 7 or 8 lower labials. Body slender, or almost uniform diameter from neck to vent. 15 rows of dorsal scales at midbody. Coloration shows considerable differences in colour and markings. The back is buff or brown, with either large black spots or cross-bars. There are two black streaks on the nape. The lower surface is whitish, sometimes with lateral spots.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : The range extends from Bihar to southern Baluchistan and south through Peninsular India to Sri Lanka.

Remarks : Largely diurnal and found of basking in the sun on rock or grass.

Status : A very common snake in the evergreen forest at higher elevations of the Western Ghats.

***56. *Oligodon arnensis* (Shaw)**
(Common Kukri Snake) Telegu name : Sanka.

1802. *Coluber arnensis* Shaw, *Gen. Zool.* 3 : 526.

1921. *Oligodon arnensis* Wall, *Sn. Ceylon.* : 231.

1943. *Oligodon arnensis* Smith, *Fauna Brit. Ind.* 3 : 225-227.

Material examined : Material not available. Description based on the literature.

Description : 8-11 maxillary teeth. 7 supralabials, 3rd and 4th touching eye ; loreal frequently united with the prefrontal ; scales in 17 rows. Body cylindrical, short, smooth and even sized. Head depressed, snout short and blunt. Tail short. Ground colour is reddish or greyish-brown with a series of black bands. The belly is plain white, sometimes with faint spots.

Distribution : *Andhra Pradesh* : (Likely to occur). Elsewhere : It is found in Bangladesh

and Central Nepal west to the Indus valley and south through Peninsular India and Sri Lanka.

Remarks : An active little snake, mainly diurnal and seen most often during the rainy season.

Status : Not uncommon.

Genus 37. *Macropisthodon* Boulenger, 1893.

**57. *Macropisthodon plumbicolor* (Cantor)
(Green keelback)**

1839. *Tropidonotus plumbicolor* Cantor, *Proc. zool. Soc. London*, : 54.

1893. *Macropisthodon plumbicolor* Boulenger, *Cat, Sn. Brit. Mus.* 1 : 267.

Material examined : East Godavari Dist. : 1 ex., Upper Godavari, 1872. Coll. Dr. Goffeny.

Diagnostic character : Head rather broad and short ; nostril between two nasals ; internasal as long, or nearly as long as the prefrontals ; loreal united with the lower preocular, 2 pre and 3 or 4 postoculars. 7 upper labials, 3rd and 4th touching the eye. Scales round the body 25 and strongly keeled. Eyes moderately large, iris greenish gold. Tail short. The colour is bright green above and white below, with an indistinct pattern of cross-bars on the back. There is a V-shaped mark on the head. The ventral surface is greyish white.

Distribution : Andhra Pradesh : (First record) as mentioned in the *material*.
Elsewhere : Occurs throughout India except the Ganges valley and extreme north-west Sri Lanka.

Remarks : A hill species found altitudes between 600-1800 m.

Status : It is somewhat rare found only in the forests and hills.

Genus 38. *Sibynophis* Fitzinger, 1843.

**58. *Sibynophis sagittarius* (Cantor)
(Cantors black headed snake)**

1839. *Calamaria sagittaria* Cantor, *Proc. zool. Soc. London* : 49.

1943. *Sibynophis sagittarius* Smith, *Fauna Brit. Ind.* 3 : 280.

Material examined : East Godavari Dist. : 1 ex., Godavari, 1877. Coll. Goffeny.

Diagnostic character : Snout broad and more rounded, 7 supralabials. 3rd and 4th touching the eye ; parietal touches both postoculars. Colour light brown above, with a vertebral series of black dots ; greyish brown on the sides, the colour occupying four

scale rows, and bordered above with black ; head and nape dark brown or black, with a large elongate oval patch of yellow on each side at the back of the head. Lower parts yellow, with a black dot on the outer edge of each ventral scale.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. (First record) from Andhra Pradesh. Elsewhere : North-eastern India from the Central and Northern India to Bangladesh.

Status : Indeterminate.

Genus 39. *Dryocalamus*, Gunthor, 1858.

*59. *Dryocalamus gracilis* (Gunther) (Bridal Snake)

1864. *Odontomus gracilis* Gunther, *Rept. Brit. Ind.* : 234.

9893. *Dryocalamus graciis* Boulenger, *Cat. Sn. Brit. Mus.* 1 : 371.

1943. *Dryocalamus gracilis* Smith, *Fauna Brit. Ind.* 3 : 275.

Material examined : Material not available. Description based on the literature.

Description : Nasal shield more or less divided into an anterior and posterior part ; loreal in contact with the eye, with a small preocular above it, rarely absent ; 2 or 3 postoculars, 7 upper labials, 3rd and 4th touching the eye. Scales in 15 rows.

Distribution : *Andhra Pradesh* : (Likely to occur). Elsewhere : Peninsular India (Anaimalais, Cuddapah Hills), Sri Lanka.

Status : A rare species.

Genus 40. *Psammophis* Fitzinger, 1826.

*60. *Psammophis condanarus* (Merrem) (Indian Sandsnake)

1920. *Coluber condanarus* Merrem, *Tent. Syst. Amph.* : 107.

1890. *Psammophis condanarus* Boulenger, *Fauna Brit. Ind.* : 365 and *Cat. Sn. Brit. Mus.* 3 : 165.

1943. *Psammophis condanarus* Smith, *Fauna Brit. Ind.* 3 : 364-365.

Material examined ; Material not available. Description based on the literature.

Description : Upper head shields not protuberant ; nasal incompletely divided a suture only from the nostril to the labial. Preocular not in contact with frontal, 2 postoculars ; one anterior and two or three posterior temporals, 8 or 9 upper labials, 4th & 5th touching eyes ; 11 lower labials. 17 rows of scales behind head, at midbody, and 13 rows ahead of the tail. Head is oval shaped pupil round. Tail long. Dorsum pale olive to

brassy streaked alternately with distinct nut brown and greenish olive or buff stripes. Belly sulphur or primrose yellow.

Distribution : *Andhra Pradesh* : (Likely to occur). Elsewhere : Arid and semi arid country in Pakistan and Peninsular India upto Bengal in the east and Andhra Pradesh in the south. Also in light forested country in western Himalayas ; Myanmar (Burma).

Remarks : A diurnal snake of grassland and open jungle.

Status : Not uncommon in some parts of its total distribution.

Genus 41. *Argorogena* Werner, 1924.

61. *Argyrogena bholanathi* (Sharma)

1976. *Coluber bholanathi* Sharma, *Comp. Physiol. Eco.* 1 (3) : 105-107.

Material examined : *Guntur Dist.* : 3x, : Nagarjuna Hill, 27. vii. 1962 and 4 and 9. ix. 1962. (Coll. BN).

Measurements : Total length 992-1190 mm. ; Tail 168-307 mm. ;

Diagnostic character : Head moderately large and distinct from the neck. Body long, slender and smooth. Pupil large and round. Rostral shield two times wider than high, not separating the internasal which are slightly smaller than prefrontals. 9 supralabials, 5th & 6th touching the eye, 11 infralabials. Postoculars 2 or 3. 1 preocular. Dorsal scales smooth, 19 : 19 : 15 rows. Ventral scales 202-212, Prominently angulated, laterally subcaudal scales 109-121 divided. Anal 2. Anterior dorsal region bears an alternate arrangement of ash coloured oval spots (vertebral) and narrow white (black spotted) bands. Posteriorly the spots fade out and form a dark brown colouration. Snout dark brown, posterior head region spotted white and black, a black bar on the complete interorbital region, two stripes across the whole of both the parietals, an oblique black stripe from base of the orbit to mouth across sixth and seventh supralabials. All the labials, chin shields and laterals scale of the head bear black spots. The lower parts, yellowish-white ; outer margins of the ventral scales spotted with black.

Distribution : *Andhra Pradesh* : as mentioned in the *material*.

Remarks : Sharma (1976) described it as a new species.

Status : Indeterminate.

Genus 42. *Boiga* Fitzinger, 1826.

62. *Boiga trigonata* (Schneider) (Indian Gamma or Cat Snake)

1802. *Coluber trigonatus* Schneider, in *Bechst. transl. Lacep.* 4 : 256.

1916. *Boiga trigonatum* Nikolsky, *Fauna de la Russic* : 187.
1943. *Boiga trigonuta*, Smith. *Fauna Brit. Ind.* 3 : 349-350.

Material examined : Guntur Dist. : 1 ex., Pullareddygudem village, 13. xi. 1963. (Coll. BN & INM). Nalgonda Dist. : 1 ex., Madhavram village, 10. x. 1963. (Coll. BN).

Measurements : Total length 555-580 mm. Standard length 450-470 mm.

Diagnostic character : Head triangular, much wider than thin neck, rather flat ; rostral strongly concave below, slightly wider than high ; nostril large between nasals ; loreal present ; eye large, with vertically elliptical pupil ; 1 preocular and 2 postoculars ; 8 upper labials, 3rd, 4th and 5th touching eye. 10-11 lower labials. Scales in 21 : 21 : 15 rows. Ground colour yellowish brown, sandy or fawn, uniform or mottled with darker shades. Dorsally a series of dark Y-shaped mark which meet at the centre and resemble arrowheads. The markings fade before or at the vent. Belly white. Head with a pair of lung-shaded brown patches often bordered with black. A narrow dark streak from behind eye to gape.

Distribution : Andhra Pradesh : as mentioned in the material. Elsewhere : The whole of the Peninsular India to Baluchistan (Pakistan) in west to Assam in the east ; Sri Lanka.

Remarks : Essentially arboreal, frequenting bushes, scrub or trees, usually close to ground.

Status : A fairly common snake in India ascending upto about 1500 m.

Subfamily (ii) HOMALOPSINAE

Key to the genera of subfamily HOMALOPSINAE

1. Nasal in contact with one another	...	...	...	2.
Nasal seperated by the internasal	...	...	...	<i>Gerardia</i>
2. Scales smooth	...	...	...	<i>Enhydris</i>
Scales keeled	...	...	...	<i>Cerberus</i>

Genus 43. *Gerardia* Gray, 1849.

63. *Gerardia prevostiana* Eydoux & Gervais
(Glossy marsh Snake)

1832-1837. *Coluber Homalopsis prevostianus* Eydoux & Gervais, in *Guer. Mag. Zool. Cl.* 3 : 5
1890. *Gerprdia prevostiana* Boulenger, *Fauna Brit. Ind.* : 379.
1943. *Gerardia Prevostiana* Smilh, *Fauna Brit. Ind.*, 3 : 394-396.

Material examined : East Godavari Dist. : 1 ex., east of Eatimoga village, 20. ix. 1964. (Coll. NVSR).

Diagnostic character : Nasals separated by the internasal ; Frontal much broader than the supraocular ; 1 pre and 2 postoculars ; loreal not in contact with the internasal. 7 supralabials, 4th touching the eye. Dorsal scale subequal. Tail short. Colour dark grey above and whitish below.

Distribution : *Andhra Pradesh* : (First record) as mentioned in the *material*. **Elsewhere :** Coasts and tidal rivers of India. Sri Lanka ; Myanmar (Burma) ; west coast of Malay peninsula.

Remarks : It is a sluggish creature on land and is not prone to bite easily.

Status : Indeterminate.

Genus 44. *Enhydris* Sonnini & Latreillie, 1802.

*64. *Enhydris enhydris* (Schneider) (Smooth water snake)

1799. *Hydrus enhydris* Schneider, *Hist. Amph.* 1 : 245.

1935. *Enhydris enhydris* Pope, *Rept. China.* : 314.

Material examined : Material not available. Description based on the literature.

Description : Snout broadly rounded : internasal single, twice as broad as long, in contact with the loreal ; frontal broader than the supraocular. 8 supralabials. 4th touching the eye. 21 or 23 scales at midbody. Scales smooth. Eyes small, placed high on the face. Pupil vertically elliptic. The body colour is dark-olive or olive-brown above and lemon yellow below. Ventrals demarcated laterally by a dark line. A continuous or interrupted dark line in the middle of the belly may be present or absent.

Distribution : *Andhra Pradesh* : (Likely to occur). Elsewhere : North-east India, from the coastal Andhra Pradesh to east Uttar Pradesh, and eastwards to S. China, Indochina, Malaya.

Remarks : An aquatic species frequenting fresh and brackish water.

Status : An uncommon snake.

Genus 45. *Cerberus* Cuvier, 1829.

65. *Cerberus rhynchops* (Schneider) (Dog-Faced Water Snake)

1799. *Hydrus rhynchops* Schneider, *Hist. Amph.* 1 : 246.

1864. *Cerberus rhynchops* Gunther, *Rept. Brit. Ind.* 279.

1943. *Cerberus rhynchops* Smith, *Fauna Brit. Ind.* 3 : 279.

Material examined : *East Godavari Dist. :* 1 ex., Nizampatnam, 26. vii. 1963, (Coll. AD). *Nalgonda Dist. :* 1 ex., Madhavram, 11. x. 1963. (Coll. KR).

Diagnostic character : Snout broadly rounded; nostril connected by suture to the first labial; internasal divided by a longitudinal suture; frontal broken into small scales, the anterior half distinct; loreal large; 1 pre, 1 post and 2 suboculars. 9-10 supralabials, 5th and 6th below the eye, the 2 or 3 horizontally divided. Scales striated and strongly keeled, in 23-25 rows. Head pear-shaped. Eyes small, pupil vertical. Tail short rather compressed at base, rapidly tapering to a point. The back is grey with numerous black crossbars which are obscure in the forepart but prominent on the hinder side. The belly is pale yellowish with conspicuous black blotches or cross-bars.

Distribution : *Andhra Pradesh :* as mentioned in the *material*. Elsewhere : An estuarine species. Coasts of India and tidal rivers from Sind to Chittagong (Bangladesh) and eastwards.

Status : A fairly common inhabitant of brackish waters of tidal river, creeks and estuaries and also the sea littoral.

Family 16. HYDROPHIIDAE

Key to the genera of family HYDROPHIIDAE

1. Ventrals distinct throughout and normally entire	...	...	2.
Ventrals not distinct throughout, either divided by a median longitudinal fissure, or vestigial	...	...	3.
2. Mental shield normal; 1-18 maxillary teeth	...	...	<i>Hydrophis</i>
Mental shield elongate; 3-5 maxillary teeth	...	...	<i>Enhydrina</i>
3. Body long and very slender anteriorly; ventrals divided by a longitudinal fissure	...	...	<i>Microcephalophis</i>
Body not long and slender anteriorly; ventrals if present entire	...	...	<i>Lapemis</i>

Genus 46. *Hydrophis* Latreille, 1802.

Key to the species of genus HYDROPHIS

Scales on the thickest part of the body with rounded or bluntly pointed tips; normally one anterior temporal	...	...	...	...	...	<i>Spiralis</i>
Scales on the thickest part of the body subquadrangular or hexagonal in shape; two anterior temporals	...	...	...	...	...	<i>Mamillaris</i>

66. *Hydrophis spiralis* (Shaw)

(Yellow Sea Snake)

1802. *Hydrus spirallis* Shaw, *Gen. zool.* 3 : 564.

1926, *Hydrophis spiralis* Smith, *Monogr. Sea. Sn.* : 48.

Material examined : *East Godavari Dist.* : 1 ex., Kakinada, 17. vii. 1963. (Coll. Dr. AD). *Visakhapatnam Dist.* : 1 ex.. Bimalipatnam, 22. ii. 1947.

Diagnostic character : Head moderate, body elongate, cylindrical, compressed in the posterior three-fifths. Eye small ; frontal as long as its distance from the rostral or the end of the snout ; 1 pre and 1, rarely 2, postoculars. A single large anterior temporal 6-8 supralabials, the 2nd in contact with the prefrontal, the 3rd, 4th and 5th, or only two of them, touching the eye. Scales on the thickest part of the body with rounded or bluntly pointed tips, scales imbricate, smooth or weakly keeled posteriorly ; scale rows at midbody 35-39, decrease anteriorly of seven rows and posteriorly three or four. Head in young black with more or less distinct yellow horseshoe mark on the crown. The black colour fades with age and the head may become light olivaceous above, yellow ventrally with 34 to 70 variable shaped black bands or bars.

Distribution : *Andhra Pradesh* : (First record) as mentioned in the *material*. Elsewhere : Persian Gulf to Malay Archipelago.

Remarks : A strong and active swimmer going for up tidal rivers.

Status : Uncommon on the west coast of the Indian Peninsula and common on the east coast.

*67. *Hydrophis mamillaris* (Daudin)
(Bombay Sea Snake)

1803. *Anguis mamillaris* Daudin, *Hist. Nat. Rept.* 7 : 340.

1926. *Hydrophis mamillaris* Smith, *Monogr. Sea. Sn.* : 88.

Material examined : Material not available. Description based on the literature.

Description : Head small, not distinct from neck which is slender and much elongated in adult ; rostral wider than high. One preocular and one or two postoculars ; two anterior and three posterior temporals ; 7-8 upper labials, the 3rd and 4th or 4th and 5th touching the eye ; 9 or 10 lower labials. Body laterally compressed posteriorly ; Scales on the thickest part of the body subquadrangular or hexagonal in shape. Scale rows at midbody 39-41, decreasing anteriorly to 28 or 30 and posteriorly to 35-39 ; ventrals small. 4 to 6 preanals. Colour yellowish or greyish with from 44 to 55 broad black bands on the body. Head entirely black or with a yellow streak on the temporal region.

Distribution : *Andhra Pradesh* : (Likely to occur). Elsewhere : From coastal Las Bela (Pakistan) around the coast of India to Visakhapatnam.

Status : Rare in east coast of India.

Genus 47 **Lapemis** Gray, 1835.68. **Lapemis curtus** (Shaw)
(Shaw's Sea Snake)1902. *Hydrus curtus* Shaw, *Gen. zool.* 3 : 562.1926. *Lapemis curtus* Smith, *Monogr. Sea. Sn.* : 112.*Material examined* : 1 ex., Visakhapatnam.

Diagnostic character : Head large, body short, the diameter of the neck is half or more than half of the greatest diameter of the body ; eye moderate ; frontal as long as or shorter than its distance from the rostral. 1 pre and 1-2 postoculars. 7 supralabials, the 2nd normally in contact with the prefrontal. Olive-green turning to pale yellow above, with ill-defined, dark greenish brown cross-bars 15 to 55 in number, the first one on the nape.

Distribution : *Andhra Pradesh* : (First record) as mentioned in the *material*. Elsewhere : Persian Gulf to Malay Archipelago. Common along the Coromandal coasts.

Status : Common.Genus 48. **Enhydrina** Gray, 1849.69. **Enhydrina schistosa** (Daudin)
(Beaked Sea Snake)1803. *Hydrophis schistosus* Daudin, *Hist. Nat. Rept.* 7 : 386.1926. *Enhydrina schistosus* Smith *Monogr. Sea. Sn.* 36.

Material examined : *East Godavari Dist.* : 2 ex., Kakinada bay. 15. vii. 1963. (Coll. AD).

Diagnostic character : Head moderate size and slightly distinct from neck ; rostral wider than high, with prominent, median downward prolongation giving beaklike profile ; mental shield elongate, 1 preocular and 1 or 2 postoculars. 4 well differentiated anterior upper labials, last two usually in contact with eye, followed by 3 to 5 small, wedge-shaped shields ; 9 lower labials. All head shields densely studded with fine tubercles. Body moderately stout, laterally compressed. Eye with dull green iris. Colouration variable. Young bluish or bluish grey with well marked black rings often broadened vertebally. With age bands disappear or may remain as bands dorsally.

Distribution : *Andhra Pradesh* : (First record) as mentioned in the *material*. Elsewhere : Coastal waters from Persian Gulf to New Guinea. Abundant on both coasts of Indian Peninsula,

Status : The commonest sea snakes very numerous all along the coast and ascending considerable distance on the tidal rivers.

Genus 49. *Microcephalophis* Lesson, 1834.

70. *Microcephalophis gracilis* (Shaw)
(Common small-headed sea snake)

1802. *Hydrus gracilis* Shaw, *Gen. zool.* 3 : 560.

1926. *Microcephalophis gracilis* Smith, *Monogr. Sea. Sn.* : 121.

Material examined : East Godavari Dist. : 1 ex., Kakinada, 27. ii. 1948. (Coll. GR).

Diagnostic character : Head very small, elongate, body long and very slender anteriorly, much compressed posteriorly. 1 preocular, 1 postocular and 1 temporal. 5 upper labials, 3rd and 4th in contact with eye, 2nd in contact with prefrontal ; 6 lower labials ; anterior and posterior chin shields short, subequal ; neck slender, cylindrical. Anterior part of body, including all of head, chin and throat, black to dark olive, with white or pale yellow spots on side of neck or with light cross bands ; posterior part pale yellow to greenish, white grey cross bands. With age the markings lose definition and the adult is usually greyish above, paler below ; with the bars or bands indistinctly marked, particularly on the thickest part of the body.

Distribution : Andhra Pradesh : (First record) as mentioned in the *material*. Elsewhere : From Persian Gulf around the coasts of India, north along the China coasts to Hongkong, and south to perhaps northern Australia.

Status : Indeterminate.

Family 17. ELAPIDAE

key to the genera of family ELAPIDAE

1. Maxillary bone extending forwards beyond the palatine	...	...	2.
Maxillary bone not extending forwards beyond the palatine	...	...	<i>Bungarus</i>
2. Vertebral series of scales enlarged	...	...	...
Vertebral series of scales not enlarged	...	...	...
3. Scales in 15-25 rows on the body ; scales oblique	...	...	...
Scales in 13-15 rows on the body ; scales not oblique	...	...	...
			<i>Naja</i>
			<i>Calliophis</i>

Genus 50. *Bungarus* Daudin, 1803.

Key to the species of genus BUNGARUS

Tail ending obtusely ; dorsal vertebrac forming a ridge down the back ; back marked with black and yellow annuli	...	...	...	...	<i>Fasciatus</i>

Tail ending in a point ; dorsal vertebrac not forming a ridge down the back ; back with narrow white cross-bars arranged more or less distinctly in pairs *Caeruleus*

71. *Bungarus caeruleus* (Schneider)
(Common Indian Krait)

1801. *Pseudoboa caerulea* Schneider, *Hist. Amph.* 2 : 284.

1890. *Bungarus caeruleus* Boulenger, *Fauna Brit. Ind.* : 388.

Material examined : Nalgonda Dist. : 2 ex., Nandikonda valley, 7. x. 1963 and 7. xi. 1963 (Coll. BN & INM).

Measurements : Total length 725-890 mm. Standard length 630-760 mm.

Diagnostic character : Head flat, distinct from neck ; snout blunt ; rostral slightly wider than high ; nostril between nasals ; eye small with round pupil, loreal, absent ; 1 preocular and 2 postoculars ; 1 anterior and 2 posterior temporals ; 7 upper labials, 3rd and 4th touching the eye ; 8 lower labials. Body cylindrical. Tail ending in a point. Scale rows on midbody 15. The vertebral scales are enlarged and hexagonal. Colour is lustrous black or bluish black above with paired narrow white crossbars arranged more or less distinctly in pairs.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : It occurs from western Bengal through Peninsular India and Sri Lanka.

Remarks : It inhabits fields, low scrub jungles and is common in the vicinity of human habitation. It is nocturnal in habits.

Status : Common.

***72. *Bungarus fasciatus* (Schneider)**
(Banded Krait) Telegu name : Bungarum pambah

1801. *Pseudoboa fasciatus* Schneider, *Hist. Amph.* 2 : 283.

1803. *Bungarus fasciatus* Daudin, *Hist. Nat. Rept.* 5 : 263.

Material examined :: Material not available. Description based on the literature.

Description : Head broad and depressed ; snout short, eye black, pupil very faintly outlined in yellow. Neck distinct. Body smooth and glossy. A prominent ridge down the back and tail formed by the spinous processes of the vertebrac ; tail ending bluntly, usually more or less swollen at the tip. Alternately banded with black or purplish-black, and yellow or buff bands, completely encircling the body. Nape has a large, elongate, black patch, rounded behind. Top of the head with a yellow 'V' with its arms passing backwards over the temples to the throat.

Distribution : *Andhra Pradesh* : (Likely to occur). Elsewhere : North-east Peninsular

India, the southern most record being Hyderabad. Also found in Assam and Bangladesh. Occurs throughout the Indochinese subregion.

Remarks : Largely nocturnal. Frequents moist places and the vicinity of water.

Status : Common in some parts of its distributional range.

Genus 51. *Naja* Laurenti, 1768.

73. *Naja naja* (Linnaeus)
(Indian Cobra)

1758. *Coluber naja* Linnaeus, *Syst. Nat.* 10th ed. : 221.

1924. *Naja naja* Prater, *J. Bombay nat. Hist. Soc.* 30 : 175,

Material examined : Guntur Dist. : 1 ex., Pullareddygudem village, 1. x. 1963, (Coll. BN & INM).

Measurements : Total length 1190 mm. Standard length 975 mm.

Diagnostic character : Head depressed with short, rounded snout. Nostrils large pupil round. Head shields glossy, body with a more or less distinct groove down the spine. 1 preoculars and 3 postoculars. 7 upper labials, 3rd largest, touching both nasal and eye. 8 lower labials ; small triangular shield (cuncate) between 4th and 5th lower labial at oral margin. Scale rows across widest part of hood usually 25 and 13-15 rows just anterior to vent. Extremely variable in colouration and markings. Three races are recognised on the basis of hood pattern. Indian cobras are generally buff, brown or black in colour. The dorsal pattern usually consists of light or dark bands, cross-bars, variegations or reticulations which disappear as age advances.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : Occurs from Transcaspia in the north, through Indian subcontinent to southern China in the east and to the Philippines in the South Andaman, Sri Lanka.

Remarks : They are found in all types of country : Plains, jungles, open fields and even in the regions heavily populated by man. Frequently found near or in water and is a strong swimmer.

Status : Common.

Genus 52. *Ophiophagus* Gunter, 1864.

*74. *Ophiophagus hannah* (Cantor)
(Hamadryad ; King cobra)

1836. *Hamadryas hannah* Cantor, *Asiat. Research*, 19 : 187.

1924. *Naja hannah* Wall, *J. Bombay nat. Hist. Soc.* 30 : 189.

1943. *Naja hannah* Smith, *Fauna Brit. Ind.* 3 : 436-439.

Material examined : Material not available. Description based on the literature.

Description : Head flat ; snout rounded and eyes moderately round with round pupil. Scales smooth, oblique, those of the vertebral series and the outer 2 rows larger than the others ; in 17 or 19 rows upon the neck, 15 at mid-body and in front of the vent. In the anterior part of the body only the vertebral row of scales is enlarged ; in the hinder part of the body the median three rows may be enlarged. The over all colouration is olive green or yellowish but the tail is almost entirely jet black. The young are black above with chevron-shaped transverse bands which disappear as age advances. The lower surfaces are whitish. Head olivaceous-brown.

Distribution : *Andhra Pradesh* : (Likely to occur). Elsewhere : In the Peninsula it occurs in the dense forests of the Western Ghats and in the forests of the hills, plains, estuaries of Orissa, Bengal, Assam and Andamans.

Remarks : Largely diurnal in habits. Its staple diet is snakes. All species including other poisonous snakes being taken.

Status : Not a common snake in India.

Genus 53. *Calliophis* Gray, 1863.

75. *Calliophis melanurus* (Shaw) (Slender coral snake)

1802. *Coluber melanurus* Shaw, *Gen. Zool.* 3 : 552.

1943. *Calliophis melanurus* Smith, *Fauna Brit. Ind.* 3 : 420.

Material examined : *Nalgonda Dist.* : 1 ex., Nandikonda valley, 6. xi. 1963. (Coll. BN & INM).

Measurements : Total length 323 mm. Standard length 300 mm.

Diagnostic character : Eye small, its diameter equal to or less than its distance from the mouth ; 1 preocular in contact with the nasal, 2 postoculars ; 6 upper labials, 3rd and 4th touching the eye ; 5th and 6th in with the temporal ; 3 lower labials. Scales in 13 rows, not oblique. The head and neck are black above with yellowish spots. The tail is encircled by two black rings, one at the base and the other at the tip. Below red.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : It may be found both in the plains and hills at low altitudes in the States of Maharashtra, Madhya Pradesh, Tamil Nadu, Karnatak and Kerala.

Remarks : When annoyed, it will curl its tail over the back to show the beautiful red colour of the underside.

Status : A fairly wide spread but uncommon species in India.

Family 18. VIPERIDAE

Key to the genera of family VIPERIDAE

1. A deep pit between the nostril and the eye	...	...	...	<i>Trimeresurus</i>
No pit between the nostril and the eye	...	...	...	2.
2. Nostril in a large nasal shield ; scales in straight rows	...	...	...	<i>Vipera</i>
Nostril in a divided nasal shield ; lateral scales in oblique series	...	...	...	<i>Echis</i>

Genus 54. *Vipera* Laurenti, 1768.

76. *Vipera russelli* (Shaw)

(Russell's viper) Telegu name : Katuka rekula poda

1797. *Coluber russelli* Shaw, *Nat. Misc.* 8 : 291.

1890. *Vipera russelli* Boulenger, *Fauna Brit. Ind.* : 420.

1943. *Vipera russelli* Smith, *Fauna Brit. Ind.* 3 : 482-485.

Material examined : Guntur Dist. : 1 ex., (Damaged) Eddenmotu Hill, 4. ix. 1963. (Coll. BN & INM).

Measurements : Total length 1190 mm. Standard length 975 mm.

Diagnostic character : Head rather long, distinct wider than neck, snout bluntly pointed ; rostral about twice as high as wide, nostril large crescent shaped, a in large nasal shield ; supraocular entire ; 11 upper labials separated from eye by three rows of scales ; 14 lower labials. Head covered with small scales and without shields, 27 to 33 costals at midbody ; subcaudals divided. Body stout, flattened dorsoventrally tapering evenly posteriorly and anteriorly ; dorsal scales in straight rows and keeled except for lowest row. The colouration and marking of this viper are so distinctive that there is no mistaking it for any other snake if once seen. There are three longitudinal rows of reddish-brown or dark-brown rings with black or black and white edges which form a chain-like pattern on the back and the sides. Head with distinct dark patch behind. A dark streak, margined with white, pink or buff behind eye. A dark stripe from eye to lip.

Distribution : *Andhra Pradesh* : as mentioned in the *material*. Elsewhere : It occurs throughout India and has been met with in the plains and hills even at elevations upto 3,000 m. in the Himalayas.

Remarks : Normally sluggish and does not strike readily unless irritated when it bites with great malice.

Status : Common,

Genus 55. *Echis* Merrem, 1820.77. *Echis carinatus* (Schneider)
(Saw-scaled Viper)1801. *Pseudoboa carinata* Schneider, *Hist. Amph.* 2 : 285.1896. *Echis carinatus* Boulenger, *Cat. Sn. Brit.* 3 : 505.1943. *Echis carinatus* Smith, *Fauna Brit. Ind.* 3 : 487-490.

Material examined : Guntur Dist. : 1 ex., Nagarjunakonda, 7. xi. 1963. (Coll. Dr. KR). 2 ex., Eddenmotu Hill, 3. ix. 1963, 1 ex., Fringimotu Hills, 8. ix. 1963. (Coll. BN & INM). Nalgonda Dist. : 1 ex., Nandikonda valley 8. viii. 1962. (Coll. BN & INM). Chittore Dist. : 1 ex., Mamandam, 6. ix. 1964. (Coll. Dr. KR). Prakasam Dist. : 1 ex., Darsi, 2. xi 1986 (Coll. DPS).

Measurements : Total length 122-352 mm, Standard length 118-312 mm.

Diagnostic character : Head short, distinctly wider than neck, snout blunt ; rostral about twice as wide as high ; nostril in divided nasal shield ; eye surrounded by 10-15 small scales exclusive of the supraocular ; 3.4 scales between nasal and the eye ; temporal scales small, keeled, except the lowermost row ; 10-12 upper labials, the 4th usually the largest ; 1-2 series of scales between them and the eye. Scales in 25 to 29 ; 27-37 : 21-27 rows, the outer most rows the largest, the oblique series in 4-5 rows, Colour and pattern varies considerably pale brown, buff or tawny with dark brown or even blackish markings in the form of dark edged spots in a vertebral series connected to a light coloured inverted U- or V-shaped flank mark enclosing a dark area connected to each other and forming a wavy flank line. Whitish below, uniform or spotted with brown.

Distribution : Andhra Pradesh : as mentioned in the *material*. Elsewhere : The whole of India south of the Gages, except Bengal.

Remarks : It is found in the desert and semi-arid tracts of India.

Status : Common.

Genus 56. *Trimeresurus* Lace'pede', 1804.*71. *Trimeresurus gramineus* (Shaw)
(Green Bamboo Pit Viper)1802. *Coluber gramineus* Shaw *Gen. Zool.* 3 : 420.1937. *Trimeresurus gramineus* Smith, *J. Bombay nat. Hist. Soc.* 39 : 730.

Material examined : Material not available. Description based on the literature.

Description : Snout twice as long as the diameter of the eye. Upper head scales small, subequal, subimbricate, smooth ; supraocular narrow, entire, 8-11 scales on a line between

them. The loreal pit between the nostril and the eye. 15-17 rows of costals two headlengths before vent. The head is flattened and appears unduly broad owing to the constricted neck 10-12 upper labials, first completely separated from the nasal, 3rd largest. Tail short and tapering. Prehensile green or yellowish-green above uniform or with occasional small dark brown spots produced by an extension of the colour of the interstitial skin on to the base of the scales. Whitish or greenish below.

Distribution : *Andhra Pradesh* : (Likely to occur). Elsewhere : Peninsular India south of lat. 22°

Remarks : A hill species not normally seen below 450 m. Frequents low vegetation showing a market preference for bamboo in localities where it occurs.

Status : Not uncommon.

VI. ACKNOWLEDGEMENT

Authors are highly indebted to Dr. A. K. Ghosh, Director, Zoological Survey of India, for providing us all sorts of facilities to carry out this work and critically going through the manuscripts, and Shri A. K. Sarkar, Scientist-'SD', for helping us to carry out these studies and to all collectors for collecting the materials and handing over the same to us for the study. Thanks are also due to the Deptt. of Forests, Govt of Andhra Pradesh for providing necessary help in various ways.

VII. SUMMARY

The paper deals with the reptilian fauna of Andhra Pradesh based on the collections made by the Surveys undertaken by the scientist of Zoological Survey of India during 1962-1988. A few examples collected prior to that and available with the named collections of Reptilia Section have also been utilized. This paper deals with 837 examples belonging to 78 species, 56 genera and 18 families. Out of which 55 species have actually been collected from the above region by the various survey parties of the Zoological Survey of India, and rest 23 species have been included in this paper are known otherwise from adjacent region and are likely to occur in Andhra Pradesh. 13 species namely *Hemidactylus frenatus*, *Hemidactylus bowringi*, *Hemiphyllodactylus typus aurantiacus*, *chamaeleo zeylanicus*, *Mabuya macularia*, *Oligodon travancoricus*,^a *Macropisthodon plumbicolor*, *Sibynophis sagitterius*, *Gerardia prevostiana*, *Hydrophis spiralis*, *Lapemis curtus*, *Enhydrina schistosa*, *Microcephalops gracilis* are recorded for the first time from Andhra Pradesh. Keys and short diagnostic characters of the

species have been given in the paper for determination of the species. A text figure and a map showing distribution of species have also been provided in the paper.

VIII. REFERENCES

- Annandale, N. 1906. Notes on the fauna of a Desert tract in Southern India Part 1. Batrachians and Reptiles. *Mem. Asiat. Soc. Bengal*, 1 : 183-202.
- Annandale, N. 1906. Notes on the Indian tortoises. *J. Asiat. Soc. Bengal*, 2 : 203-206.
- Annandale, N. 1912. The Indian mud-turtles (Trionychidae). *Rec. Zool. Surv. India*. 7 : 151-179.
- Annandale, N. 1915. Notes on some Indian Chelonia. *Rec. Indian. Mus.* 11 : 189-195.
- Beddome, R. H. (1870). Descriptions of new Reptiles from Madras Presidency. *Madras Month. J. Med. Sci.*, 9 : 169-176.
- Bhaskar, S. 1982. Sea turtle survey of northern Andhra Pradesh, India. Report to the WWF-1. 6 pg.
- Biswas, S. 1984. A preliminary survey of sea turtle of the Andhra coast. *Bull. Zool. Surv. India*. 6 (1-3) : 325-326.
- Boulenger, G. A. 1890. *The Fauna of British India including Ceylon and Burma. Reptilia Batrachia*. Taylor and Francis, London. xviii+541 pp.
- Constable, T. D. 1949. Reptiles from the Indian Peninsula in the Museum of comparative zoology. *Bull. Mus. Comp. Zool. Harv.*, 103 : 59-160.
- Daniel, J. C. 1983. *The book of Indian reptiles, Bombay Natural Hist. Soc.* x+141 pp., pls, photos.
- Daniel, J. C. and Bhusan, B. 1985. Golden Gecko of Tirumalai Hills. *Hornbill*. 1985 (3) : 17-19.
- Daniel, J. C., Bhushan, B. and Sekar, A. G., 1986. Rediscovery of the Golden Gecko *Calodactylodes anreus* (Beddome) in the Eastern Ghats of Andhra Pradesh. *J. Bombay nat. Hist. Soc.*, 83 (1) : 15-16.
- Das, I. 1985. *Indian turtles. A field guide*. World life Fund India (Eastern Region), Calcutta. 199, pp.
- Das, I. 1991. *Colour guide to the turtles and tortoises of the Indian subcontinent*. R. & A Publishing Limited, Portishead, Avon England. vi+133 pp, pls, Maps.
- Dutt, S. 1979. Sea turtle notes from Visakhapatnam. *Hamadryad* 4 (2) : 14-15.
- Ganapati, P. N. and Nayar, K. 1952. Occurrence of limbless lizard *Barkudia* Annandale at Waltair. *Curr. Sci.* 21 : 105-106.
- McCann, C. 1945. Reptiles and amphibians of Vizagapatnam and neighbouring Ghats. *J. Bombay nat. Hist. Soc.*, 45 (3) : 435-436.
- Moll, E. O. and Vijay, J. 1986. Distributional records for some Indian turtles. *J. Bombay nat. Hist. Soc.*, 83 (1) : 57-62.

- Murthy, T. S. N. 1986. Lizards of Kurnool district. *Bullet. Maryland Herpt. Soc.*, **22** (3) : 134-143.
- Murthy, T. S. N. and Venkateswarlu. 1980. Record of Rock-lizard, *Psammophilus blanfordianus* (Stolicezka) in Araku valley Eastern Ghats, Andhra, *J. Bombay nat. Hist. Soc.*, **76** (3) : 524.
- Rao, R. J. 1991. Salt water crocodile, *Crocodylus porosus* in Andhra Pradesh, *J. Bombay nat. Hist. Soc.*, **88** (1) : 116-117.
- Sharma, R. C. 1969. Two lizards of genera *Mabuya* Fitzinger and *Riopa* Gray (Scincidae) from India, *Bull. Syst. Zool.* Calcutta, **1** (2) : 71-75.
- Sharma, R. C. 1971 The reptile fauna of Nagarjuna sagar dam area (Andhra Pradesh, (India), *Rec. Zool. Surv. India*, **63** (1-4) : 77-93.
- Sharma, R. C. 1976. "Some observations on ecology and systematics of *Coluber bholanathi*. A new species of snake (Reptilia : Squamata : Colubridae) from India. *Camp. Physiol. Ecol.* **1** : (3) pp 105-107.
- Smith, M. A. 1926. *Monograph of the Sea-snakes (Hydrophiidae)* London, xvii + 130 pp, 2 pls. (reprinted, 1964).
- Smith, M. A. 1931. *The Fauna of British India, including Ceylon and Burma. Reptilia and Amphibia*. Vol. I. Loricata, Testudines. Taylor and Francis, London 185 pp.
- Smith, M. A. 1935. *The fauna of British India, including Ceylon and Burma, Reptilia and Amphibia* Vol. 2. Sauria. Taylor and Francis, London. xii + 440 pp, figs., Map.
- Smith, M. A. 1943. *The fauna of British India, including Ceylon and Burma, Reptilia and Amphibia* Vol. 3 Serpentes, Tailors and Francis, London xii + 583 pp, fig, maps.
- Underwood, G. 1954. On the classification and evolution of Geckos. *Proc. Zool. Soc., London*, **124**, pt. 3 : 469-492.

AMPHIBIA

A. K. SARKAR, P. K. CHANDRA AND S. RAY

Zoological Survey of India, Calcutta

INTRODUCTION

There is very little information about the amphibian fauna of Andhra Pradesh. Murthy (1968) recorded six species of frogs and toads from Nagarjun valley of Andhra Pradesh, and besides some scattered records by Boulenger (1890, 1920), Parker (1934), Sattamurti (1967), Pillai and Murthy (1982), Inger and Dutta (1986) and Sekar (1991), no other consolidated faunal account on the amphibians from the State as a whole is available. So, this will be first detailed account on the amphibians of Andhra Pradesh, which comprises 1151 examples belonging to 17 species (204 species so far reported from India and 5145 species from the World : Chanda, 1991), 8 genera and 4 families. Four species Viz., *Bufo fergusonii*, *Bufo hololius*, *Philautus variabilis* and *Tomopterna dobsonii* recorded by earlier authors have also been included in the paper for a complete account of amphibians of Andhra Pradesh. Where the collections are large, only localities of collections are given under 'Material examined'. Data on field observation are included in the 'Remarks' of the species.

Physiogeographically, Andhra Pradesh is situated on eastern coast of Indian Peninsula, and lies between latitudes 12° 14'—19° 54' N and longitudes 76°50'—84°30' E. The State is divided into 23 districts with Hyderabad as its State Capital. Two major river systems namely, Godavari and Krishna alongwith their several tributories drain the State. A large natural swampy area (C. 250 sq. km.) known as Kolleru Lake which is regarded as one of the largest wetland in India is situated partially in the costal districts namely, Krishna and West Godavari. The area may be utilized as a good frog culture centre. Evergreen, semi-evergreen and moist deciduous forests are found in the State. Palm is of common occurrence throughout the State. The districts headquarters are well connected by rail and road.

The Orders Apoda and Caudata are not represented in the collection.

MATERIAL AND METHOD

Amphibians are either aquatic, terrestrial or arboreal. Aquatic form has been collected by the help of water-net, a net fitted with a metal ring fixed at the end of a long

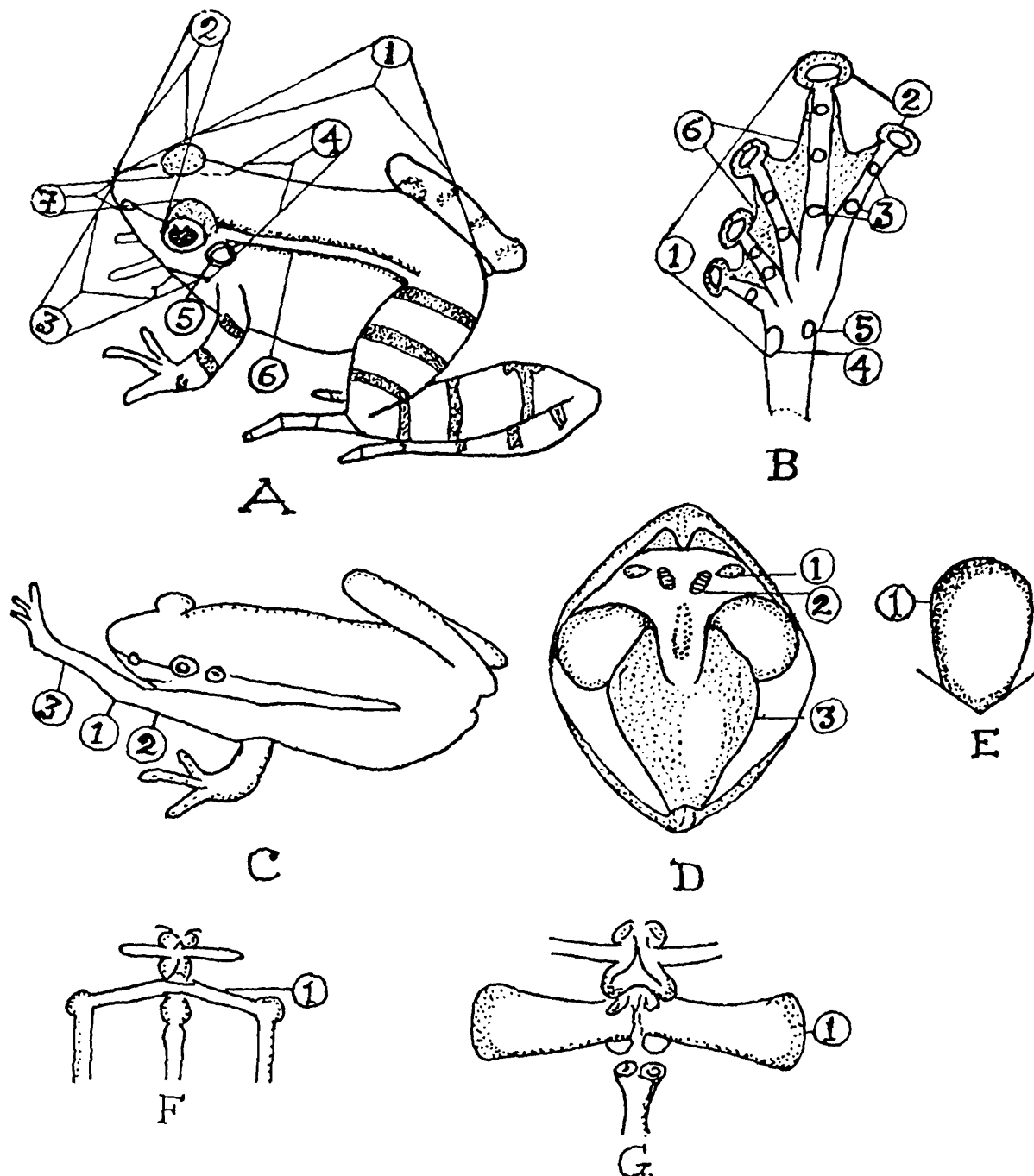


Fig. 1 : Illustrations of measurements and essential morphological characters.

[A 1 : Snout to vent length, A 2 : Snout length, A 3 : Head length, A 4 : Head width, A 5 : Tympanum, A 6 : Glandular dorso-lateral fold, A 7 : Width of interorbital space. B 1 : Foot length, B 2 : Suctorial disc, B 3 : Subarticular tubercles, B 4 : Inner metatarsal tubercle, B 5 : Outer metatarsal tubercle, B 6 : Webs of toes. C 1 : Position of tibiotarsal articulation when hind limb is kept parallel to body, C 2 : Tibia, C 3 : Tarsus. D 1 : Position of Choanae, D 2 : Position of vomerine Teeth, D 3 : Tongue (bifid). E 1 : Tongue (entire). F 1 : Cylindrical sacral vertebra. G 1 : Dilated sacral vertebra.]

bamboo pole, cast-net and fishing hook. Both terrestrial and arboreal forms have been collected by hand or long forceps. The amphibians reported in this paper have been collected by survey parties of Zoological Survey of India from several ecological niches of Andhra Pradesh. As amphibians hibernate during winter, collections have mainly been made during pre-monsoon and monsoon months, the breeding season of amphibia. In the field, notes have been taken regarding the habits and habitats of the frogs and toads. For collection, aquatic vegetations, bushes grown on moist soil, heap of rotten leaves or straw, burrows made on elevated banks of ponds and canals, dark corners of village huts, undersurface of barks of trees, soil under stones etc. are explored. Nocturnal fauna has been explored by the help of lamps. The collected material are first chloroformed and then put into 5% formalin solution at least for 24 hours for fixation. Before putting in the formalin, an incision on the abdomen for the smaller specimens, and injection of 10% formalin solution inside the abdomen for larger specimens are given for the fixation of viscera. The fixed material alongwith labels containing the data of locality, altitude, habitat, date of collection and name of collector, are packed properly and kept in 5% formalin again. Then the material have been studied and identified with the help of literature in the laboratory.

SYSTEMATIC ACCOUNT

Class : AMPHIBIA

Order : ANURA

Key to the families

1. Jaws toothless	...	...	...	...	1.
Upper Jaw toothed	...	...	...	...	2.
2. Skin rough with well-developed warts, parotoids present	...	...	...	...	<i>Bufonidae</i>
Skin more or less smooth, parotoids absent	...	...	...	...	<i>Microhylidae</i>
3. No intercalary ossification (extra cartilaginous bone) between the distal and penultimate phalanges	...	...	...	...	<i>Ranidae</i>
An intercalary ossification between the distal and penultimate phalanges	...	...	...	...	<i>Rhacophoridae</i>

Family I. BUFONIDAE

Family Bufonidae is represented in Andhra Pradesh by four species of the genus *Bufo*.

Genus 1. *Bufo* Laurenti, 1768.

Key to the species of the genus *Bufo*

1. Head with bony ridges	...	...	...	...	2.
Head without bony ridges	...	...	...	...	3.

2. First finger longer than second	...	...	...	<i>melanostictus</i> Schneider
First finger equals the second	...	...	...	<i>fergusonii</i> Boulenger
3. Tympanum as long as the diameter of the eye, toes minutely webbed	...	...	...	<i>hololius</i> Gunther
Tympanum two-third diameter of the eye, toes more than half webbed	...	...	...	<i>stomaticus</i> Lutken

1. *Bufo melanostictus* Schneider (Common Indian Toad)

1799. *Bufo melanostictus* Schneider, *Hist. Amph.* 1 : 216.

1963. *Bufo melanostictus* : Daniel, *J. Bombay nat. Hist. Soc.*, 60 (2) : 435-437.

1968. *Bufo melanostictus* : Murthy, *J. Univ. Poona*, No. 34 : 6.

Material examined : Adilabad dist. : 1 ex., Mancherial, 6. i. 1981, E. V. Muley. 5 ex., Nirmal, 26-28. viii. 1983, D. P. Sanyal. Anantapur dist. : 1 ex., Penakachorla tank, 15. ix. 1986 ; 1 ex., Kalasamudram, 16. ix. 1986. All coll. A. K. Sarkar. East Godavari dist. : 1 ex., Rajamundri, 17. iii. 1986, A. K. Sarkar. Hyderabad dist. : 3 ex., Hyderabad, 10. ii. 1979, A. K. Mondal. 2 ex., Osman Sagar, 22. vi. 1982, Dharamnath. 1 ex., Mohammedabad, 9. ii. 1985, A. K. Sarkar. Karimnagar dist. : 1 ex., Jagtial, 5. ix. 1984 ; 1 ex., Mahadevpur, 7. ix. 1984. All coll. D. P. Sanyal. Krishna dist. : 1 ex., Machilipatnam, 29. iii. 1986, A. K. Sarkar. Khamam dist. : 4 ex., Bhadrachalam, 25-26. ix. 1984, D. P. Sanyal. Mehboobnagar dist. : 2 ex., Mannanur, 19. i. 1988 ; 4 ex., Mehboobnagar, 24. i. 1988. All coll. D. P. Sanyal. Nalgonda dist. : 6 ex., Nagarjun Sagar, Aug.-Sept., 1962 ; 2 ex., Nagarjun hill, 28. ix. 1963. All coll. B. Nath. 2 ex., Rayaram, 20. x. 1963, K. Reddiah. Nellore dist. : 1 ex., Nellore, 21. x. 1986 ; 46 ex., Atmakur, 24-25. x. 1986. All coll. D. P. Sanyal. Prakasam dist. : 10 ex., Kanigiri, 30-31. x. 1986 ; 5 ex., Podile, 2-3. xi. 1986 ; 3 ex., Doranala, 5. xi. 1986 ; 2 ex., Shrisailam, 6. xi. 1986. All coll. D. P. Sanyal. Shrikakulam dist. : 1 ex., Shrikakulam, 14. ix. 1985 ; 2 ex., Palkonda, 18-19. ix. 1985. All coll. D. P. Sanyal. Vizianagram dist. : 3 ex., Bhadraviri, 22-23. ix. 1985 ; 14 ex., Vizianagaram town, 25-27. ix. 1985. All coll. D. P. Sanyal. Warangal dist. : 9 ex., Gundapet, 9. ix. 1980. Dharamnath. 1 ex., Mulug, 14. ix. 1984, D. P. Sanyal. West Godavari dist. : 2 ex., Koylagudam, 23. iii. 1986, A. K. Sarkar.

Measurements : Snout to vent length 40-89 mm.

Diagnostic character : Head broader than long, with cornified bony ridges ; snout rounded, nearly equal the diameter of the eye ; nostril a little nearer to the tip of snout than to the eye ; interorbital width broader than that of upper eyelid ; tympanum very distinct two third the diameter of the eye. Fingers free, first a little longer than second, tips of fingers and toes swollen. Toes nearly half-webbed, more than three phalanges of fourth toe free ; two oval (inner and outer) metatarsal tubercles present. Tarsometatarsal articulation reaches in between tympanum and eye. Dorsum dark brownish, rough with several spiny warts, parotoid large, kidney-shaped. Venter dull whitish with numerous small spiny warts.

Distribution : Andhra Pradesh : As mentioned in the *Material examined*. Murthy (1968) recorded it from Nagarjun Valley (Andhra Pradesh). *Elsewhere* : Common throughout the plains of India, and Andaman and Nicobar. Also Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, South China, Malaya Peninsula and Archipelago.

Remarks : Big-sized toad. It is nocturnal in habit and found in gardens and road sides preying on arthropodes and other invertebrates. Terrestrial, and found in and near water during breeding season. The toads are used for dissection in College laboratories, and the males are used in pregnancy diagnosis tests of human beings.

Status : Common.

2. *Bufo fergusonii* Boulenger (Ferguson's toad)

1892. *Bufo fergusonii* Boulenger, *J. Bombay nat. Hist. Soc.*, 7 : 317.

1963. *Bufo fergusonii* : Daniel, *J. Bombay nat. Hist. Soc.*, 60 (2) : 434-435.

Material examined : Nil ; record from published literature.

Diagnostic character : Head broader than long, with weak, less cornified bony ridges ; snout rounded, nearly equal the diameter of the eye ; nostril a little nearer to the tip of snout than to the eye ; interorbital width broader than that of upper eyelid ; tympanum very distinct, more than the half diameter of the eye. Fingers free, first equals the second, tips of fingers and toes swollen. Toes half webbed, more than three phalanges of fourth toe free ; two oval (inner and outer) metatarsal tubercles present. Tarsometatarsal articulation reaches the eye. Dorsum olive brown in life, little rough with less spiny warts, parotoid large, kidney-shaped. Venter dull-whitish, granular.

Distribution : Andhra Pradesh, Karnataka, Kerala, Orissa and Tamil Nadu in India (Inger and Dutta, 1986). Also Sri Lanka.

Remarks : Small sized toad. Nocturnal in habit. Apart from weaker development of cranial ridges, less cornified warts, and first finger equals the second, the toad do not differ from *B. melanostictus*. Narayan Rao (1915) made a good observation on its habits.

Status : Rare.

3. *Bufo hololius* Gunther

1875. *Bufo hololius* Gunther, *Proc. Zool. Soc. London*, : 569.

1890. *Bufo hololius* : Boulenger, *Fauna Br. India, Rept. & Batr.* : 502.

1963. *Bufo hololius* : Daniel, *J. Bombay nat. Hist. Soc.*, 60 (2) : 432.

Material examined : Nil ; record from published literature.

Diagnostic character : Head broader than long ; without bony ridges ; snout short,

depressed, projecting beyond the mouth ; nostril nearer the tip of the snout than the eye ; interorbital width broader than that of upper eyelid ; tympanum very distinct, as long as the diameter of the eye. Fingers free, first longer than second ; tips of fingers and toes blunt. Toes minutely webbed ; two small metatarsal tubercles present. Tarsometatarsal articulation reaching the eye. Dorsum olive-brown, more or less smooth, parotoids flat. Venter dull-whitish, granular.

Distribution : Andhra Pradesh : Chittoor and Nellore (Sattamurti, 1967), and Nagarjun Sagar, Nalgonda district (Pillai and Murthy, 1982). Also Kerala in India.

Status : Rare.

4. *Bufo stomaticus* Lutken (Marbled Toad)

1863. *Bufo stomaticus* Lutken, *Vidensk. Meddr dansk naturh-Foren*, 14 : 305.

1923. *Bufo stomaticus* : Nieden, *Das Tierreich*. Anura I : 85.

1968. *Bufo andersoni* : Murthy, *J. Univ. Poona*, No. 34 : 6.

Material examined : Anantapur dist. : 15 ex., Anantapur town, 14 & 18. ix. 1986 ; 1 ex., Bukkapatnam, 19. ix. 1986 ; 2 ex., Dharmavaram, 20. ix. 1986 ; 1 ex., Puttapurthy, 21. ix. 1986. All coll. A. K. Sarkar. Nalgonda dist. : 1 ex., Nandikonda valley, 9. viii. 1962, I. N. Maligi. 1 ex., Nagarjun Sagar, 15. ix. 1962, B. Nath. Prakasam dist. : 1 ex., Kanigiri, 31. x. 1986, D. P. Sanyal. Warangal dist. : 1 ex., Mulug, 14. ix. 1984, D. P. Sanyal.

Measurements : Snout to vent length 29-65 mm.

Diagnostic character : Head broader than long, without bony ridge ; snout rounded, nearly once the diameter of the eye ; nostril nearer the tip of snout than the eye ; interorbital width broader than that of the upper eyelid ; tympanum very distinct, two-third diameter of the eye. Fingers free, first a little longer than second, tips of fingers and toes swollen. Toes more than half webbed, two phalanges of fourth toe free ; two oval (inner and outer) metatarsal tubercles present. Tarsometatarsal articulation reaches in between tympanum and eye. Dorsum brownish, rough with several non-spiny warts, parotoids large, flat, not kidney shaped. Venter dull-whitish with numerous small non-spiny warts.

Distribution : Andhra Pradesh : As mentioned in the *Material examined*. Murthy (1968) recorded it first from Nagarjun Valley (Andhra Pradesh). **Elsewhere :** Plains of India from jammu and Kashmir to Karnataka, and Assam in the east. Also Nepal, Myanmar, Sri Lanka, Pakistan and Arabia.

Remarks : Medium-sized toad. It is terrestrial, nocturnal in habit, and found in or near water during breeding. Adults can be used in College laboratories for dissection. One example collected from Mulug (Warangal district) possesses thickly tuberculated skin on dorsum.

Status : More or less common in the central and southern districts of Andhra Pradesh.

Family II. MICROHYLIDIAE

This family is represented in Andhra Pradesh by three genera, two of which are again represented by single species each and third (*Microhyla*) is represented by two species.

Key to the genera of the family MICROHYLIDAE

1. Tips of fingers more or less blunt (or rounded), but not dilated into discs	...	...	2.
Tips of fingers dilated into triangular discs, a dermal ridge a little way behind each choana	...	...	<i>Ramanella</i> Rao and Ramanna
2. Two strong and shovel-shaped metatarsal tubercles (inner larger) present	...	...	<i>Uperodon</i> Dumeril and Bibron
Two small but distinct, and normal (not shovel-shaped) metatarsal tubercles present	...	...	<i>Microhyla</i> Tschudi

Genus 2. *Ramanella* Rao and Ramanna, 1925

5. *Ramanella variegata* (Stoliczka) (Variable *Ramanella*)

1872. *Callula variegata* Stoliczka, *Proc. Asiat. Soc., Bengal* : 111.

1934. *Ramanella variegata*, Parker, *Mongr. Microhylidae* : 93-94.

1963. *Ramanella variegata* : Daniel, *J. Bombay nat. Hist. Soc.*, 60 (3) : 700-701.

Material examined : Adilabad dist. : 1 ex., Dosi Nagar, near Indian-palli, 12. i. 1981, E. V. Mulley.

Measurements : Snout to vent length 23 mm.

Diagnostic character : Head broader than long, snout rounded, as long as the diameter of the eye ; nostril nearer to the tip of snout than the eye ; interorbital width much broader than the upper eyetid ; tympanum hidden ; dermal ridge a little way behind the internal nares. Fingers free, first shorter than second, tips bearing well-developed truncate discs ; subarticular tubercles of fingers and toes distinct. Toes feebly webbed, tips a little dilated ; inner metatarsal tubercle prominent, outer metatarsal tubercle not prominent. Tibiotarsal articulation reaching the shoulder. Dorsum more or less smooth and brownish. Venter smooth and white with reddish brown at gular region ; anal region poorly granular.

Distribution : Andhra Pradesh : As mentioned in the *Material examined*. Boulenger (1890) records it from Godavari, and Parker (1934) from Bhadrachalam. *Elsewhere :* Karnataka, Kerala, Madhya Pradesh, Orissa and Tamil Nadu States in India. Also Sri Lanka.

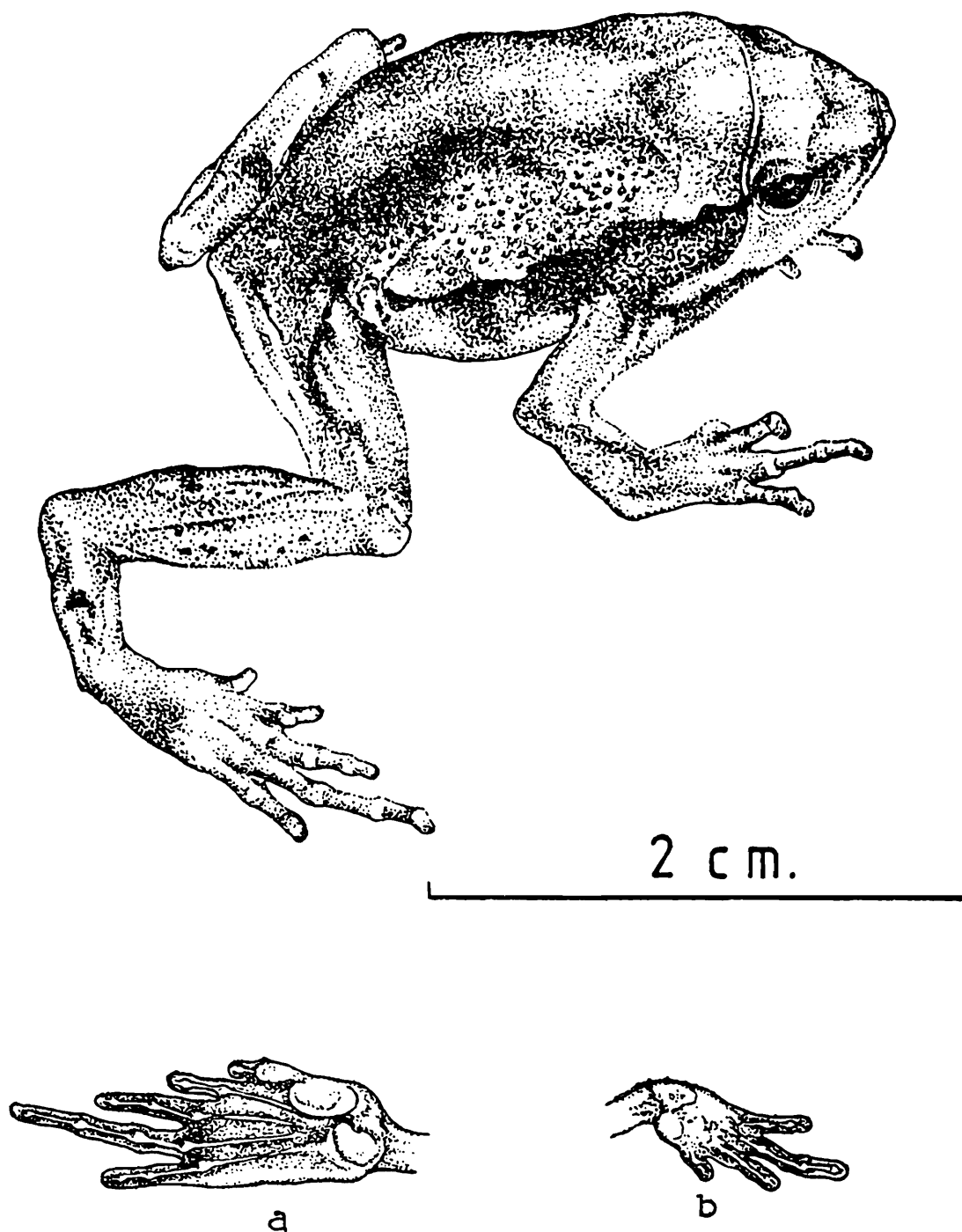


Fig. 2: *Ramanella Variegata* (Stoliczka) Ventral view of a. foot, b. palm.

Remarks : Small-sized frog. Nocturnal in habit. Records of collection are there from termites nest, and under stones in association with large black scorpions, *Heterometrus* sp.

Status : Rare.

Genus 3. *Uperodon* Dumeril and Bibron, 1841.

6. *Uperodon systoma* Schneider
(Marbled Balloon Frog)

1799. *Rana systoma* Schneider, *Hist. Amph.*, 1 : 144.

1934. *Uperodon systoma*: Parker, *Mongr. Microhylidae* : 75-76.

1963. *Uperodon systoma*: Daniel, *J. Bombay nat. Hist. Soc.* 60 (3) : 698.

Material examined : Anantapur dist. : 1 ex., Near Bukkapatnam Forest Rest House, 19. ix. 1986, A. K. Sarkar.

Measurements : Snout to vent length 62 mm.

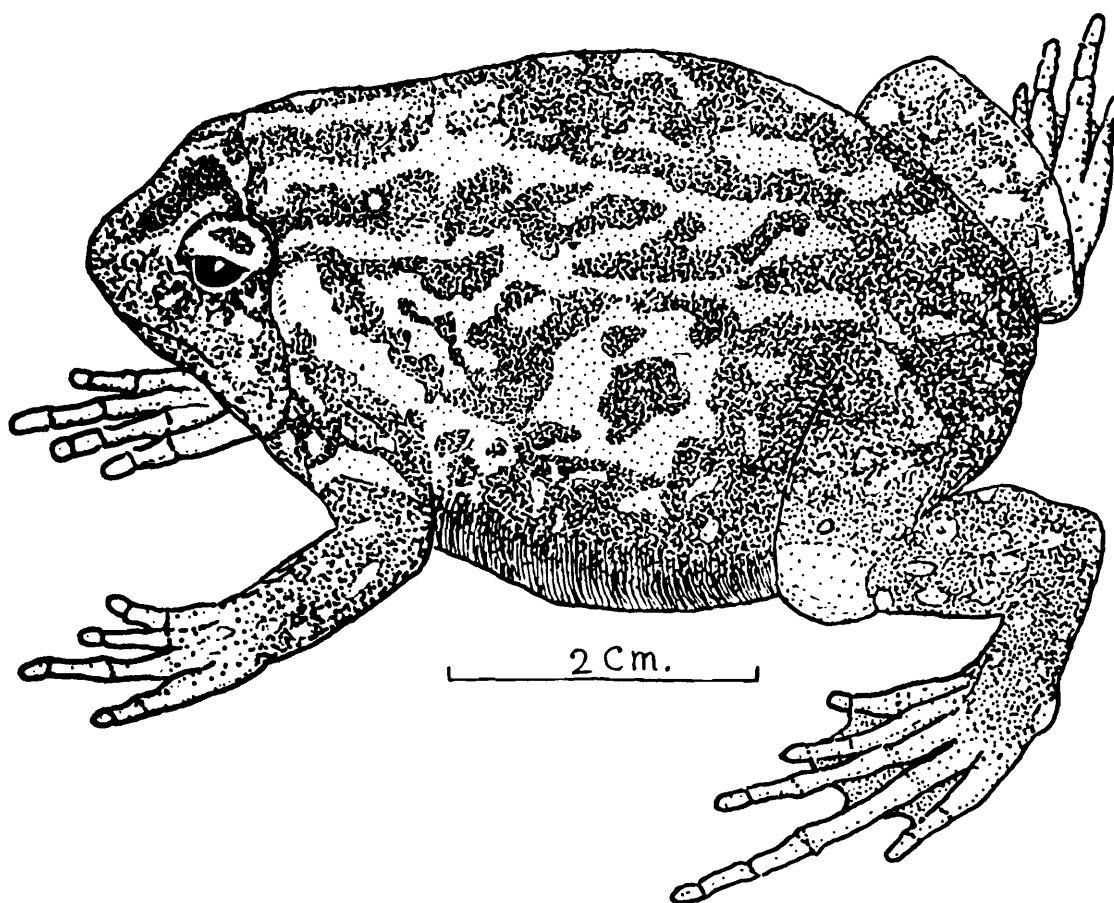


Fig. 3 : *Uperodon systoma* Schneider

Diagnostic character : Head broader than long ; snout rounded, as long as the diameter of the eye ; nostril equidistant from the tip of the snout and the eye ; interorbital width about twice the width of the upper eyelid ; tympanum hidden. Fingers free, first shorter than second, tips not bearing discs ; subarticular tubercles of fingers and toes not very distinct ; two shovel-shaped metatarsal tubercles present, the inner very large.

Tibiotarsal articulation not reaching the shoulder. Dorsum smooth or slightly tuberculated, olive, marbled and spotted darker. Venter smooth, white, and spotless.

Distribution : Andhra Pradesh : As mentioned in the *Material examined*. First record from Anantapur district of Andhra Pradesh. *Elsewhere :* Himachal Pradesh, Karnataka, Kerala, Orissa, Tamil Nadu and Uttar Pradesh in India. Also Sri Lanka.

Remarks : Medium-sized frog. Nocturnal in habit, mostly found underground. The specimen has been collected by the side of a rainfed seasonal stream, bed of which is covered with rocky bounders.

Status : Rare.

Genus 4. *Microhyla* Tschudi, 1838

Key to the species of the genus *Microhyla*

Two small, oval (not shovel-shaped) metatarsal tubercles present	...	<i>ornata</i> Dumeril and Bibron
Two large, shovel-shaped metatarsal tubercles present	...	<i>rubra</i> Jerdon

7. *Microhyla ornata* (Dumeril and Bibron) (Ornate Microhylid)

1841. *Engystoma ornatum* Dumeril and Bibron, *Erpet. Gen.*, 8 : 745.

1934. *Microhyla ornata* : Parker, *Monogr. Microhylidae* : 139-141.

1968. *Microhyla ornata* : Murthy, *J. Univ. Poona*, No. 34 : 6.

Material examined : Anantapur dist. : 7 ex., Bukkapatnam, 19. ix. 1986 ; 1 ex., Puttaporthy, 21. ix. 1986. All coll. A. K. Sarkar. Guntur dist. : 1 ex., Nagarjunkonda Valley, 1. viii. 1962, I. N. Maligi. Hyderabad dist. : 1 ex., Osman Sagar, 22. vi. 1982, Dharamnath. Karimnagar dist., : 12 ex., Mahadevpur, 9. ix. 1984, D. P. Sanyal. Kurnool dist. : 17 ex., Mahanandi 27. ix. 1986, A. K. Sarkar. Mehboobnagar dist. : 2 ex., Mehboobnagar, 22 & 24. 1. 1988, D. P. Sanyal. Nalgonda dist. : 2 ex., Devarkonda Valley, 14.viii. 1962, I. N. Maligi. 1 ex., Nagarjun Sagar, 14. ix. 1962 ; 1 ex., Nagarjun Sagar, 15. x. 1963. All coll. B. Nath. Nellore dist. : 1 ex., Udayagiri, 27. x. 1986, D. P. Sanyal. Nizamabad dist. : 1 ex., Armur, 23. viii. 1983, D. P. Sanyal. Srikakulam dist. : 9 ex., Srikakulam, 13-15. ix. 1985 ; 4 ex., Palkonda, 17-19. ix. 1985. All coll. D. P. Sanyal. Vizianagram dist. : Vizianagaram town, 26-27. ix. 1985, D. P. Sanyal. Warangal dist. : 3 ex., Mannanur, 15. ii. 1979, A. K. Mondal. 1 ex., Mulug, 14. ix. 1984, D. P. Sanyal. West Godavari dist. : 3 ex., Koyyalagudem, 22. iii. 1986, A. K. Sarkar.

Measurements : Snout to vent length 8-28 mm.

Diagnostic charactor : Head broader than long ; Snout obtusely pointed, a little longer than the diameter of the eye ; nostril nearer to the tip of snout than the eye ;

Interorbital width a little broader than that of upper eyelid ; tympanum not so distinct. Fingers free, first shorter than second, tips flattened. Toes with a rudiment of web, tips blunt, two small but distinct oval (inner and outer) metatarsal tubercles present. Tibio-tarsal articulation reaches near to eye. Dorsum smooth, brownish with broad darker markings. Venter smooth, dull whitish, little darker on throat.

Distribution : Andhra Pradesh : As mentioned in the *Material examined*. Murthy (1968) recorded it from Nagarjun Valley (Andhra Pradesh). *Elsewhere* : It is widely distributed species in India and found all over the plains of the country upto an altitude of 1524 metres, and Andaman. Also Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, South China, South east Asia and Taiwan.

Remarks : Small frog. The frogs are normally found inside the bush, and under dry leaves spread over moist soil. They are nocturnal in habit, sometimes found inside human dwellings during monsoon days.

Status : Common.

8. *Microhyla rubra* (Jerdon) (Red Microhylid)

1854. *Engystoma rubrum* Jerdon, J, *Asiat. Soc. Bengal*, 22 : 534.

1882. *Microhyla rubra* : Boulenger, *Cat. Batr. Sal. Br. Mus.*, : 164.

1934. *Microhyla rubra* : Parker, *Mongr. Microhylidae* : 142-143.

Material examined : Anantapur dist. : 11 ex., Bukkapatnam, 19. ix. 1986,

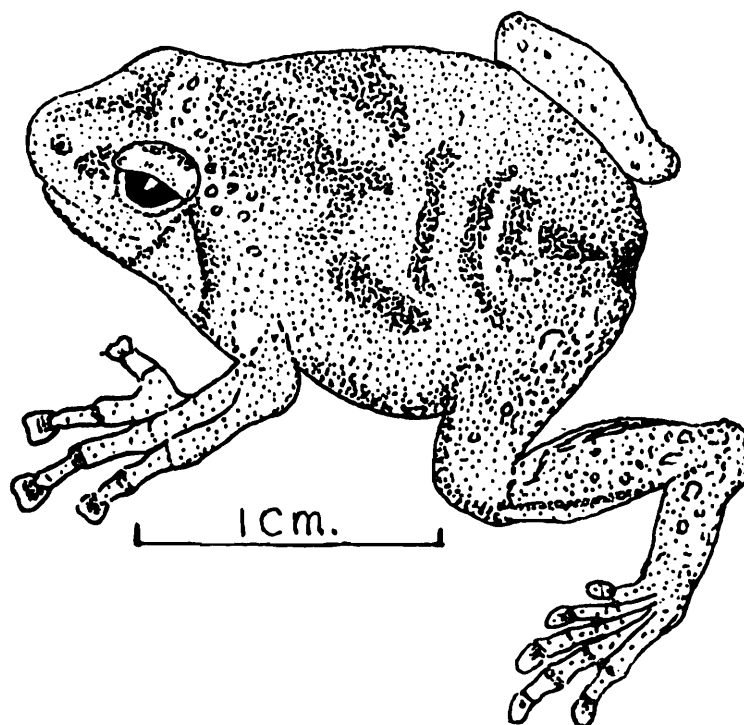


Fig. 4 : *Microhyla rubra* (Jerdon)

A. K. Sarkar. Kurnool dist. : 13 ex. (moist forest bed), Mahanandi, 26-27. ix. 1986,
A. K. Sarkar.

Measurements : Snout to vent length 31-35 mm.

Diagnostic character : Head broader than long, snout rounded, a little shorter than the diameter of the eye ; nostril nearer the tip of the snout than the eye ; interorbital width broader than that of upper eyelid ; tympanum hidden. Fingers free, first finger much shorter than second, tips swollen. Toes more than one-fourth webbed, tips swollen, two large, shovel-shaped metatarsal tubercles present. Tibiotarsal articulation reaching nearer to eye. Dorsum a little warty, brownish. Venter smooth, dull-whitish, darker on gular region.

Distribution : Andhra Pradesh : As mentioned in the *Material examined*. New record from Anantapur and Kurnool districts of Andhra Pradesh. *Elsewhere :* Assam, Karnataka, Kerala and Tamil Nadu in India. Also Sri Lanka.

Remarks : Small sized frog. Cryptozoic and nocturnal in habit. The frogs have been collected from bush grown by the sides of big rocky boulders fallen scatteringly at the base of a seasonal rain-fed stream at Bukkapatnam, Anantapur district. They have been collected at night while they are making breeding call. Specimens collected at Mahanandi were found resting under heap of rotten leaves inside deep forest in day-time. All the specimens in our disposal possess distinct row of warts running dorso-laterally from the posterior and of the eye to the flanks. There is one specimen from Nellore in the collection of Zoological Survey of India collected by T. C. Jerdon in 1869.

Status : Uncommon.

Family III. RANIDAE

This family represented in Andhra Pradesh by five species of the genus *Rana* and two species of genus *Tomopterna*.

Key to the genera of the family RANIDAE

Outer metatarsal separated by web, at least in the distal half	...	...	<i>Rana</i> Linnaeus
Outer metatarsal united or separated in their distal extremity	...		<i>Tomopterna</i> Dumeril and Bibron.

Genus 5. *Rana* Linnaeus, 1758.

Key to the species of the genus *Rana*

1. Toes webbed upto the tips	...	...	...	2.
Toes webbed not upto the tips	...	...	...	3.
2. Ventral surface smooth with no porous warts ; tips of toes swollen	...		<i>cyanophlyctis</i> Schneider	
Ventral surface more or less granulated with porous warts on throat, under surface of thighs, and sides of belly ; tips of toes pointed	...	...	...	<i>hexadactyla</i> Lesson

3. Both inner and outer metatarsal tubercles present ; toes one-third webbed (generally three phalanger of fourth-toe free)	...	...	...	<i>limnocharis</i> Boie
Only inner metatarsal tubercle present ; toes entirely webbed (Penultimate phalange of fourth-toe may partially be free)	...	...	...	4.
4. Inner metatarsal tubercle sharp and shovel-shaped	...	...	...	<i>crassa</i> Jerdon
Inner metatarsal tubercle blunt, not shovel-shaped	...	...	...	<i>tigerina</i> Daudin

9. *Rana cyanophlyctis* Schneider (Skipping Frog)

1799. *Rana cyanophlyctis* Schneider, *Hist. Amph.*, 1 : 137.

1920. *Rana cyanophlyctis* : Boulenger, *Rec. Indian Mus.*, 20 : 12.

1968. *Rana cyanophlyctis* : Murthy, *J. Univ. Poona*, No. 34 : 5.

Material examined : 200 frogs and 17 tadpoles collected from Adilabad dist. : Monacherru, Jannaram. Anantapur dist. : Dharmavaram, Kalasamudram, Penakachorla tank, Mudugubba, Singanamala. Chittoor dist. : Chittoor forest. East Godavari dist. : Ramchandrapuram, Chodavaram, Rajanagaram. Guntur dist. : Firigimotu hill, Nagarjun-konda, Vijayapuri, Nagarjun Sagar dam, Macherla. Hyderabad dist. : Shamur Pet, Ibrahim bag, Jeedimetla, Osman Sagar, Kurmalguda, Indro Sagar, Komatkunta II, Chintalkunta, Shameerpet, Medchal, Tandur, Mohammedabad, Hasanabad, Hyderabad Zoo Garden. Khammam dist. : Konjerla Lake. Krishna dist. : Machilipatnam, Mylavaram, Gudiveda, Vijayawada. Kurnool dist. : Mahanadi, Alur. Mehboobnagar dist. : Mannanur. Medak dist. : Pocharam Wild Life Sanctuary, Rayan Pally. Nalgonda dist. : Tiger Valley, Dindi, Peddamunigal, Nagarjun Hill, Nagarjun Sagar, Debarkonda, Nalgonda town, Choutyppal. Nellore dist. : Udayagiri town. Prakasam dist. : Monigiri. Visakapatnam dist. : Araku, Paderus. Warangal dist. : Durai Charubu, Mulug. West Godavari dist. : Koyyalagudem, Jangareddigudem, Eluru, Akividu. All coll. staff of Z. S. I. Collections are available almost throughout the year.

Measurements : Snout to vent length 18-75 mm.

Diagnostic character : Head broader than long ; snout generally rounded, equal or a little longer than the diameter of the eye ; nostril equidistant from the tip of the snout and the eye ; interorbital width much smaller than that of the upper eyelid ; tympanum distinct, nearly once the diameter of the eye. Fingers free, first equals second, tips pointed ; subarticular tubercles of fingers and toes feebly prominent. Toes fully webbed, tips swollen ; a pointed digit-like inner metatarsal tubercle present, outer metatarsal tubercle absent. Tibiotarsal articulation reaches in between posterior end of tympanum and nostril. Dorsum darker with small warts. Venter whitish and smooth.

Distribution : Andhra Pradesh : As mentioned in the *Material examined* : Murthy (1968) recorded it from Nagarjun Valley (Andhra Pradesh). *Elsewhere* : Throughout the plains of India, and upto 1846 m. in the Himalayas. Also Pakistan, Afghanistan, Beluchistan, Iran, South Arabia, Nepal, Bangladesh, Thailand and Sri Lanka,

Remarks : Medium-sized frog. The frogs are normally found floating on the surface of water. Adults can be used in College laboratories for dissection.

Status : Very common throughout the State.

10. *Rana hexadactyla* Lesson (Pond Frog)

1834. *Rana hexadactyla* Lesson, in Balang, *Voy. Indian or Rept.*, : 331.

1920. *Rana hexadactyla* : Boulenger, *Rec. Indian Mus.*, 20 : 10-11.

1984. *Rana hexadactyla* : Sarkar, *Rec. Zool. Surv. India*, 81 (3&4) : 225-227.

Material examined : Anantapur dist. : 6 ex. (rain-fed pool), Mudugubba, 17. ix. 1986, A. K. Sarkar.

Measurements : Snout to vent length 20-30 mm.

Diagnostic character : Head as long as broad or a little broader than long ; snout rounded or very slightly pointed, hardly projecting beyond the mouth, longer than the diameter of the eye ; nostril nearer the tip of the snout than the eye ; interorbital width much smaller than that of upper eyelid ; tympanum distinct, nearly once the diameter of the eye. Fingers free, first longer than second, tips pointed ; subarticular tubercles of fingers and toes feebly prominent. Toes fully webbed, tips pointed, digit-like inner metatarsal tubercle present, outer metatarsal tubercle absent. Tibiotarsal articulation reaching in between posterior end of tympanum and anterior end of the eye. Dorsum leaf-green or darker with porous warts. Venter dull whitish, granular with large porous warts on the throat, lateral sides of belly, and under the thighs.

Distribution : Andhra Pradesh : As mentioned in the *Material examined*. Annandale in Boulenger (1920) reported it from Nellore. *Elsewhere* : Goa, Gujarat, Karnataka, Kerala, Maharashtra, Orissa, Rajasthan, Tamil Nadu and West Bengal in India. Also Bangladesh, Sri Lanka and Pakistan.

Remarks : A giant edible frog generally found floating in the ponds with rich green aquatic vegetation. Specimens recorded here have been collected from rain-fed pools by the side of a running stream.

Status : Uncommon in the State.

11. *Rana limnocharis* Boie (Cricket Frog)

1835. *Rana limnocharis* (Boie), Wiegmann, *N. Acta. Ac. Leop. Carol.*, 17 (i) : 255,

1920. *Rana limnocharis* : Boulenger, *Rec. Indian Mus.*, 20 : 28.

1968. *Rana limnocharis* : Murthy, *J. Univ. Poona*, No. 34 : 5.

Material examined : 518 frogs collected from Adilabad dist. : Udampur, Pallaykonta, Anantapur dist. : Anantapur town, Dharmavaram, Kalasamudram, Kadiri, Mudugubba, Penakachorla tank and Puttapurthy. East Godavari dist. : Chodavaram, Ramchandra-puram, Rajanagaram. Hyderabad dist. : Hasanabad, Hyderabad Zoo Garden, Hussien Sagar, Ibrahimpatnam, Mohammedabad, Medchal, Osman Sagar, Tandur and Tikkuguda. Karim-nagar dist. : Jagtial, Karimnagar, Mahadevpur and Sireilla. Krishna dist. : Mylavaram and Vijayawada. Khammam dist. : Bhadrachalam, Khammam, Kottagudem, Rama Samudram and Yellandu. Kurnool dist. : Kurnool, Mahanandi. Mehboobnagar dist. : Korangal, Mannanur and Mehboobnagar. Medak dist. : Poncharam Wild Life Sanctuary, Rayanpally, Sadasivpet and Zahirabad. Nalgonda dist. : Nandikonda, Nalgonda, Nidigul, Nirmalguda town and Tiger Valley. Nellore dist. : Atmakur, Bata, Nellore and Udaygiri. Visakhapatnam dist. : Anantagiri, Araku Valley, Hukumpet, Paderu, Simlachalani, Bhimunipatnam and Visakhapatnam. Vizianagaram dist. : Bhadrachalam and Vizianagaram town. Warangal dist. : Durai Charubu, Kazipet, Mulug, Narsampet and Warangal. West Godavari dist. : Akividu, Koyyalagudem and Eluru. All coll. staff of Z. S. I. Collections are available throughout the year.

Measurements : Snout to vent length 12-42 mm.

Diagnostic character : Head generally as long as broad ; snout generally pointed, projecting beyond the mouth, as long as or a little longer than the diameter of the eye, nostril nearer to the tip of snout than the eye ; interorbital width much smaller than that of the upper eyelid ; tympanum distinct, nearly two-third the diameter of the eye. Fingers free, first longer than second, tips swollen : subarticular tubercles of fingers and toes distinct. Toes half-webbed, normally three phalanges of fourth toe free ; a distinct oval inner metatarsal tubercle, and feebly distinct outer metatarsal tubercle present. Tibiotarsal articulation reaches in between tympanum and nostril. Dorsum greyish and warty. Venter whitish and smooth.

Distribution : Andhra Pradesh : As mentioned in the *Material examined*. Murthy (1968) recorded it from Nagarjun Valley (Andhra Pradesh). *Elsewhere :* It is a broadly distributed species in India and found almost all the biotopes of the country, and Andaman and Nicobar. Also Eastern Asia from Pakistan, Nepal, Bangladesh, Sri Lanka and China to Japan.

Remarks : Medium-sized frog. The frogs are found inside bush grown on moist soil and on moist forest bed covered with thick canopy of trees. Two examples of frogs collected from Mahadevpur (Karimnagar dist.) and one example from Khammam (Khammam dist.) possess thickly tuberculated skin on dorsum, and developed (shovel-shaped) inner metatarsal tubercle.

Status : Very common throughout the State.

12. *Rana crassa* Jerdon (Jerdon's Bull Frog)

1853. *Rana crassa* Jerdon, *J. Asiat. Soc. Beng.*, 22 : 531

1947. *Rana crassa* : Bhaduri, *J. Bombay nat. Hist. Soc.*, 44 (3 & 4) : 481-484.

1982. *Rana crassa* : Pillai and Murthy, *Proc. Seminar Resources Eastern Ghat* : 83.

Material examined : Adilabad dist. : 1 ex., Nirmal, 27. viii. 1983 ; 3 ex., Adilabad, 30-31. viii. 1983 & 1. ix. 1983. All coll. D. P. Sanyal. Anantapur dist. : 4 ex., Bukkapatnam 19. ix. 1986 ; 1 ex., Puttaparthi, 21. ix. 1986. All coll. A. K. Sarkar. Guntur dist. : 1 ex., Nagarjunkonda Valley, 29. vii. 1962, I. N. Maligi. 1 ex., Nagarjunkonda, 10. xi. 1963, K. Reddiah. Karimnagar dist. : 2 ex., Mahadevpur, 9. ix. 1984, D. P. Sanyal. Khammam dist. : 1 ex., Khammam, 19. ix. 1984, D. P. Sanyal. Kurnool dist. : 7 ex., Mahanandi, 25-27. ix. 1986, A. K. Sarkar. Nellore dist. : 3 ex., Nellore, 20 & 22. x. 1989 ; 1 ex., Atmakur, 24. x. 1986 ; 4 ex., Udaygiri, 27. x. 1986. All coll. D. P. Sanyal. Prakasam dist. : 1 ex., Kanigiri, 30. x. 1986, D. P. Sanyal. Srikakulam dist. : 2 ex., Srikakulam, 14. ix. 1985 ; 3 ex., Palkonda, 17-19. ix. 1985. All coll. D. P. Sanyal. Vizianagaram dist. : 6 ex., Bhadravari, 22-23. ix. 1985, D. P. Sanyal.

Measurements : Snout to vent length 38-98 mm.

Diagnostic character : Head a little broader than long ; snout generally pointed, projecting beyond the mouth, longer than the diameter of the eye ; nostril generally equidistant from the tip of snout and the eye ; interorbital width much smaller than that of upper eyelid ; tympanum distinct, nearly equal to the diameter of the eye. Fingers free, first longer than second ; subarticular tubercles of fingers and toes feebly distinct. Toes entirely webbed, penultimate phalange of fourth toe free, tips not pointed ; a highly developed, shovel-shaped inner metatarsal tubercle present, outer metatarsal tubercle absent. Tibiotarsal articulation reaches the tympanum or the eye. The heels do not overlap when the limbs are folded at right angle to the body. Dorsum light greyish with interrupted long warts. Venter dull whitish with darker spots on throat, and smooth.

Distribution : Andhra Pradesh : mentioned in the *Material examined*. Pillai and Murthy (1982) recorded it from Eastern Ghat, and Inger and Dutta (1986) from Andhra Pradesh. New record from the districts of Adilabad, Anantapur, Guntur, Karimnagar, Khammam, Kurnool, Nellore, Prakasam, Srikakulam and Vizianagaram. It has so far been recorded from Kerala, Tamil Nadu, Orissa, Bihar, Uttar Pradesh and West Bengal States in India. *Elsewhere :* Sri Lanka.

Remarks : Fairly big-sized frog. Nocturnal in habit. It is an edible burrowing frog that spends day inside the crevices on elevated walls of ditches, ponds and canals. In the month of September these frogs have been found in abundance inside rain-fed roadside ditches inside the reserve forest at Mahanandi, Kurnool district. One frog ♂ measuring 92 mm. from snout to vent collected from Bukkapatnam, Anantapur district has got highly

developed inner metatarsal tubercle, long warts on dorsum, chocolate brown spots on gular region.

Status : Common in Andhra Pradesh.

13. *Rana tigerina* Daudin (Indian Bull Frog)

1803. *Rana tigerina* Daudin, *Hist. Rain. Gren. Crap.*, : 64.

1920. *Rana tigrina* : Boulenger, *Rec. Indian Mus.*, 20 : 17-20.

1968. *Rana tigrina tigrina* : Murthy, *J. Univ. Pooda*, No. 34 : 5.

Material examined : Adilabad dist. : 1 ex., Nirmal, 26. viii. 1983, D. P. Sanyal. Guantur dist. : 1 ex., Nagarjun Konda, 10. xi. 1963, K. Reddiah. Khammam dist. : 1 ex., Bhadrachalam, 26. ix. 1984, D. P. Sanyal. Kurnool dist. : 18 ex., Mahanandi, 26. ix. 1986, A. K. Sarkar. Mehboobnagar dist. : 1 ex., Korangal, 26. i. 1988, D. P. Sanyal. Nalgonda dist. : 2 ex., Nagarjun Sagar, Oct., 1962 ; 1 ex., Nagarjun Hill, 30. x. 1963. All coll. B. Nath. Nizamabad dist. : 3 ex., Armur, 23-24. viii. 1983, D. P. Sanyal. Srikakulam dist. : 1 ex., Srikakulam, 14. ix. 1985, D. P. Sanyal. Visakhapatnam dist. : 1 ex., Paderu, 5. x. 1985, D. P. Sanyal. Vizianagaram dist. : 1 ex., Bhadrakiri, 23. ix. 1985, D. P. Sanyal. West Godavari dist. : 1 ex., Koyyalagudem, 22. iii. 1986 ; 1 ex., Jangareddigudem, 23. iii. 1986. All coll. A. K. Sarkar.

Measurements : Snout to vent length 22-143 mm.

Diagnostic character : Head as long as broad or a little broader than long ; snout rounded or pointed, projecting beyond the mouth, longer than the diameter of the eye ; nostril generally equidistant from the tip of the snout and the eye ; interorbital width much smaller than that of the upper eyelid ; tympanum distinct, nearly equal to the diameter of the eye. Fingers free, first longer than second, tips not sharply pointed ; subarticular tubercles of fingers and toes not very distinct. Toes entirely webbed tips not pointed ; a blunt, not shovel-shaped inner metatarsal tubercle present, outer metatarsal tubercle absent. Tibiotarsal articulation reaches in between posterior end of eye and nostril. The heels overlapping when the limbs are folded at right angles to the body. Dorsum olive green with darker spots, distinct warts and long glandular folds. Venter whitish and smooth.

Distribution : Andhra Pradesh : As mentioned in the *Material examined*. Murthy (1968) recorded it from Nagarjun Valley (Andhra Pradesh). *Elsewhere* : The species is common throughout India from the base of the Himalaya to Southern part of the Country, and Andaman. Also Pakistan, Nepal, Bangladesh, Sri Lanka, Myanmar, Thailand, South China and Taiwan.

Remarks : Large frog. Commonest species of edible frog, found throughout the

plains of Andhra Pradesh and other parts India. It frequents inside the bush grown on the banks of ditches, ponds, canals and lakes. Bhattacharya (1936) reported its tadpoles feeding on mosquito larvae. Abdulali (1985) has stated its utility in the control of agricultural pests. While in the field scientists of our department came to know from the villagers of Andhra Pradesh that population of *Rana tigerina* have gradually been depleted from the nature owing to severe commercial exploitation in costal districts of Andhra Pradesh during 1970s and early 1980s.

Status : Common.

Genus 6. *Tomopterna* Dumeril and Bibron, 1841.

Key to the species of the genus *Tomopterna*

Snout shorter than eye ; toes 1/4 to 1/2 webbed	...	...	<i>breviceps</i> Schneider
Snout as long as eye ; toes with a rudiment of web	...	...	<i>dobsonii</i> Boulenger

14. *Tomopterna breviceps* (Schneider) (Burrowing Frog)

1799. *Rana breviceps* Schneider, *Hist. Amph.*, 1 : 140.

1920. *Rana breviceps* : Boulenger, *Rec. Indian Mus.*, 20 : 103-105.

1986. *Tomopterna breviceps* : Inger and Dutta, *J. Bombay nat. Hist. Soc.*, 83 : 138.

Material examined : Adilabad dist. : 34 ex. (33 frogs and 1 tadpole), Nirmal, 26-28. viii. 1983 ; 10 ex., Adilabad, 30-31. viii. & 1. ix. 1983. All coll. D. P. Sanyal. Anantapur dist. : 1 ex. (tadpole), Bukkapatnam, 19. ix. 1986, A. K. Sarkar. Khammam dist. : 2 ex., Bhadrachalam, 26. ix. 1984, D. P. Sanyal. Kurnool dist. : 4 ex., Mahanadi, 27. ix. 1986, A. K. Sarkar. Nizamabad dist. : 7 ex., Armur, 23-24. viii. 1983, D. P. Sanyal. Prakasam dist. : 1 ex., Srisailam, 6. xi. 1986, D. P. Sanyal. Srikakulam dist. : 5 ex., Srikakulam, 3 & 14-15. ix. 1985, D. P. Sanyal. Vizianagaram dist. : 8 ex., Bhadrakiri, 22-23. ix. 1985 ; 4 ex., Vizianagaram, 25-27. ix. 1985. All coll. D. P. Sanyal.

Measurements : Suout to vent length 10-49 mm.

Diagnostic character : Head broader than long ; snout rounded, not projecting beyond the mouth, shorter than the diameter of the eye ; nostril equidistant from the tip of the snout and the eye ; interorbital width is smaller than that of the upper eyelid ; tympanum distinct, more or less half diameter of the eye. Fingers free, first much longer than second, tips swollen, subarticular tubercles of fingers and toes well-developed. Toes 1/4 to 1/2 webbed ; a highly developed, large, shovel-shaped inner metatarsal tubercle present, outer metatarsal tubercle absent. Tibiotarsal articulation reaches axil or shoulder. Dorsum greyish and warty. Venter whitish and granular.

Distribution : Andhra Pradesh : As mentioned in the *Material examined*. Sattamurti (1967) reported it from Cuddapah district (Andhra Pradesh). New record from the districts of Adilabad, Anantapur, Khammam, Kurnool, Nizamabad, Prakasam, Sriakulam and Vizianagaram. *Elsewhere :* The species is available all over the plains of India. Also Sri Lanka, Nepal and Myanmar.

Remarks : Medium-sized frog. Burrowing and nocturnal in habit. One example of frog collected from Adilabad, and another from Vizianagaram possess broad mid-dorsal yellowish stripe from snout to vent. One example of frog collected from Malkapur (Adilabad) in August possesses a thin dark mid-ventral line on belly.

Status : Common in Andhra Pradesh.

15. *Tomopterna dobsonii* (Boulenger) (Dobson's burrowing frog)

1882. *Rana dobsonii* Boulenger, *Cat. Batr. Sientia* : 32.

1920. *Rana dobsonii* : Boulenger, *Rec. Indian Mus.*, 20 : 105-106.

1986. *Tomopterna dobsonii* : Inger and Dutta, *J. Bombay nat. Hist. Soc.* 83 : 138.

Material examined : Nil ; record from published literature.

Diagnostic character : Head broader than long ; snout rounded, not projecting beyond the mouth, as long as the eye ; nostril equidistant from the tip of the snout and the eye ; interorbital width is smaller than that of upper eyelid ; tympanum distinct, about $\frac{2}{3}$ diameter of the eye. Fingers free, first much longer than second, tips swollen ; subarticular tubercles of fingers and toes very prominent. Toes with a rudiment of web ; large, shovel-shaped inner metatarsal tubercle present, outer metatarsal tubercle absent. Tibiotarsal articulation reaches the shoulder. Dorsum greyish, little tuberculated. Venter whitish, a little granular.

Distribution : Andhra Pradesh, Karnataka and Tamil Nadu (Inger and Dutta, 1986)

Remarks : Medium-sized frog. Burrowing and nocturnal in habit.

Status : Rare.

Family IV. RHACOPHORIDAE

Key to the genera of the family RHACOPHORIDAE

Vomerine teeth present	...	...	...	<i>Polypedates</i> Tschudi
Vomerine teeth absent	...	...	...	<i>Philautus</i> Gistel

Genus 7. *Polypedates* Tschudi, 1838.16. *Polypedates maculatus* (Gray)
(Tree frog)

1832. *Hyla maculata* Gray, III. *Indian Zool.*, 1, pl. 82, fig. 1.
 1890. *Rhacophorus maculatus* : Boulenger, *Fauna Br. India Rept. & Batr.* : 475-476.
 1931. *Rhacophorus maculatus* : Ahl. *Das Tierreich*, Anura III : 133-134.
 1986. *Polypedates maculatus* : Inger and Dutta, *J. Bombay nat. Hist. Soc.*, 83 : 139.

Material examined : Adilabad dist. : 1 ex., Mancherial, 17. i. 1981, E. V. Mulley.
 East Godavari dist. : 1 ex., Chodavaram, 19. iii. 1986, A. K. Sarkar. Nellore
 dist. : 1 ex., Nellore, 22. x. 1986, D. P. Sanyal. Prakasam dist. : 1 ex., Podile, 3. xi 1986,
 D. P. Sanyal. Warangal dist. : 3 ex., Mulug, 13-14. ix. 1984, D. P. Sanyal.

Measurements : Snout to vent length 52-72 mm.

Diagnostic character : Vomerine teeth present. Head broader than long, skin on head free ; snout pointed, projecting a little beyond the mouth, generally longer than the diameter of the eye ; nostril nearer the tip of the snout than the eye ; interorbital width broader than that of the upper eyelid ; tympanum distinct, about three-fourth diameter of the eye. Fingers with rudimentary web, first equals the second, tips of fingers and toes bear horse-shoe shaped distinct discs ; subarticular tubercles of fingers and toes distinct. Toes nearly three-fourth webbed, two phalanges of fourth toe free ; a distinct oval inner metatarsal tubercle present. Outer metatarsal tubercle absent. Tibiotarsal articulation reaches in between posterior end of eye and tip of snout. Dorsum brownish with light darker spots and smooth. Venter dull whitish and granular.

Distribution : Andhra Pradesh : As mentioned in the *Material examined*. Elsewhere : Plains of India in general. Also Sri Lanka.

Remarks : Medium-sized frog. Nocturnal in habit, generally found inside thick bush, dark and moist corners village huts and forest rest houses. One example measuring 72 mm. from snout to vent collected from Podile, Prakasam district, possesses dark brown coloration on dorsum, and skin on head a little rugose.

Status : Not very common in the State.

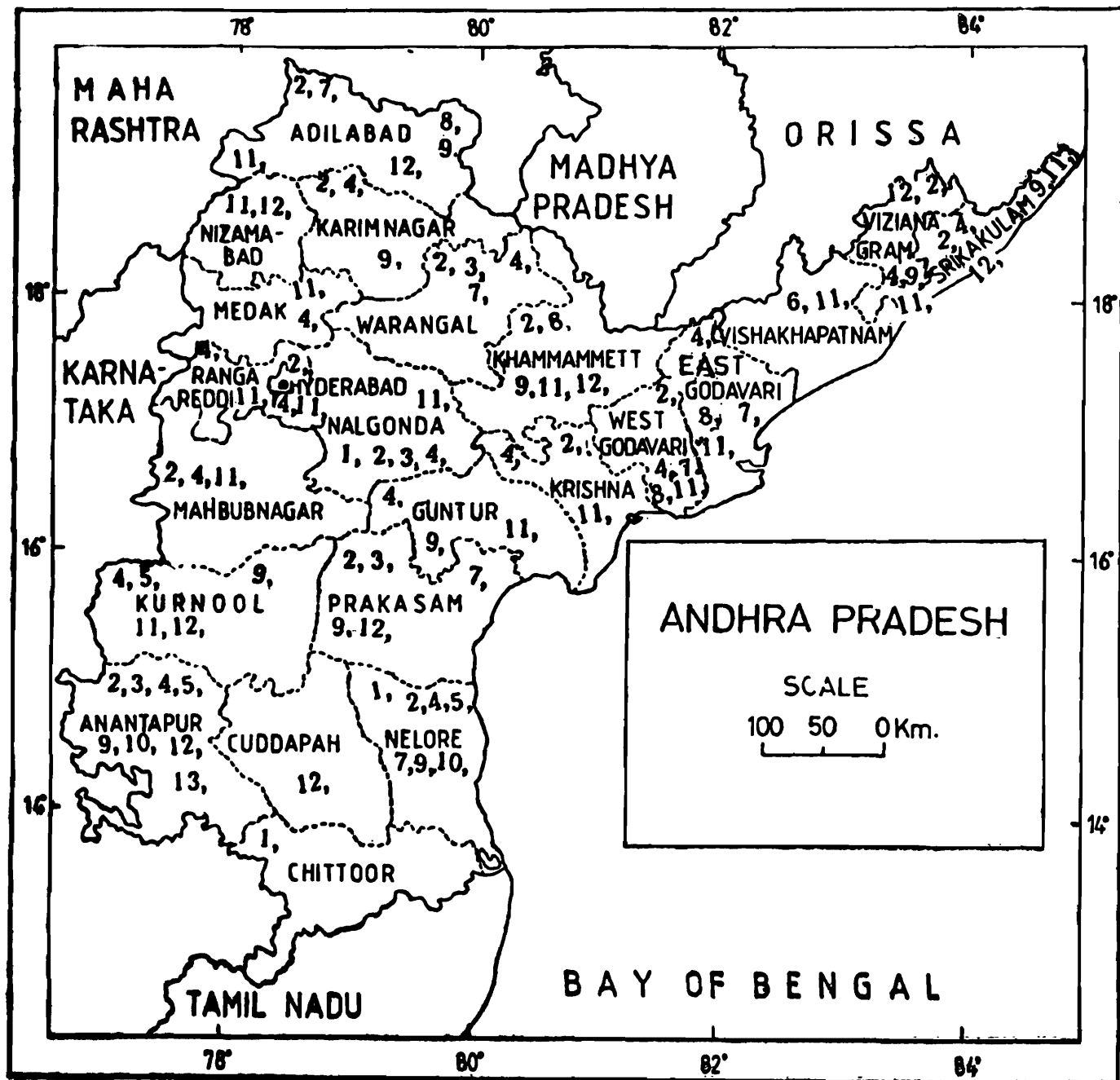
Genus 8. *Philautus* Gistel, 1848.17. *Philautus variabilis* (Gunther)

1859. *Ixalus variabilis* Gunther, *Cat. Batr. Salientia, Coll. Br. Mus.*, : 74.
 1890. *Ixalus variabilis* : Boulenger, *Fauna Br. India, Rept. & Batr.* : 487.
 1985. *Philautus variabilis* : Forst, *Amphibians of the world* : 532.

Material examined : Nil ; record from published literature.

Diagnostic character : Head broader than long ; tongue without conical papilla in

the middle ; vomerine teeth absent ; snout rounded, as long as the diameter of the eye ; nostril in between the eye and the tip of the snout ; interorbital width much broader than that of upper eyelid ; tympanum not very distinct, smaller than eye. Fingers free, first shorter than second, tips with distinct discs ; subarticular tubercles of fingers and toes not distinct.



Map showing district-wise distribution of species.

NAME OF SPECIES : 1. *Bufo holollus* 2. *Bufo melanosticus* 3. *Bufo stomaticus* 4. *Microhyla ornata*
5. *Microhyla rubra* 6. *Philautus variabilis* 7. *Polypedates maculatus* 8. *Ramanella variegata* 9. *Rana crassa*
10. *Rana hexadactyla* 11. *Rana tigerina* 12. *Tomopterna breviceps* 13. *Uperodon systoma*

Species found in all the districts of Andhra Pradesh
Rana cyanophlyctis *Rana limnocharis*

Toes $1/4$ webbed, tips with distinct discs ; inner metatarsal tubercle feebly distinct, outer metatarsal tubercle absent. Tibiotarsal articulation reaching in between eye and tip of snout. Dorsum dark-brown (in spirit), smooth with few tubercles and darker bands on limbs. Venter dark brownish (in spirit), granular ; white patches on flanks.

Distribution : Andhra Pradesh : Golconda Hills, Visakhapatnam ; Kerala and Tamil Nadu (Sattamurti, 1967) in India. Also Sri Lanka.

Remarks : Small-sized frog. Mainly found inside bush. Seven examples of frogs collected from "Golconda Hills, Vigapatnam" by R. H. Beddome probably during 1870s, are representing in the collection of Zoological Survey of India. We have examined the frogs. The specimens are in good condition. They have got two black tubercles on the middle of dorsum and white patches bordered with chocolate on the flanks.

Status : Rare in Andhra Pradesh.

ACKNOWLEDGEMENT

Authors are highly indebted to Dr. A. K. Ghosh, Director, Zoological Survey of India for providing working facilities, constant inspiration to carry out these studies and kindly going through the manuscripts, to all the collectors specially to Mr. D. P. Sanyal, Scientist-'SD', for collecting the material and handing over the same to us for the study. Thanks are also due to the officers and staff, Deptt. of Forests, Govt. of Andhra Pradesh for providing necessary help and guidance during field trips.

SUMMARY

The paper deals with the Amphibian fauna of Andhra Pradesh based on the collections mainly made by the surveys undertaken by the scientists of Zoological Survey of India during July, 1962 to January, 1988. The paper consists of 1151 examples of anurans belonging to 17 species, 8 genera and 4 families. Many species are recorded for the first time from different districts of the State. Keys, illustrations of essential morphological characters of the species have been added in the paper for determination of the species. Diagrams of three uncommon species represented in our collection viz., *Ramanella variegata*, *Micorhyla rubra* and *Uperodon systoma*, and a map showing distribution of species have also been provided in the paper.

REFERENCES

- Abdulali, H. 1985. On the export of legs from India. *J. Bombay nat. Hist. Soc.*, 82 (2) : 347-375.

- Bhattacharya, G. C. 1936. Tadpole of *Rana tigrina* feeding on Mosquito Larvae. *Curr. Sci.*, 5 (4) : 206.
- Boulenger, G. A. 1890. The fauna of British India, including Ceylon and Burma. Reptilia and Batrachia. London (Taylor & Francis), pp. xviii+541.
- Boulenger, G. A. 1920. A monograph of the South Asian, Papuan, Melanesian and Australian Frogs of the Genus *Rana*. *Rec. Indian Mus.*, 20 : 1-226.
- Chandra, S. K. 1991. Animal Resources of India : Protozoa to Mammal (Amphibia), xxvii+694.
- Inger, R. F. and Dutta, S. K. 1986. An overview of the amphibian fauna of India. *J. Bombay nat. Hist. Soc.*, 83 : 135-146.
- Murthy, T. S. N. 1968. Notes on collection of Amphibian from Nagarjun Valley, (Andhra) with one new record. *J. Univ. Poona*, No. 34, pp. 63-71.
- Rao, C. R. N. 1915. Notes on some South Indian Batrachia. *Rec. Indian Mus.*, 11 : 31-38.
- Parker, H. W. 1934. A monography of the Frogs of the family Microhylidae, London (Trustees of British Museum), pp. viii+208, 67 figs.
- Pallai, R. S. and Murthy, T. S. N. 1982. Herpetofauna on Eastern Ghats. *Proc. Seminar Resources Eastern Ghats* : 81-84.
- Sattamurti, S. T. 1967. The South Indian Amphibian in the collection of the Madras Government Museum. *Bull. Madras Govt. Mus.* (N. S.) N. H. 7 (2) : 1-87, Pls. 13.
- Sekhar, A. G. 1991. Distribution of the Amphibian Fauna of India. *J. Bombay nat. Hist. Soc.*, 88 (1) : 125-127.

PISCES : FRESHWATER FISHES

R. P. BARMAN

Zoological Survey of India, Calcutta

INTRODUCTION

Andhra Pradesh is the fifth largest state in terms of geographical dimension and population. The state is unique in having a very rich fisheries potentiality in both the freshwater and marine fish fauna. It has a coast line of 982 kms. with continental shelf of 39,109 sq. kms. The inland fishery resources comprise rivers, reservoirs lakes, tanks, ponds and other water bodies. All these provide an immense scope for fish and fisheries development in the state.

A perusal of the literature shows that though a considerable works have been done on the fish fauna of the Peninsular India previously and in recent years but the state of Andhra Pradesh has remained practically unexplored. Our knowledge on the fish fauna of Andhra Pradesh is very limited and mainly based on Day's classical works (1875-78 and 1889), Misra (1938, 1962, 1976a and 1976b), Jayaram (1977 and 1981), Babu Rao (1976), Chacko (1949), Chacko, Abraham and Andal (1952), Chacko and Kuriyan (1948), David (1963a and 1963b), Dutt and Murthy (1971, 1976a and 1976b), Dutt and Reddy (1979), Dutt and Sharma (1979), Jerdon (1849), Jhingran (1983), Mahmood and Rahimullah (1947a and 1947b), Menon (1966), Murthy (1977), Rahimullah (1943a, 1943b and 1944), Sykes (1838, 1840 and 1841), Hora (1937a, 1942a, 1942b, 1943a and 1943b), Hora and Misra (1942) and Silas (1958b).

Though Day's Fishes of India (1875-78) and the Fauna of British India, Fish series (1889) remain even today the most useful classical works on the fishes of the Indian subcontinent, a considerable amount of additional systematic data have been accumulated resulting many changes in the nomenclature and classification of fishes. Day's monograph (1875-78) is the first publication to contain a comprehensive account of all the fishes, both freshwater and marine, found in the entire Indian subcontinent up to 1878. Day included in his monograph (including the supplement 1888) 1418 species of fishes found in the present day of India, Pakistan, Bangladesh, Burma and Sri Lanka. Besides these, the works on the fishes of Andhra Pradesh are scanty and widely scattered and there is no any comprehensive survey and detailed report of the state. The present

work is aimed at bringing a consolidated account of the fish fauna of the state. Therefore, an attempt has been made in this present study to give an up to date classification, nomenclature and distributional records, along with the descriptions of all the available freshwater fishes throughout Andhra Pradesh.

Seven faunistic field surveys were conducted during the period from 1983 to 1987 covering almost all the important fish landing centres of 21 districts out of the 23 districts of the present day of Andhra Pradesh. Two districts, viz., Adilabad and Prakasam have not been covered. All these districts are directly or indirectly connected by the two major river systems of Andhra Pradesh, viz. the Godavari and Krishna, both the river systems originate from the Western Ghat and flow through this state, ultimately fall into the Bay of Bengal. Besides these two rivers, I have collected specimens from some other rivers of lesser important, reservoirs, lakes, ponds and streams within the political boundary of Andhra Pradesh. The collection shows that a wide range of both riverine and a very few species which are also found in marine and brackish waters. These fishes belong to 10 orders, 27 families, 68 genera comprising 158 species. 8 species are being recorded here for the first time from Andhra Pradesh. All the orders, families, subfamilies, genera have been described in brief along with key to the above systematic categories. All the species have been described giving their diagnostic features, colour in alcohol, distribution, size, fishery values and remarks along with the species keys. It is hoped that it would prove a very useful to the students of Ichthyology as well as the field workers engaged in the development of fish and fisheries of Andhra Pradesh, where there is a great potentialities in fishery resources.

TOPOGRAPHY OF ANDHRA PRADESH

Andhra Pradesh (Map 1) is one of the eight maritime states in the country lying between latitude of $12^{\circ}14'$ to $19^{\circ}54'N$ and longitudes of $76^{\circ}50'$ to $86^{\circ}50'$. It is located on the eastern coast of the Indian Peninsula and south-eastern part of the Indian subcontinent. The state is surrounded by Orissa, Madhya Pradesh and Maharashtra in the north, to the east the Bay of Bengal, to the south Tamil Nadu and to the west Karnataka and Maharashtra. Its area is 2,76,814 sq. kms. which is 8.4 per cent of the total area of India. The state has a coast line of 982 kms. from Srikakulam to Nellore districts covering 9 out of 23 districts of the state. The state ranks third in the length of coast line next to Gujarat and Tamil Nadu and forms 15 per cent of the total coast line of 6,520 kms. of India (excluding those of the islands). Nellore district has the largest coast line, followed by Srikakulam, while West Godavari has the shortest one.

There are three main mountain chains in the state. (i) Eastern Ghats which form a chain of hills fringing the east coast line, (ii) the Deccan plateau with the Sahyadri range of Adilabad district to the north border of the state and (iii) the Horseley and

other hills of the Chittoor and Anantapur districts to the south border. Andhra Pradesh is often called the river state and is watered by 34 rivers. The River Godavari and Krishna with their numerous tributaries form the major perennial river systems of the state. There are a large number of medium sized and small rivers and streams in the state. These rivers and their tributaries cover a length of 3.2 lakh kilometers of running water flowing through the state. The fishing intensity along the course of a river varies from stretch to stretch, depending upon the current velocity, terrain of the river bed, approachability, general productivity of the water bodies. Good fishing grounds for *Hilsa*, carps and prawns were noticed in the river Godavari and Krishna. Therefore, these two rivers serve as source of natural fish seed.

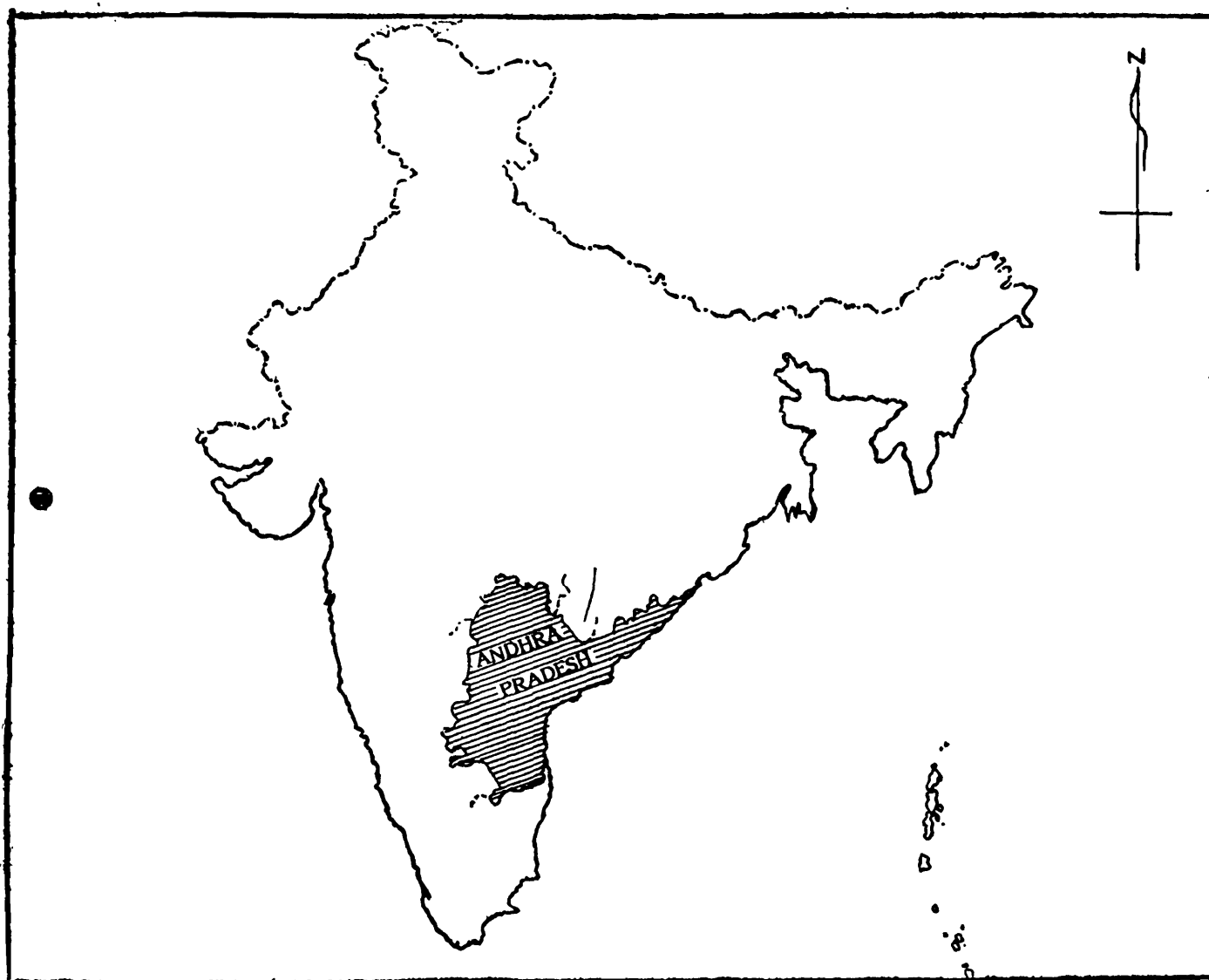
There is a very important freshwater lake in the state, in respect of its fish and fisheries value, Kolleru Lake. It is a natural depression of land between the deltas of rivers Krishna to the west and Godavari to the east, situated partially in Krishna and West Godavari district. The lake has an area of about 650 sq. kms. and receives water from a catchment area of 2,942 sq. kms. of which 2,102 sq. kms. are in upland area and 840 sq. kms. are deltaic. Four rivers, several small streams and ten delta drains open into the lake. The average depth is 3 feet going up to 10 feet in flood. The lake is 32 kms. away from the Bay of Bengal and is connected by one outlet Upputeru (63 kms. long channel). A second straight cut was made as a flood water drains measure in the lake and the Bay of Bengal in 1981-82. The lake is a low-lying swamp type with 85 per cent freshwater dominance, at the time of high tides, the sea water gets into Upputeru and the resultant salinity in the water provides an ample opportunity for the lake as a good source of fish breeding specially of air breathing fishes like Murrels, Catfish, Featherbacks and Prawns which are in great demand in India and abroad. As per reports of the state fisheries department the total production is 7000 tonnes/annum of live fish of which 4000 tonnes/annum are exported.

Man made reservoirs are the important source of inland capture fisheries, next to rivers and lakes. There are 113 major, medium and small sized multipurpose and irrigation reservoirs, covering a surface water spread area of 24108 hectares and a few are under construction. Some of the important reservoirs are Nagarjuna sagar (282 sq. kms.), Hussain sagar (40 sq. kms.), Osman sagar (41 sq. kms.), Himayat sagar (36 sq. kms.), Kadam (24 sq. kms.), Pocharam (15 sq. kms.), Mannair (15 sq. kms.), Cumbum (13 sq. kms.), Koil sagar (10 sq. kms.) etc. Most of the reservoirs have not been surveyed properly. These are leased out annually by auction. Fish breeding is an important activity in these reservoirs. The Indian major carps, viz. Catla and Mrigal occupy the important place followed by minor Carps, Grass carp, Silver carp etc.

The two most important rivers of Andhra Pradesh are Godavari and Krishna. Both rivers are fed by the two monsoons (South-West and North-East) and are of perennial type. The other rivers of lesser important are Pennar, Nagavali and Vamasadhara. The total

length of the river systems of Andhra Pradesh is more than 1,500 kms. Many of the rivers are harnessed for hydro-electric power and irrigation. The two major river courses from where most of the collections were made are described below in brief.

Godavari river systems : It is the largest river in the Peninsular India. It has a total length of 1,498 kms. and has a catchment area of 315,000 kms. It arises in the northern region of the Western Ghats at elevations of 4,000 to 5,000 feet, in the Deolali hills near Nasik to its tidal limits below Rajamundry in Andhra Pradesh and draining



MAP 1 : Location of Andhra Pradesh is shown in Indian map.

into the Bay of Bengal (Map 2). The river cover a distance of 720 kms. in the state and has a catchment area of 90,650 sq. kms. A large part of the area through which this river flows is densely forested. On its way, the Godavari receives several important

tributaries like Manjira, Maneru, Pranhita, Indravati and Sabari. The Pranhita flowing north of Adilabad district form the boundary between Andhra Pradesh, Maharashtra and Madhya Pradesh.

The river bed in the middle reaches has a disproportionately thin streams of water coursing through narrow, broken up channels between rocks or interspersed with wide sandy stretches. Isolated rocky pools and shallower sandy channels are common and can easily wade across the river as far as Manthani during dry seasons. Deep rocky or silty shelters known locally as "madugus" (in Telegu) which during dry seasons protect large sized fish, are found at frequent intervals along the river. One such shelter, almost 1.6 kms. in length, is found at the confluence of the Manjira with the Godavari in Nizamabad district and the second, over 4.8 kms. in length known as "Lanjan Madugu" is close to Manthani. Thereafter the river courses over rapids through a very sparsely inhabited forest region, occasionally broken by minor tributary valleys as far as Etturagaram in Warangal district. Here the river sprawls almost 4.8 kms. over a sandy and silty stretch forming several muddy islands between low embankments. At Dummugudem and Bhadrachellum weir sites, the river again narrows to about 1.6 kms., with stream confined between rocky outcrops forming a number of small "madugus" up to Konavaram. Two weirs, at Dhawaleswaram for irrigation and navigation and at Dummugudem for navigation, have been built. No major dams exist on the main Godavari as yet, but the lake Beale formed by a dam in Nasik district across a small tributary, the Bhandardar dam (270 feet high) on the Pravara, the Lloyd dam at Bhatgarh on the Nira and the Whiting Lake are some of the high masonry dams in the Western Ghat headwaters. The Manjira, Maner, Kadam and Machkund rivers have each a major high dam forming large reservoirs.

Krishna river systems : It is the second important river systems in Andhra Pradesh. It rises near Mahabaleswar in the Western Ghats. It flows through Maharashtra, Karnataka and enters Andhra Pradesh in the Mahbubnagar district while the Tungabhadra which is chief tributary enters Andhra Pradesh in the Kurnool district. The total length of the river is 1200 kms. and its total catchment area is 2,51,000 kms. It flows through a length of 720 kms. in the state and the catchment area including that of Thungabhadra is 1,92,000 sq. kms. in Andhra Pradesh. The main tributaries of Krishna are Tungabhadra (which is composed of the Tunga and Bhadra rivers) rising in Western Karnataka and joining together just below Shimoga (Karnataka), Dindi, Musi, Paleru and Muneru.

Major reservoirs formed of high dams within Krishna drainage are the Lakkavali reservoir on the Bhadra, the Tungabhadra reservoir, the Koyna, Vanivilasagar and a few more on the Mutha, Ghataprabha and other minor tributaries. Several reservoirs are formed by the masonry dams around Hyderabad city across the Musi and the minor

I want to express my sincere thanks and gratitude to the Commissioner of Fisheries, Govt. of Andhra Pradesh, Hyderabad and his staff for their co-operations during field surveys throughout Andhra Pradesh. I also want to record my indebtedness to the Officer-in-charge of this following districts fisheries offices at Khammam (from 27.8.83 to 29.8.83), Warangal (30.8.83 to 31.8.83), Karimnagar (1.9.83 to 3.9.83), Hyderabad (4.9.83 to 7.9.83), Nizamabad (6.12.84 to 9.12.84), Medak (11.12.84 to 13.12.84), Mahbubnagar (14.12.84 to 16.12.84), Nellore (29.11.85 to 2.12.85), Cuddapah (3.12.85 to 6.12.85), Anantapur (6.12.85 to 8.12.85), Kurnool (8.12.85 to 9.12.85), Guntur (11.6.86 to 14.6.86), Nalgonda (15.6.86 to 18.6.86), Hyderabad (19.6.86 to 26.6.86), East Godavari (30.5.87 to 3.6.87), West Godavari (4.6.87 to 9.6.87), Krishna 10.6.87 to 14.6.87), Srikakulam (2.12.87 to 14.12.87), Vizianagram (5.12.87 to 8.12.87), Visakhapatnam (9.12.87 to 13.12.87), Chittoor (15.12.87 to 18.12.87) for their whole hearted help, cooperation and hospitality they extended to me during my stay at the above mentioned districts. In fact the people of Andhra Pradesh deserve much praise and deep sense of gratitude for their helping nature on any matter sought to them. If this book serves in any way to the people of Andhra Pradesh, I shall think myself as a successful worker in the field of systematic Ichthyology of Andhra Pradesh. Whatever good there may be in this book is presented to them. Knowledge and understanding are sources of satisfaction even when they do not yield any immediate material benefit.

Thanks are due to Sarvashri P. Biswas and D. Pyne our departmental artists for drawing some fish specimens and to the Photography section of the Zoological Survey of India, Calcutta for taking photograph of some of the fish specimens incorporated in the book. I also wish to keep a record here the co-operation I got from my colleagues Sarvashri Pranesh Banerjee, Paritosh Mukherjee, Amitava Das and Nandalal Khanal who accepted all troubles gladly during my field surveys of the 21 districts out of the present 23 districts of Andhra Pradesh. Thanks are also due to my colleagues Sarvashri Sankar Nath Paul and Subrata Kar for their assistance and to Himadri Majumdar for typing some portions of this manuscript.

Quite obviously, I remain solely responsible for all errors of commission and omission which doubtless will be found in this book. Any constructive criticism on this work will be accepted very gladly and will be duly credited in proper places.

Before I conclude I would like to thank my wife Smt. Nandini and to my two daughters Soma and Tota Barman for their love and help in supplying me necessary things during the preparation of this manuscript and for making it all worthwhile—a work I dedicate to the cherished memory of my parents.

METHODS OF COLLECTIONS

Fishes can be collected by various methods depending from locality to locality whether it is in the large rivers or small rivers, tanks, lakes, streams or any water bodies

and species to species depending on their sizes. A Majority of the freshwater fishes are caught by seine nets which are operated across a river and either dragged or closed like a purse. Hill stream fishes are usually caught by damming a stretch of the river or diverting the water for the streams to dry up. Fishes are then collected by hand from below stones, rocks and boulders. The various methods employed in collecting fishes are given in brief below.

(a) **Nets :** Cast nets of various meshes, with or without radial cards or pockets, are the commonly used type employed by some fishermen. The nets are designed for small or large fishes with meshes and sinkers adjusted to suit individual local requirements including capture of prawns. At Etturunagaram the local fishermen use six or more nets which held together and drawn in a concerted manner as a single drag net within shallow streams, can efficiently collect a considerable number of fish. At Manthani, scare ropes strung with leafy branches are tied to a single cast net which is provided with an improvised float and sinkers, and drawn as a bottom drag net, it can land profitable numbers of even large fish from the silty bottom. Simply designed rectangular drag nets are employed on the sandy stretch of the Godavari river and on the Thunga-bhadra river. Gill nets also known as "Eduvala" are extensively used for catching small fishes. Fishermen at Rajamundry have evolved efficient nets adapted to seasonal flow conditions, species and sizes of fish. Rocky pools and rapids remain largely untouched by drag nets, but light entangling gill nets are employed in such situations. These nets are usually made up of hemp. Small drag nets made up of mosquito netting cloth, shaped into triangular push nets slung on bamboo frame work, are also used for catching fishes during all the months along the shallow margins. "Rangoon" nets-drifting gill nets of 25 feet height are used for capturing ascending *Hilsa* close to Rajamundry and Vijaywada. These have proved useful in Nizam sagar reservoir for large fishes.

(b) **Traps :** Trapping in the main rivers is only a seasonal activity since most traps can be fixed only in conjunction with temporary barriers erected for the purpose in shallow waters of up to 5 feet depth. At Ramagundem Mancherla area, every three four kilometres of the sandy stretch for 56 to 64 kilometres is barricaded by closely knit fibrous sheets of a water resistant plant and split bamboo box traps are placed with entrances alternately opening towards and against the current so that both upstreams and downstream moving fish may be trapped. The entire construction is known as "Eduthorakhalu" in Telegu.

(c) **Line fishing :** Line fishing is the most exclusive type within Papikonda gorges as net fishing is not possible. Angling by hook and line is common, often semi-commercially as anglers are not all professional fishermen. Catfishes, Carps, Mahaseers, Eels and Murrels are caught by line fishing.

(d) **Poisoning Method :** Poisoning of pools of the minor tributary streams within

forest tracts is prevalent. Several plants, shrubs and trees those poisonous values are well known, are freely used by some fishermen for killing or narcotizing fish for easy capture.

METHODS OF PRESERVATIONS

The fish is generally preserved in a solution of formalin. Live fishes are usually preserved in such a solution to obtain best results, as they die in this solution with all the fins expanded. This solution is prepared by adding one part of the concentrated formalin or commercial formaldehyde (the strength varies from 37 to 40 per cent) with nine parts of water. It is advisable to neutralise this solution with 5 to 10 grams of Borax per litre. The volume of material to be preserved should never exceed that of the preserving liquid. The fish should be left in this solution for 24 hours for proper fixation. Small fishes less than 10 cms. (4 inches) long should be immersed completely in the formalin solution. Fish above 10 cms. (up to 30 cms.) should have a narrow cut made on the abdominal wall a little to one side of the midventral line. Fish longer than 30 cms. (more than one foot) should be injected with undiluted concentrated formalin in several places and the abdomen should have a long slit. Fishes with keel abdomen should be injected preferably on the side of the fish.

All colours, colour patterns, spots, blotches, number and design should be noted in the field-note book as soon as the fishes are caught and when they are fresh. Labels indicating exact locality, its provenance, the altitude where necessary, longitude and latitude if possible, date and time of collection, name of collector, gear employed should be clearly written out in pencil and packed with each lot. Information on the nature on water, substratum, extent of vegetation and animal associations should be recorded in the field-note book.

Preserved fishes are packed in thin cloth for transportation. They may also be kept in plastic bags soaked with formalin-wet cloth or cotton. Containers for transportation may be empty clean tin cans, paint buckets and large or small cans which have been cleansed of their contents thoroughly. Plastic drums of 20 or 40 litres with extra-wide mouth are ideal for this purpose.

SYSTEMATIC ACCOUNT

Class : PISCES

Subclass : TELEOSTOMI

Skeleton bony. Gills covered by a bony operculum and having only one external opening on each side. Skin normally covered with overlapping scales which in some

families may be obsolete and in others modified by calcification into a hard covering, ossified dermal plates or a complete bony casing. Caudal fin almost symmetrical.

Key to the orders

1. Body more or less cylindrical, elongated and eel-shaped	...	...	2.
Body not cylindrical, elongated and eel-shaped but fusiform and laterally compressed	...	...	5.
2. Gill openings small, confluent as a single slit	...	...	<i>Synbranchiformes</i> .
Gill openings non-confluent as two lateral slits	...	...	3.
3. Pelvic girdle and fins absent	...	...	<i>Mastacembeliformes</i>
Pelvic girdle and fins present	...	...	4.
4. Dorsal and anal fins far from caudal fin. Gill openings wide, membranes of two sides connected beneath isthmus. Scales moderately large	...	<i>Channiformes (Ophiocephaliformes)</i>	
Dorsal and anal fins confluent with caudal fin when the latter is present (absent in Ophichthidae). Gill openings of moderate extent situated near base of pectoral fins. Scales present or absent, when present small embedded in skin	...	...	<i>Anguilliformes</i>
5. Skin without scales, either smooth or covered with osseous plates or with scattered tubercles. Pectoral fins with outer most ray modified into osseous spine or thick ray.	...	<i>Siluriformes</i>	
Skin scaled or rarely without scales, but never with ossous plates. Pectoral fins without any such modifications	...	...	6.
6. Abdominal edge keeled with double or single serrations	...	...	7.
Abdominal edge smooth, rounded	...	...	8.
7. Lateral line present. Abdomen with double serrations	...	<i>Osteoglossiformes</i>	
Lateral line absent. Abdomen with single serration	...	<i>Clupeiformes</i>	
8. Pelvic fins inserted in the thoracic region and with spines. Dorsal and anal fins with spines. Mostly dorsal fin in two parts, continuous or separate, one spiny, another with soft rays	...	<i>Perciformes</i>	
Pelvic fins inserted in the abdominal region and without spines. Dorsal and anal fins without spines. Mostly with a single dorsal fin	...	...	9.
9. Scales on head and body. Teeth present on jaws	...	<i>Atheriniformes</i>	
No scales on head. No teeth on jaws	...	<i>Cypriniformes</i>	

Order ANGUILLIFORMES

(Eels)

Body elongated and cylindrical (snake-like) with spineless fins. Pelvic fins absent. Pectoral fins laterally inserted when present. Usually the dorsal, the anal and the caudal fins are joined to form one continuous fin over the rear of the body. Body with minute or rudimentary scales embedded in skin or absent. Gill openings comparatively narrow. Generally all the eels pass through a metamorphosis in which the young or 'Leptocephalus' stage is lived in the ocean, in the freshwater forms. Lateral line present, sometimes obsolete. All the 19 families of eels are marine except the family Anguillidae.

Family ANGUILLIDAE

Freshwater eels

Eel-like fishes, cylindrical anteriorly, with minute embedded scales. Gill openings vertical slits near base of pectoral fins. Dorsal fin commences at some distance behind nape, far behind gill openings. Pectoral fins well-developed. Vertical fins confluent. Lateral line present.

Only one genus is recognised.

Genus *Anguilla* Shaw, 1803.

1803. *Anguilla* Shaw, *General Zoology*, 4 : 15 (type-species : *Anguilla vulgaris* Shaw).

**1981. *Anguilla*, Jayaram, *Handbk. Freshw. Fish. India*, : 27
(genus characters and distribution)**

Genus characters are same as those of the family.

***Anguilla bengalensis bengalensis* (Gray and Hardwicke)**

1834. *Muraena bengalensis* Gray and Hardwicke, *Illust. Indian Zool.*, : pl. 95, fig. 5 (type-locality : the River Ganges)

1878. *Anguilla bengalensis* Day, *Fish. India*, : 659, pl. 168, fig. 1 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 86, fig. 35.

1981. *Anguilla bengalensis bengalensis*, Jayaram, *Handbk. Freshw. Fish. India*, : 27, 28 (distribution and key to species).



**Fig. 1 : *Anguilla bengalensis bengalensis* (Gray and Hardwicke)
[A=Anal opening]**

Local name : *Malugu* (Telugu).

Common name : Long-finned eel (English).

Material examined : (i) 1 ex., 300 mm. TL. ; Godavari river at Rajamundry, E. Godavari district, Andhra Pradesh ; R. P. Barman and party ; 1. 6. 1987. (ii) 1 ex., 360 mm. TL. ; Kolleru Lake, W. Godavari district, Andhra Pradesh ; R. P. Barman and party 9. 6. 1987.

Diagnostic features : D. 250-305, P. 18, A. 220-250, C. 10-12.

Body snake-like, cylindrical anteriorly. Mouth oblique, extending beyond the orbit. Teeth small, in cardiform bands in jaws and vomer ; teeth in lower jaw divided by a

longitudinal groove. Head length 3.00 to 3.10 in the distance between snout and vent. Head rather broader than body. Dorsal fin origin midway between gill opening and anal fin base. Pectoral fins well-developed.

Colour in alcohol : Body brownish dorsally mottled with darker brown and ventrally yellowish. Fins yellowish mottled with brown.

Distribution : Freshwaters and seas of India and Pakistan, Bangladesh, Sri Lanka, Burma, Malaya Archipelago and the Pacific.

Size : It grows 1,219 mm. (4 feet) and upwards in total length.

Fishery information : One of the most common commercial eels of the east coast of India and the Andaman Islands.

Order CLUPEIFORMES

Body oblong, generally compressed, not eel-shaped with cycloid scales. Abdomen with keeled scutes along the ventral midline. Jaws not protrusible. Branchiostegals numbering as high as 15 but usually fewer. Recessus lateralis present. Hypurals on one to three centra. Mesocoracoids invariably present. Leptocephalus larvae absent. A single dorsal fin without spines, may be absent in some genera. Anal fin spineless. Lateral line short, incomplete. Usually no lateral line pores on trunk. Cephalic lateral line canals extending over operculum.

A characteristically marine, pelagic and shoaling fishes with numerous freshwater representatives in tropical Africa and India.

Family CLUPEIDAE (Sardines, Shads)

Typically clupeids are silvery fusiform fishes, with a complete series of scutes along the belly. Pelvic scutes always present. Gill openings usually very wide. Mouth terminal, lower jaw short but deep, giving typical clupeid mouth shape. Barbels absent. Usually 4 to 10 branchiostegal rays. Cycloid scales present on body but head scaleless. Scales are adherent and of moderate size (about 40 to 50 in lateral series). Dorsal fin short and near the midpoint of the body. Anal fin usually short (less than 30 rays) but sometimes very long (40 to 60 rays in *Ilisha* and *Opisthopterus*). Caudal fin deeply forked.

Primarily marine, some freshwater and anadromous fish. A valuable commercial fishery exists for clupeids in many parts of the world. Most species form schools and

swim near the surface, usually in coastal waters, feeding on plankton.

The Indian clupeids are divided into 4 subfamilies. Only one subfamily Alosine is available in Andhra Pradesh.

Subfamily ALOSINE

(Shads, River-shads)

Indo-Pacific clupeid fishes with an upper jaw not evenly rounded in front, but with a distinct notch into which the symphysis of lower jaw fits. Mouth terminal, lower jaw normal. Dorsal fin at about midpoint of body and last dorsal fin ray normal. Usually with a dark spot posterior to gill openings and in some species a series of similar spots along flank.

Key to the genera

Scales large 39 to 44 in lateral line series	...	...	...	...	<i>Hilsa</i>
Scales small 77 to 91 in lateral line series	...	...	...	...	<i>Gududia</i>

Genus *Hilsa* Regan, 1917.

1917. *Hilsa* Regan, *Ann. Mag. nat. Hist.* (8) 19 : 303 (type-species : *Paralosa durbanensis* Regan = *Clupea keeles* Cuvier).

1984. *Hilsa*, Talwar and Kacker, *Commercial Sea fishes off India*, : 162 (genus character).

Body oblong, compressed. Abdomen serrated, with 15 to 18 prepelvic and 11 to 16 postpelvic scutes present. Mouth generally terminal, upper jaw with a distinct median notch. Maxilla extending to postorbital margin. Branchiostegal rays 5 to 6. Dorsal fin origin in advance of pelvic fin, with 11 to 16 branched rays. Anal fin short with 14 to 24 branched rays. Pelvic fins with 8 rays. Caudal fin forked. Scales large, 39 to 44 in lateral line series. Lateral line absent.

Hilsa ilisha (Hamilton Buchanan, 1822)

1822. *Clupanodon ilisha* Hamilton Buchanan, *Fish. Ganges*, : 243, 382, pl. 19, fig. 73 (type-locality : Ganges estuary).

1878. *Clupea ilisha*, Day, *Fish. India*, : 640, pl. 162, fig. 3 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 376, fig. 115.

1984. *Hilsa ilisha*, Talwar and Kacker, *Commercial Sea fishes of India*, : 163, 164 (synonymy, species character and distribution).

Local name : *Palasah, Polasa* (Telugu).

Common name : Indian shad, Hilsa shad (English).

Material examined : 7 exs., 75mm.-112mm. TL. ; Godavari river at Rajamundry, E. Godavari district, Andhra Pradesh ; R. P. Barman and party ; 31.5.87 and 1.6.87.

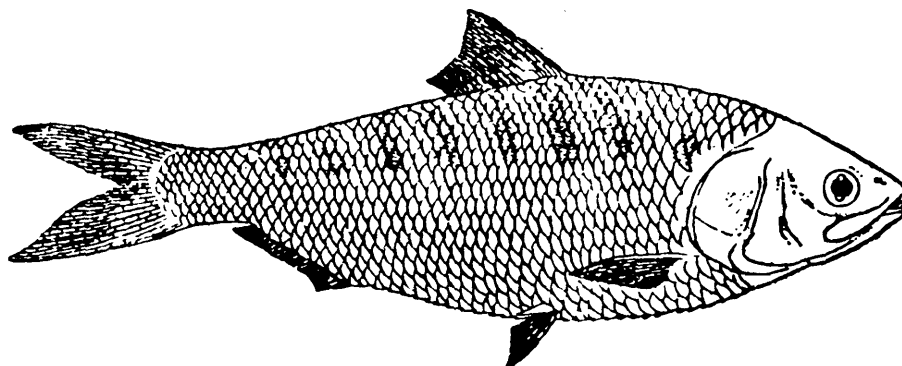


Fig. 2 : *Hilsa ilisha* (Hamilton Buchanan)

Diagnostic features : D.18-19, A.19-22, P.15, V.8, C.19. LL. 39-44.

Head length 4.25 to 4.50 and body depth 3.50 to 4.00 in total length. Eye diameter 4.50 to 6.00 in head length. Lower jaw not prominent, maxilla extending to or a little beyond posterior margin of the orbit. Dorsal and ventral profiles equally convex. Origin of dorsal fin nearer to tip of snout than to base of caudal fin. Lateral transverse rows of scales 17 to 20. Prepelvic scutes 16 to 17 and postpelvic acutes 14 to 15.

Colour in alcohol : Silvery shot with gold and purple. Young specimens with bronze colour along back with a row of spots in the upper half of the body.

Size : It grows to 600mm. (2 feet) in standard length.

Distribution : India : Ganga, Yamuna, Narmada, Tapti, Krishna, Godavari, Cauvery and Pennar river systems. Pakistan, Bangladesh, Burma, Sri Lanka, Iraq and Persian Gulf.

Fishery information : This is a very popular fish and well known Indian culpeid fish of considerable economic importance all over India (especially to the Bengal), Pakistan, Bangladesh and Burma. It is also one of the best known Indian migratory fishes ascending all the major river systems, where it is caught in considerable numbers. It is found in coastal waters in the vicinity of the mouths of the rivers Narmada, Tapti, Cauvery, Pennar, Godavari, Krishna and Mahanadi. This species forms the largest commercial fishery in Andhra Pradesh. It ascends up to Bhadrachellum in the River Godavari and some distance above Vijayawada in the River Krishna.

Genus *Gudusia* Fowler, 1911.

1911. *Gudusia* Fowler, *Proc. Acad. nat. Sci. Philad.*, : 207 (type-species : *Clupanodon chapra* Hamilton)

1981. *Gudusia*, Jayaram, *Handbk. Freshw. Fish. India*, : 40 (genus character and distribution).

Body deep and compressed. Abdomen serrated and keeled with 18 to 19 prepelvic and 8 to 10 postpelvic scutes. Mouth slightly upturned, terminal, cleft extending to below the middle of the orbit. Upper jaw with a distinct median notch. Dorsal fin origin a little behind pelvic fin origin. Pelvic fin with 8 rays. Anal fin with 21 to 24 rays, well behind dorsal fin base. Caudal fin deeply forked. Scales small, the rows somewhat irregular except on upper part of body, 77 to 91 in lateral series. Lateral line absent.

***Gudusia chapra* (Hamilton Buchanan, 1822)**

1822. *Clupanodon chapra* Hamilton Buchanan, *Fish. Ganges*, : 248, 283 (type-locality : Upper parts of the Ganges).

1878. *Clupea chapra*, Day, *Fish. India*, : 639, pl. 161, fig. 1 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 375.

1981. *Gudusia chapra*, Jayaram, *Handbk. Freshw. Fish. India*, : 40 (genus character and distribution)

Local name : Nil.

Common name : Ganges shad (English).

Material examined : 3 exs. 95mm.-105mm. TL. ; Godavari river at Rajamundry, E. Godavari district, Andhra Pradesh ; R. P. Barman and party ; 31.5.87. (ii) 2 exs., 60 mm.-90mm. TL. ; Kolleru Lake, W. Godavari district, Andhra Pradesh ; R. P. Barman and party ; 7.6.87.

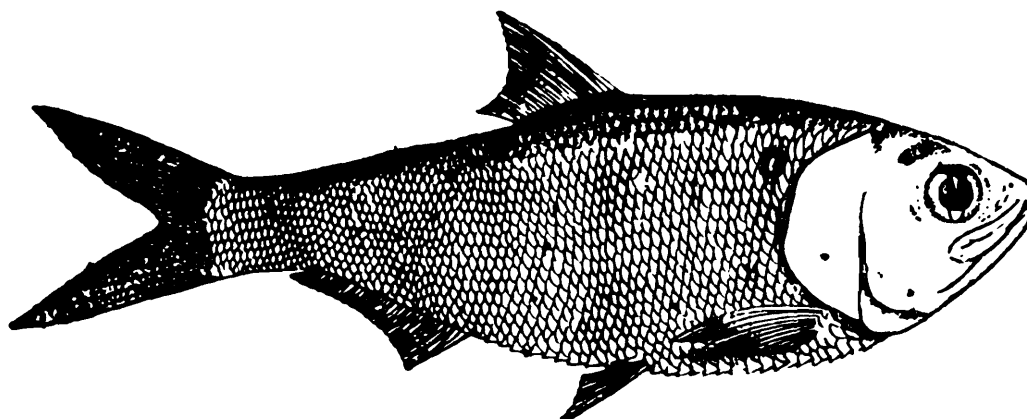


Fig. 3 : *Gudusia chapra* (Hamilton Buchanan)

Diagnostic features : D.14-16 (2-3/12 13), A.21-24 (2/19-22), P.13, V. 8, C.17, LL. 77-91.

Head length 4.25 to 4.50 and body depth 3.50 to 4.00 in total length. Eye diameter 3.50 to 4.00 in head length. Maxilla extending to middle of the orbit. Dorsal fin inserted nearer to hind base of anal fin than to snout tip. Lateral transverse rows of scales 33 to 35. Prepelvic scutes 18 to 19 and postpelvic scutes 9 to 10. Predorsal scales 23 to 25. Caudal fin deeply forked, lower lobe slightly longer.

Colour in alcohol : Body silvery shot with gold at sides. Dorsal surface dark.

Distribution : India : Throughout except Malabar and Tamil Nadu. Pakistan, Nepal, Bangladesh, Burma and Malaya.

Size : It attains at least 203 mm. (8 inches) in total length.

Fishery information : Economically this species is less important and hence does not form any important fishery in Andhra Pradesh.

Order OSTEOGLOSSIFORMES

Body and head strongly compressed with ornamental scales. Caudal region very long and tapering. Maxillaries well toothed forming the greater part of the upper jaw. Maxilla and premaxilla firmly bound together and have restricted mobility. Branchiostegal rays 3 to 5. Abdomen non-keeled. Dorsal fin present or absent. Pelvic fins abdominal. Barbels absent. Pectoral fins depressed. Anal fin long, united with caudal fin. Caudal fin skeleton is greatly reduced and no distinct caudal fin.

This order is represented by only one family and one genus with 2 species in India. Out of the 2 species known from the Indian region, 1 species is available in Andhra Pradesh.

Family : NOTOPTERIDAE

Featherbacks or knifefishes

Body broad, elongated and strongly compressed with ornamental scales including head. Abdomen serrated before pelvic fin, with almost 28 prepelvic double serrations. Mouth large with numerous teeth, cleft extending to up to or beyond posterior margin of the orbit. Maxilla well toothed and firmly bound together with the premaxilla. No barbels. Dorsal fin small, tuft-like, inserted almost middle of body with 8 to 10 rays, Anal fin very long, with 100 to 110 rays, confluent with caudal fin. Pelvic fin very small with 3 to 6 rays. No distinct caudal fin. Lateral line nearly arched with 120 to 180 scales.

The family Notopteridae is represented by a single genus in the Indian region.

Genus *Notopterus* Lacepède, 1800.

1800. *Notopterus* Lacepède, *Hist. nat. Poiss.*, 2 : 189 (type-species : *Notopterus kaptat* Lacepède = *Gymnotus notopterus* Pallas).

1981. *Notopterus*, Jayaram, *Handbk. Freshw. Fish. India* : 53 (genus character and distribution).

Genus characters are same of those of the family characters.

***Notopterus notopterus* (Pallas)**

1769. *Gymnotus notopterus* Pallas, *Spicil. Zool.*, 7 : 40, pl. 6, fig. 2 (type-locality : ? Indian ocean)
 1878. *Notopterus kapirot*, Day, *Fish. India*, : 653, pl. 159, fig. 4 : 1889. Day, *Fauna Br. India, Fish*, 1 : 406, fig. 129.
 1936. *Notopterus osmani* Rahimullah & Das, *Bull. Soc. Port. nat.*, 12 (18) : 136, pl. 23 (type-locality : rivers of Hyderabad, Deccan).
 1981. *Notopterus notopterus*, Jayaram, *Handbk. Freshw. Fish. India*, : 53, 54 (distribution and key to species).

Local name : *Ulakathatta, Mangali katti* (Telegu).

Common name : Feather back (English).

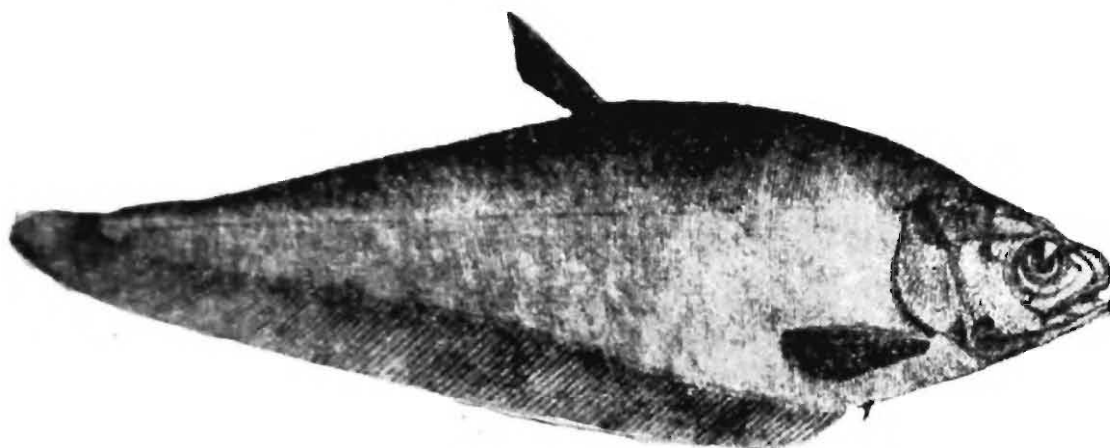


Fig. 4 : *Notopterus notopterus* (Pallas)

Material examined : (i) 2 exs., 137 mm.-227 mm. TL. ; Kinnersoni reservoir, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 28.8.83. (ii) 3 exs., 56 mm.-75 mm. TL. ; Godavari river, Karimnagar, Andhra Pradesh ; R. P. Barman and party ; 4.9.83. (iii) 1 ex., 102 mm. TL. ; Manjira river, Medak district, Andhra Pradesh ; R. P. Barman and party ; 12.12.84. (iv) 4 exs., 80 mm.—106 mm. TL. ; Godavari river at Rajamundry, E. Godavari district, Andhra Pradesh ; R. P. Barman and party ; 31.5.87, 1.6.87. (v) 3 exs., 140 mm.-200 mm. TL. ; Kolleru Lake, W. Godavari district, Andhra Pradesh ; R. P. Barman and party ; 5.6.87, 7.6.87.

Diagnostic features : D. 8-10 (1-2/7-8), A. 100-110, P. 17, V.5-6, C. 19, LL. 120-180.

Head length 4.50 to 5.50 and body depth 3.50 to 4.00 in total length. Eye diameter 4.50 to 5.00 in head length. Maxilla extending to below middle of the orbit. Preorbital serrated. Dorsal fin small, its origin midway between the snout tip and end of caudal fin, far behind the pelvic fin origin. Pelvic fin very short. Anal fin united with the caudal fin. Scales on opercle larger than those on body.

Colour in alcohol : Silvery sides with bluish grey back, golden yellow tinge on head. Juveniles may have some vertical bars on lateral sides of the body.

Distribution : India, Pakistan, Nepal, Bangladesh, Burma, Thailand, Malaya and Indonesia.

Size : It grows to 609 mm. (2 feet) or more in total length.

Fishery information : Though this fish contains numerous small soft bones, it is a good eating fish and found almost throughout Andhra Pradesh.

Order : CYPRINIFORMES

The body is generally with scales, rarely naked. Head scaleless. Head and body plates never developed. Branchiostegal rays 3 to 5. Mouth usually protractile and always toothless. Barbels often present around the mouth. Jaws, palatine and pterygoid bones without tooth. A single dorsal fin. No adipose dorsal fin. Lateral line present. Swim-bladder free or usually closed in a bony capsule in bottom dwelling forms. Weberian apparatus connects the swimbladder with the internal ear.

A widely distributed group of fishes of economic value. Members of this group are popular aquarium fishes, especially in minnows and loaches.

Key to the Families

1. Head and body depressed, flattened below	...	...	...	<i>Homalopteridae.</i>
Head and body compressed, not flattened below	...	...	...	2.
2. 2 to 4 barbels or barbels absent. Swimbladder divided into an anterior and a posterior part not surrounded by a bony capsule	...	...	...	<i>Cyprinidae</i>
6 to 8 barbels. Swimbladder entirely or partially enclosed by a bony capsule, its posterior part small or vestigial	...	...	...	<i>Cobitidae</i>

Family : CYPRINIDAE

Carps

Body with scales and usually laterally compressed. Abdomen rounded or cutting. Mouth with or without a sucker, sometimes with a symphysial knob. Lips developed in various stages, sometimes absent from one of the jaws or closely infesting both jaws or reflected from one of the other. A continuous or interrupted labial fold present. Some genera have sometimes a horny cartilaginous covering to either of the lips or both. Gill openings wide. Opercular bones well developed. Barbels 1 or 2 pairs or absent. Last undivided dorsal fin ray osseous or articulated. Lateral line complete, incomplete or absent. Swimbladder often large and divided into an anterior and a posterior chamber not surrounded by a capsule.

A very large and most common group of primary freshwater fishes.

Key to the sub-families

1. Abdomen or part of abdomen compressed into a sharp keel-like edge. Barbels absent ... 2.
Abdomen rounded or flat, not compressed. Barbels 2 pairs or 1 pair or absent ... 3.
2. Abdomen entirely keeled from throat to vent. Gill rakers fused into a spongy plate. Scales do not extend to interorbital space ... *Hypophthalmichthyinae*
Abdomen partly keeled. Gill rakers free. Scales extend to interorbital space ... *Cultrinae*
3. Upper lip continuous with the skin of snout. Mouth conspicuously inferior. Lower lip with or without an adhesive disk ... *Garrinae*
Upper lip separate from the skin of rostrum by a deep groove. Mouth anterior, inferior or subinferior. Lower lip without an adhesive disk ... 4
4. Lower jaw with a symphyseal knob (exception *Aspidoparia* Heckel). Lateral line when complete with an abrupt downward curvature anteriorly, running in lower half of caudal peduncle. Dorsal fin without any osseous simple ray ... *Rasbora*
Lower jaw without symphyseal knob. Lateral line complete or incomplete running along the middle of caudal peduncle. Dorsal fin with or without an osseous simple ray ... *Cyprininae*

Subfamily : CULTRINAE

A symphyseal knob on lower jaw present or absent. A part or whole of abdominal edge cutting. Mouth directed upwards. Dorsal fin without osseous ray, inserted in posterior half of body. Lateral line concave. Barbels absent.

Key to the genera

- Lower jaw with a symphyseal knob. Predorsal scales extend to the interorbital space. Pelvic fin with outer ray generally not elongated ... *Salmostoma*
Lower jaw without a symphyseal knob. Predorsal scales do not extend to the interorbital space. Pelvic fin with outer ray elongated ... *Chela*

Genus *Chela* Hamilton Buchanan, 1822.

1822. *Chela* Hamilton Buchanan, *Fish. Ganges*, : 258, 383 (type-species : *Cyprinus (Chela) cachius* Hamilton Buchanan, as restricted by Bleeker).
1860. *Laubuca* Bleeker, *Ichth. Archipel. Indici. Prodr.*, 2, Cyprini (type-species : *Perilampus guttatus* McClelland = *Cyprinus (Chela) laubuca* (Hamilton Buchanan)).
1958. *Chela*, Silas, *J. Bombay nat. Hist. Soc.* 55 (1) : 54-99 (revision).

Body oblong, compressed with a cutting abdominal edge. Mouth directed obliquely upward, cleft extending to below anterior border of the orbit. Lower jaw without a symphyseal knob. Dorsal fin with 9 to 11 rays. Pelvic fins with outer ray elongated. Anal fin with 17 to 25 rays. Caudal fin emarginate. Lateral line curved downwards, with 34 to 68 scales. Predorsal scales do not extend to interorbital space.

Silas (1958a) revised the fishes of this genus.

Key to the species

Lateral line scales 51 to 68. Pectoral fin not reaching anal fin. Pelvic fin with an elongated ray, extending to middle or even end of anal fin base	...	...	...	<i>C. cachi</i>
Lateral line scales 34 to 37. Pectoral fin reaching anal fin. Pelvic fin with elongated ray end before anal fin base	...	...	...	<i>C. laubuca</i>

Chela (Chela) cachi (Hamilton Buchanan, 1822)

1822. *Cyprinus cachi* Hamilton Buchanan, *Fish. Ganges* : 258, 384 (type-locality : River Ganges, about the commencement of the delta).
 1822. *Cyprinus atpar* Hamilton Buchanan, *Fish. Ganges* : 259, 384 (type-locality : branches of the Ganges, the Jamuna and Brahmaputra rivers).
 1878. *Perilampus atpar*, Day, *Fish. India* : 598, pl. 151, fig. 6 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 359.
 1958. *Chela (Chela) cachi*, Silas, *J. Bombay nat., Hist. Soc.*, 55 (1) : 667 (revision).
 1981. *Chela (Chela) cachi*, Jayaram, *Handbk. Freshw. Fish India* : 72. 73, fig. 40 (distribution and key to species).

Local name : Nil.

Common name : Chela (English).

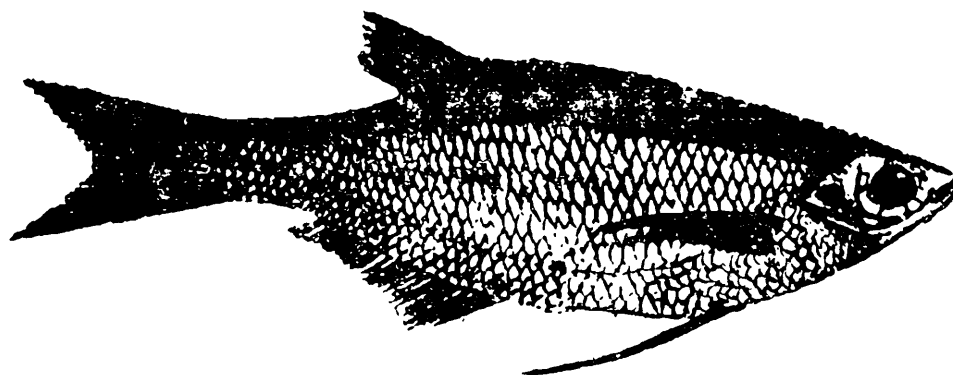


Fig. 5 : *Chela (Chela) cachi* (Hamilton Buchanan)

Material examined : 3 exs. 30.0 mm.-35.0 mm. TL. ; Krishna river, Kurnool district, Andhra Pradesh ; R. P. Barman and party ; 9.12.1985.

Diagnostic features : D.9-10 (2/7-8), P.1/8-11, V.1/4-5, A. 20-25 (2-3/18-23), C. 19, LL. 51-68.

Head length 4.50 to 5.75 and body depth 4.00 to 6.00 in total length. Eye diameter 2.75 to 4.00 in head length. Dorsal fin origin opposite to the second third of anal fin, Pectoral fin not reaching anal fin. Pelvic fin with an elongated ray extending to middle or even end of caudal fin. 4 rows of scales between the lateral line and base of pelvic fin. Caudal fin forked.

Colour in alcohol : Body silvery with a brownish lateral band. Dorsal and caudal fin yellow.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh and Burma.

Size : Largest recorded specimen 102 mm. (4 inches) in total length.

Fishery information : Economic importance of this species is less because of its small size. *C. cachius* and *C. laubuca* breed freely in ponds, tanks and small streams and in these habitats whenever they occur they are found in large numbers. Their wide distribution stands in their favour of being used as larvicidal fish. These two species, *C. cachius* and *C. laubuca* are reared as aquarium fishes and in many places as a bait for Mahaseer, *Channa* and other large carnivorous fishes.

***Chela (Chela) laubuca* (Hamilton Buchanan, 1822)**

1822. *Cyprinus laubuca* Hamilton Buchanan, *Fish. Ganges* : 260, 384 (type-locality : ponds of the northern parts of Bengal).

1878. *Perilampus laubuca*, Day, *Fish. India*, : 598, pl. 151, fig. 5 ; 1889, Day, *Fauna Br. India. Fish*, 1 : 360, fig. 112.

1858. *Chela (Chela) laubuca*, Silas, J. *Bombay nat. Hist. Soc.* 55 (1) : 70-85 (revision).

1981. *Chela (Chela) laubuca*, Jayaram, *Handbk. Freshw. Fish. India*, : 72, 73 (distribution and key to species).

Local name : Nil.

Common name : Winged rasbora (English).

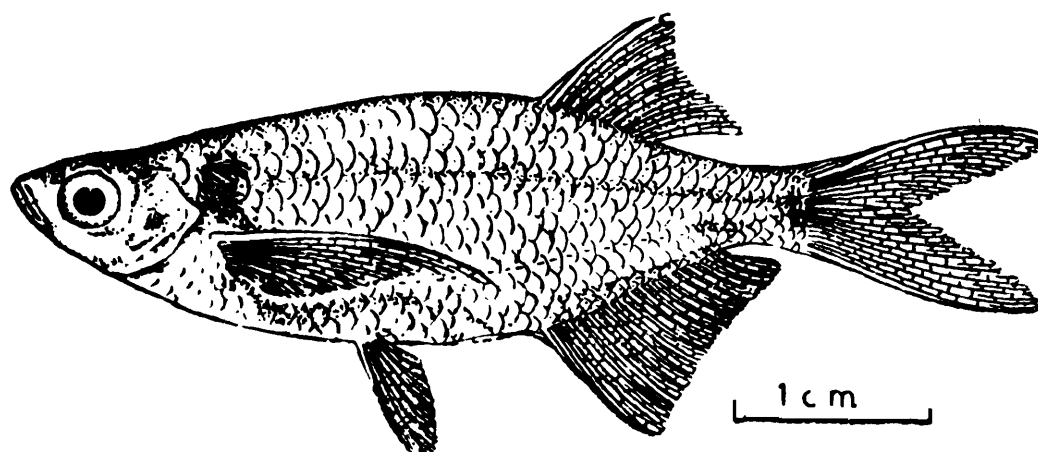


Fig. 6 : *Chela (Chela) laubuca* (Hamilton Buchanan)

Material examined : 4 exs. 61 mm.-77 mm. TL. ; Kolleru Lake, W. Godavari district, Andhra Pradesh ; R. P. Barman and party ; 4. 6. 87, and 7. 6. 87.

Diagnostic features : D.10-11 (2/8-9), P.1/8-11, V.1/6, A. 19-23 (2/17-21), C.19, LL. 34-37.

Head length 5.00 to 6.00 and **body depth** 2.50 to 4.08 in total length. **Eye diameter**

2.66 to 4.00 in head length. Dorsal fin origin midway between snout tip and end of caudal fin, slightly behind anal fin origin. Pectoral fin almost reaching anal fin. Pelvic fin with elongated ray ends before anal fin base. $3\frac{1}{2}$ rows of scales between lateral line and pelvic fin base. Caudal fin deeply forked.

Colour in alcohol : Body silvery with golden vertical stripes when alive and two black marks, one at the base of caudal fin and the other at the base of pectoral fin. A dark spot on the superior angle of gill opening also present.

Distribution : India : N. E. India, Orissa, West Bengal, Madhya Pradesh, Gujarat, Andhra Pradesh, Tamil Nadu. Also in Pakistan, Nepal, Bangladesh, Burma, Sri Lanka, Peninsular Thailand, Malaya Peninsula and Sumatra.

Size : This species attains 89 mm. ($3\frac{1}{2}$ inches) in total length.

Remarks : It is a larvivorous and polytypic species like *C. cachius*, generally found in ditches, ponds etc.

Genus *Salmostoma* Swainson, 1839.

1839. *Salmostoma* Swainson, *Nat. Hist. Fish.*, 2 : 184 (type-species : *Cyprinus bacaila* Hamilton Buchanan).
 1968. *Salmostoma*, Banarescu, *Rev. Roum. Biol. Zool.*, 13 (1) : 3-14 (revision).
 1981. *Salmostoma*, Jayaram, *Handbk. Freshw. Fish. India* : 73, 74 (genus descriptions and distribution).

Body elongated and compressed. Abdomen keeled from pectoral fin to anus, keel not hardened. Lower jaw longer, with a symphysial knob. Barbels absent. Dorsal fin short, inserted mostly opposite to anal fin, ahead in some (*S. boopis*), with 9 to 10 rays (7 to 8 branched). Pelvic fins outer ray usually not elongated. Anal fin short with 13 to 22 rays (2 to 3 simple). Caudal fin deeply forked. Lateral line complete, usually decurved with 38 to 112 scales. Predorsal scales extend to interorbital space.

Baranescu (1968) revised the genus *Salmostoma*.

Key to the species

1. Lateral line scales above 70 (74 to 112)	...	...	...	2.
Lateral line scales below 70 (38 to 65)	...	...	...	5.
2. Body with vertical dark stripes on sides	...	...	...	<i>S. horai</i>
Body without vertical dark stripes on sides	...	...	...	3.
3. Anal fin with 11 to 13 branched rays	...	...	...	4.
Anal fin with 16 to 18 branched rays	...	...	...	<i>S. phulo phulo</i>
4. Rows of scales between lateral line and pelvic fin base 3 to 4. Gill rakers 24 to 29. ...	<i>S. clupeoides</i>			
Rows of scales between lateral line and pelvic fin base 4 to 6. Gill rakers 17 to 21 ...	<i>S. bacaila</i>			

5. Lateral line scales 38 to 40. Dorsal fin inserted ahead of anal fin. Anal fin rays 14 to 15	...	...	...	<i>S. boopis</i>
Lateral line scales 55 to 65. Dorsal fin inserted above anal fin. Anal fin rays 17 to 19	...	...	...	<i>S. untrahi</i>

***Salmostoma bacaila* (Hamilton Buchanan, 1822)**

1822. *Cyprinus bacaila* Hamilton Buchanan, *Fish, Ganges*, : 265, 384, pl. 8, fig. 76 (type-locality : freshwater rivers of all the Gangetic provinces).
 1878. *Chela bacaila* Day, *Fish. India*, : 603, pl. 152, fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 367.
 1981. *Salmostoma bacaila*, Jayaram, *Handbk. Freshw. Fish. India* : 74, 75 (distribution and key to species).

Local name : Chela.

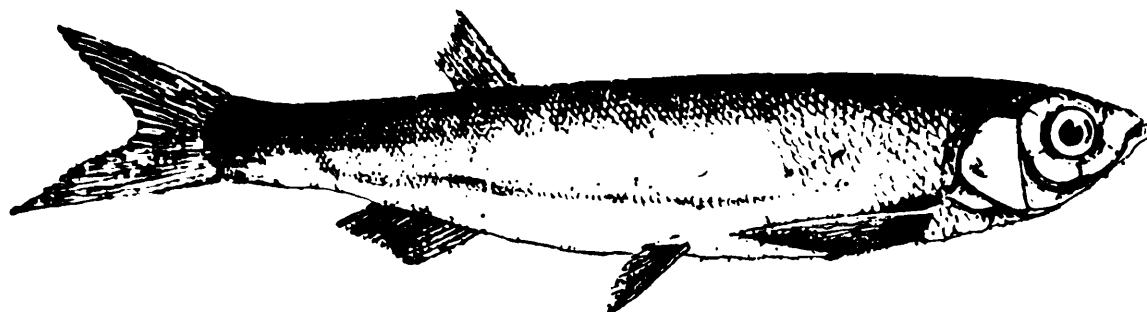


Fig. 7 : *Salmostoma bacaila* (Hamilton Buchanan)

Material examined : (i) 3 exs., 65 mm.-105 mm. TL. ; Godavari river, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 28. 8. 83. (ii) 5 exs., 100 mm.-150 mm. ; Nizam sagar, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 9. 12. 89, (iii) 2 exs., 130 mm.-140 mm. TL. ; Chitoor district. Andhra Pradesh ; R. P. Barman and party ; 16. 12. 87.

Diagnostic features : D. 9 (2/7), P. 13, V. 9, A. 13-15 (2/11-13), C. 19, LL. 86-110.

Head length 5.25 to 6.00 and body depth 5.50 to 6.00 in total length. Eye diameter 3.50 to 3.75 in head length. Snout longer than eye. Gill rakers 17-21. Gape of mouth extends to below first fourth of orbit. Keeled portion of ventral profile originates opposite pectoral fin. Suborbital ring of bones broad, almost covering cheek. Dorsal fin commences half ahead of anal fin. 4 to 6 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Body uniformly silvery.

Distribution : India : Ganga, Brahmaputra, Mahanadi river system. Also in Pakistan, Bangladesh, Nepal.

Size : This species grows at least 177 mm. (7 inches) in total length.

Remarks : *S. bacaila* is closely related to *S. clupeoides* from which it is distinguished

mainly by the number of lateral line scales which varies 86 to 110 in the former species vs. 80 to 93 in latter species.

***Salmostoma boopis* (Day)**

1873. *Chela boopis* Day, *Proc. zool. Soc. Lond.*, : 708 (type-locality : South Canara).

1878. *Chela boopis* Day, *Fish. India*, : 602, pl. 152, fig. 4 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 366.

1981. *Salmostoma*, Jayaram, *Handbk. Freshw. Fish. India* : 74, 75 (distribution and key to species).

Local name : Chela.

Material examined : No specimen obtained by me. It was recorded by Rahimullah (1943a & 1944) from both the river of Godavari and Krishna, Andhra Pradesh.

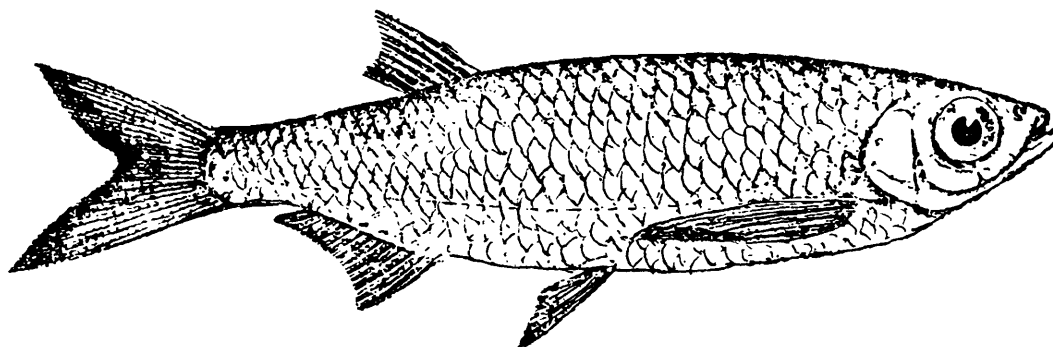


Fig. 8 : *Salmostoma boopis* (Day)

Diagnostic features : D. 9-10 (2/7-8), P. 15, V. 9, A. 14-15 (2/12-13), C. 21, LL. 38-40.

Head length 5.25 to 5.50 and body depth 5.00 to 5.25 in the total length. Eye diameter 2.50 to 3.00 in head length. Cleft of mouth extends to below the anterior margin of orbit. Suborbital ring of bones nearly cover the cheeks. Dorsal fin originates slightly in advance of anal fin and extends to over it. Caudal fin deeply forked. 2 to 2½ rows of scales between the lateral line and base of pelvic fin. Predorsal scales 22 to 24.

Colour in alcohol : Body silvery, with a burnished lateral band. Dorsal, anal and caudal fins edged with black.

Distribution : India : Western Ghats, South Canara, Mutha-Mula river, Poona and Krishna river.

Size : It attains at least 130 mm. (5 inches) in total length.

Remarks : It is a very common species of the Krishna river systems.

***Salmostoma clupeoides* (Bloch, 1795)**

1795. *Cyprinus clupeoides* Bloch, *Naturg. Ausland. Fische*, 12 : 49, pl. 408, fig. 2 (type-locality : Tranquebar).

1878. *Chela clupeoides* Day, *Fish, India* : 602 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 366.

1981. *Salmostoma clupeoides*, Jayaram, *Handbk. Freshw. Fish. India* : 74, 75 (distribution and key to species).

Local name : Vellache Candee, Neg teli, Ichkey, Vellichi, Nettelai (Tamil).

Material examined : (i) 2 exs., 198 mm-214 mm TL. ; Kinersoni reservoir, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 28. 8. 83, (ii) 3 exs., 205 mm-240 mm TL. ; Krishna river, Guntur district, Andhra Pradesh ; R. P. Barman and party ; 13. 6. 86, (iii) 5 exs., 110 mm-142 mm TL. ; Godavari river, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 31. 5. 87.

Diagnostic features : D. 9 (2/7), P. 13, V. 9, A. 13-15 (2/11-13), C. 19 ; LL. 80-93.

Head length 5.50 to 5.75 and body depth 5.50 to 7.50 in total length. Eye diameter 4.00 in head length. Snout equal to eye diameter. Gill rakers 24-29. A well developed knob on the symphysis. Dorsal fin originates in advance of anal fin. Pectoral fin longer than head but does not touch the pelvic fin. Caudal fin lobed, the lower lobe the longer. 3 or 4 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Body uniformly silvery.

Distribution : India : Narmada, Tapi, Krishna, Godavari and Cauvery river system, Tripura. Burma.

Remarks : This species is known to occur in the Narmada, Tapi, Krishna, Godavari and Cauvery river system. I have recorded this species from Tripura, N. E. India (Barman, 1988).

Although this fish contains numerous small bones, it is a very good edible fish.

***Salmostoma horai* (Silas)**

1951. *Chela horai* Silas, *J. zool. Soc. India*, 3 : 7-10 (type-locality : River Cauvery, Coorg, Mysore).

1981. *Salmostoma horai*, Jayaram, *Handbook Freshw. Fish. India*, : 74, 75 (distribution and key to species).

Local name : Chela.

Material examined : (i) 2 exs., 100 mm.-103 mm. TL. ; paddy field near Ramappa reservoir, Warangal district, Andhra Pradesh ; R. P. Barman and party ; 31. 8. 83. (ii) 6 exs., 83 mm.-118 mm. TL. ; Kurnool Cuddapah canal. Kurnool district, Andhra Pradesh ; R. P. Barman and party ; 9. 12. 85.

Diagnostic features : D. 2/8 ; P. 13, V. 9, A. 3/14-15, LL. 76-90.

Head length 4.00 to 4.50 and body depth 4.50 to 4.75 in standard length. Body elongate and compressed. Keeled abdominal edge originates from opposite the base of pectoral fin. Eye anterior, diameter 4.00 to 4.75 in head length. Snout more or less pointed and anteriorly notched. Snout length slightly greater than eye diameter.

Dorsal fin originates slightly ahead of anal fin origin and extends to above it. Dorsal fin height is almost half of pectoral fin length. The pectorals long, pointed and extend to nearly pelvic fin base. Caudal fin deeply forked, more or less equal to head, with lower lobe slightly longer. Lateral line complete and slightly curved, with 76 to 90 scales. Predorsal scales 40 to 45. 11 to 12 rows of scales between dorsal origin and lateral line ; 3 rows of scales between lateral line and pelvic base.

Colour in alcohol : 6 to 13 short vertical brownish bands or spots on either side of the body. Upper third of body light brownish and abdomen silvery. A narrow dark band along middle of body from upper angle of opercle and extending to base of caudal fin which is edged with black.

Distribution : India : Cauvery river, Coorg, Karnataka.

Size : It attains 128 mm. (5 inches) in total length.

Remarks : Silas (1951) recorded this species from cauvery river, Karnataka. I have collected 6 specimens, measuring 80 to 118 mm. TL. of this species from Kurnool Cuddpah Canal, Kurnool district, Andhra Pradesh on the 9.12.89. Therefore, it is being recorded here for first time from Andhra Pradesh.

***Salmostoma phulo phulo* (Hamilton Buchanan)**

1822. *Cyprinus phulo* Hamilton Buchanan, *Fish. Ganges* : 262, 384 (type-locality : rivers and ponds of north-eastern parts of Bengal).

1878. *Chela phulo*, Day, *Fish, India* : 602, pl. 153, fig. 1 ; 1889, Day, *Funa Br. India*, 1 : 365.

1981. *Salmostoma phulo phulo*, Jayaram, *Handbk. Freshw. Fish. India*, : 74, 75 (distribution and key to species).

Local name : *Blancha* (Telegu).

Material examined : No specimen obtained by me. It was recorded by Rahimullah (1943a & 1944) and Mahmood and Rahimullah (1947b) from Nizamabad district, Andhra Pradesh. It was also recorded by David (1963 a) from both the river of Godavari and Krishna, Andhra Pradesh.

Diagnostic features : D.9(2/7), P. 13, V.8, A. 18-20(2/16-18), C. 19, LL. 80-87.

Head length 5.00 to 5.50 and body depth 4.50 to 5.00 in total length. Eye diameter 3.50 in head length. Abdominal profile cutting behind the base of pectoral fin. Maxilla extending to below the anterior border of the orbit. Dorsal fin originates opposite the commencement of anal fin. Caudal fin deeply forked, lower lobe longer. Lateral line curves gently downwards.

Colour in alcohol : Body uniformly silvery, with a bright silvery lateral band.

Distribution : India : Assam, West Bengal, Orissa, Madhya Pradesh and Deccan as far southwards as the Tungabhadra and Krishna rivers. Bangladesh.

Size : It attains at least 130 mm. (5 inches) in total length.

Remarks : It is a very common species in both the Godavari and Krishna river systems.

***Salmostoma untrahi* (Day)**

1869. *Chela untrahi* Day, *Proc. Zool. Soc. Lond.* : 381 (type-locality : Mahanadi).

1878. *Chela untrahi*, Day, *Fish. India.* : 601, pl. 151, fig. 7 ; 1889, Day, *Fauna Br. India. Fish.* 1 : 364

1981. *Salmostoma untrahi*, Jayaram, *Handbk. Freshw. Fish. India*, 74, 75 (distribution and key to species).

Local name : Chela.

Material examined : 8 exs., 135 mm-140 mm TL. ; a pond at Mosampet village, Mahbubnagar district, Andhra Pradesh ; R.P. Barman and party ; 15.12.84.

Diagnostic features : D.9 (2/7), P.13, V.7, A.17-19 (2-3/14-17), C.17, LL.55-65.

Head length 5.50 to 6.00 and body depth 5.25 to 6.00 in total length. Eye diameter 3.00 to 3.25 in head length. Dorsal profile almost horizontal and ventral profile with

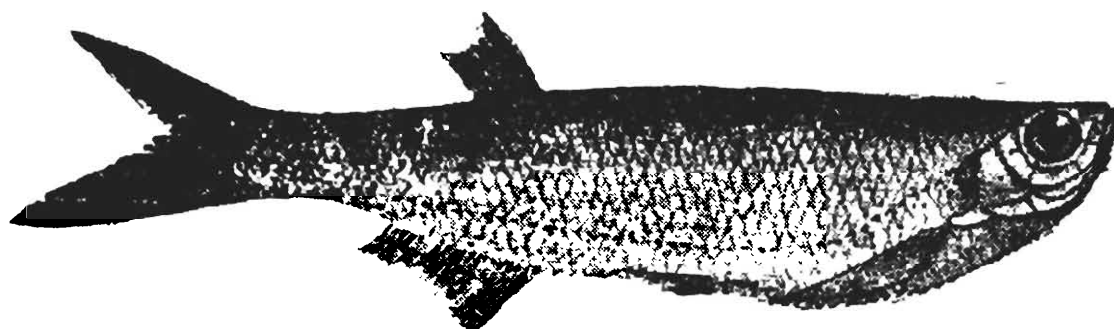


Fig. 9 : *Salmostoma untrahi* (Day)

a cutting edge from opposite pectoral fin base. Lower jaw longer, maxilla extending to below anterior margin of first third of orbit. Pectoral fin longer than head, reaches pelvic fin. Dorsal fin originates midway between posterior border of orbit and tip of caudal fin. Anal fin arises below middle of dorsal fin. Caudal fin lobed, lower lobe longer.

Colour in alcohol : Body uniformly silvery.

Distribution : India : Mahanadi river system, Orissa ; Andhra Pradesh and Cauvery river system, South India.

Size : It grows at least 205 mm. (8 inches) in total length.

Remarks : I have collected 8 specimens measuring 135 mm. to 140 mm. TL. from a tank near Mosampet village, Mahbubnagar district, Andhra Pradesh on 15.12.84. This is the new state record of Andhra Pradesh.

Subfamily : HYPOPTHALMICHTHYINAE

Strongly keeled abdomen from breast to vent. Scales not extending to interorbital space. Barbels absent.

Genus : *Hypophthalmichthys* Bleeker.

Silver carp

1859. *Hypophthalmichthys* Bleeker, *Nat. Tijdschr. Ned. India* (type-species : *Leuciscus molitrix* Valenciennes).

1981. *Hypophthalmichthys*, Jayaram, *Handbk. Freshw. Fish. India* : 76 (genus description and distribution).

Abdomen strongly compressed with a sharp keel extending from breast to vent. Body stout. Barbels absent. Dorsal fin originates posterior to pelvic fins or above tip of pectoral fins, with 10 rays and anal fin with 14 to 17 rays. Caudal fin forked. Lateral line decurved, complete with 110 to 115 cycloid scales.

Hypophthalmichthys molitrix (Valenciennes)

1983. *Hypophthalmichthys molitrix*, Jhingran, *Fish and Fisheries of India*, : 436-446.

Local name : Silver carp.

English name : Silver carp.

Material examined : 4 exs. 250-310 mm TL. ; Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 7. 12. 84.

Dignostic features : D. 3/7, A. 2-3/12-14, V. 1/7, LL. 110-115.

Head length 3.55 to 4.62 and body depth 3.81 to 4.62 in total length. Eye diameter 5.33 to 7.54 in head length. Snout bluntly rounded and body oblong. Lower jaw slightly

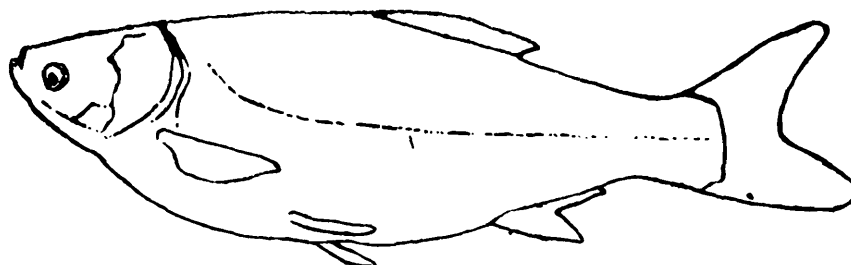


Fig. 10 : *Hypophthalmichthys molitrix* (Valenciennes)

protruding with a tubercle, and upper jaw slightly notched. Pectoral fins extending beyond pelvic fins origin. Dorsal fin originates between snout tip and caudal fin base.

Colour in alcohol : Silvery body with blood red spots generally on the caudal peduncle region. Fins dark.

Distribution : Naturally found in the river systems of Yangtse, West river, Kwangsi, Kwagtung in south and central China and in the Amur basin in the U. S. S. R. In India, the first ever consignment of 360 fingerlings of Silver carp was brought from Japan in 1959 to the pond culture division of Central Inland Fisheries Research Institute, Cuttack, Orissa (Jhingran, 1983).

Size : This fish grows up to an average length of 81.4 cm and 7.2 kg in weight within a period of approximately more than four years.

Remarks : In Andhra Pradesh, this exotic fish has been introduced in the various districts by the State Fisheries Department, Govt. of Andhra Pradesh.

Subfamily : RASBORINAE

Body oblong or elongated and compressed. Abdomen not trenchant, somewhat rounded. Mouth terminal, obliquely ascending ; lower jaw usually projecting, generally provided with a symphysial knob. Dorsal fin without an osseous ray. Lateral line if present, abruptly bending downwards, if complete running along lower half of caudal peduncle.

Key to the genera

1. Lower lip absent. Lower jaw with a sharp crescentic bony edge	...	<i>Aspidoparia</i>
Lower lip present. Lower jaw with or without symphysial knob	...	2.
2. Maxillary barbels very long. No symphysial knob on lower jaw	...	<i>Esomus</i>
Maxillary barbels short or absent. A symphysial knob on lower jaw present.	...	3.
3. Cleft of mouth extending up to middle of the orbit.	...	<i>Barilius</i>
Cleft of mouth not extending beyond anterior border of the orbit	...	4.
4. Upper lip absent	...	<i>Amblypharyngodon</i>
Upper lip present	...	5.
5. Lower jaw with three prominences. Anal fin with 8 to 9 rays	...	<i>Rasbora</i>
Lower jaw with a single symphysial knob. Anal fin with 11 to 20 rays	...	<i>Danio</i>

Genus *Esomus* Swainson, 1839.

1839. *Esomus* Swainson, *Nat. Hist. Fishes*, 2 : 285 (type-species : *Esomus vittatus* Swainson = *Cyprinus danrica* Hamilton, by monotypy).
1928. *Esomus*, Hora and Mukerji, *Rec. Indian Mus.*, 30 (1) : 41-50 (revision).
1981. *Esomus*, Jayaram, *Handbk. Freshw. Fish. India* : 77 (genus characters and distribution).

Body elongated and compressed with rounded abdomen. Mouth narrow, directed obliquely upwards. No symphysial knob on lower jaw. Barbels 2 pairs, maxillary pair very long extending up to anal fin. Dorsal fin inserted in the opposite interspace between pelvic

and anal fins, nearer to anal fin than to pelvic fin, with 8 to 9 soft rays and no spine. Anal fin with 5 to 6 branched rays. Caudal fin forked. Lateral line, when present, passing to the lower half to caudal fin base, with 27 to 34 scales.

Key to the species

Lateral line complete or nearly so extending to at least the base of anal fin	...	<i>E. barbatus</i>
Lateral line absent or nearly so, piercing only 4 to 6 anterior scales	...	<i>E. danricus</i>

Esomus barbatus (Jerdon, 1849)

1849. *Leuciscus barbatus* Jerdon, *Madras J. Lit. Sci.*, 15 : 322 (type-locality : rivers and tanks all over Mysore and Carnatic).

1981. *Esomus barbatus*, Jayaram, *Handbk. Freshw. Fish. India* : 78 (distribution and key to species).

Local name : Nil.

Common name : Messai paravai (Tamil).

Material examined : 2 exs., 81 mm-90 mm TL. ; a pool at Janampet village, Mahbubnagar district, Andhra Pradesh ; R. P. Barman and party ; 15. 12. 84.

Diagnostic features : D. 8-9 (2/6-7), P. 15, V. 9, A. 8-9 (3/5-6), C. 19, LL. 30-34.

Head length 4.10 to 5.25 and body depth 4.00 to 6.00 in total length. Eye diameter 3.40 to 4.57 in head length. Snout length slightly longer eye diameter. Barbels 2 pairs, rostral pair short and maxillary pair usually extend up to middle of pectoral fin, but may be slightly longer or shorter. Lateral line complete and well-defined. Predorsal scales 17 to 19. Circumpeduncular scales 12. Caudal fin forked.

Colour in alcohol : Silvery white, darkish above and lighter below. On the sides there are broad but indistinct silvery bands passing along middle of body and becoming quite prominent behind pelvic fin.

Distribution : India : Tamil Nadu, Karnataka and Andhra Pradesh.

Size : It attains 110 mm ($4\frac{1}{2}$ inches) in total length.

Esomus danricus (Hamilton Buchanan, 1822)

1822. *Cyprinus danrica* Hamilton Buchanan, *Fish. Ganges* : 325, 390, pl. 16, fig. 88 (type-locality : ponds and ditches of Bengal).

1878. *Nuria danrica*, Day, *Fish. India* : 583, pl. 145, fig. 7 ; 1889 Day, *Fauna Br. India, Fish*, 1 : 334, fig. 106.

1981. *Esomus danricus*, Jayaram *Handbk, Freshw. Fish, India* : 77, 78, text-fig. 41 : (distribution and key to species).

Local name : Asta Pakke (Telegu).

Common name : Flying barb (English).

Material examined : (i) 5 exs., 57 mm-64 mm TL. ; Ramappa reservoir, Warangal district, Andhra Pradesh, R. P. Barman and party ; 31. 8. 83. (ii) 82 exs., 51 mm-65 mm. TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 7. 6. 87. (iii) 29 exs., 56 mm-66 mm TL. ; Machilipatnam, Krishna district, Andhra Pradesh ; R. P. Barman and party ; 12. 6. 87.

Diagnostic features : D. 8 (2/6), P. 15, V. 9, A. 8-9 (3/5-6), C. 19, LL. 30-34.

Head length 4.75 to 5.25 and body depth 5.00 to 5.50 in total length. Eye diameter 3.25 to 4.00 in head length. Mouth obliquely directed upwards. Barbels 2 pairs, rostral pair slightly longer than eye diameter and maxillary pair very long extending up to base of pelvic fin or sometimes up to base of anal fin. Lateral line absent or pierces only up

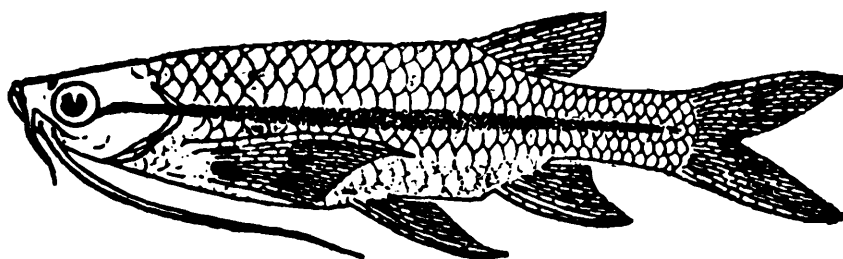


Fig. 11 : *Esomus danricus* (Hamilton Buchanan)

to 4 to 6 anterior scales. 2 rows of scales between lateral line and base of pelvic fin. Predorsal scales 17 to 20. Dorsal fin origin considerably nearer to base of caudal fin than to tip of snout. Caudal fin emarginate.

Colour in alcohol : Dorsal surface light olive and sides silvery with a broad black lateral band which sometimes may be absent.

Distribution : India : Throughout North India, Gujarat, Orissa, Madhya Pradesh, Andhra Pradesh, Tamil Nadu. Pakistan. Nepal. Bangladesh. Burma. Sri Lanka. Malaya and Thailand.

Size : It attains 127 mm (5 inches) in total length.

Fishery information : Its commercial importance is less due to its small size. It is a larvicidal fish which lives in shallow waters of ponds, tanks, pools, paddy-fields, ditches etc. where they breed freely.

Genus *Danio* Hamilton Buchanan, 1822.

- 1822. *Danio* Hamilton Buchanan, *Fish. Ganges* : 321, 390 (type-species : *Cyprinus dangila* Hamilton).
- 1981. *Danio*, Jayaram *Handbk. Freshw. Fish. India* : 78, 79 (genus characters and distribution).
- 1991. *Danio*, Barman, *Rec. zool. Surv. India, Occ. Paper No. 137* : i-viii+1-91, text-figs. 20 (Synonymy and revision).

Body more or less elongated, compressed, subcylindrical with rounded abdomen. Mouth small, anterior, directed obliquely upwards. Lower jaw conspicuous with a symphyseal knob. Maxilla extending up to anterior margin of the orbit. Eyes sometimes provided with a backwardly directed preorbital spinous process at the anterior rim of the orbit. Barbels 2 pairs, 1 pair or absent. Dorsal fin with 6 to 17 branched rays. Anal fin with 11 to 20 rays. Caudal fin emarginate, lunate or forked. Lateral line concave, complete, incomplete or absent with 32 to 65 scales along the normal course of lateral line.

Key to the species

1. Lateral line incomplete or absent	...	...	...	<i>D. rerio</i>
Lateral line present and complete	...	...	...	2.
2. Lateral line scales 45 to 52. Dorsal fin rays 17 to 20. Barbels 1 pair, very short or absent	...	...	...	<i>D. devario</i>
Lateral line scales 35 to 37. Dorsal fin rays 13 to 15. Barbels 2 pairs	...	...	...	<i>D. aequipinnatus</i>

Danio aequipinnatus (McClelland, 1839)

1839. *Perilampus aequipinnatus* McClelland, *Asiat. Res.*, 19 (2) : 393, pl. 60, fig. 1 (type-locality : Assam).
1849. *Perilampus malabaricus* Jerdon, *Madras, J. Lit. and Sci.*, 15 : 325 (Malabar coast).
1907. *Danio browni* Regan, *Rec. Indian Mus.*, 1 : 395 (Upper Burma).
1924. *Danio strigillifer* Myers, *Am. Mus. Novit.*, 150 : 2 (Upper Burma).
1981. *Danio aequipinnatus* Jayaram, *Handbk. Freshw. Fish. India* : 80, 81 (distribution and key to species).
1991. *Danio aequipinnatus*, Barman, *Rec. Zool. Surv. India, Occ. Paper No. 137* : 22-27, text -figs. 3, 3a and 3b (synonymy and revision).

Local name : Nooltu (Telegu).

Common name : Giant Danio (English).

Material examined : (i) 26 exs., 63 mm-86 mm TL. ; Phulang river, Nizamabad district, Andhra Pradesh, R. P. Barman and party ; 7. 12. 84. (ii) 16 exs., 60 mm-70 mm TL. ; Koil sagar, Mahbubnagar district, Andhra Pradesh ; R. P. Barman and party ; 16. 12. 84. (iii) 2 exs., 48 mm-57 mm ; Krishna river, Kurnool district, Andhra Pradesh ; R. P. Barman and party ; 9. 12. 85.

Diagnostic features : D. 13-15 (2-3/11-12), P. 13, V. 8, A. 16-18 (2-3/14-15), C. 19, LL. 35-37.

Head length 4.50 to 5.25 and body depth 4.00 to 4.50 in total length. Eye diameter 3.00 to 4.00 in head length. Eye provided with a backwardly directed preorbital spinous process at the anterior margin of the orbit. Cleft of mouth small, obliquely directed upwards. Maxilla extending up to anterior border of the orbit. Third suborbital bone

almost touches the preopercular ridge. Barbels 2 pairs, rostral pair equal to half of the orbit and maxillary pair shorter than rostral pair. Pectoral fin extending up to base of pelvic fin. Caudal fin forked. $1\frac{1}{2}$ to $2\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin.

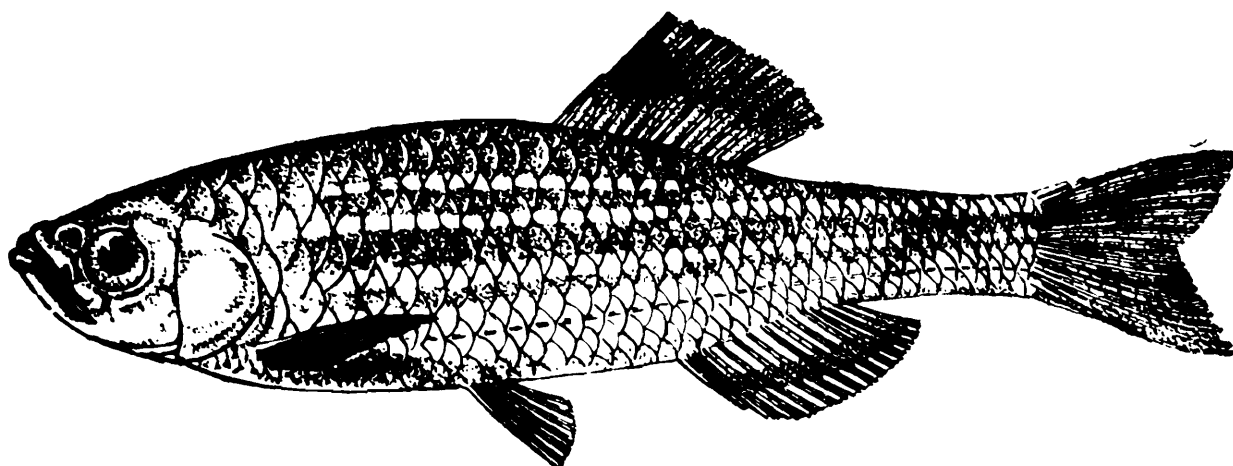


Fig. 12 : *Danio aequipinnatus* (McClelland)

Colour in alcohol : Yellowish white with a wide bluish lateral band extending from behind the head to base of caudal fin. Another narrow longitudinal band above and two lighter bands below them. Sometimes a dark spot present on the superior angle of the gill openings.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma, Sri Lanka, Thailand and China.

Size : It attains 152 mm (6 inches) in total length.

Remarks : The preorbital spinous process at the anterior rim of the orbit in this species seems to have overlooked by earlier Indian workers. I have already pointed out this preorbital structure in this species (Barman, 1985, 1988, 1991).

***Danio devario* (Hamilton Buchanan, 1822)**

- 1822.** *Cyprinus devario* Hamilton Buchanan, *Fish. Ganges* : 341, 393, pl. 6, fig. 94 (type-locality ; rivers and ponds of Bengal).
- 1878.** *Danio devario*, Day, *Fish. India* : 595, pl. 150, fig. 4 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 354.
- 1981.** *Danio devario*, Jayaram, *Handbk. Freshw. Fish. India* : 80 (distribution and key to species).
- 1991.** *Danio devario*, Barman, *Rec. Zool. Surv. India, Occ. Paper No, 137* : 41-44, text fig. 9 (Synonymy and revision).

Local name : Nil.

Common name : Danio (English).

Material examined : 6 exs., 45 mm-62 mm TL. ; Hyderabad, Andhra Pradesh ; Prof. M. Sajeed-ud-Din ; 1936.

Diagnostic features : D. 17-20 (2-3/15-17), P. 13. V. 9, A. 18-20 (2-3/16-17), C. 19, LL. 45-52.

Head Length 5.00 to 5.25 and body depth 3.25 to 4.00 in total length. Eye diameter 2.50 to 3.00 in head length. Lower jaw longer. Maxilla extends below front margin of

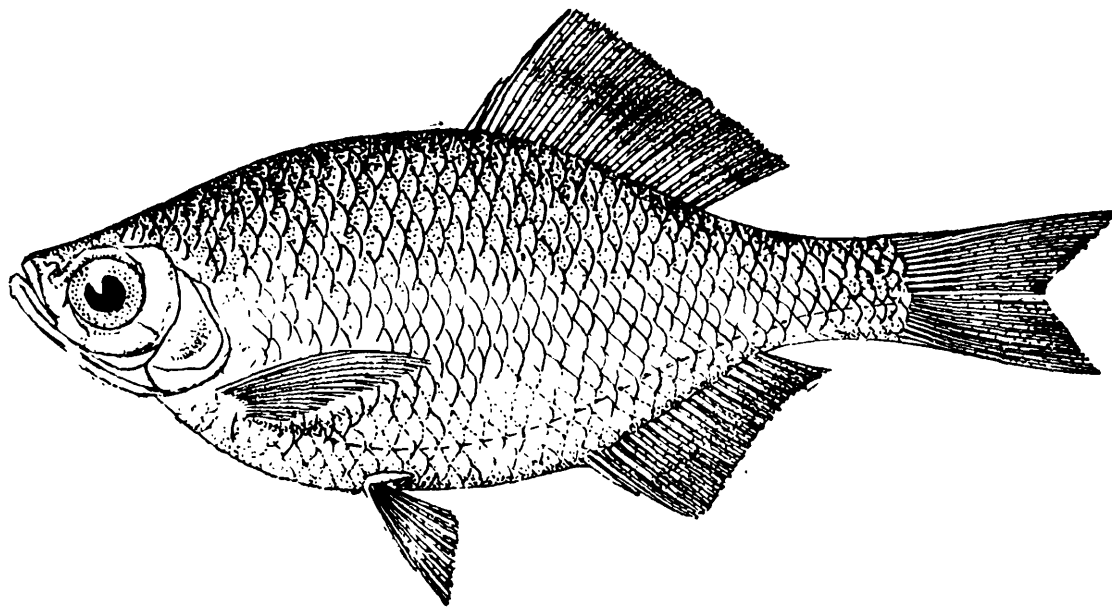


Fig. 13 : *Danio devario* (Hamilton Buchanan)

the orbit. Third suborbital bone broad. Barbels 1 pair, maxillary very short or totally absent. Dorsal fin commences almost midway between snout tip and caudal fin base. $2\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Dorsal surface greenish and sides silvery. Three blue narrow bands divided by yellow bands extending backwards to base of caudal fin. Sometimes a pair of blue marks present at the base of caudal fin.

Distribution : India : North India, N. E. India, Rajasthan, Gujarat, Madhya Pradesh, Orissa, Krishna and Godavari river systems. Bangladesh. Nepal. Pakistan.

Size : It attains 103 mm (4 inches) in total length.

***Danio rerio* (Hamilton Buchanan, 1822)**

- 1822. *Cyprinus rerio* Hamilton Buchanan, *Fish. Ganges* : 323 (type-locality : River Kosi).
- 1878. *Danio rerio*, Day, *Fish. India* : 597, pl. 151, fig. 4 ; 1889, Day, *Fauna, Br. India, Fish*, 1 : 358.
- 1981. *Danio (Brachydanio) rerio*, Jayaram, *Handbk. Freshw. Fish. India* : 80-82 (distribution and key to species).
- 1991. *Danio rerio*, Barman, *Rec. Zool. Surv. India, Occ. Paper No. 137* : 57-60, text-fig. 17 (synonymy and revision).

Local name : *Chintaku parega, Akkukorpil* (Telegu).

Common name : Zebra Danio (English).

Material examined : 2 exs., 35 mm-40 mm TL.; Krishna river, Krishna district, Andhra Pradesh; R. P. Barman and party; 12. 6. 87.

Diagnostic features : D. 8-9 (2/6-7), P. 12, V. 8, A. 14-16 (2-3/12-13), C. 19, LL. 32-33.

Head length 5.00 to 5.25 and body depth 4.70 to 5.00 in total length. Eye diameter 3.00 to 3.50 in head length. Lower jaw longer. Maxilla extends before anterior margin of the orbit. Barbels 2 pairs, well developed, rostral pair considerably longer than eye diameter and maxillary pair extending beyond the half length of pectoral fin. Dorsal fin

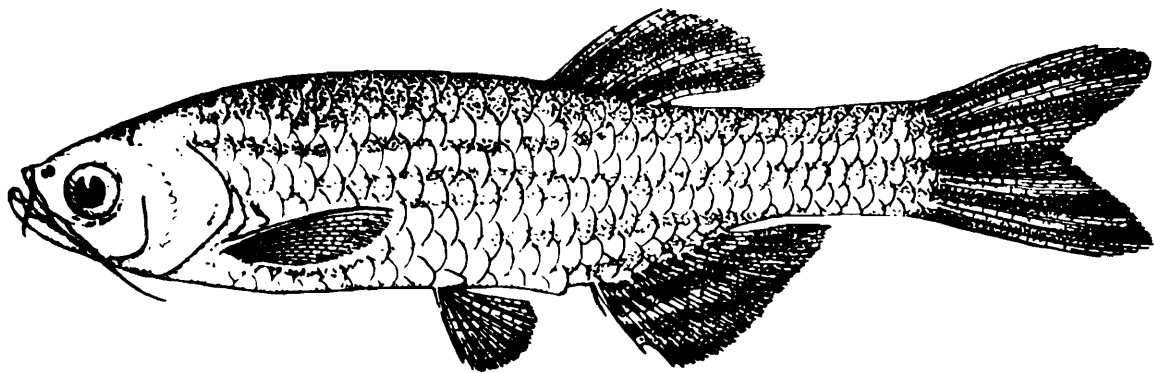


Fig. 14 : *Danio rerio* (Hamilton Buchanan)

origin considerably nearer to base of caudal fin than to tip of snout. Lateral line is highly variable, it may be incomplete extending up to base of pelvic fin or absent totally. Predorsal scales 15 to 16. Lateral transverse rows of scales 6 to 7 and circumpeduncular scales 10. Caudal fin deeply forked.

Colour in alcohol : Four metallic longitudinal bands separated by three narrow silver ones along either side present forming three bands on the caudal fin. Anal fin with three bands across their rays.

Distribution : India : North India, N. E. India, Rajasthan, Madhya Pradesh, Karnataka, Andhra Pradesh. Pakistan. Bangladesh. Burma. Sri Lanka and Nepal.

Sizes : It attains 50 mm (2 inches) in total length.

Remark : This fish is popularly known as "Zebra fish." It is one of the most popular aquarium fishes. Its blue and silver stripes, its constant activity, the ease with which it is kept and fed and its inoffensive nature make it a prime favourite with the most tropical fish hobbyists.

Genus Rasbora Bleeker, 1860.

1860. *Rasbora* Bleeker, *Acta. Soc. Sci. Indo-Neerl.*, 7 : 435 (type-species : *Cyprinus rasbora* Hamilton Buchanan).

1954. *Rasbora*, Brittan, *Monog. Inst. Sci. and Techn. Manila*, 3 : 134 (revision).

1981. *Rasbora*, Jayaram, *Handbk. Freshw. Fish. India* : 83 (genus characters and distribution).

Body elongated and compressed with rounded abdomen. Mouth wavy, oblique and large. Lower jaw conspicuous, with three internal prominences. Barbels one pair or absent. Dorsal fin inserted opposite interspace between pelvic and anal fin, with 9 to 10 soft rays and no spine. Anal fin with 8 to 9 rays (5 to 6 branched rays). Caudal fin emarginate or forked. Lateral line concave, complete with 26 to 44 scales.

7 species are known under the genus in the Indian subcontinent, 3 species are found in Andhra Pradesh.

Brittan (1954) revised the fishes of this genus.

Key to the species

1. Distance from anterior base of dorsal fin to end of hypural plate when carried forward falling behind the posterior border of the orbit *R. caverii*
Distance from anterior base of dorsal fin to end of hypural plate when carried forward falling before the posterior border of the orbit 2.
2. Lateral line scales 32 to 34. A black lateral longitudinal band present ... *R. daniconius daniconius*
Lateral line scales 28 to 31. Caudal fin with well-defined blackish hind border ... *R. rasbora*

Rasbora caverii (Jerdon, 1848)

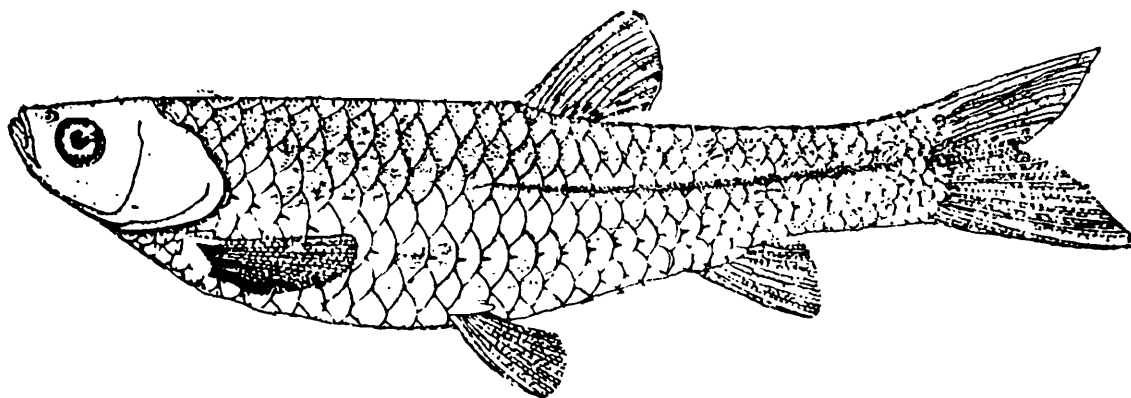
1848. *Leuciscus caverii* Jerdon, *Madras J. Lit. and Sci.*, 15 : 320 (type-locality : Cauvery river, Coorg state).

1937. *Rasbora caverii*, Hora, *Rec. Indian Mus.*, 39 : 26-28, fig. 11 (redescription).

1981. *Rasbora caverii*, Jayaram, *Handbk. Freshw. Fish. India* : 84, 85 (distribution and key to species).

Local name : Nil.

Material examined : 2 exs., 47 mm-60 mm TL., Kalwala reservoir, Karimnagar district, Andhra Pradesh ; R. P. Barman and party ; 3. 9. 83.



Fig, 15 : *Rasbora caverii* (Jerdon)

Diagnostic features : D. 9 (2/7), P. 14, V. 7, A. 8 (3/5), C. 19, LL. 32.

Head length 5.10 to 5.60 and body depth 5.00 in total length. Eye diameter 3.50 to 3.60 in head length. Snout length somewhat shorter than eye diameter. Mouth small, obliquely directed upwards, maxilla not extending to below anterior border of the orbit. Symphysial knob on lower jaw present. Barbels absent. Lateral transverse rows of scales 7, 1½ to 2 rows of scales between lateral line and base of pelvic fin. Predorsal scales 16-17. Circumpeduncular scales 14. Dorsal fin originates considerably behind pelvic fin origin but not extends over anal fin, its commencement considerably nearer to caudal fin base than to snout tip. Caudal fin forked with both lobes pointed, lower lobe slightly longer.

Colour in alcohol : Body olivaceous with a faintly marked lateral streak. This lateral band more prominent in posterior half of the body.

Distribution : India : Southern India, specially Karnataka. Sri Lanka.

Size : It attains 96 mm (4 inches) in total length.

Remarks : It is being recorded here for the first time from Andhra Pradesh.

***Rasbora daniconius daniconius* (Hamilton Buchanan, 1822)**

1822. *Cyprinus daniconius* Hamilton Buchanan, *Fish. Ganges* : 327, pl. 15, fig. 89 (type-locality: rivers of southern Bengal).
 1878. *Rasbora daniconius*, Day, *Fish. India* : 584, pl. 146, fig. 2 and 3 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 336.
 1981. *Rasbora daniconius daniconius*, Jayaram, *Handbk. Freshw. Fish. India* : 84, 85, fig. 43 (distribution and key to species).

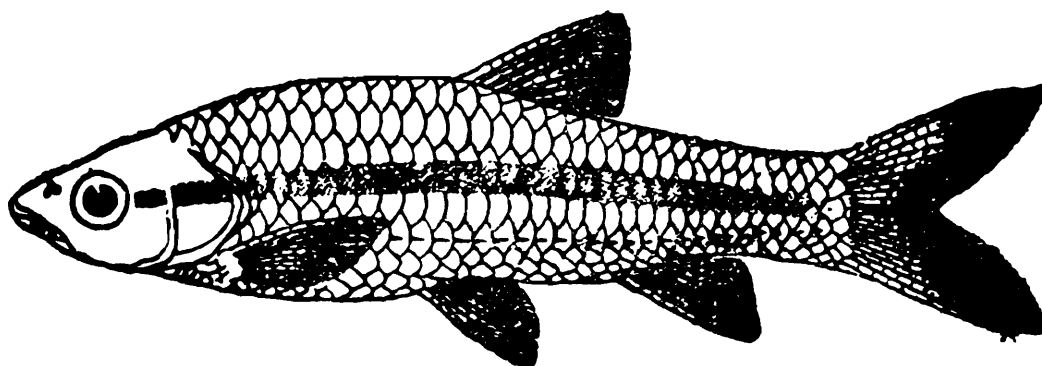


Fig. 16 : *Rasbora daniconius daniconius* (Hamilton Buchanan)

Local name : Jobidayee, Narangi (Telugu).

Common name : Common rasbora (English).

Material examined : (i) 3 exs., 68 mm-83 mm TL. ; Ramappa reservoir, Warangal district, Andhra Pradesh ; R. P. Barman and party ; 31. 8. 83. (ii) 8 exs., 61 mm-85mm

TL. ; Phulang river, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 7.12.84 (iii) 2 exs., 75 mm-98 mm TL. ; Manjira river, Medak district, Andhra Pradesh ; R. P. Barman and party ; 12. 12. 84. (iv) 4 exs., 63 mm-83 mm TL. ; Koil sagar, Mahbubnagar district, Andhra Pradesh ; R. P. Barman and party ; 16. 12. 84. (v) 2 exs., 77 mm-82 mm TL. ; Krishna river, Nalgonda district, Andhra Pradesh ; R. P. Barman and party ; 16. 6. 86. (vi) 1 ex., 73 mm TL. ; Machilipatnam, Krishna district, Andhra Pradesh ; R. P. Barman and party ; 12. 6. 87. (vii) 1 ex., 75 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 9. 6. 87.

Diagnostic features : D. 9-10 (2/7-8), P. 15, V. 9, A. 7-9 (2-3/5-6), C. 19, LL. 32-34.

Head length 4.50 to 5.00 and body depth 4.50 to 6.00 in total length. Eye diameter 3.75 to 4.25 in head length. Three prominences on the lower jaw well-defined. Cleft of mouth reaches to below anterior margin of the orbit. Barbels absent. Dorsal fin origin nearer to base of caudal fin than to tip of snout. 2 rows of scales between lateral line and base of pelvic fin. Predorsal scales 12 to 14. Caudal fin emarginate.

Colour in alcohol : Dorsal surface greenish yellow and sides silvery with a black band more or less distinct extending from behind the orbit to the base of caudal fin. Sometimes this lateral band exists at its termination towards base of caudal fin or in some specimens it may be bright silvery. Caudal fin sometimes with its lobes tipped with grey.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Sri Lanka, Burma, Malaya Archipelago and Zanzibar.

Size : It attains 203 mm (8 inches) in total length.

Remarks : It is one of the very common fish found all over Andhra Pradesh.

Rasbora rasbora (Hamilton Buchanan, 1822)

1822. *Cyprinus rasbora* Hamilton Buchanan, *Fish. Ganges* : 329, 391, pl. 2, fig. 90 (type-locality : ponds of Bengal).

1878. *Rasbora bhananani*, Day, *Fish, India* : 584, pl. 145. fig. 10 ; 1889, Day, *Fauna Br. India, Fish, 1* : 337 fig. 107.

1981. *Rasbora rasbora*, Jayaram, *Handbk. Freshw. Fish. India* : 84, 85, (distribution and key to species).

Local name : Nil.

Material examined : 1 ex., 180 mm TL. ; Kinnersoni reservoir, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 28. 8. 83.

Diagnostic features : D. 9 (2/7), P. 15, V. 9, A. 7-8 (2-3/5), C. 19, LL. 28-31.

Head length 4.75 to 5.25 and body depth 4.00 to 4.25 in total length. Eye diameter 3.50 to 3.75 in head length. Three prominences on lower jaw well-defined. Cleft of mouth extends almost anterior margin of the orbit. Barbels absent. Dorsal fin origin

nearer to base of caudal fin than to tip of snout. 2 rows of scales between lateral line and base of pelvic fin. Predorsal scales 12 to 14. Caudal fin emarginate.

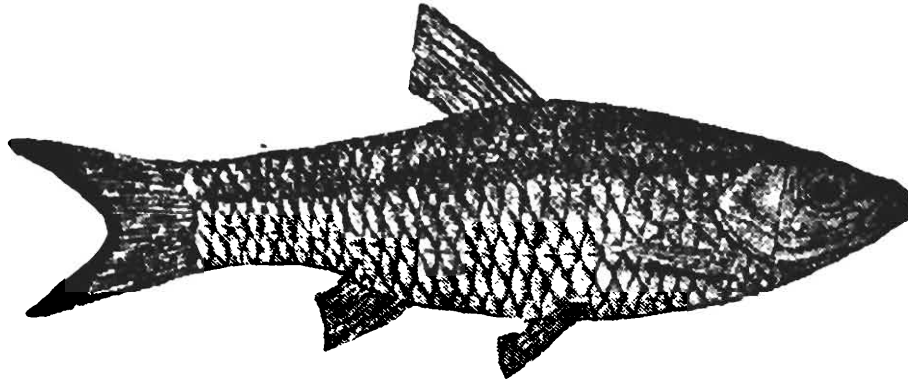


Fig. 17 : *Rasbora rasbora* (Hamilton Buchanan)

Colour in alcohol : Dorsal surface olive brown and sides silvery with a faint lateral streak. Caudal fin generally tipped with black.

Distribution : India : Gangetic provinces and the coromondal coast. Pakistan, Bangladesh, Burma, Malaya and Thailand.

Size : It attains 128 mm (5 inches) in total length.

Remarks : It is a common fish of the coromondal coast.

Genus *Aspidoparia* Heckel, 1843.

1843. *Aspidoparia* Heckel, in Fenzl. *Abbild. Thiere Pfl. Syr. Fish.* : 186 (type-species : *Aspidoparia sardina* Heckel = *Aspidoparia morar* (Hamilton)).

1859. *Morara* Bleeker, *Nat. Tijds. Ned. Indie*, 20 : 102 (type species : *Cyprinus morar* Hamilton, Orthotypic).

1981. *Aspidoparia*, Jayaram, *Handbk. Freshw. Fish. India* : 85 (genus characters and distribution).

Body elongated, subcylindrical and compressed. Abdomen rounded. Mouth small, inferior. Lower jaw without lip and with a sharp crescentic bony edge. Barbels absent. Dorsal fin inserted posterior to pelvic fin, with 9 to 10 soft rays without any spine. Anal fin with 9 to 12 rays and no spine. Caudal fin forked. Lateral line concave, passing along the lower half of caudal fin base, with 38 to 60 scales.

One species is found in Andhra Pradesh out of the two species known from the Indian subcontinent.

***Aspidoparia morar* (Hamilton Buchanan, 1822.)**

1822. *Cyprinus morar* Hamilton Buchanan, *Fish. Ganges* : 264, 384, pl. 31. fig. 75 (type-locality : rivers of Yamuna and Teesta).

1878. *Aspidoparia morar*, Day, *Fish. India* : 585, pl. 146, fig. 4 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 338, fig. 108.
1981. *Aspidoparia morar*, Jayaram, *Handbk. Freshw. Fish. India* : 85, 86 (distribution and key to species).

Local name : *Gitlu* (Telugu).

Common name : *Aspidoparia* (English).

Material examined : (i) 17 exs., 53 mm-99 mm TL. ; Krishna river, Kurnool district, Andhra Pradesh ; R. P. Barman and party ; 9. 12. 85. (ii) 15 exs., 81 mm-95 mm TL. ; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 31. 5. 87, 1. 6. 87.

Diagnostic features : D. 9-10 (2-3/7-8), P 15, V. 8, A. 10-12 (2-3/8-10), C. 19, LL. 38-42.

Head length 5.00 to 6.00 and body depth 4.00 to 5.50 in total length. Eye diameter 3.00 to 3.75 in head length. Snout very obtuse. Upper jaw overlapping the lower jaw.

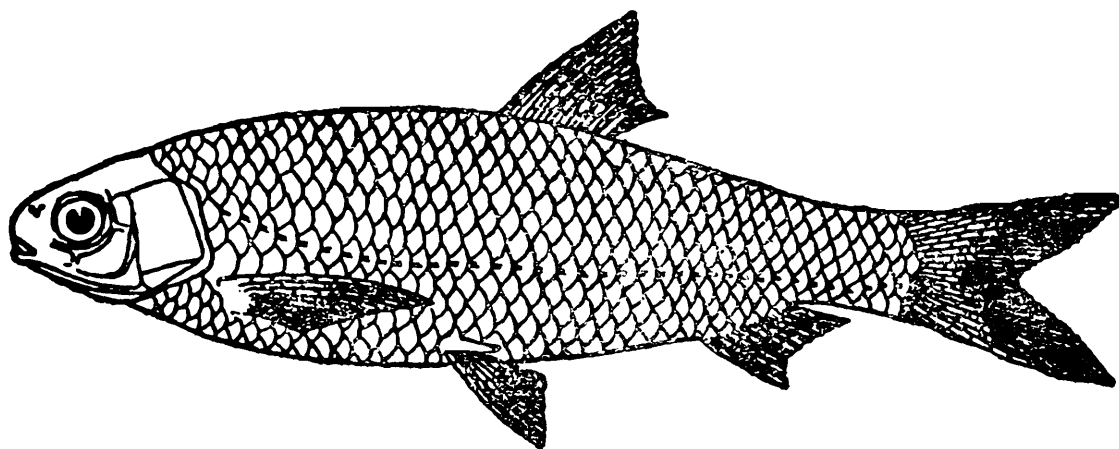


Fig. 18 : *Aspidoparia morar* (Hamilton Buchanan)

Barbels absent. Lower jaw without lower lip. Dorsal fin origin nearer the caudal fin base than to snout tip. $2\frac{1}{2}$ to 3 rows of scales between lateral line and pelvic fin base. Predorsal scales 18 to 20. Caudal fin emarginate with lower lobe slightly longer.

Colour in alcohol : Dorsal surface light brown, divided from the silvery side by a burnished streak.

Distribution : India : Throughout except the western coast and localities south of the Krishna river. Pakistan. Bangladesh. Burma and Thailand.

Size : It attains at least 177 mm (7 inches) in total length.

Fishery information : Economic importance of this species is less due to its small size. It occurs in profitable numbers in all the main running waters throughout Andhra Pradesh.

Genus Amblypharyngodon Bleeker, 1860.

- 1860.** *Amblypharyngodon* Bleeker, *Ichth. Arch. Ind. Prod.*, 2 : 409 (type-species : *Cyprinus mola* Hamilton, by original designation).
1981. *Amblypharyngodon*, Jayaram, *Handbk. Freshw. Fish. India* : 86 (genus characters and distribution).

Body somewhat elongated, subcylindrical and compressed. Abdomen rounded. Mouth wide, upper lip absent. Barbels absent. Dorsal fin inserted slightly behind pelvic fin, with 9 soft rays and without any spine. Anal fin with 7 to 8 rays. Caudal fin forked. Lateral line incomplete, with 55 to 75 scales along the normal course of lateral line.

2 species are found in Andhra Pradesh out of the 4 species known from the Indian subcontinent under this genus.

Key to the species

4 to 5 rows of scales between lateral line and base of pelvic fin	...	...	<i>A. microlepis</i>
9 to 10 rows of scales between lateral line and base of pelvic fin	...	...	<i>A. mola</i>

***Amblypharyngodon microlepis* (Bleeker, 1853)**

- 1853.** *Leuciscus microlepis* Bleeker, *Verh. Batav. Geneotsch*, 25 : 41 (type-locality : River Hooghly).
1878. *Amblypharyngodon microlepis*, Day, *Fish. India* : 555, pl. 135, fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 291.
1981. *Amblypharyngodon microlepis*, Jayaram, *Handbk. Freshw. Fish. India* : 86 (distribution and key to species).

Local name : Nil.

Common name : Oori (Tamil).

Material examined : 17 exs ; 50 mm-80 mm TL. ; Cuddapah district, Andhra Pradesh ; R. P. Barman and party ; 2. 12. 85.

Diagnostic features : D. 9 (2/7), P. 14, V. 9, A. 7-8 (2/5-6), C. 19, LL. 55-60.

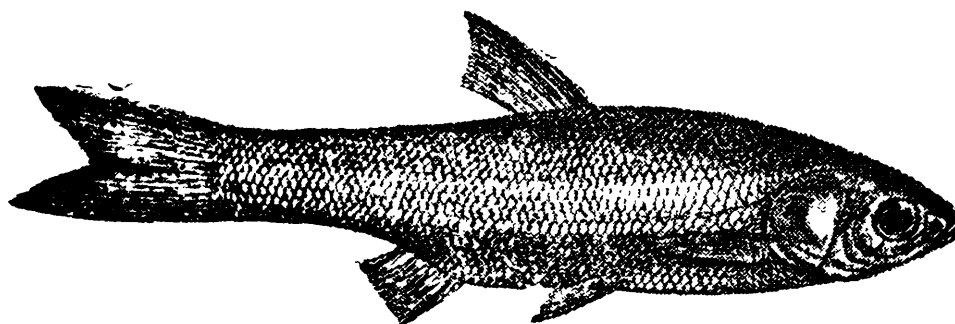


Fig. 19 : *Amblypharyngodon microlepis* (Bleeker)

Head length 4.75 to 5.00 and body depth 4.75 to 5.00 in total length. Eye diameter 3.70 to 4.00 in head length. Dorsal fin origin nearer to base of caudal fin than to snout tip. Lateral line ceases after a few anterior scales. 4 to 5 rows of scales between lateral line and base of pelvic fin. Caudal fin forked, lower lobe slightly longer.

Colour in alcohol : Body with a silvery broad lateral band.

Distribution : Throughout India except Malabar coast. And Bangladesh.

Size : Largest specimen collected by me from Andhra Pradesh is 85 mm. (3.4 inches) in total length.

Fishery information : Commercially it is a less important species found in stagnant waters along with rivers.

***Amblypharyngodon mola* (Hamilton, 1822)**

1822. *Cyprinus mola* Hamilton, *Fish. Ganges* : 334, 392, pl. 38, fig. 92 (type-locality : ponds and freshwater rivers in every part of the Gangetic Provinces).

1878. *Amblypharyngodon mola*, Day, *Fish. India* : 555, pl. 135, fig. 4 ; 1889, Day, *Fauna Br. India, Fish, 1* : 291, fig. 101.

1981. *Amblypharyngodon mola*, Jayaram, *Handbk. Freshw. Fish. India* : 86 (distribution and key to species).

Local name : *Tella Maya* (Telugu).

Common name : Mola, Indian carplet (English).

Material examined : (i) 48 exs., 52-mm 85 mm TL. ; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 1. 6. 87, 3.6.87. (ii) 52

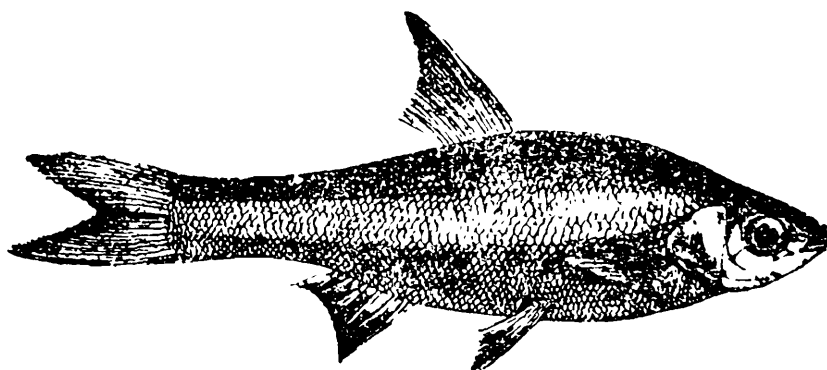


Fig. 20 : *Amblypharyngodon mola* (Hamilton Buchanan)

exs., 60 mm-85 mm. TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 6 to 9. 6.87. (iii) 168 exs., 58 mm-82 mm TL. ; Krishna river, Krishna district, Andhra Pradesh ; R. P. Barman and party ; 12. 6. 87.

Diagnostic features : D. 9 (2/7), P. 15, V. 9, A. 8 (3/5), C. 19, LL. 65-75.

Head length 4.50 to 5.00 and body depth 4.00 to 4.25 in total length. Eye diameter 3.50 to 4.00 in head length. Dorsal fin origin behind the pelvic fin origin, nearer to base of caudal fin than to tip of snout. Caudal fin forked. Lateral line ceases after 15 anterior scales. 9 to 10 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Body with a lateral silvery band. Usually dark markings on the dorsal, caudal and anal fins.

Distribution : Throughout India except Kerala. Nepal. Bangladesh. Pakistan and Burma.

Size : Largest specimen collected by me from Andhra Pradesh is 85 mm (3.4 inches) in total length.

Fishery information : Economically this fish is less important due to its small size. It is a very common species found in stagnant water bodies along with the rivers.

Genus *Barilius* Hamilton Buchanan, 1822.

1822. *Barilius* Hamilton Buchanan, *Fish. Ganges* : 384 (type-species : *Cyprinus barila* Hamilton, by tautonymy).

1981. *Barilius*, Jayaram, *Handbk. Freshw. Fish. India* : 87 (genus characters and distribution).

Body more or less elongated, compressed, subcylindrical with rounded abdomen. Mouth anterior, sometimes oblique, gape of mouth extending up to middle of the orbit. Lower jaw usually with a symphysial knob. Barbels 2 pairs or 1 pair or absent. Dorsal fin inserted opposite interspace between pelvic and anal fin, nearer to caudal fin base than to snout tip with 9 to 13 soft rays and no spine. Anal fin with 9 to 17 rays. Caudal fin forked. Lateral line concave and complete, with 38 to 75 scales. Body generally with vertical bands or clusters of dots.

Howes (1980) made a classical work on the anatomy, phylogeny and classification of the bariline cyprinid fishes.

Key to the species

1. Body without vertical bands ...	...	...	...	2.
Body with vertical bands ...	...	...	...	4.
2. Lateral line scales 40 to 43. Anal fin with 9 to 11 rays. Each scale with a black spot	...	...	...	<i>B. bendelisis</i>
Lateral line scales 38 to 40. Anal fin rays with 14 to 17. Scales without any black spot	...	...	...	3.
3. Body uniformly silvery ...	...	...	...	<i>B. evezardi</i>
Body with rows of spots ...	...	...	...	<i>B. bakeri</i>
4. Body with vertical bands 9 to 11. Body depth 3.32 to 3.68 in standard length. Barbels absent or very short ...	...	...	...	<i>B. barna</i>
Body with vertical bands 10 to 15. Body depth 4.77 to 5.22 in standard length. Barbels 2 pairs, well developed ...	...	...	...	<i>B. barila</i>

Barilius bakeri Day, 1865

1865. *Barilius bakeri* Day, *Proc. zool. Soc. Lond.* : 305 (type-locality : hill-ranges of Travancore).
 1878. *Barilius bakeri* Day, *Fish. India* : 591, pl. 151, fig. 2 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 348.
 1981. *Barilius bakeri*, Jayaram *Handbk. Freshw. Fish. India* : 88, 90 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by Rahimullah (1944).

Diagnostic features : D. 13 (3/10), P. 15, V. 9, A. 16-17 (2-3/14), C. 17, LL. 38-40.

Head length 4.25 to 4.70 and body depth 3.50 to 3.75 in total length. Eye diameter 3.25 to 4.00 in head length. Lower jaw longer with a symphysial knob. Maxilla extends to

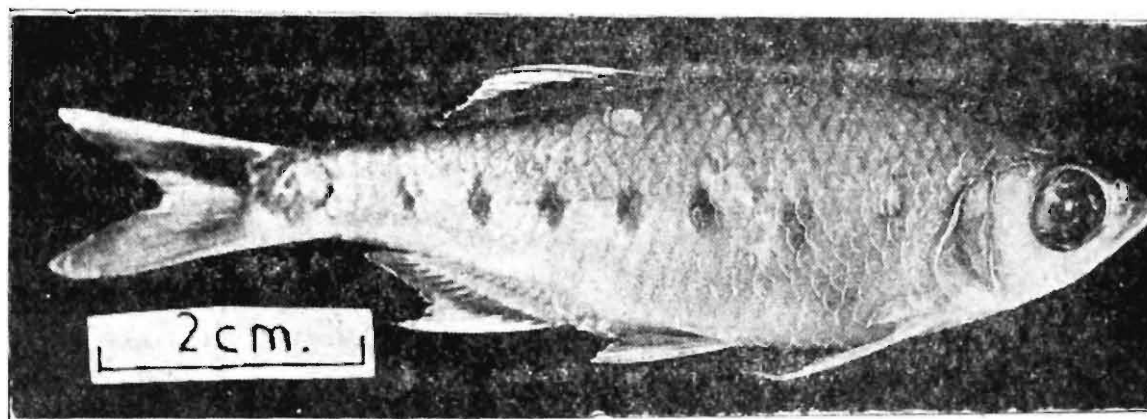


Fig. 21 : *Barilius bakeri* (Day)

almost below middle of the orbit. Suborbital ring of bones wide, the third almost covering the cheek. Barbels very short, 2 pairs or 1 pair or even entirely absent. Dorsal fin commences nearer to caudal fin base than to snout tip, in the interspace between pelvic and anal fin. Caudal fin forked, with lower lobe slightly longer. $2\frac{1}{2}$ rows of scales between lateral line and pelvic fin base. Predorsal scales 17 to 18.

Colour in alcohol : Dorsal surface grey and sides silvery. A row of large dark spots along the sides. Dorsal, anal and pectoral fins margined with white and having dark grey bases. Caudal fin dark in the middle.

Distribution : India : Kerala and Andhra Pradesh.

Size : It attains to about 162 mm (6 inches) in total length.

Fishery information : Economic importance of this fish is less.

Barilius barila (Hamilton Buchanan, 1822)

1822. *Cyprinus barila* Hamilton Buchanan, *Fish. Ganges* : 267, 384 (type-locality : rivers of northern Bengal).

1878. *Barilius barila*, Day, *Fish. India* : 591, pl. 148, Fig. 4; 1889, Day, *Fauna Br. India, Fish*, 1: 348.

1981. *Barilius barila*, Jayaram, *Handbk. Freshw. Fish. India* : 88, 89 (distribution and key to species).

Local name : Nil.

Material examined : 2 exs., 50 mm-60 mm TL.; Godavari river, Nizamabad district, Andhra Pradesh; R. P. Barman and party; 8. 12. 84.

Diagnostic features : D. 9⁻ (2/7), P. 13, V. 9, A. 13-14 (3/10-11), C. 19, LL. 43-46.

Head length 5.00 to 5.50 and body depth 5.25 to 5.50 in total length. Eye diameter 3.25 to 4.00 in head length. Maxilla extends to below anterior third of the orbit. Third suborbital bone wide and almost touching preopercular ridge. Barbels 2 pairs, rostral

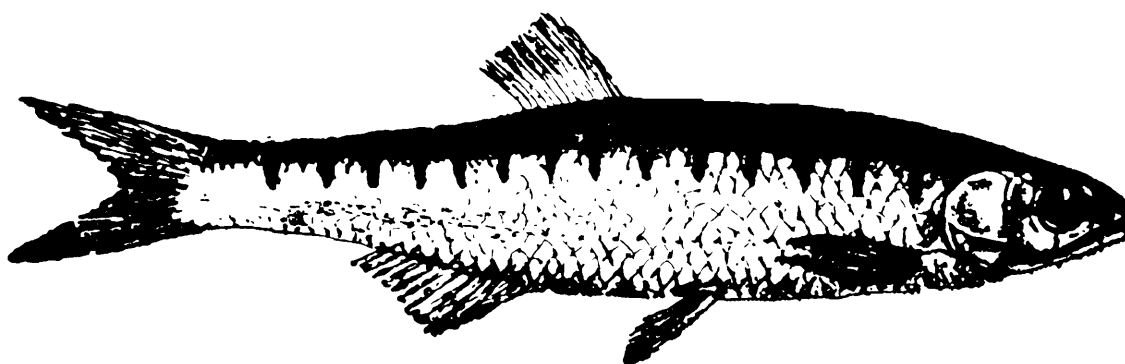


Fig. 22 : *Barilius barila* (Hamilton Buchanan)

pair slightly longer than maxillary pair. Dorsal fin commences midway between the hind border of the orbit and caudal fin base, nearly entirely ahead of anal fin. Caudal fin forked, lower lobe slightly longer. $1\frac{1}{2}$ to 2 rows of scales between lateral line and pelvic fin base. Predorsal scales 18-22.

Colour in alcohol : Body silvery with 10 to 15 vertical black bands.

Distribution : India : N. E. India, N. India, Madhya Pradesh, Orissa, Andhra Pradesh, Karnataka, Nepal. Pakistan.

Size : It attains 100 mm (4 inches) in total length.

Remarks : Day (1878) described this species without barbels. Hora (1921) and Tilak (1967) pointed out that both the barbels are present in this species.

***Barilius barna* (Hamilton Buchanan, 1922)**

1822. *Cyprinus barna* Hamilton Buchanan, *Fish. Ganges* : 268, 384 (type-locality : Yamuna and Brahmaputra).

1878. *Barilius barna*, Day, *Fish. India* : 592, pl. 148, fig. 1 and 2; 1889, Day, *Fauna Br. India, Fish*, 1: 350,

1981. *Barilius barna*, Jayaram, *Handbk. Freshw. Fish. India* : 88, 89 (distribution and key to species).

Local name : Nil.

Material examined : 3 exs., 70 mm-75mm TL.; Krishna river, Mahbubnagar district, Andhra Pradesh; R. P. Barman and party; 16. 12. 84.

Diagnostic features : D. 9 (2/7), P. 15, V. 9, A. 13-14 (3/10-11), C. 19, LL. 39-42.

Head length 4.75 to 5.25 and body depth 3.50 to 4.00 in total length. Eye diameter 2.50 to 3.50 in head length. Maxilla extends to below the first third of the orbit. Third suborbital bone thrice as deep as the uncovered portion of the cheek below it. Barbels

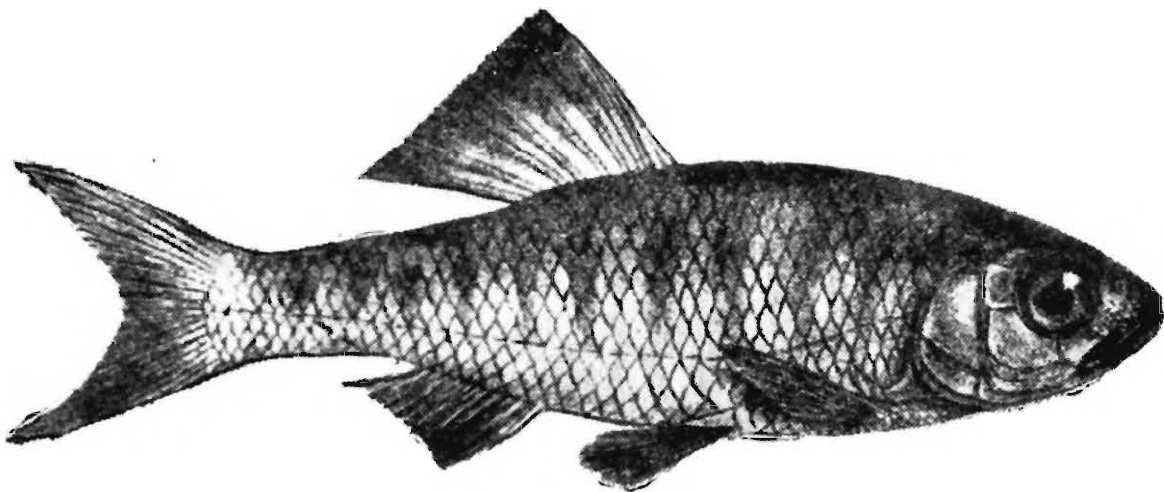


Fig. 23 : *Barilius barna* (Hamilton Buchanan)

2 pairs or absent, when present very short. Dorsal fin highly variable, commencing midway between the orbit and the caudal fin base. $2\frac{1}{3}$ rows of scales between lateral line and pelvic fin base. Predorsal scales 16.

Colour in alcohol : Body dull green with 8 to 9 vertical bands on sides. Dorsal and anal fin edged with black.

Distribution : India : Ganga, Brahmaputra, Mahanadi and Krishna river systems. Bangladesh. Nepal.

Size : It attains 125 mm (5 inches) in total length.

Remarks : It is a very common species in both the Godavari and Krishna river systems.

***Barilius bendelisis* (Hamilton Buchanan, 1807)**

1807. *Cyprinus bendelisis* Hamilton Buchanan, *Journey Mysore*, 3 : 345, pl. 32 (type-locality : rivers of Mysore);

1878. *Barilius bendelisis*, Day, *Fish. India* : 590, pl. 148, figs. 7, 8, 9 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 347.

1981. *Barilius bendelisis*, Jayaram, *Handbk. Freshw. Fish. India* : 88, 89 (distribution and key to species).

Local name : Nil.

Common name : Hill trout (English).

Material examined : (i) 13 exs. 65 mm-124 mm TL. ; Godavari river, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 8. 12. 84. (ii) 9 exs., 61 mm-93 mm TL. ; Koil sagar, Mahbubnagar district, Andhra Pradesh ; R. P. Barman and party ; 16, 12. 84. (iii) 2 exs., 87 mm-103 mm TL. ; Tungbhadra river, Kurnool district, Andhra Pradesh ; R. P. Barman and party ; 9. 12. 85.

Diagnostic features : D. 9 (2/7), P. 15, V. 9, A. 9-11 (2-3/7-8), C. 19, LL. 40-43.

Head length 4.50 to 5.25 and body depth 4.25 to 5.25 in total length. Eye diameter 4.25 to 4.60 in head length. Maxilla extends to anterior third of the orbit. Barbels 2

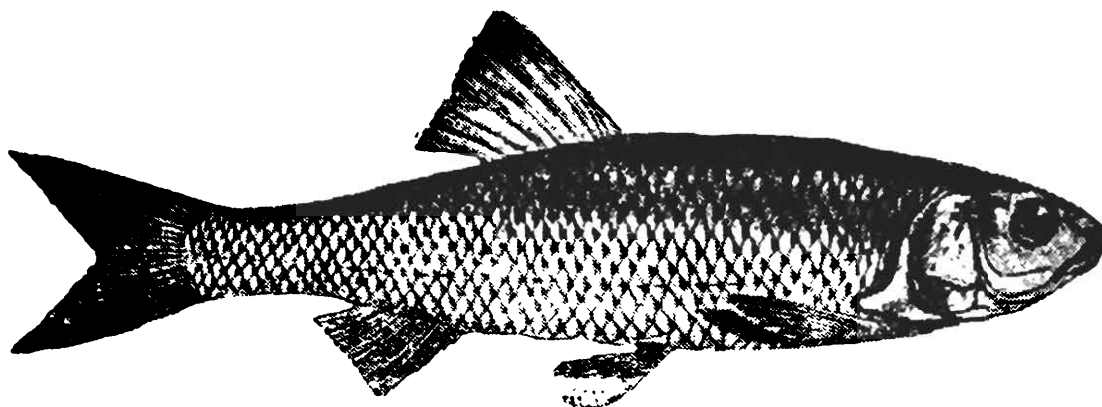


Fig. 24 : *Barilius bendelisis* (Hamilton Buchanan)

pairs, usually short, rostral pair sometimes absent. Dorsal fin commences nearer to caudal fin base than to snout tip, not extending to over anal fin. Caudal fin forked, lower lobe, slightly longer. $2\frac{1}{2}$ to $3\frac{1}{2}$ rows of scales between lateral line and pelvic fin base. Predorsal scales 20.

Colour in alcohol : Dorsal surface slaty grey becoming purplish silvery at sides. Young specimens have vertical bands on sides which become indistinct in adult specimens. Each scale in the adult specimen with a black spot at its base and two on each forming lateral line but no spots in the young specimens.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh and Sri Lanka.

Size : It grows 152 mm (6 inches) in total length.

Remarks : It is a very common species found throughout Andhra Pradesh,

Barilius evezardi Day, 1872

1872. *Barilius evezardi* Day, *J. Asiat. Soc. Bengal*, 41: 326, pl. 2 (type-locality: Poona, Maharashtra).
 1878. *Barilius evezardi* Day, *Fish. India* : 593, pl. 148, fig. 6 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 352.
 1981. *Barilius evezardi*, Jayaram, *Handbk. Freshw. Fish. India* : 89, 90 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by David (1963 a) from Vijayawada on the Krishna river.

Diagnostic features : D. 9 (2/7), P. 13, V 9, A. 14 15 (2/12-13), C. 19, LL. 40.

Head length 5.50 and body depth 5.00 to 5.50 in total length. Eye diameter 3.00 in head length. Lower jaw slightly longer, with a well developed knob at the symphysis. Maxilla extends to below anterior margin of the orbit. Suborbital ring of bones rather

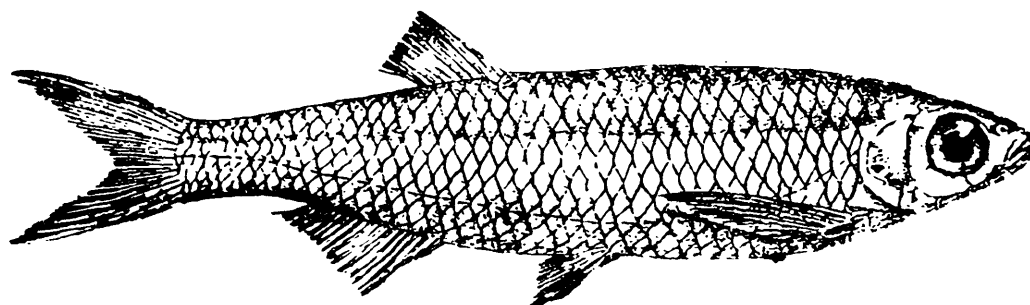


Fig. 25 : *Barilius evezardi* (Day)

wide, the third being more than twice as deep as the uncovered portion of the cheek below it. Barbels absent. Dorsal fin commences almost midway between posterior border of the orbit and tip of caudal fin, the last half being above the anal fin. Caudal fin forked. 2 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Body uniformly silvery, of brown tint along the dorsal surface and a lateral burnished silvery band. Dorsal, caudal and anal fins orange but dorsal and caudal fin edged with black.

Distribution : India : Maharashtra and Andhra Pradesh.

Size : It attains 115 mm ($4\frac{1}{2}$ inches) in total length.

Remarks : It is one of the rare species found in Andhra Pradesh.

Subfamily : CYPRININAE

Abdominal edge rounded. Barbels either present or absent. Dorsal fin with or without an osseous simple ray. Generally a symphysial knob on lower jaw absent, sometimes present. Lateral line complete or incomplete, usually straight in the middle lateral sides.

Key to the genera

1. Anal fin with anterior rays osseous, third spine serrated	...	...	<i>Cyprinus</i>
Anal fin with anterior rays not osseous	...	...	2.
2. Snout projecting over mouth, horizontally divided by a groove passing from one orbit to opposite one, giving the appearance of a blunt compressed knob between and before the orbit	...	...	<i>Schismatorhynchus</i>
Snout plain, not divided	...	...	3.
3. A short, smooth, anteriorly directed precumbent predorsal spine present	...	...	<i>Rohtee</i>
No precumbent predorsal spine	...	...	4.
4. Dorsal fin inserted posterior to pelvic fin in the interspace between pelvic and anal fins, generally extending to over anal fin	...	...	<i>Osteobrama</i>
Dorsal fin inserted above pelvic fin or slightly anterior to it	...	...	5.
5. Lateral line scales 120	...	...	<i>Thynnichthys</i>
Lateral line scales not more than 84	...	...	6.
6. A knob or a horny tubercle present at the symphysis of lower jaw	...	...	<i>Cirrhinus</i>
No such symphysial knob present	...	...	7.
7. Upper lip absent. Scales large (40 to 43 along lateral line)	...	...	<i>Catla</i>
Upper lip present	...	...	8.
8. Lower lip with an uninterrupted posterior groove, continuous around corner of the mouth	...	...	9.
Lower lip with posterior groove interrupted in the middle when a groove is present or without any groove	...	...	11.
9. Lateral line incomplete	...	...	<i>Oreichthys</i>
Lateral line complete	...	...	10.
10. Barbels present. Dorsal fin with a spine	...	...	<i>Tor</i>
Barbels absent. Dorsal fin without a spine	...	...	<i>Ctenopharyngodon</i>
11. A horny covering on the inner side of the lips. Lips distinct	...	...	<i>Labeo</i>
A horny covering on the lips absent	...	...	12.
12. Lower jaw not covered by lip. Attachment of lower lip to lower jaw at some distance from mouth	...	...	<i>Osteocheilus</i>
Lower jaw covered by lip. Lower lip attached to lower jaw along the entire mouth	...	...	<i>Puntius</i>

Genus *Cyprinus* Linnaeus, 1758.

1758. *Cyprinus* Linnaeus, *Syst. Nat.* ed. 10, 1 : 320 (type-species : *Cyprinus carpio* Linnaeus).

1961. *Cyprinus*, Jayaram, *Handbk. Freshw. Fish. India* : 94 (genus description and distribution).

Body robust anteriorly, somewhat compressed. Abdomen rounded. Mouth terminal, oblique, cleft not extending to front border of the orbit. Maxillary protractile, extending to anterior nostril. Barbels 2 pairs, one pair each of rostral and maxillary. Dorsal fin with 3 spines and 17 rays ; third spine strongest and serrated. Anal fin short with 3 spines and 5 rays. Caudal fin deeply emarginate. Scales large, pentagonal, cycloid. Lateral line straight with 30 to 40 scales.

***Cyprinus carpio carpio* Linnaeus, 1758**

1758. *Cyprinus carpio* Linnaeus, *Syst. Nat.* ed. 10, 1 : 525 (type-locality : Europe).

1981. *Cyprinus carpio carpio*, Jayaram, *Handbk. Freshw. Fish. India* : 94 (distribution).

Local name : Nil.

Common name : Common carp (English).

Material examined : 5 exs., 215 mm-245 mm TL. ; Manjira river, Medak district, Andhra Pradesh ; R. P. Barman and party ; 12. 12. 84.

Diagnostic features : D. 3-4/17-22, P. 1/15-16, V 2/8-9, A. 3/5, C. 17-19, LL. 30-40.

Head length 4.50 in total length. Moderately deep and slightly compressed body.

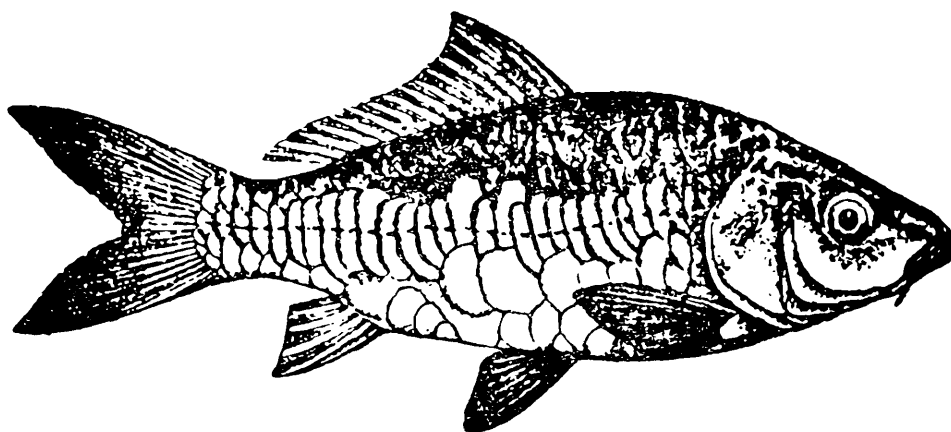


Fig. 26 : *Cyprinus carpio carpio* Linnaeus

Mouth surrounded by fleshy lips, directed forwards, protrusible. Barbels 2 pairs, one pair each of rostral and maxillary. Teeth absent. Eyes placed relatively high on head. Lateral line complete.

Colour in alcohol : Dorsal surface dark with golden yellowish sides and white ventral surface with dark and pink tinged fins.

Distribution : Its original home is China and Japan. This fish was introduced in India from Sri Lanka in 1939.

Size : A growth of 10 kg. body weight of a 30-months old specimen of this species is known from the Barang Fish farm, Orissa.

Remarks : It is an exotic fish naturally found throughout China, Korea, Japan, Taiwan, Europe and America. At present this common carp of Asia enjoys a global distribution especially in the tropical and temperate regions.

Three varieties of this fish are known.

1. *Cyprinus carpio communis* (the Scale Carp)—Body fully covered by regularly arranged rows of scales. This is supposed to be the original form.
2. *Cyprinus carpio specularies* (the Mirror Carp)—Body covered unevenly with a few large and bright scales. A large area of body is without scales.
3. *Cyprinus carpio nudus* (the Leather Carp)—Body almost without scales and has a leathery appearance.

This fish breeds almost throughout the year but unlike the major carps such as *Labeo rohita*, *Catla catla* and *Cirrhinus mrigala*, it also breeds in ponds.

Genus *Oreichthys* H. M. Smith, 1933.

1933. *Oreichthys* H. M. Smith, *J. Siam. Soc. Nat. Hist. Suppl.*, 9 : 63 (type-species : *Oreichthys parvus* Smith).

1981. *Oreichthys*, Jayaram, *Handbk. Freshw. Fish. India* : 96, 97 (genus description and distribution).

Body short, deep with rounded abdomen. Sides of head with numerous fine, parallel sensory folds. Barbels absent. Dorsal fin inserted above posterior half of pectoral fins, with 11 rays (8 branched) and without any spine. Anal fin short with 7 rays (5 branched). Caudal fin forked. Lateral line incomplete.

Only 1 species is known under the genus in the Indian subcontinent, as well as in the Andhra Pradesh.

Oreichthys cosuatis (Hamilton Buchanan, 1822)

1822. *Cyprinus cosuatis* Hamilton Buchanan, *Fish. Ganges* : 338, 392 (type-locality : Kosi River).

1937. *Cyprinus cosuatis*, Hora, *Rec. Indian Mus.*, 39 (4) : 321-323 (systematic position discussed).

1981. *Oreichthys cosuatis*, Jayaram, *Handbk. Freshw. Fish. India* : 97 (distribution).

Local name : Nil.

Material examined : No specimen obtained by me. It recorded by David (1963 a) from Andhra Pradesh.

Diagnostic features : D. 11 (3/8), P. 13, V. 9, A. 7 (2/5), C. 19, LL. 22.

Head length 4.00 to 4.50 and body depth 3.30 in total length. Eye diameter 2.50 to 2.75 in head length. Dorsal fin without any osseous ray, it originates midway between snout tip and caudal fin base, its upper edge is oblique and its height exceeds that of body depth below it. Head is provided with numerous sensory folds. Lateral line incomplete, extends

up to the 20th scale. As a rule, it is present only on the first 4 or 5 scales. 2 rows of scales between lateral line and pelvic fin base. Predorsal scales 8 to 9.

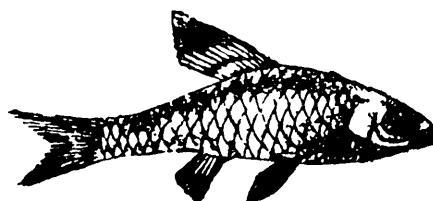


Fig. 27 : *Oreichthys cosuatis* (Hamilton Buchanan)

Colour in alcohol : Body silvery, the scales having dark bases. Dorsal and anal fins marked with well-defined spots, while the spot at the caudal fin base very diffuse and indistinctly marked.

Distribution : India : West Bengal, Madhya Pradesh, Maharashtra, Karnataka, Kerala and Andhra Pradesh. Pakistan, Bangladesh and Thailand.

Size : It attains 75 mm. (3 inches) in total length.

Remarks : Hora (1937 b) discussed the systematic position of this species. He justified the reasons put forward by Smith (1933) for the creation of a new genus *Oreichthys* from Thailand for cyprinid fishes of the type of *Barbus cosuatis* and has assigned to it a new species *O. parvus*. Hora (1937 b : 323) is of definite opinion that *O. parvus* is a juvenile form of *Cyprinus cosuatis*. The most remarkable feature of the species appears to be the presence of numerous fine, parallel sensory folds on the head. This feature shares with the fishes of the genus *Cyclocheilichthys* Bleeker, but in other respects it is quite different Hora (1937a : 18).

Genus *Puntius* Hamilton Buchanan, 1822.

1822. *Puntius* Hamilton Buchanan, *Fish. Ganges* : 310, 388 (type-species : *Cyprinus sophore* Hamilton Buchanan).

1981. *Puntius*, Jayaram, *Handbk. Freshw. Fish. India* : 97-99 (genus description and distribution).

Body short, somewhat elongated, compressed with rounded abdomen. Lips thin covering the jaws, may have leathery lobes, but without any horny covering. Jaws simple, covered by lips. No symphyseal knob or tubercle. Barbels 2 pairs, 1 pair or none. Dorsal fin short, inserted almost opposite pelvic fins, with 9 to 13 rays (7 to 9 branched) with or without spine. Anal fin with 7 to 9 rays (5 to 6 branched). Caudal fin forked. Lateral line complete or incomplete with 20 to 43 scales.

Key to the species

1. Barbels absent	...	...	...	2.
Barbels present	...	...	...	8.

2. Dorsal spine weak, articulated	...	...	...	<i>P. vittatus</i>
Dorsal spine strong, osseous	...	...	...	3.
3. Dorsal spine serrated	...	...	...	4.
Dorsal spine smooth	...	...	...	7.
4. Lateral line scales 29 to 31	...	...	...	<i>P. guganio</i>
Lateral line scales 20 to 26	...	...	...	5.
5. Body with vertical coloured bands	...	...	...	<i>P. gelius</i>
Body without any vertical black coloured bands	...	...	...	6.
6. Body depth 2.40 to 2.50 in total length	...	...	...	<i>P. conchoniis</i>
Body depth 3.00 to 3.50 in total length	...	...	...	<i>P. ticto ticto</i>
7. Lateral line complete	...	...	...	<i>P. sophore</i>
Lateral line incomplete	...	...	...	<i>P. terio</i>
8. Barbels 1 pair	...	...	...	9.
Barbels 2 pairs	...	...	...	14.
9. Dorsal spine, strong, osseous	...	...	...	10.
Dorsal spine weak and articulated	...	...	...	12.
10. 2 or 2½ rows of scales between lateral line and base of pelvic fin	...	...	...	<i>P. dorsalis</i>
3 to 3½ rows of scales between lateral line and base of pelvic fin	...	...	...	11.
11. Predorsal scales 10 to 12. A dark blotch from the 23rd to 25th scales on lateral line.	...	...	...	
A dark spot along base of anterior dorsal ray and occasionally a dark mark behind gill openings	...	...	...	<i>P. chola</i>
Predorsal scales 8. A diffused black spot on lateral line from the 20th to 22nd scale	...	...	...	<i>P. parrah</i>
12. Lateral line scales 40 to 43	...	...	...	<i>P. kolus</i>
Lateral line scales 21 to 24	...	...	...	13.
13. A deep black oval mark on lateral line above anal fin present	...	...	...	<i>P. filamentosus</i>
No such deep black oval spot on anal fin	...	...	...	<i>P. amphibius</i>
14. Lateral line scales 41	...	...	...	<i>P. curmuca</i>
Lateral line scales 20 to 34	...	...	...	15.
15. Lateral line scales 20 to 21	...	...	...	<i>P. melanampyx melanampyx</i>
Lateral line scales 24 to 34	...	...	...	16.
16. Lateral line scales 32 to 34	...	...	...	<i>P. sarana sarana</i>
Lateral line scales 24 to 28	...	...	...	17.
17. Eye diameter 3.00 to 3.50 in head length. Predorsal scales 12. Lateral line scales 27 to 28	...	...	...	<i>P. jerdoni</i>
Eye diameter 4.50 to 5.00 in head length. Predorsal scales 9. Lateral line scales 24 to 26	...	...	...	<i>P. neilli</i>

Puntius amphibius (Valenciennes, 1842)

1842. *Capoeta amphibia* Valenciennes, *Hist. nat. Poiss.*, 16 : 282, pl. 478 (type-locality : Bombay).
 1878. *Barbus amphibius*, Day, *Fish. India* : 574, pl. 142, fig. 8 ; 1889, *Fauna Br. India, Fish.* 1 : 322.
 1981. *Puntius amphibius*, Jayaram, *Handbk. Freshw. India* : 99, 108 (distribution and key to species).

Local name : *Perka-chappa* (Telugu).

Common name : Scarlet banded barb (English).

Material examined : 1 ex., 71 mm TL. ; Nizam sagar, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 8. 12. 84.

Diagnostic features : D. 10-11 (2-3/8) ; A. 7 (2/5) ; P. 15 ; V. 9 ; C. 19 ; LL. 23-24.

Head length 4.00 to 5.00 and body depth 4.25 to 5.00 in standard length. Eye 3.5 in head length. A pair of maxillary barbels extending below the middle of the orbit. Dorsal

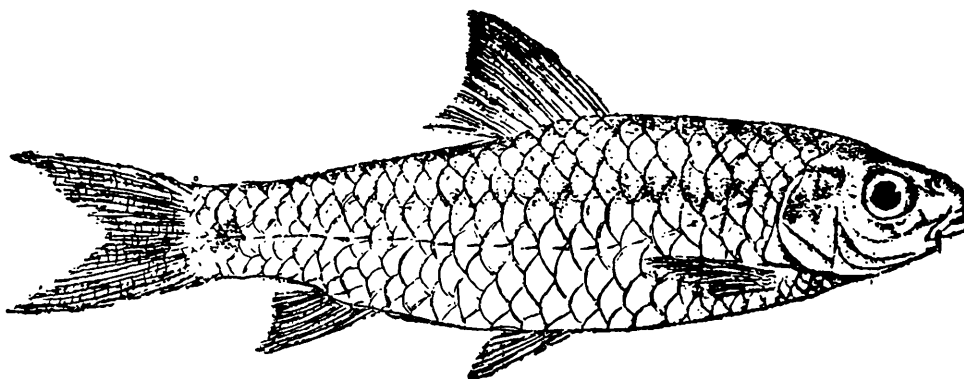


Fig. 28 : *Puntius amphibius* (Valenciennes)

fin originates slightly in advance of pelvic fin, nearer to tip of the snout than to base of caudal fin which is deeply forked. Lateral line complete, 2 rows of scales between lateral line and base of pelvic fin. Predorsal scales 8.

Colour in alcohol : Dorsal surface steel blue, becoming white tinged with golden on sides and below. Usually with a lateral crimson band and a black spot on either side of the caudal base. Fins yellowish, dorsal edge black.

Distribution : India : Uttar Pradesh, Orissa, Rajasthan, Central India, Western coast of India, Peninsular India. Sri Lanka.

Size : It attains at least 152 mm (6 inches) in total length.

Remarks : This species is available in both the Godavari and Krishna river systems in Andhra Pradesh.

***Puntius chola* (Hamilton Buchanan, 1822)**

1822. *Cyprinus chola* Hamilton Buchanan, *Fish. Ganges*: 312, 389 (type-locality : north-eastern parts of Bengal).

1878. *Burbus chola*, Day, *Fish. India* : 571, pl. 142, fig. 4 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 317.

1981. *Puntius chola*, Jayaram, *Handbk. Freshw. Fish. India* : 100, 107 (distribution and key to species).

Local name : *Chaddu paddaka, Pakki* (Telugu).

Common name : Green barb (English).

Material examined : 4 exs., 45 mm-98 mm TL. ; Nellore tank, Nellore district, Andhra Pradesh ; R. P. Barman and party ; 30.11.85.

Diagnostic features : D. 11 (3/8), P. 15, V. 9, A. 7 (2/5), C. 19, LL. 26-28.

Head length 4.50 to 4.75 and body depth 3.25 to 3.75 in the total length. Eye diameter 3.50 to 4.00 in head length. Barbels one maxillary pair, almost half of the eye diameter. Dorsal fin commences opposite the pelvic fin, midway between the snout tip and

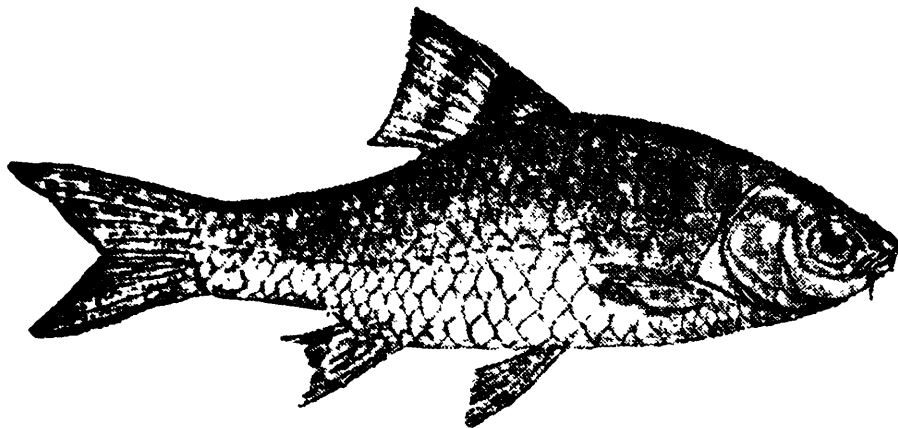


Fig. 29 : *Puntius chola* (Hamilton Buchanan)

base of caudal fin, its last undivided ray is osseous and smooth. Lateral line complete, 3 to 3½ rows of scales between lateral line and base of pelvic fin. Predorsal scales 10-12.

Colour in alcohol : Body silvery, opercles shot with purple and gold. A dark blotch is usually present on the side of the free portion of the tail from the 23rd to 25th scales of the lateral line. Sometimes there is a dark mark behind the gill opening. A dark mark along the base of the anterior dorsal ray and a row of dark spots along its centre.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma and Sri Lanka.

Size : It attains about 130 mm (5 inches) in total length.

Remarks : This species is available in both the Krishna and Godavari river systems in Andhra Pradesh.

***Puntius conchoni* (Hamilton Buchanan, 1822)**

1822. *Cyprinus conchoni* Hamilton Buchanan, *Fish. Ganges* : 317, 389 (type-locality : ponds of north-east of Bengal and in the rivers of Kosi and Ami).

1878. *Barbus conchoni*, Day, *Fish. India* : 576, pl. 143, fig. 7 ; 1889, *Fauna Br. India, Fish.* 1 : 325.

1889. *Puntius conchoni*, Jayaram, *Handbk. Freshw. Fish. India* : 100, 109 (distribution and key to species).

Local name : *Perka-chappa* (Telugu).

Common name : Stigma barb (English).

Material examined : 2 exs., 73 mm-74 mm TL. ; Koil sagar, Mahbubnagar district, Andhra Pradesh ; R. P. Barman and party ; 16.12.84 (ii) 2 exs., 45 mm-55 mm TL. ; Godavari river, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 31.5.87.

Diagnostic features : D. 11 (3/8), A. 7 (2/5), P. 11, V 9, C. 19, LL. 24-26.

Head length 5.00 and body depth 2.40-2.50 in total length. Eye diameter 3.00 in head length. No barbels. Dorsal fin origin in advance of pelvic fin and midway between the

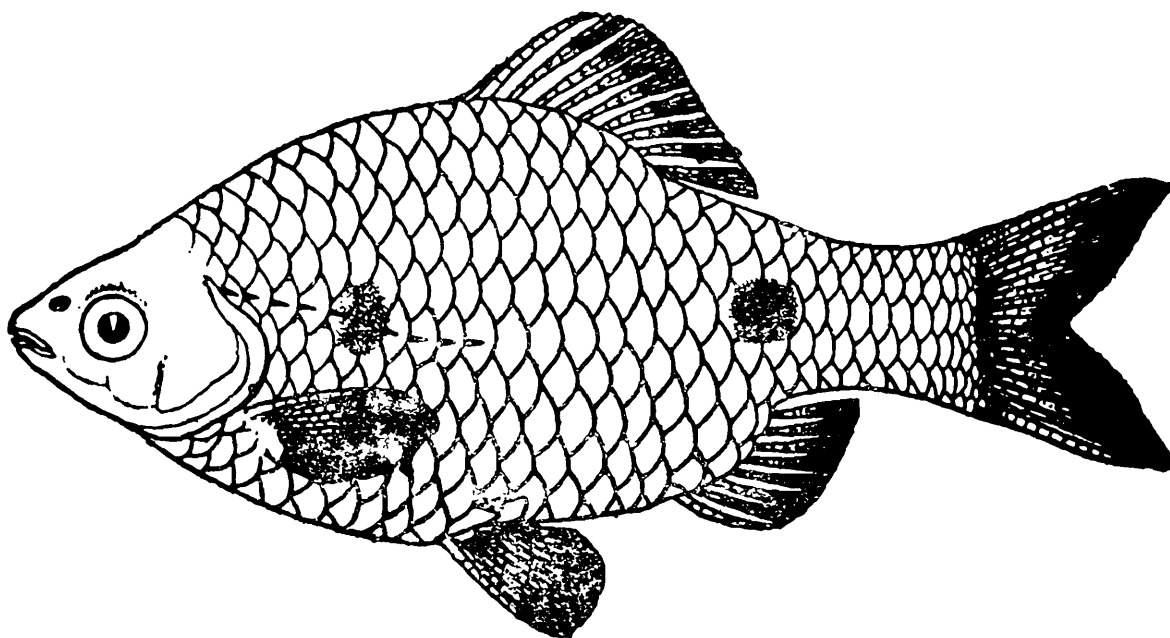


Fig. 30 : *Puntius conchoni* (Hamilton Buchanan)

anterior margin of the orbit and base of caudal fin. Dorsal spine moderately strong, serrated. Lateral line incomplete, ceasing after 8 to 10 scales. 4 to $4\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin. Predorsal scales 9.

Colour in alcohol : Dorsal surface greenish grey becoming silvery towards sides. A large dark spot above posterior part of anal fin. Fin orange colour, dorsal fin with its upper half black.

Distribution : India : Ganga, Brahmaputra, Mahanadi river system in Uttar Pradesh, Bihar, West Bengal, Orissa, Andhra Pradesh and Cauvery river system, S. India. Pakistan. Nepal. Bangladesh.

Size : It attains at least 127 mm (5 inches) in total length.

Fishery information : It is a very common species found throughout Andhra Pradesh.

***Puntius curmuca* (Hamilton Buchanan, 1807)**

- 1807. *Cyprinus curmuca* Hamilton Buchanan, *Journey in Mysore*, 3 : 344, pl. 30 (type-locality : Western Ghats of India).
- 1877. *Barbus curmuca*, Day, *Fish. India* : 566, pl. 141, fig. 1 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 310.
- 1981. *Puntius curmuca*, Jayaram, *Handbk. Freshw. Fish. India* : 100, 105 (distribution and key to species).

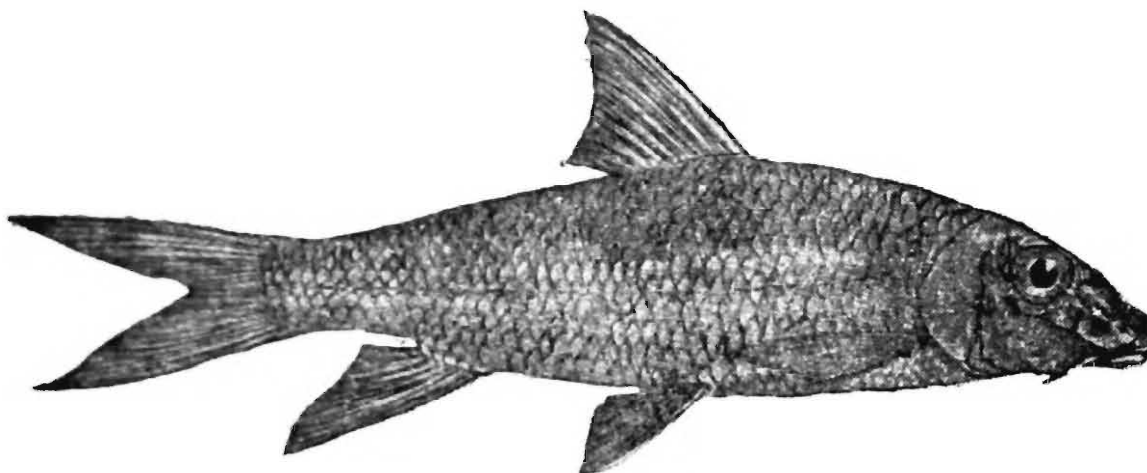
Local name : Nil.

Common name : Curmuca (Kannada).

Material examined : 1 ex., 110 mm TL. ; Nizam sagar, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 9.12.84. (ii) 1 ex., 95 mm TL. ; Godavari river, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 1.6.87.

Diagnostic features : D. 12 (3/9), P. 16, V. 9, A. 8 (3/5), C. 18, LL. 41.

Head length 5.00 and body depth 5.00 in total length. Eye diameter 4.30 in head length. Dorsal profile more convex than ventral profile. Snout conical. Interorbital space transversely concave. In adult specimen a band of open pores from the preorbital along the cheek. Barbels 2 maxillary pairs, the lower equal to eye diameter and the upper half as



31. *Puntius curmuca* (Hamilton Buchanan)

long. Dorsal fin as high as the body, its upper edge concave, it arises before the insertion of pelvic fins, its last undivided ray weak and articulated. Lateral line complete. $3\frac{1}{2}$ rows of scales between lateral line and base of pelvic fins. Predorsal scales 10. Caudal fin deeply forked, its lobes pointed.

Colour in alcohol : Silvery, lightest on sides and beneath. Caudal fin tips blackish. In the young specimen the middle third of caudal is orange and it is tipped with black.

Distribution : India : rivers of Western Ghats of India.

Size : Largest specimen collected by me 110 mm (4 inches) in total length from A. P.

Remarks : This is being recorded here for the first time from Godavari river in Andhra Pradesh.

***Puntius dorsalis* (Jerdon, 1849)**

1849. *Systomus dorsalis* Jerdon, *Mad. Jour. L. Sc.* 15 : 314 (type-locality : Kurnool, Karnataka and Tamil Nadu).

1878. *Barbus dorsalis*, Day, *Fish. India* : 573, pl. 142, fig. 2 ; 1889, Day, *Fauna Br. India. Fish.* 1 : 319

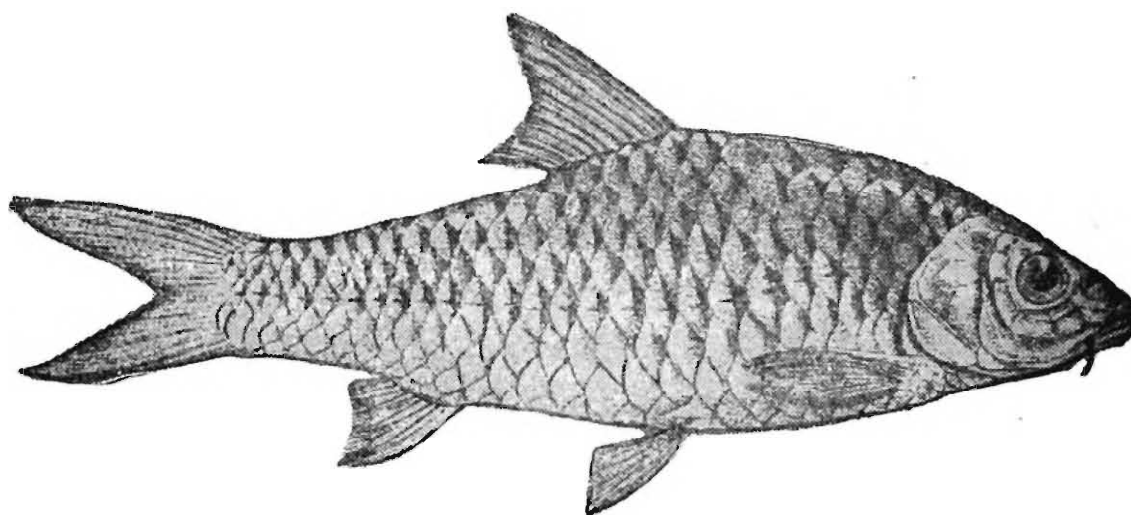
1981. *Puntius dorsalis*, Jayaram, *Handbk, Freshw. Fish India* : 100, 107 (distribution and key to species).

Local name : Nil.

Material examined : 2 exs., 130 mm-132 mm TL. ; Himayat sagar, Hyderabad ; R. P. Barman and party ; 17.9.83.

Diagnostic features : D. 11-12 (3-4/8), P 15, V. 9, A. 8 (3/5), C. 19, LL. 24-25.

Head length 4.50 and body depth 4.00 to 4.25 in the total length. Eye diameter 4.00 to 4.50 in the head length. Snout pointed, head conical anteriorly and upper jaw longer. Interorbital space flat. Barbels one maxillary pair, almost half of the orbit. Dorsal fin



32. *Puntius dorsalis* (Jerdon)

originates in advance of pelvic fin and almost midway between snout tip and caudal fin base, its last undivided ray osseous, smooth, moderately strong. Caudal fin forked. Lateral line complete, 2 to 2½ rows of scales between it and pelvic base.

Colour in alcohol : Body uniformly silvery, often the scales in the upper two thirds of the body with dark bases. A black spot at the posterior portion of the base of the dorsal fin.

Distribution : India : Cauvery and Krishna river systems, S. India. Sri Lanka.

Size : Largest specimen collected by me from Andhra Pradesh is 132 mm (5 inches) in total length.

Remarks : This species is a very common fish of the Krishna river systems, Andhra Pradesh.

***Puntius filamentosus* (Valenciennes, 1844)**

1844. *Leuciscus filamentosus* Valenciennes, *Hist. nat. Poiss.*, 17: 96, pl. 492 (type-locality : d'Allypey = Alleppey).
 1878. *Barbus filamentosus* Day, *Fish. India* : 582, 1889, Day, *Fauna Br. India*, 1 : 333.
 1889. *Barbus mahecola* Day, *Fauna Br. India*, *Fish.* 1 : 323, figs. 105.
 1981. *Puntius filamentosus*, Jayaram, *Handbk. Freshw. Fish. India* : 100, 108 (distribution and key to species).

Local name : *Chevalle sevvai, Macha kendai* (Tamil).

Common name : Filamented barb (English).

Material examined : 2 exs., 110 mm-120 mm TL ; Krishna river, Nalgonda district, Andhra Pradesh ; R. P. Barman and party ; 16.6.86.

Diagnostic features : D. 11 (3/8), P. 15, V. 9, A. 7 (2/5), C. 19, LL. 21.

Head length 4.70 to 5.00 and body depth 3.00 to 3.50 in total length. Eye diameter 3.20 to 3.50 in head length. Body compressed, elevated. Snout tuberculated. A thin pair of maxillary barbels extending below to middle of orbit, or very minute or absent. Dorsal fin commences slightly nearer to snout than to base of caudal fin or midway between them,

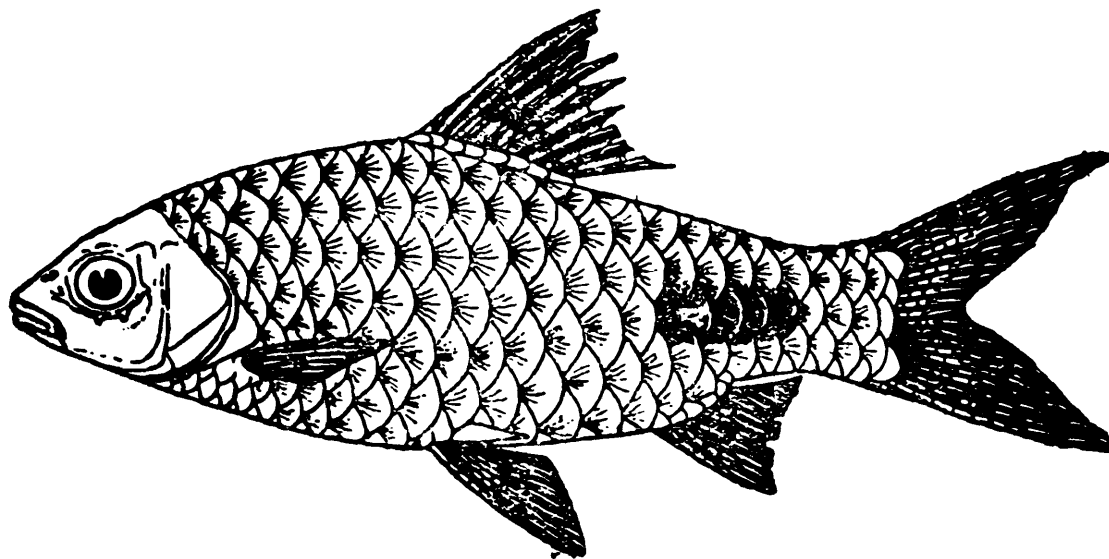


Fig. 33 : *Puntius filamentosus* (Valenciennes)

dorsal spine feeble. Lateral line complete. 2 or $3\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin. Predorsal scales 7.

Colour in alcohol : Body silvery white. A dark blotch on the lateral line from the 14th to 18th scales. Dorsal and pelvic fin black. Caudal fin red and tipped black.

Distribution : India : Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Goa. Sri Lanka.

Size : This species grows 152 mm (6 inches) in total length.

Remarks : This species is a common fish of the Krishna river systems, Andhra Pradesh.

***Puntius gelius* (Hamilton Buchanan, 1822)**

1822. *Cyprinus gelius* Hamilton Buchanan, *Fish. Ganges* : 320, 390, pl. 145, fig. 3 (type-locality : North-East parts of Bengal).

1878. *Barbus gelius*, Day, *Fish. India* : 577, pl. 145, fig. 3 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 327.

1981. *Puntius gelius*, Jayaram, *Handbk. Freshw. Fish. India* : 100, 109 (distribution and key to species).

Local name : Nil.

Material examined : No specimen was obtained by me. It was recorded by David (1963 a) from Andhra Pradesh.

Diagnostic features : D. 10-11 (2-3/8), P. 15, V. 9, A. 8 (3/5), C. 19, LL. 23-24.

Head length 4.25 to 4.50 and body depth 3.00 to 3.50 in total length. Eye diameter 2.50 in head length. Barbels absent. Dorsal fin inserted slightly in advance of pelvic

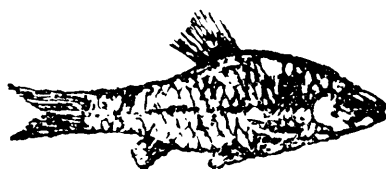


Fig. 34 : *Puntius gelius* (Hamilton Buchanan)

fins, its osseous ray strong, rather coarsely serrated. Caudal fin deeply forked. Lateral line incomplete, ceasing after 5 or 6 scales. 3 rows of scales between lateral line and pelvic fin base. Predorsal scales 8.

Colour in alcohol : Body reddish brown, with a black band over the tail a little before caudal fin base and another less distinct close to base of that fin. A silvery band along the sides. A black spot passes across the base of anterior half of dorsal, extending one third the distance up the rays. A black band over the base of anal, highest in front.

Distribution : India : Assam, Bihar, Orissa, West Bengal and Andhra Pradesh. Bangladesh. Pakistan.

Size : It attains 75 mm (3 inches) in total length.

Remarks : In Andhra Pradesh it is found in both the rivers of Krishna and Godavari.

***Puntius guganio* (Hamilton Buchanan, 1822)**

1822. *Cyprinus guganio* Hamilton Buchanan, *Fish. Ganges* : 338, 339, 392 (type-locality : the Brahmaputra and Yamuna).

1877. *Barbus guganio*, Day, *Fish. India* : 579 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 328-329.

1981. *Puntius guganio*, Jayaram, *Handbk. Freshw. Fish. India* : 101, 108 (distribution and key to species).

Local name : Nil.

Material examined : No specimen was obtained by me. It was recorded by David (1963 a) from Andhra Pradesh.

Diagnostic features : D. 10 (2/8), P. 12, V. 9, A. 7 (2/5), C. 19, LL. 29-31.

Head length 5.00 in total length. Eye diameter 3.00 in head length. Barbels absent. Dorsal fin inserted between snout tip and caudal fin base, its osseous ray strong and serrated. Lateral line incomplete.

Colour in alcohol : Head and back dotted, light greenish on the back with silvery sides with a band on the middle of body.

Distribution : India : the Ganga, the Brahmaputra and Krishna river systems. Bangladesh.

Size : It attains 36 mm ($1\frac{1}{2}$ inches) in total length.

Remarks : In Andhra Pradesh this species is available in the river Krishna.

***Puntius jerdoni* (Day, 1870)**

1870. *Barbus* (*Barbodes*) *jerdoni* Day, *Proc. Soc. Lond.* : 372 (type-locality : Mangalore).

1878. *Barbus jerdoni* Day, *Fish. India* : 568, pl. 138, fig. 5 ; 1889, Day, *Fauna Br. India. Fish.* 1 : 312.

1981. *Puntius jerdoni*, Jayaram, *Handbk. Freshw. Fish. India* : 101, 105 (distribution and key to species).

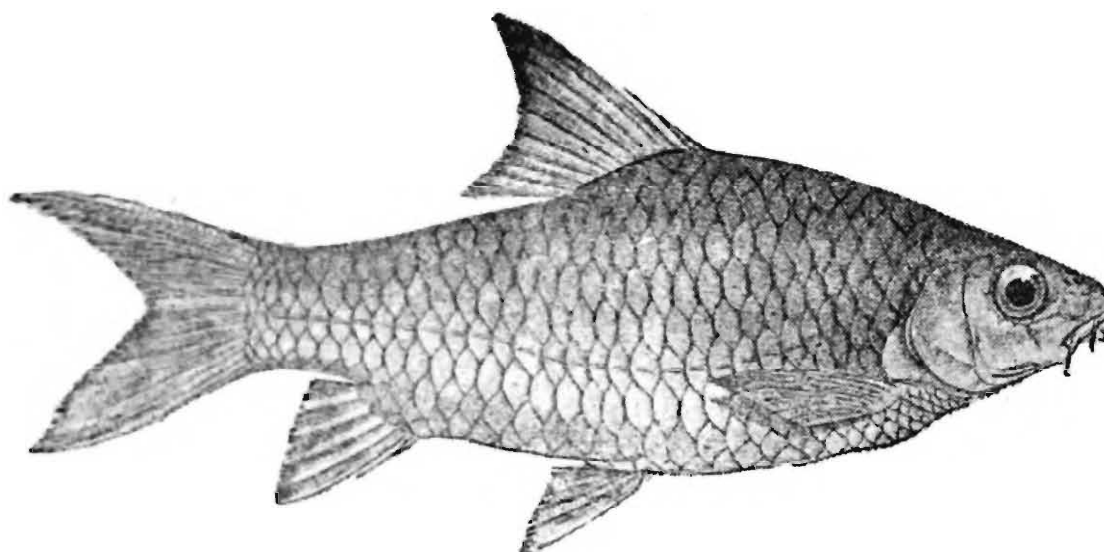


Fig. 35 : *Puntius jerdoni* (Day)

Local name : Cha-meen (Telegu).

Common name : Jerdon's carp (English).

Material examined : 3 exs., 135 mm-160 mm TL. ; Godavari river, Khammam district, Andhra Pradesh ; 28.8.83,

Diagnostic features : 12 (3/9), P. 15, V 9, A.8 (3/5), C. 19, LL. 27-28.

Head length 5.00 to 5.25 and body depth 4.00 in the total length. Eye diameter 3.00 to 3.50 in the head length. Interorbital space almost flat. Dorsal profile sharply arched to dorsal fin origin. Mouth narrow, upper jaw longer. Barbels 2 pairs, maxillary pair equal to the orbit and rostral pair slightly shorter. Dorsal fin origin between snout tip and caudal fin base, its last undivided ray articulated, weak and not enlarged. Lateral line complete, concave and $2\frac{1}{2}$ to $3\frac{1}{2}$ rows of scales between it and pelvic fin base. Predorsal scales 12.

Colour in alcohol : Body silvery, fins orange coloured and tipped with black.

Distribution : India : Canara, Karnataka, Maharashtra and Deccan.

Size : It attains 457 mm (18 inches) in total length.

Remarks : It is a predominant species of both the Krishna and Godavari river systems, Andhra Pradesh. *Puntius pulchellus* (Day) and *Barbus dobsonii* (Day) are the synonym of *Puntius Jerdoni* (Day). This fish has been designated as a threatened species of India.

***Puntius kolus* (Sykes, 1841)**

1841. *Barbus kolus*, Sykes, *Trans. Zool. Soc. Lond.*, 2 : 357, pl. 62, fig. 1 (type-locality : Mota Mola river, 8 miles east of Poona).
 1878. *Barbus kolus*, Day, *Fish. India*, : 573, pl. 141, fig. 2 ; 1889, *Fauna Br. India Fish.* 1 : 319.
 1981. *Puntius kolus*, Jayaram, *Handbk. Freshw. Fish, India* : 101, 107 (distribution and key to species).

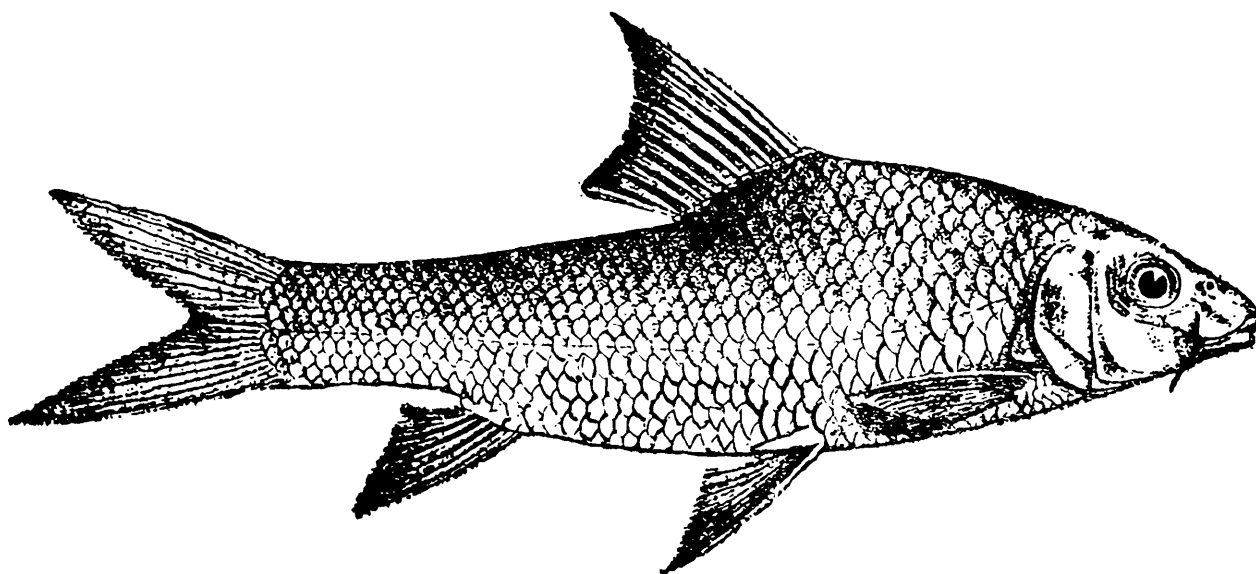


Fig. 36 : *Puntius kolus* (Sykes)

Local name : Nilusu (Telegu).

Material examined : 4 exs., 125 mm-140 mm TL. ; Krishna river, Karimnagar district, Andhra Pradesh ; R. P. Barman and party ; 2.9.83.

Diagnostic features : D. 12-13 (3-4/9), P. 15, V 9, A. 8 (3/5), C. 19, LL. 40-43.

Head length 5.25 to 5.50 and body depth 4.00 to 4.50 in total length. Eye diameter 3.75 to 4.00 in head length. Body compressed, a considerable rise in the dorsal profile from the occiput to dorsal fin. Barbels one pair, extending beyond middle of orbit. Dorsal fin commences in advance of pelvic fin, nearer to snout than to base of caudal fin which is deeply forked. Dorsal spine weak and articulated. Lateral line complete, 4 to 5 rows of scales between it and base of pelvic fin.

Colour in alcohol : Body silvery shot with yellow. Dorsal, caudal and anal fin tipped with grey.

Distribution : India : Krishna, Godavari and Cauvery river systems, S. India and Madhya Pradesh. Malaya.

Size : It grows more than 304 mm (1 foot) in total length.

Remarks : It is a predominant species of the Krishna and Godavari river systems, Andhra Pradesh.

***Puntius melanampyx melanampyx* (Day, 1865)**

1865. *Labeo melanampyx* Day, *Proc. zool. Soc. Lond.* : 298 (type-locality : The Wanaad, Nilgiri and Travancore ranges of hills and streams along their bases).

1878. *Barbus melanampyx* Day, *Fish. India* : 570, pl. 139, fig. 1 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 316.

1981. *Puntius melanampyx melanampyx*, Jayaram, *Handbk. Freshw. Fish. India* : 101, 106 (distribution and key to species).

Local name : Nil.

Material examined : 2 exs., 45 mm-50 mm TL. ; Krishna river, Nalgonda district, Andhra Pradesh ; R. P. Barman and party ; 16.6.86.

Diagnostic features : D. 11 (3/8), P. 15, V. 9, A. 7 (2/5), C. 15, LL. 20-21.

Head length 4.25 to 4.50 and body depth 3.00 to 3.50 in total length. Eye diameter 3.00 to 3.50 in head length. Numerous pores on the snout. Cleft of mouth extends to below anterior margin of the orbit. Barbels 2 pairs, rostral pair short and maxillary pair equal to the orbit. Dorsal fin originates midway between the snout tip and base of caudal fin, no osseous ray. Caudal fin deeply forked. Lateral line complete, 2 rows of scales between it and base of pelvic fin. Predorsal scales 7 or 8.

Colour in alcohol : Body of deep dull red, with three black cross bands, the first from below the whole of the base of dorsal to just beneath the lateral line, the second commences four scales beyond the posterior extremity of the base of dorsal and descends to one scale below the lateral line, whilst the last is just before the base of the caudal fin and usually absent. Fins pinkish and edged with black.

Distribution : India : Wynaad, Nilgiri, Travancore range of hills, Cauvery river and Andhra Pradesh.

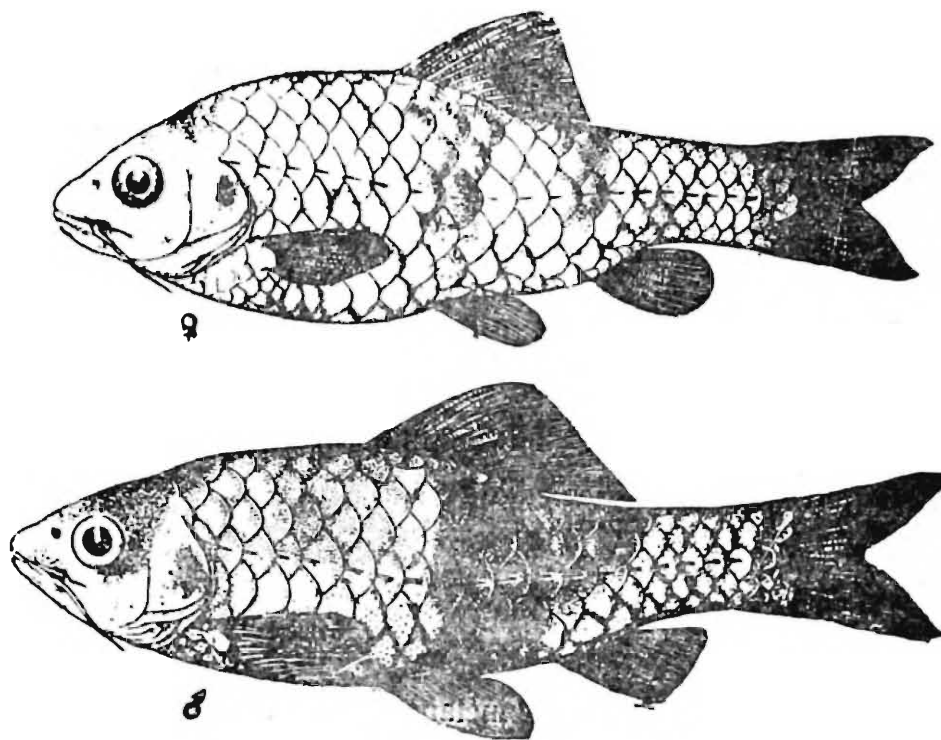


Fig. 37 : *Puntius melanampyx melanampyx* (Day)
Top : Female Bottom : Male

Size : It attains 65 mm ($2\frac{1}{2}$ inches) in total length.

Remarks : Misra (1938) recorded this species from Andhra Pradesh (Eastern Ghat) and gave the description of colour pattern of both the sexes of this species.

***Puntius neilli* (Day, 1866)**

1866. *Barbus neilli* Day, *Proc. zool. Soc. Lond.* 581 (type-locality : Kurnool on the Tungabhadra river.)
1878. *Barbus neilli* Day, *Fish. India*, : 569, pl. 140, fig. 4 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 314.
1981. *Puntius neilli*, Jayaram, *Handbk. Freshw. Fish. India* : 101, 106 (distribution and key to species).

Local name : Nil.

Material examined : 3 exs., 50 mm-55 mm TL. ; Krishna river, Kurnool district, Andhra Pradesh ; R. P. Barman and party ; 9.12.85.

Diagnostic features : D. 13 (4/9), P. 15, V. 10, A. 8 (3/5), C. 19, LL. 24-26.

Head length 4.50 to 5.00 and body depth 3.50 to 4.00 in total length. Eye diameter 4.50 to 5.00 in head length. Dorsal and ventral profiles about equally convex. Snout conical. Lower labial fold continuous. Barbels 2 pairs, rostral pair extend the anterior margin of the orbit and the maxillary pair equal to $1\frac{1}{2}$ times of the orbit, Dorsal fin origin

anterior to the insertion of the pelvic fin, its upper edge concave, its last undivided ray osseous, entire and very weak. Caudal fin forked. Lateral line complete, $3\frac{1}{4}$ rows of scales between it and base of pelvic fin. Predorsal scales 9.

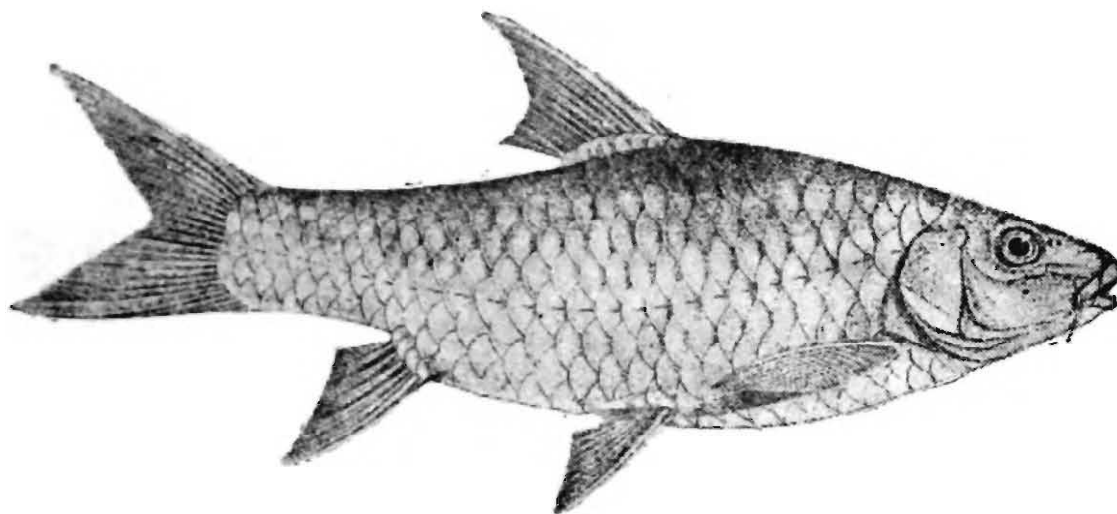


Fig. 38 : *Puntius neilli* (Day)

Colour in alcohol : Body silvery above the lateral line with a tinge of yellow below it. Fins with a bluish tinge in some specimens, reddish in others. Young specimens have a dark spot at the base of caudal fin.

Distribution : India : Tungabhadra river and Krishna river system.

Size : Largest specimen recorded 50 to 60 lbs.

Remarks : It is a predominant species of the Krishna river systems, Andhra Pradesh.

***Puntius parrah* Day, 1865**

1865. *Puntius parrah* Day, *Proc. zool. Soc.* : 301 (type-locality : Malabar, Mysore and Madras).

1878. *Barbus parrah* Day, *Fish. India* : 572, pl. 142, fig. 3 ; 1889, Day, *Fauna Br. India. Fish.* 1 : 317.

1981. *Puntius parrah*, Jayaram, *Handbk. Freshw. Fish. India* : 101, 107 (distribution and key to species).

Local name : Nil.

Material examined : 3 exs., 110 mm-125 mm TL. ; Kamalapuram tank, Cuddapah district, Andhra Pradesh ; R. P. Barman and party ; 4.12.85.

Diagnostic features : D. 11 ($3/8$), P. 15, V. 9, A. 8 ($3/5$), C. 19, LL. 25-26.

Head length 5.00 and body depth 3.75 to 4.00 in total length. Eye diameter 3.00 to 3.25 in head length. Interorbital space slightly convex. Dorsal profile more convex than that of ventral. Barbels one pair, equal to two thirds of the orbit. Dorsal fin originates midway between the snout tip and base of caudal fin, its last undivided ray osseous and

weak in the young but strengthening with age. Lateral line complete, $3\frac{1}{2}$ rows of scales between it and base of pelvic fin. Predorsal scales 8.

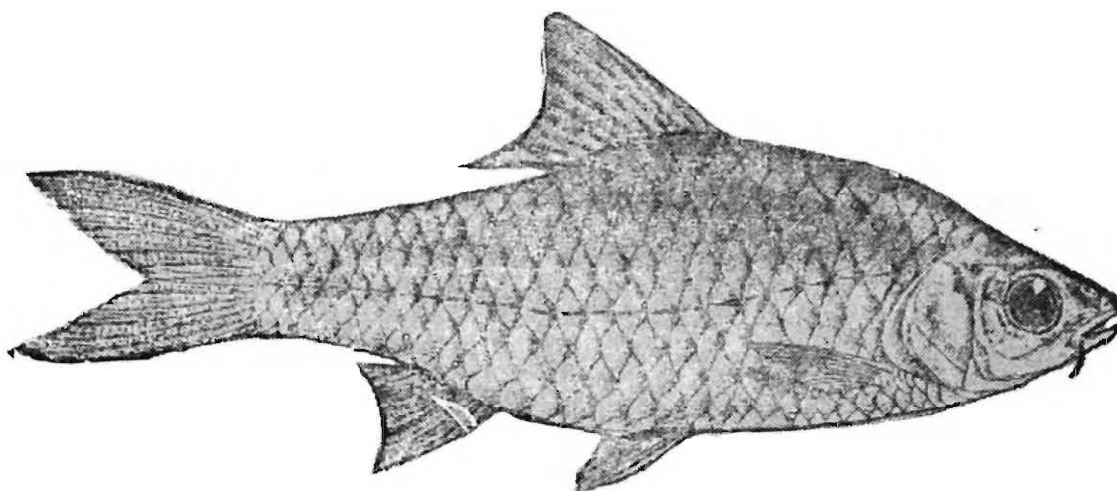


Fig. 39 : *Puntius parrah* Day

Colour in alcohol : Dorsal surface greenish, divided from the silvery abdomen by a dark bluish line. Pectoral, pelvic and anal fins tinged with yellow, dorsal and caudal fin dusky. A diffused dark spot present on the lateral line extending from the 20th to the 22nd scales.

Distribution : India : Kerala, Karnataka, Tamil Nadu and Andhra Pradesh.

Size : It attains at least 150 mm (6 inches) in total length.

Remarks : It is a predominant species of the Krishna and Godavari river systems, Andhra Pradesh.

***Puntius sarana sarana* (Hamilton Buchanan, 1822)**

1822. *Cyprinus sarana* Hamilton Buchanan, *Fish. Ganges* : 307, 388 (type-locality : Gangetic system, Bengal).

1878. *Barbus sarana*, Day, *Fish. India* : 560, pl. 136, fig. 2 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 300.

1981. *Puntius sarana sarana*, Jayaram, *Handbk. Freshw. India* : 102, 104 (distribution and key to species).

Local name : Kannaku, Kakoo, Kadoon, Kunnamoo, Paraga, Goodha paraga, Kanga pakki (Telegu).

Common name : Olive carp (English).

Material examined : (i) 12 exs., 71 mm-102 mm TL. ; Manjira river, Medak district, Andhra Pradesh ; R. P. Barman and party ; 12.12.84 (ii) 7 exs., 95 mm-145 mm TL. ; a tank at Vizianagaram district, Andhra Pradesh ; R. P. Barman and party ; 6.12.87.

Diagnostic features : D. 11 ($3/8$), P. 15, V. 9, A. 8 ($3/5$), C. 19, LL. 32-34.

Head length 5.00 to 5.25 and body depth 3.50 to 3.75 in total length. Eye diameter 4.25 to 4.75 in head length. Dorsal profile more elevated than ventral profile. Barbels 2 pairs, rostral pair equal to orbit and maxillary pair equal to or $1\frac{1}{2}$ time eye diameter.

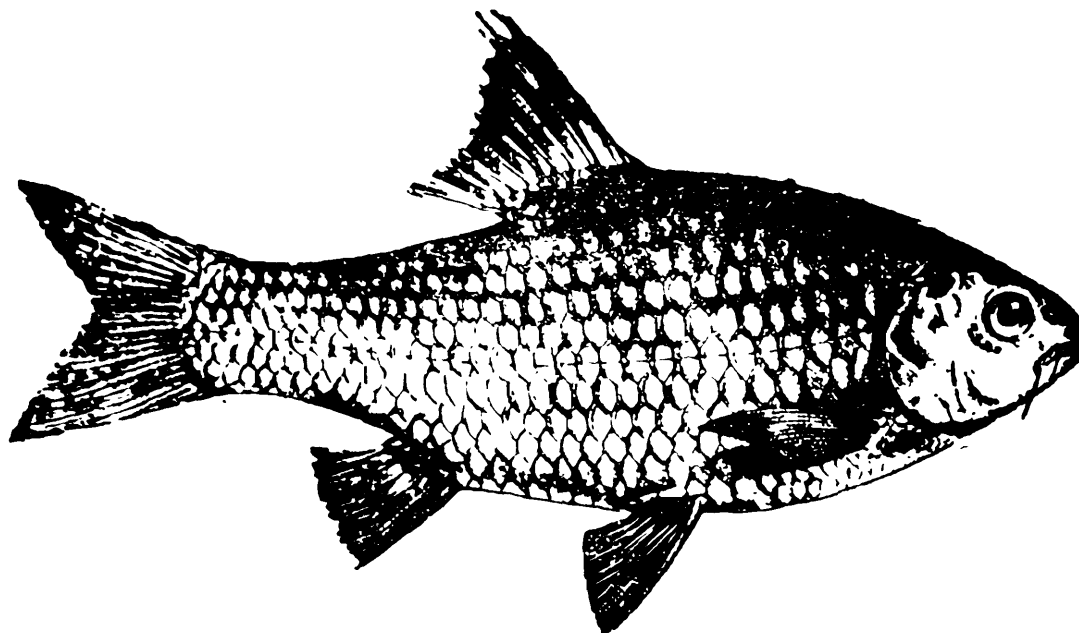


Fig. 40 : *Puntius sarana sarana* (Hamilton Buchanan)

Dorsal fin originates slightly nearer to snout tip than to base of caudal fin, opposite the insertion of pelvic fin. Dorsal spine strong, bony serrated. Lateral line complete, $3\frac{1}{2}$ to 4 rows of scales between it and base of pelvic fin. Predorsal scales 10-11. Caudal fin forked.

Colour in alcohol : Dorsal surface dark grey and silvery below. Sometimes the young specimens have dull blotch on the lateral line before caudal base. Horizontal bands along the rows of scales in the upper half of body sometimes present.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma, Thailand and China.

Size : It attains at least 304 mm (1 foot) in total length.

Remarks : This fish is found in both the Godavari and Krishna river systems in Andhra Pradesh.

***Puntius sophore* (Hamilton Buchanan, 1822)**

- 1822. *Cyprinus sophore* Hamilton Buchanan, *Fish. Ganges* : 310, 389 (type-locality : ponds of Bengal).
- 1844. *Leuciscus stigma* Valenciennes, *Hist. nat. Poiss.*, 17 : 93, pl. 489 (type-locality : Mysore).
- 1878. *Barbus sophore*, Day, *Fish. India* : 566, pl. 143, fig. 4 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 309.
- 1981. *Puntius sophore*, Jayaram, *Handbk. Freshw. Fish. India* : 192, 110 (distribution and key to species).

Local name : *Budda pakke, Chedu parega, Chedu parigi* (Telugu).

Common name : Stigma barb (English).

Material examined : (i) 4 exs., 62 mm-86 mm TL. ; Koil sagar, Mahbubnagar, Andhra Pradesh ; R. P. Barman and party ; 15.12.84 (ii) 30 exs., 83 mm-90 mm TL. ; Kolleru Lake, West Godavari district, R. P. Barman and party, 5 to 7.6.87.

Diagnostic features : D. 11-12 (3/8-9), P. 15, V. 9, A. 8 (3/5), C. 19, LL. 23-28.

Head length 4.50 to 5.00 and body depth 3.50 to 3.75 in the total length. Eye diameter 3.00 to 4.00 in head length. Barbels absent. Dorsal profile more convex than ventral

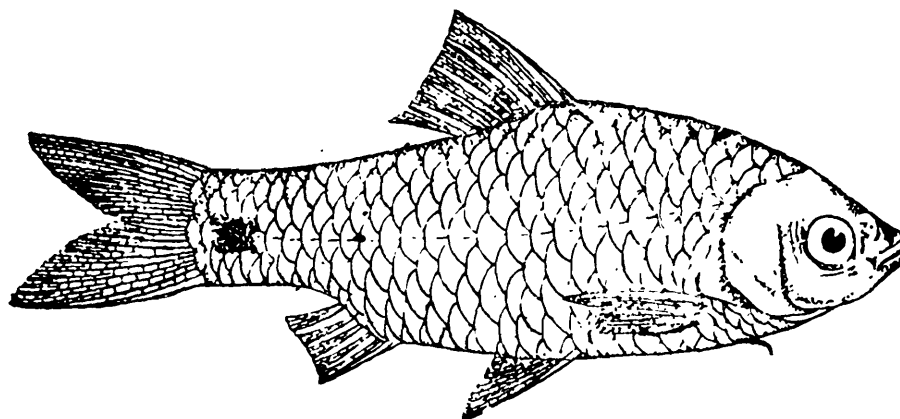


Fig. 41 : *Puntius sophore* (Hamilton Buchanan)

profile. Dorsal fin origin midway between snout tip and caudal base, its last undivided ray osseous, rather weak or moderately strong. Lateral line complete, $2\frac{1}{2}$ to $3\frac{1}{2}$ rows of scales between it and pelvic base. Predorsal scales 8-9.

Colour in alcohol : Body silvery, usually with scarlet, lateral band. A dark spot at the base of caudal fin.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma and Yunnan.

Size : It attains at least 127 mm (5 inches) in total length.

Remarks : It is a predominant species of the Krishna river systems, Andhra Pradesh.

Chaudhuri (1916) clarified the errors in Hamilton's original description of this species in respect of the barbels.

***Puntius terio* (Hamilton Buchanan, 1822)**

1822. *Cyprinus terio* Hamilton Buchanan, *Fish. Ganges* : 313, 389 (type-locality : North-East Bengal),

1878. *Barbus terio*, Day, *Fish. India* : 580, pl. 144, fig. 3 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 330-331.

1981. *Puntius terio*, Jayaram, *Handbk. Freshw. Fish. India* : 103, 109 (distribution and key to species).

Local name : Nil.

Material examined : No specimen was obtained by me. It was recorded by

Rahimullah (1943 b) from Andhra Pradesh.

Diagnostic features : D. 11 (3/8), P. 15, V. 9, A. 7 (2/5), C. 19, LL. 22-23.

Head length 4.00 to 4.50 and body depth 3.00 in total length. Eye diameter 2.75 to 3.00 in head length. Barbels absent. Dorsal fin inserted slightly in advance of pelvic

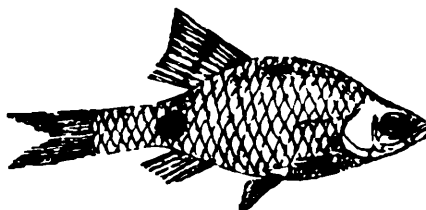


Fig. 42 : *Puntius terio* (Hamilton Buchanan)

fins, its last undivided ray osseous, entire, moderately or very strong. Lateral line incomplete, ceasing after 3 or 4 scales. 3 rows of scales between lateral line and pelvic fin base. Predorsal scales 9.

Colour in alcohol : Silvery, greenish along the back, each scale having a number of fine black spots, most numerous at anterior margin. A large black blotch in middle of side over posterior extremity of anal fin. Fins yellowish, their margins stained with black, dorsal fin having a median band.

Distribution : India : Assam, Orissa, West Bengal to Punjab and Andhra Pradesh, Bangladesh. Pakistan.

Size : It attains 103 mm (4 inches) in total length.

Remarks : In Andhra Pradesh this species is found in both the Krishna and Godavari river systems.

***Puntius ticto ticto* (Hamilton Buchanan, 1822)**

1822. *Cyprinus ticto* Hamilton Buchanan, *Fish. Ganges* : 314, 389, pl. 8, fig. 87 (type-locality : south eastern parts of Bengal).

1878. *Barbus ticto*, Day, *Fish. India* : 576, pl. 144, fig. 7 ; 1889, Day, *Fauna Br. India*, 1 : 325.

1981. *Puntius ticto ticto*, Jayaram, *Handbk. Freshw. Fish. India* : 103, 109 (distribution and key to species).

Local name : *Parigi* (Telegu).

Common name : Fire fin barb (English).

Material examined : 12 exs., 44 mm-73 mm TL.; Krishna river, Guntur district, Andhra Pradesh ; R. P. Barman and party ; 12.6.86.

Diagnostic features : D. 11 (3/8), P. 15, V. 9, A. 7 (2/5), C. 19, LL. 23-26.

Head length 4.00 to 5.00 and body depth 3.00 to 3.50 in total length. Eye diameter 2.50 to 3.00 in head length. Upper jaw slightly longer. No barbels, Dorsal fin commences

midway between snout tip and base of caudal fin. Dorsal spine strong and serrated. Lateral line incomplete, ceasing after 6 or 8 scales, 4 or 5 rows of scales between lateral line and base of pelvic fin. Predorsal scales 11. Caudal fin forked.

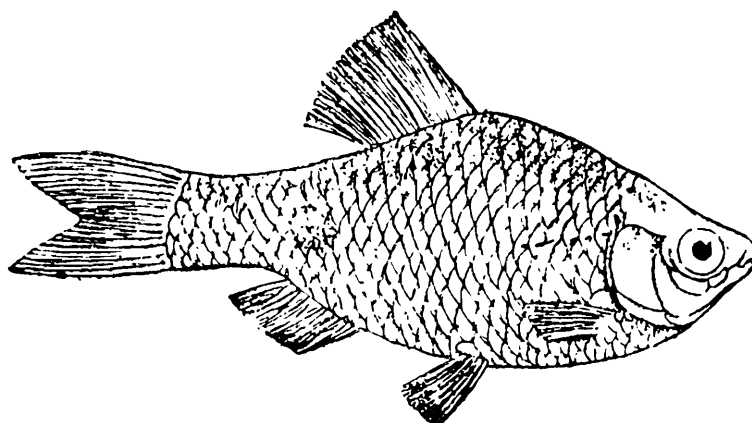


Fig. 43 : *Puntius ticto ticto* (Hamilton Buchanan)

Colour in alcohol : Body silvery generally with two lateral dark spots, the first one over 3rd and 4th scales and the second one over 18th and 19th scales on the lateral line.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma, Sri Lanka and Thailand.

Size : This species grows 102 mm (4 inches) in total length.

Fishery information : It is also a very common species found throughout Andhra Pradesh.

***Puntius vittatus* Day, 1865**

1865. *Puntius vittatus* Day, *Proc. zool. Soc. Lond.* : 303 (type-locality : Madras).

1878. *Barbus vittatus* Day, *Fish. India* : 582, pl. 144, fig. 2 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 333.

1981. *Puntius vittatus*, Jayaram, *Handk. Freshw. Fish. India* : 103, 110 (distribution and key to species).

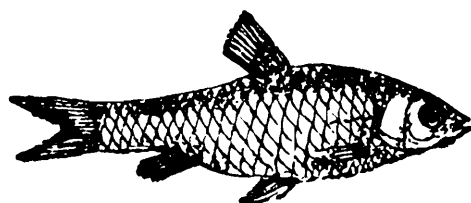


Fig. 44 : *Puntius vittatus* Day

Local name : Nil.

Common name : Silver barb (English).

Material examined : (i) 1 ex., 38 mm. TL. ; Godavari river, Warangal district, Andhra Pradesh ; R. P. Barman and party ; 31.8.83. (ii) 3 exs., 35 mm-38 mm TL. ;

Mapair Project, Karimnagar district, Andhra Pradesh ; R. P. Barman and party ; 4.9.83.

Diagnostic features : D. 10 (2/8), P. 12, V. 9, A. 7 (2/5), C. 20, LL. 20-22.

Head length 4.00 to 4.50 and body depth 3.50 in total length. Eye diameter 2.00 to 3.00 in head length. Barbels absent. Last undivided dorsal fin ray articulated, weak and entire ; inserted somewhat-in advance of pelvic fins. Lateral line incomplete, ceasing after about 5 scales. 3 rows of scales between lateral line and base of pelvic fin. Predorsal scales 8.

Colour in alcohol : Silvery, generally with 4 black spots in adult specimen, one just before dorsal fin, one below its posterior margin, another at caudal fin base and a fourth at anal fin base. Dorsal fin with a vertical black stripe and a black tip with orange markings.

Distribution : India : Karnataka, Kerala, Tamil Nadu, Goa, Kutch and Rajasthan. Sri Lanka. Pakistan.

Size : It attains 36 mm ($1\frac{1}{2}$ inch) in total length.

Remarks : This species is being recorded here for the first time from Andhra Pradesh.

Genus Rohtee Sykes, 1839.

1839. *Rohtee* Sykes, *Proc. zool. Soc. Lond.* : 16 (type-species : *Rohtee ogilbil* Sykes, designated by Bleeker, in *Ned. Tijds. Dierk.*, 1 : 11, 218, 1863).

1940. *Rohtee*, Hora and Mukerji, *Rec. Indian Mus.*, 42 : 155-172 (revision).

1981. *Rohtee*, Jayaram, *Handbk. Freshw. Fish. India* : 111 (genus characters and distribution).

Body deep, compressed with rounded abdomen. Mouth narrow, almost directed upwards. Upper jaw slightly longer. Barbels absent. Dorsal fin origin above pelvic fins, with 11 soft rays and a strong serrated spine. A precumbent predorsal spine present. Anal fin with 16 rays. Caudal fin forked. Lateral line complete with 55 scales.

Only 1 species is known under the genus, found in Peninsular India.

***Rohtee ogilbil* Sykes, 1839**

1839. *Rohtee ogilbil* Sykes, *Trans. zool. Soc. Lond.*, 2 : 364, fig. 2 (type-locality : the Beema river, Paigaoon).

1878. *Rohtee ogilbil*, Day, *Fish. India* : 588, pl. 147, fig. 5 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 342.

1981. *Rohtee ogilbil*, Jayaram, *Handbk. Freshw. Fish. India* : 111 (distribution).

Local name : Nil.

Common name : Vatani (Marathi).

Material examined : 3 exs., 80 mm-95 mm TL. ; Krishna river, Kurnool district, Andhra Pradesh, R. P. Barman and party ; 9. 12. 85.

Diagnostic features : D. 11 (3/8), P. 15, V. 10, A. 16 (3/13), C. 20, LL. 55.

Head length 5.00 to 6.00 and body depth 3.00 to 3.25 in total length. Eye diameter 2.50 to 3.50 in head length. Mouth small, somewhat directed upwards and forwards.

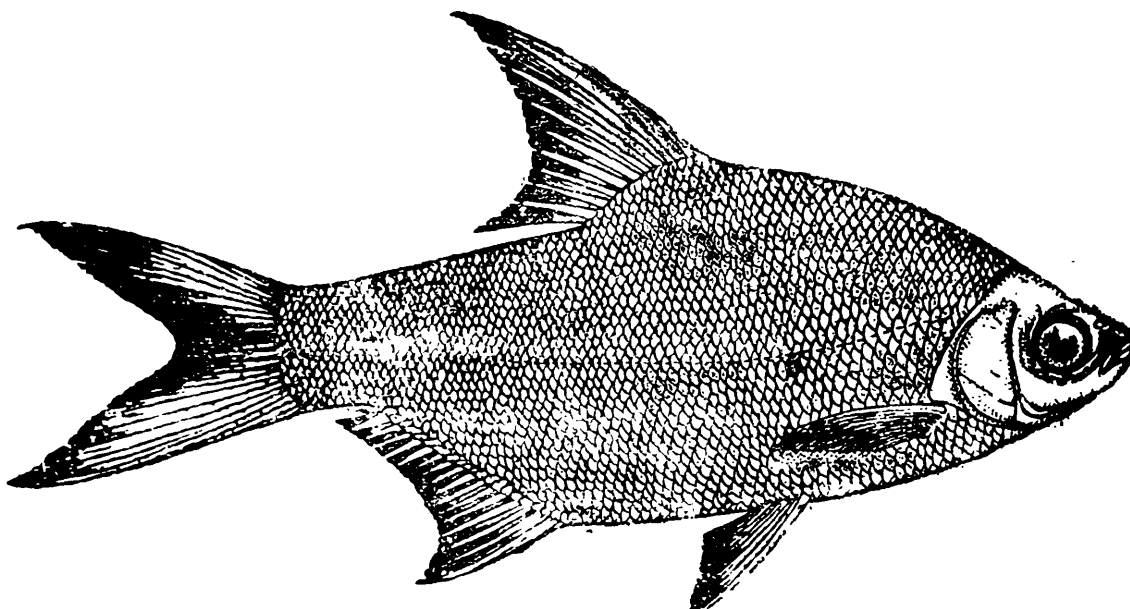


Fig. 45 : *Rohtee ogilbii* Sykes

Upper jaw slightly longer. Barbels absent. Dorsal fin inserted above pelvic fin, midway between tip of snout and base of caudal fin. Dorsal spine strong, serrated. A precumbent predorsal spine present. Caudal fin forked. 9 to 10 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Dorsal surface purplish silvery becoming silvery white below. Young specimens have a dark spot at the base of caudal fin and 4 to 5 narrow black bands descending from the back to the middle of the sides.

Distribution : India : the Krishna, Godavari and Cauvery river systems, South India.

Size : It attains 152 mm (6 inches) in total length.

Remarks : It is a common species, occurring in both the Godavari and Krishna river systems.

Genus *Osteobrama* Heckel, 1842.

1842. *Osteobrama* Heckel, *Ichth. Russeger's Reisen in Europe, Asia and Africa*, 1 : 1033 (type-species : *Cyprinus cotio* Hamilton, logotypic).

1981. *Osteobrama*, Jayaram, *Handbk. Freshw. Fish. India* : 112, 113 (genus characters and distribution).

Body deep, compressed with rounded abdomen. Mouth small, somewhat directed upwards. Upper jaw slightly longer. Barbels 2 pairs, 1 pair or absent. Dorsal fin inserted slightly behind pelvic fin, with 11 to 12 soft rays and a strong serrated spine. Anal fin

with 14 to 36 rays. Caudal fin deeply forked. Lateral line complete with 42 to 80 scales.

7 species are known from the Indian subcontinent under the genus, 4 species are found in Andhra Pradesh.

Key to the species

1. Barbels absent	...	...	...	...	2.
Barbels present	...	...	...	...	4.
2. Anal fin with less than 20 branched rays. Abdominal edge keeled throughout	...				<i>O. belangeri</i>
Anal fin with more than 20 branched rays. Abdominal edge keeled only between pelvic and anal fins	...	...	...	...	3.
3. Predorsal scales 18 to 24. Lateral line scales 42 to 58. $7\frac{1}{2}$ to $9\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin	...	...	...	...	<i>O. cotio cunma</i>
Predorsal scales 24 to 28. Lateral line scales 55 to 70. $10\frac{1}{2}$ to 13 rows of scales between lateral line and base of pelvic fin	...	...	...	...	<i>O. cotio cotio</i>
4. 2 pairs of well developed barbels. Lateral line scales 59	...	...	...	...	<i>O. neilli</i>
1 pair very short barbels or barbels totally absent. Lateral line scales 75 to 80	...	...	...	...	<i>O. vigorsii</i>

***Osteobrama belangeri* (Valenciennes, 1844)**

1844. *Leuciscus belangeri* Valenciennes (in C. & V.), *Hist. Nat. Poiss.*, 17 : ? 99 (type-locality : Bengal).
1878. *Rohitee belangeri*, Day, *Fish. India* : 587, pl. 147, fig. 4 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 342.
1981. *Osteobrama belangeri*, Jayaram, *Handbk. Freshw. Fish. India* : 113 (distribution and key to species).

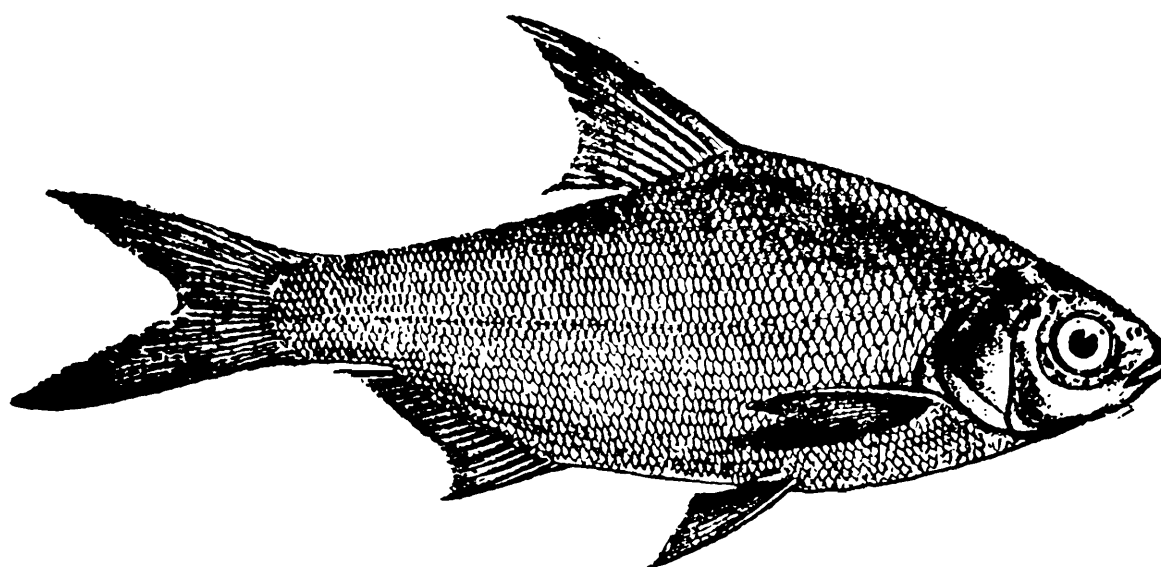


Fig. 46 : *Osteobrama belangeri* (Valenciennes)

Local name : Dammisa (Telugu).

Material examined : No specimen obtained by me. It was recorded by David (1963a) from both the Godavari and Krishna rivers.

Diagnostic features : D. 11-12 (3-4/8), P. 17, V. 9, A. 20-21 (3/17-18), C. 17, LL. 68-73.

Head length 5.50 to 6.00 and body depth 3.00 to 3.50 in total length. Eye diameter 3.00 to 3.25 in head length. Barbels absent. Lower jaw slightly shorter. Dorsal fin osseous ray strong and serrated posteriorly, the bony part equal to head. Caudal fin deeply forked. 14 rows of scales between lateral line and base of pelvic fin. Predorsal scales 25.

Colour in alcohol : Body silvery, dorsal surface greyish. Sometimes a dark streak from the shoulder to pectoral fin base present. Young specimens are partially banded.

Distribution : India : the Godavari and Krishna river systems, South India.

Size : It attains 380 mm (15 inches) in total length.

***Osteobrama cotio cotio* (Hamilton Buchanan, 1822)**

1822. *Cyprinus cotio* Hamilton Buchanan, *Fish Ganges* : 339, pl. 39, fig. 93 (type-locality : ponds and ditches of Bengal).

1878. *Rohtee cotio*, Day, *Fish. India* : 587, pl. 151, fig. 1 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 340.

1981. *Osteobrama cotio cotio*, Jayaram, *Handbk. Freshw. Fish. India* : 113 (distribution and key to species).

Local name : Nil.

Common name : Cotio (English).

Material examined : (i) 1 ex., 117 mm TL. ; Godavari river, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 28. 8. 83 (ii) 24 exs., 57 mm-78 mm TL. ; a

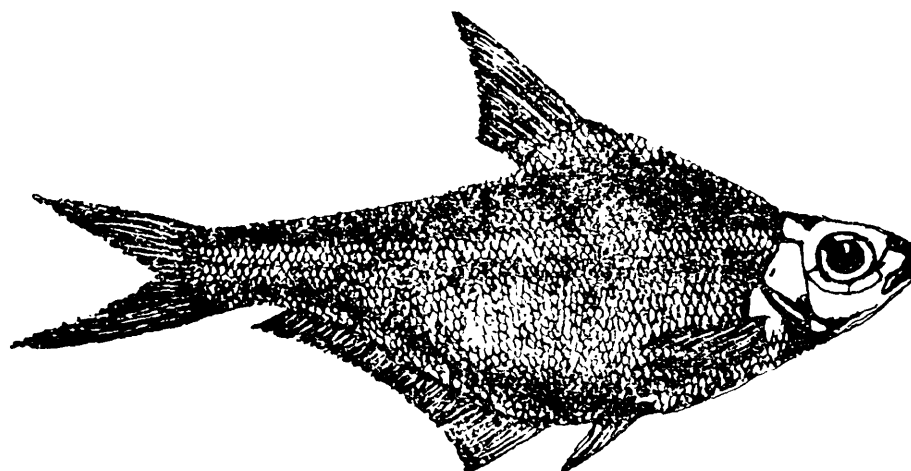


Fig. 47 : *Osteobrama cotio cotio* (Hamilton Buchanan)

pond at Mosampet village, Mahbubnagar district, Andhra Pradesh ; R. P. Barman and party ; 15.12.84. (iii) 3 exs., 85 mm-92 mm TL ; Nizam sagar, Nizamabad district, Andhra

Pradesh ; R. P Barman and party ; 9.12.84. (iv) 6 exs., 57 mm-85 mm TL. Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 31.5.87, 1.6.87.

Diagnostic features : D. 11-12 (2-3/9), P. 13, V. 10, A. 29-36 (2-3/27-33), C. 19, LL. 55-70.

Head length 5.00 to 6.00 and body depth 3.00 to 3.50 in total length. Eye diameter 2.50 to 3.00 in head length. Upper jaw slightly longer. Barbels absent. Dorsal fin inserted nearer to tip of snout than to base of caudal fin, dorsal spine weak and serrated. $10\frac{1}{2}$ to 13 rows of scales between lateral line and base of pelvic fin. Predorsal scales 24 to 28. Caudal fin deeply forked.

Colour in alcohol : Dorsal surface silvery black, often with a silvery band. Generally with a dark blotch just before the base of dorsal fin.

Distribution : Throughout India except Malabar. Bangladesh, Nepal, Pakistan and Burma.

Size : It attains 152 mm (6 inches) in total length.

Remarks : Hora and Misra (1940) remarked that barbels are always present in this species. Day (1878) recorded this species with barbels either absent or rudimentary. Specimen collected from Andhra Pradesh shows that barbels are absent in this species.

Osteobrama cotio cunma Day, 1878

1878. *Rohtee cunma* Day, *Fish. India, Suppl.* : 807 (type-locality : Moulmeln, Burma).

1889. *Rohtee cunma* Day, *Fauna Br. India, Fish*, 1 : 343.

1981. *Osteobrama cotio cunma*, Jayaram, *Handbk. Freshw. Fish. India* : 113 (distribution and key to species).

Local name : Chinna dammisa (Telugu).

Material examined : 2 exs., 215-230 mm TL. ; Kinneroni reservoir, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 28. 8. 83.

Diagnostic features : D. 12 (3/9), P. 13, V. 10, A. 30, C. 18, LL. 42-58.

Head length 5.50 and body depth 3.00 in total length. Eye diameter 3.00 in head length. Barbels absent Snout obtuse, upper jaw longer. Dorsal fin commences somewhat nearer to snout tip than to caudal fin base, its spine smooth, weak and longer than head. Caudal fin deeply forked, lower lobe somewhat longer. Lateral line strongly marked in its first 4 scales. $7\frac{1}{2}$ to $9\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin. Predorsal scale 18 to 24.

Colour in alcohol : Dorsal surface olive, becoming silvery on sides and below. A brassy tinge along lateral line and over cheek and operculum. Dorsal and caudal fins with a narrow black edge.

Distribution : India : Manipur, Peninsular India. Burma.

Size : It attains 140 mm. ($5\frac{1}{2}$ inches) in total length.

Remarks : It is a common species found almost all over Andhra Pradesh.

***Osteobrama neilli* (Day, 1873)**

1873. *Rohtee neilli* Day, *Proc. zool. Soc. Lond.* : 239 (type-locality : Bhavani river at the base of Nilgiri Hills).

1878. *Rohtee neilli* Day, *Fish. India* : 586, pl. 146, fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 340.

1981. *Osteobrama neilli*, Jayaram, *Handbk. Freshw. Fish. India* ; 113-114 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by Rahimullah (1943b) from Andhra Pradesh.

Diagnostic features : D. 12 (4/8), P. 13, V. 10, A. 20 (3/17), C. 19, LL. 59.

Head length 4.75 and body depth 3.50 in total length. Eye diameter 2.70 in head length. Dorsal profile over nape concave, from there a considerable rise to dorsal fin base. Upper jaw somewhat longer. Barbels 2 pairs, equal to the orbit. Dorsal fin three fourths

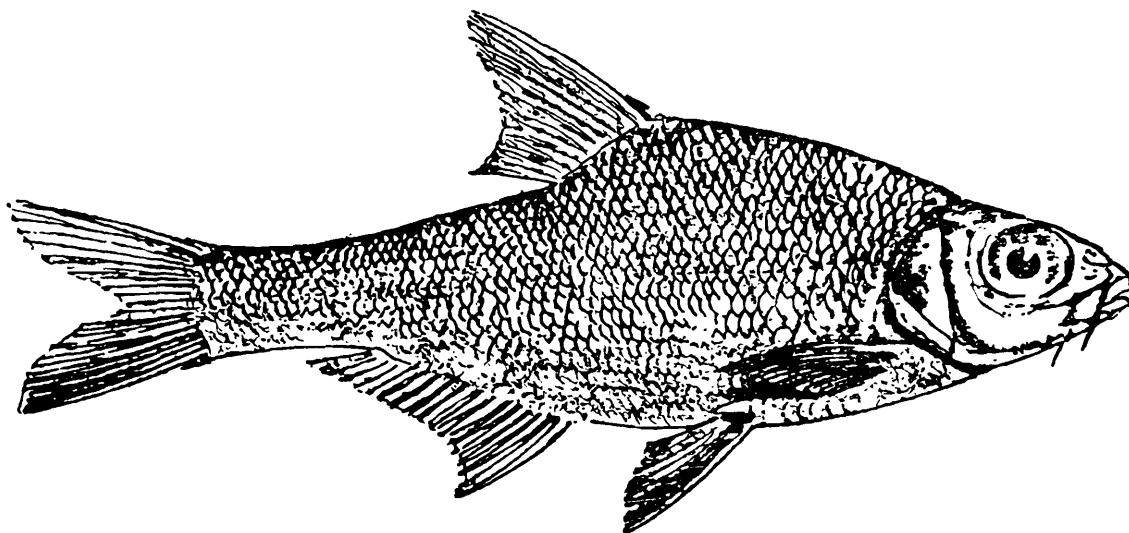


Fig. 48 : *Osteobrama neilli*. (Day)

as high as the body, its last undivided ray osseous, very strong, serrated and its length equal to head excluding the snout. Pectoral fin almost equal to head length. Caudal fin forked. Lateral line strongly marked in its first few scales. 8 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Body silvery, opercles golden.

Distribution : India : the Bhavani, Godavari, Krishna and Cauvery river systems.

Remarks : It is a common species occurring in both the Godavari and Krishna river systems.

***Osteobrama vigorsii* (Sykes, 1841)**

1841. *Rothee vigorsii* Sykes, *Trans. zool. Soc. Lond.*, 2 : 364, pl. 63. fig. 3 (type-locality : Beema river, Pairgaon).
 1878. *Rohtee vigorsii*, Day, *Fish. India* : 587, pl. 147, fig. 3 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 341, 342.
 1981. *Osteobrama vigorsii*, Jayaram, *Handbk. Freshw. Fish. India* : 113-114 (distribution and key to species).

Local name : Khira (Telugu).

Common name : Deccan cotio (English).

Material examined : (i) 1 ex., 148 mm TL. ; Wyra reservoir, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 29.8.83. (ii) 5 exs., 60 mm-77 mm TL ; Krishna river, Kurnool district., Andhra Pradesh ; R. P. Barman and party ; 9.12.85. (iii) 7 exs., 100 mm-140 mm TL, ; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; 31.5.87, 1.6.87.

Diagnostic features : D. 12-14 (3/9-11), P. 19, V. 10, A. 24-30 (2-3/22-27), C. 19, LL. 75-80.

Head length 4.75 to 5.00 and body depth 3.00 to 4.00 in total length. Eye diameter 3.00 to 3.50 in head length. A concavity over nape. Lower jaw slightly longer. Barbels either absent or 1 pair, very short. Dorsal fin commences nearer to base of caudal fin than

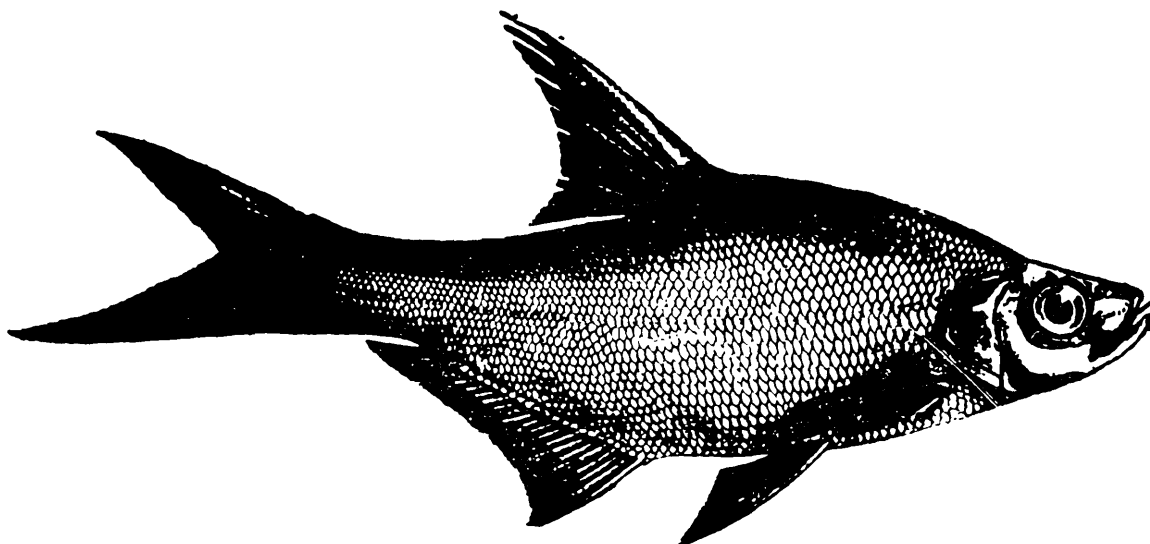


Fig. 49 : *Osteobrama vigorsii* (Sykes)

to tip of snout, dorsal spine strong and serrated. Caudal fin deeply forked. 11 to 11½ rows of scales between lateral line and base of pelvic fin. Predorsal scales 34 to 37.

Colour in alcohol : Dorsal surface greenish grey, sides silvery. A bifurcated black spot present at the posterior portion of head on its superior margin. A lateral silvery band present in the young specimens.

Distribution : India : Orissa, Madhya Pradesh and the Godavari and Krishna river systems.

Size : It attains 228 mm (9 inches) in total length.

Remarks : Specimens collected from Andhra Pradesh show that both the pairs of barbels are present but very short.

Genus *Thynnichthys* Bleeker, 1859.

Sandkhol Carp

1859. *Thynnichthys* Bleeker, *Nat. Tijdschr. Ned.*, 20 : 417 (type-species : *Leuciscus thynnoides* Bleeker).

1981. *Thynnichthys*, Jayaram, *Handbk. Freshw. Fish. India* : 114 (genus characters and distribution).

Body somewhat elongated with compressed head and tail. Abdomen rounded. Mouth rather wide. Upper lip absent. Lower lip thin, with a short labial fold on the sides. Barbels absent. Dorsal fin origin in advance of pelvic fins, with 12 soft rays and without a spine. Anal fin with 8 rays (5 branched). Caudal fin forked. Lateral line complete with 120 scales.

Only one species is known under the genus which is found in the Peninsular India.

Thynnichthys sandkhol (Sykes, 1841)

1841. *Leuciscus sandkhol* Sykes, *Trans. zool. Soc. Lond.*, 2 : 363 (type-locality : the Goreh river at Kullub).

1878. *Thynnichthys sandkhol*, Day, *Fish. India* : 554, pl. 134, fig. 2 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 289.

1981. *Thynnichthys sandkhol*, Jayaram, *Handbk. Freshw. Fish. India* : 114 (distribution).

Local name : Kalavathondu, Thalasingadu, Kala tale, Aaku chepa (Telugu).

Common name : Sandkhol carp (English).

Material examined : 3 exs., 165 mm-170 mm TL. ; Nizam sagar, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 9.12.84.

Diagnostic features : D. 12 (3/9), P. 19, V 9, A. 8 (3/5), C. 19, LL. 110-120.

Head length 4.00 to 4.50 and body depth 3.25 to 4.00 in total length. Eyes diameter 3.00 to 5.00 in head length. Barbels absent. Dorsal profile more convex than ventral profile. Dorsal fin inserted slightly in advance of pelvic fin origin, midway between the tip of snout and base of caudal fin. No dorsal spine. Anal fin origin at some distance behind

end of dorsal fin. 17 to 19 rows of scales between lateral line and base of pelvic fin. Caudal fin deeply forked.

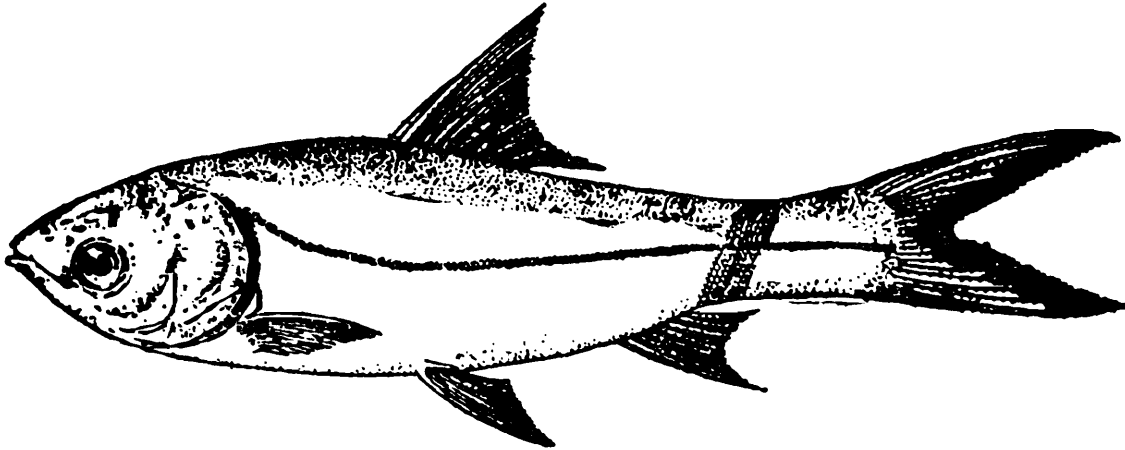


Fig. 50 : *Thynnichthys sandkhol* (Sykes)

Colour in alcohol : Body silvery with purplish head.

Distribution : India : Mahanadi, Godavari and Krishna river systems. Also found in Malaysia, Islands of Western Indonesia.

Size : It attains above 457 mm (18 inches) in total length.

Fishery information : This is one of the dominating species of the Nizam sagar and found almost all over Andhra Pradesh.

Genus *Schismatorhynchus* Bleeker, 1855.

1855. *Schismatorhynchus* Bleeker, *Nat. Tijdschr. Ned. Ind.*, 9 : 258, 269 (type-species : *Schismatorhynchus heterorhynchus* Bleeker).

1981. *Schismatorhynchus*, Jayaram, *Handbk. Freshw. Fish. India* : 115, 116 (genus characters and distribution).

Body somewhat elongated with rounded abdomen. Snout projecting over mouth and having a deep groove passing from one orbit to another, with two short horns or projections on the inter orbital space. Mouth moderate width, subterminal. Lower lip reflected, not continuous with upper lip (subgenus *Schismatorhynchus*) or continuous with upper lip and with large papillae (subgenus *Nukta*). Lower jaw separated from the lower lip by the post-labial groove. Post-labial groove divided by a longitudinal fleshy frenulum in a median and lateral part (*Schismatorhynchus*) or without such prolongations (*Nukta*). A pair each of maxillary and rostral barbels (*Schismatorhynchus*) or absent (*Nukta*). Dorsal fin origin much in advance of pelvic fins, with 11 (9 branched) rays. Caudal fin deeply forked. Lateral line complete with 37 to 38 scales,

Schismatorhynchus (Nukta) nukta (Sykes, 1841)

1841. *Cyprinus nukta* Sykes, *Trans. zool. Soc. Lond.*, 2 : 355 (type-locality : Mahloongeh, 18 miles north of Ponna from the Indranee river).

1878. *Labeo nukta*, Day, *Fish. India* : 543, pl. 128, fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 270.

1981. *Schismatorhynchys (Nukta) nukta*, Jayaram, *Handbk. Freshw. Fish. India* : 116 (distribution).

Local name : Nil.

Common name : Nukta, Nakata, Nanktashendra (Marathi).

Material examined : No specimen obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 11 (2/9), P. 15, V. 9, A. 7 (2/5), C. 19, LL. 37-38.

Head length 5.00 to 6.25 and body depth 4.50 in total length. Eye diameter 4.00 to 6.00 in head length. Dorsal profile convex and ventral profile almost horizontal. Lips not fringed, with a thin deciduous horny layer internally. Snout with a deep groove. Barbels

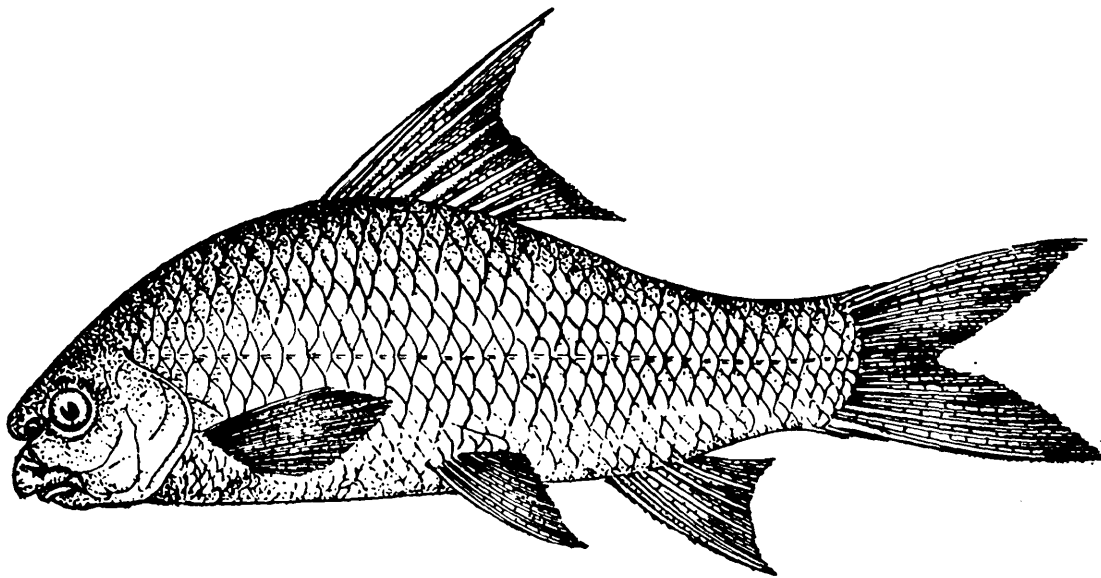


Fig. 51 : *Schismatorhynchus (Nukta) nukta* (Sykes)

1 pair, very short, maxillary. Dorsal fin inserted in advance of pelvic fin, nearer to tip of snout than to base of caudal fin. Caudal fin forked. Lateral line badly marked. $4\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Body silvery, with some red marks on the scales. Fins reddish, caudal fin edged with grey.

Distribution : India : Peninsular India.

Size : It attains at least 304 mm (1 foot) in total length.

Fishery information : It is a common fish often found in the commercial catches of both the rivers of Godavari and Krishna.

Genus Labeo Cuvier, 1817.

1817. *Labeo* Cuvier, *Regne Animal.*, 2 : ed. 1 : 194 (type-species : *Cyprinus niloticus* Forsskal).

1981. *Labeo*, Jayaram, *Handbk. Freshw. Fish. India* : 116, 117 (genus characters and distribtulon).

Body moderately elongated with rounded abdomen. Mouth mostly inferior, transverse and semi-oval. Lips thick, covering the jaws, continuous at the angle of mouth and one or both having an inner transverse fold. A soft and movable horny covering, with a sharp margin on the inner side of one or both lips. Barbels, when present, 2 pairs or 1 pair, if there is only one pair they are on the maxilla, the second pair being on the snout. Dorsal fin inserted before pelvic fin, with 11 to 26 rays and no spine. Anal fin with 7 to 8 rays. Caudal fin emarginate or forked. Lateral line complete, with 36 to 85 scales.

26 species are known under the genus from the Indian subcontinent, 13 species are found in Andhra Pradesh.

Key to the species

1. Dorsal fin rays not more than 13. Only 1 pair of barbels	...	...	2.
Dorsal fin rays more than 13. Generally 2 pairs of barbels (exception <i>L. potail</i> which has 1 pair of barbels)	...	...	7.
2. Lateral line scales 60 to 65. 8 to 9 rows of scales between lateral line and base of pelvic fin	...	...	<i>L. boggut</i>
Lateral line scales not more than 45. Not more than 7 rows of scales between lateral line and base of pelvic fin	...	...	3.
3. 4½ rows of scales between lateral line and base of pelvic fin	...	...	<i>L. kawrus</i>
5 to 6 rows of scales between lateral line and base of pelvic fin	...	...	4.
4. Pectoral fin reaching pelvic fin	...	...	<i>L. bata</i>
Pectoral fin not reaching pelvic fin	...	...	5.
5. Snout with a distinct lateral lobe	...	...	<i>L. pangusia</i>
Snout without a distinct lateral lobe	...	...	6.
6. Dorsal fin inserted slightly posterior to tip of pectoral fin	...	...	<i>L. ariza</i>
Dorsal fin inserted above or slightly anterior to tip of pectoral fin	...	...	<i>L. boga</i>
7. Dorsal fin rays 19 to 22. 6 to 7 rows of scales between lateral line and base of pelvic fin	...	...	<i>L. fimbriatus</i>
Dorsal fin rays 13 to 18	...	...	8.
8. Lateral line scales 71 to 84. 9 to 13 rows of scales between lateral line and base of pelvic fin	...	...	<i>L. gonius</i>
Lateral line scales not more than 60. 5 to 6½ rows of scales between lateral line and base of pelvic fin	...	...	9.
9. Lateral line scales 53 to 60	...	...	<i>L. dussumieri</i>
Lateral line scales 39 to 44	...	...	10.
10. Simple unbranched rays in dorsal fin 3 to 4	...	...	11.
Simple unbranched rays in dorsal fin rays 2	...	...	12.

11. $5\frac{1}{2}$ to 6 rows of scales between lateral line and base of pelvic fin. Dorsal fin rays 16 to 18. Body uniformly blackish *L. calbasu*
 6 to $6\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin. Dorsal fin rays 15 to 16. Body bluish or brownish along dorsal surface and silvery beneath *L. rohita*
12. Snout with a lateral lobe. Dorsal fin rays 13 to 14. $5\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin *L. potail*
 Snout without a lateral lobe. Dorsal fin rays 15 to 16. 5 rows of scales between lateral line and base of pelvic fin *L. porcellus*

***Labeo ariza* (Hamilton Buchanan, 1822)**

1807. *Cyprinus ariza* Hamilton Buchanan, *Journey Mysore*, 3 : 344, pl. 31 (type-locality : rivers of Karnataka).
 1878. *Labeo ariza*, Day, *Fish. India* : 544, pl. 132, fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 272.
 1981. *Labeo ariza*, Jayaram, *Handbook Freshw. Fish. India* : 117, 120 (distribution and key to species).

Local name : Nil.

Material examined : 1 ex., 160 mm TL., Krishna river, Mahbubnagar district, Andhra Pradesh ; R. P. Barman and party ; 15.12.84.

Diagnostic features : D. 11 (2/9), P 18, V. 9, A. 7-8 (2-3/5), C. 19, LL. 38.

Head length 5.25 to 5.50 and body depth 4.00 to 4.50 in total length. Eye diameter 5.50 in head length. Snout with few pores. Lips smooth, with a thin cartilaginous covering

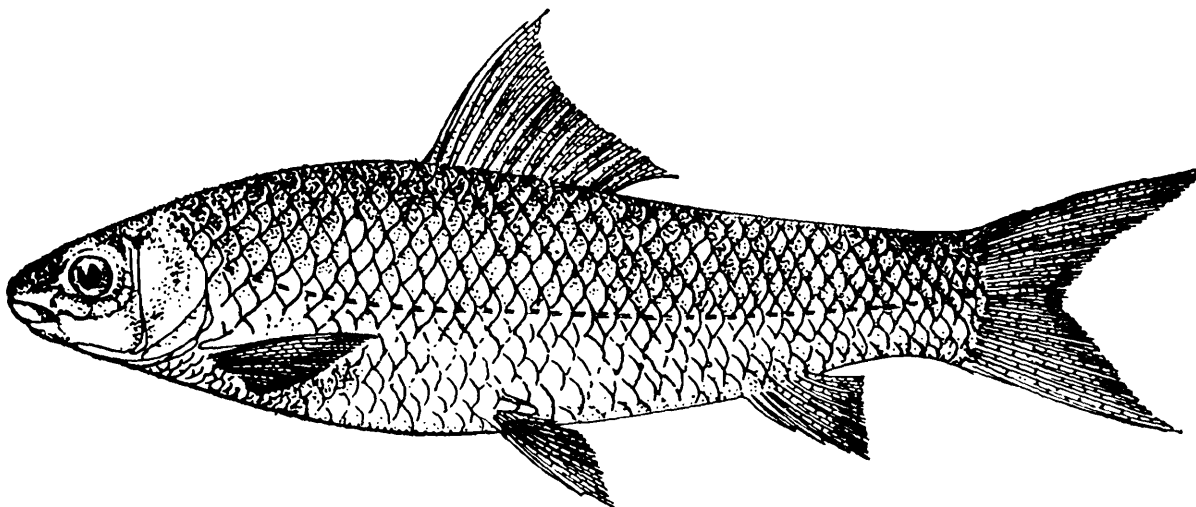


Fig. 52 : *Labeo ariza* (Hamilton Buchanan)

inside the lower jaw. Barbels 1 pair, very short, maxillary. Dorsal fin commences nearer to snout tip than caudal fin base. Caudal fin deeply forked. $5\frac{1}{2}$ rows of scales between the lateral line and pelvic fin base.

Colour in alcohol : Dorsal surface leaden grey, becoming silvery on sides and beneath.

Distribution : India : Wynaad, the Bhavani river at the foot hills of the Nilgiri hills in Tamil Nadu, the Cauvery and the Krishna river system, South India.

Size : It attains to about 240 mm (9½ inches) in total length.

Remarks : David (1963a) recorded this species from the Krishna river systems. This species is being recorded here for the first time from Andhra Pradesh.

***Labeo bata* (Hamilton Buchanan, 1822)**

1822. *Cyprinus bata* Hamilton Buchanan, *Fish. Ganges* : 283, 386 (type-locality : rivers and pond of Bengal).

1878. *Labeo bata*, Day, *Fish. India* : 542, pl. 129, fig. 5 ; 1889, *Fauna Br. India, Fish.*, 1 : 268.

1981. *Labeo bata*, Jayaram, *Handbk. Freshw. Fish. India* : 117, 119 (distribution and key to species).

Local name : Mosu (Telugu).

Common name : Bata (English).

Material examined : 3 exs., 130 mm-140 mm TL. ; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 31.5.87 and 1.6.87.

Diagnostic features : D. 11-13 (2-3/9-10), P. 18, V. 9, A. 7 (2/5), C. 19, LL. 37-40.

Head length 5.50 to 5.75 and body depth 4.30 to 4.75 in total length. Dorsal profile more convex than ventral profile. Eye diameter 4.00 to 4.30 in head length. Lips thin,

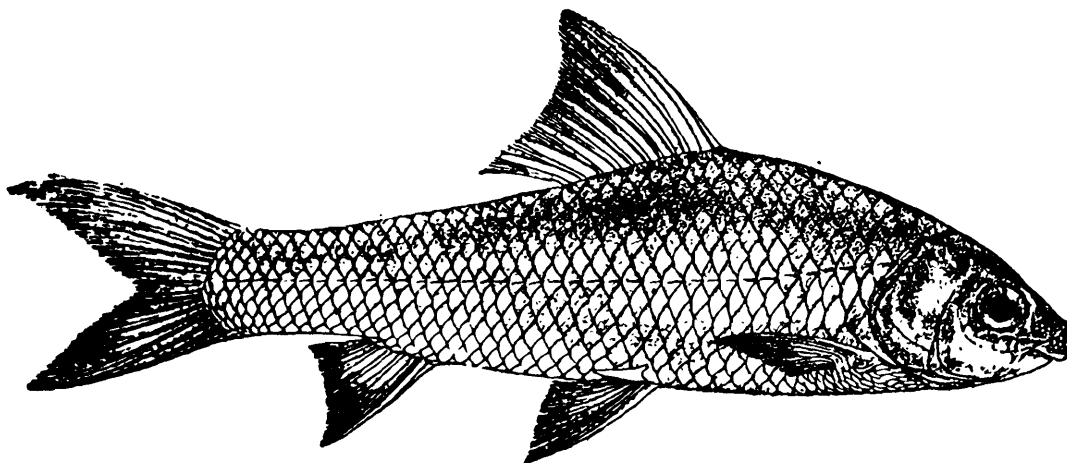


Fig. 53 : *Labeo bata* (Hamilton Buchanan)

continuous ; a tubercle inside lower jaw above symphysis and no horny covering inside jaws. **Barbels** 1 pair of very short maxillary barbels. Dorsal fin originates slightly nearer to tip of snout than to caudal base. Pectoral fin reaching pelvic fin. Caudal fin deeply forked. 5½ rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Dorsal surface grey and silvery below with lower fins stained orange. Young specimens often with 3 to 4 small, lateral black spots.

Distribution : Throughout India, Bangladesh and Pakistan.

Size : It attains 609 mm (2 feet) in total length.

Fishery information : This fish is used extensively for stocking tanks almost throughout Andhra Pradesh.

***Labeo boga* (Hamilton Buchanan, 1822)**

1822. *Cyprinus boga* Hamilton Buchanan, *Fish. Ganges* : 286, 386, pl. 28, fig. 80 (type-locality : River Brahmaputra).
 1878. *Labeo boga*, Day, *Fish. India* : 543, pl. 128, fig. 3 and pl. 131, fig. 4 ; 1889, *Fauna Br. India, Fish.*, 1 : 269.
 1981. *Labeo boga*, Jayaram, *Handbk. Freshw. Fish. India* : 117, 120 (distribution and key to species).

Local name : Mosu, Ariza (Telegu).

Common name : Burmese fish, Jamuna fish (English).

Material examined : 3 exs., 70 mm-110 mm TL. ; Godavari river, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 7.12.84.

Diagnostic features : D. 11-13 (2-3/9-10), A. 7 (2/5), P. 16, V. 9, C. 19, LL. 37-39.

Head length 5.25 to 5.50 and body depth 5.50 to 5.75 in total length. Dorsal profile more convex than ventral profile. Eye diameter 3.75 to 4.00 in head length. Lips some-

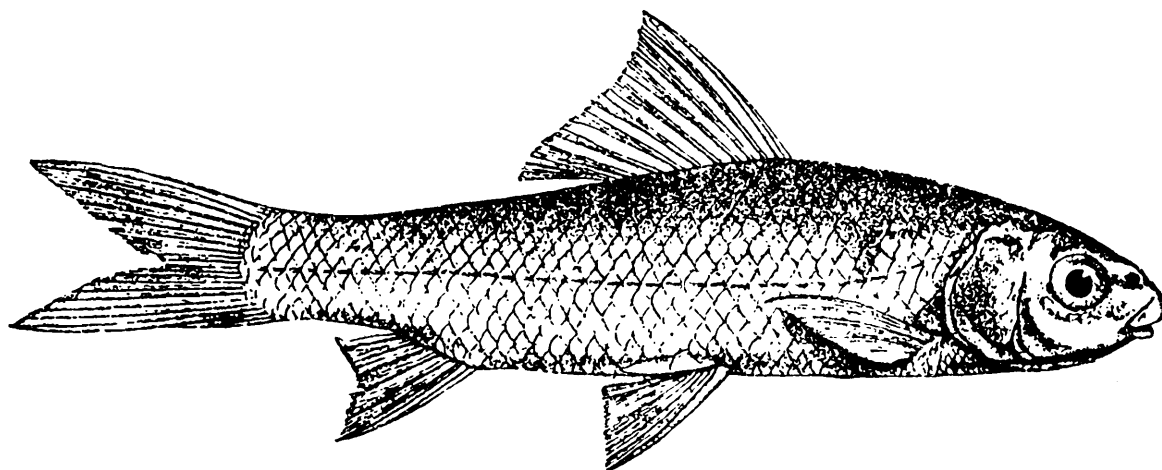


Fig. 54 : *Labeo boga* (Hamilton Buchanan)

what thick with a thin layer of cartilage to inner surface of lower jaw. Snout sometimes covered with tubercles. Barbels 1 pair of very short maxillary barbels. Dorsal fin origin considerably in advance of pelvic fin origin, nearer to tip of snout than to caudal base. Pectoral fin not reaching pelvic fin. Caudal fin deeply forked with equal lobes. 5 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Body orange, with the fins of a reddish tinge. Sometimes with a dark spot on the shoulder.

Distribution : India : Punjab, Uttar Pradesh, West Bengal and Deccan. Bangladesh. Nepal, Burma and Pakistan.

Size : This species grows 304 mm (1 foot) in total length.

Fishery information : This fish frequently appears in the commercial catches of the river Godavari and Krishna.

***Labeo boggut* (Sykes, 1841)**

1841. *Chondrostoma boggut* Sykes, *Trans. zool. Soc. Lond.*, 2: 359 (type-locality : Poona waterways).

1878. *Labeo boggut*, Day, *Fish. India* : 542, pl. 128, fig. 4 ; 1889, *Fauna Br. India, Fish.* 1 : 269.

1981. *Labeo boggut*, Jayaram, *Handbk. Freshw. Fish. India* : 117, 119 (distribution and key to species).

Local name ; Nuslgadu (Telegu).

Material examined : 2 exs., 116 mm.-185 mm TL. ; Godavari river, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 30.8.83.

Diagnostic features : D. 11-12 (3/8-9). P. 17, V. 9, A. 7 (2/5), C. 19, LL. 60-65.

Head length 5.50 to 6.00 and body depth 5.50 to 6.25 in total length. Eye diameter 4.50 to 5.00 in head length. Dorsal profile somewhat more convex than ventral profile. Lower lip fimbriated with a horny covering inside. Snout thick with a few tubercles. Barbels 1

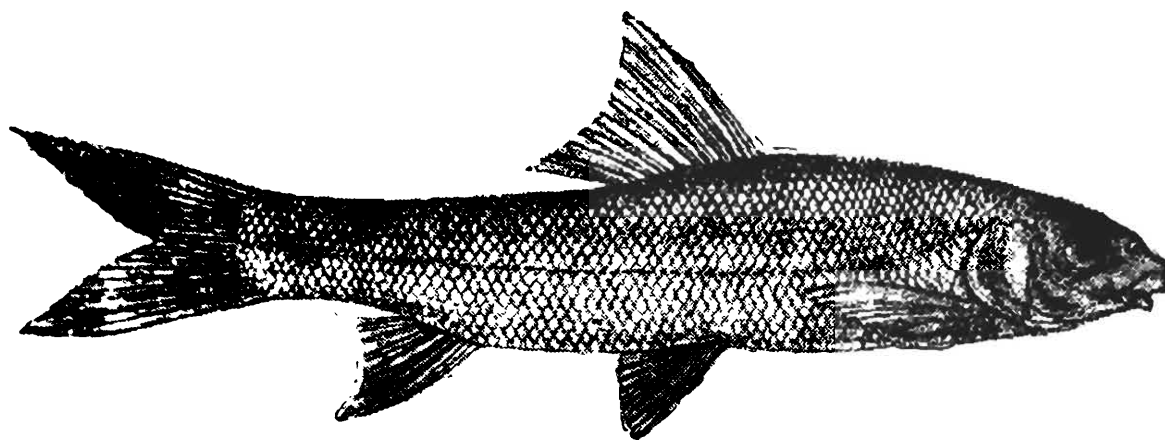


Fig. 55 : *Labeo boggut* (Sykes)

pair, maxillary. Dorsal fin origin nearer to tip of snout than to caudal fin base. Pectoral fin almost equal to head and not extending to pelvic fin. Caudal fin deeply forked. 8 to 9 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Body silvery, darkest black. Fins orange with a few lateral light lines or a bluish band and a dark spot near caudal base.

Distribution : India : Throughout North India and up to Cauvery river system, Pakistan.

Size : It attains at least 190 mm (7 inches) in total length.

Fishery information : This is a common fish often found in the commercial catches of the rivers Godavari and Krishna.

***Labeo calbasu* (Hamilton Buchanan, 1822)**

1822. *Cyprinus calbasu* Hamilton Buchanan, *Fish. Ganges* : 297, 387, pl. 2, fig. 83 (type-locality : rivers and ponds of Bengal and in the western provinces).

1877. *Labeo calbasu*, Day, *Fish. India* : 536, pl. 126, fig. 4 ; 1889, *Fauna Br. India, Fish*, 1 : 259.

1981. *Labeo calbasu*, Jayaram, *Handbk. Freshw. Fish. India* : 117, 121, (distribution and key to species).

Local name : *Nalla gandu meenu* (Telegu).

Common name : Calbasu, Orange fin labeo (English).

Material examined : 5 exs., 61 mm 87 mm TL. ; Krishna river, Mahbunagar district, Andhra Pradesh ; R. P. Barman and party ; 15.12.84.

Diagnostic features : D. 16-18 (3/13-15), A. 7 (2/5), P. 19, V. 9, C. 19, LL. 40-44.

Head length 5.00 to 6.00 and body depth 4.00 to 4.25 in total length. Eye diameter 4.25 to 4.50 in head length. Dorsal and ventral profiles almost equally convex. Lips thick, fringed and each having a distinct inner fold. Snout obtuse, with pores. Barbels 2 pairs,

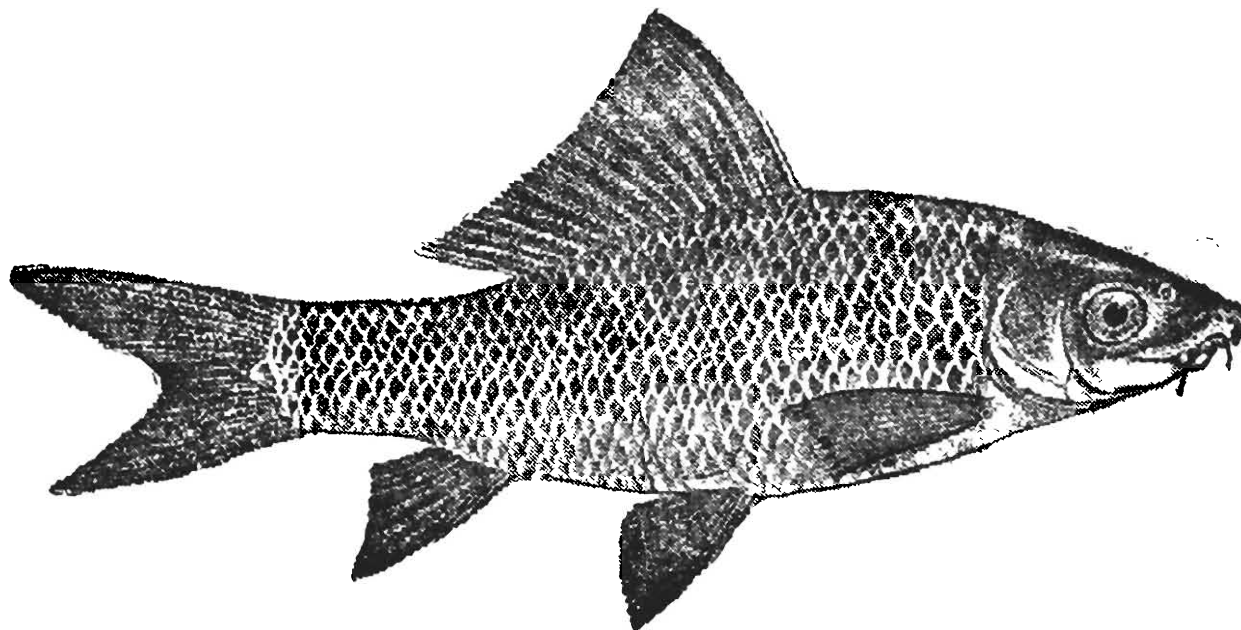


Fig. 56 : *Labeo calbasu* (Hamilton Buchanan)

rostral pair slightly longer, almost equal to the diameter of the orbit. Dorsal fin originates in advance of pelvic fins, midway between the tip of snout and base of caudal fin which is deeply forked. $5\frac{1}{2}$ to 6 rows of scales between lateral line and base of pelvic fin,

Colour in alcohol : Body blackish green, becoming lighter below. Fins black, upper tips of caudal fin usually edged white.

Distribution : Throughout India, Pakistan, Burma, Bangladesh, Nepal, Thailand and Yunnan.

Size : It attains 914 mm (3 feet) in total length.

Fishery information : It is an important food and game fish of India. It is used largely in stocking tanks all over Andhra Pradesh.

***Labeo dussumieri* (Valenciennes, 1841)**

1841. *Rohita dussumieri* Valenciennes, *Hist. Nat. Poiss.*, 16 : 258, pl. 475 (type-locality : Alleppey, Kerala).

1878. *Labeo dussumieri*, Day, *Fish. India* : 538, pl. 126, fig. 5 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 262.

1981. *Labeo dussumieri*, Jayaram, *Handbk. Freshw. Fish. India* : 118, 120 (distribution and key to species).

Local name : Nil.

Common name : Common labeo (English).

Material examined : No specimen obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 15-16 (3/12-13), P. 17, V. 9, A. 7 (2/5), C. 19, LL. 53-60.

Head length 5.75 to 7.00 and body depth 5.00 to 5.25 in total length. Eye diameter 4.00 to 4.50 in head length. Body elongated and compressed, the ventral profile rather more convex than dorsal profile. Mouth of moderate width and somewhat inferior, surrounded by fleshy, fringed lips, having a distinct inner fold above and below, but

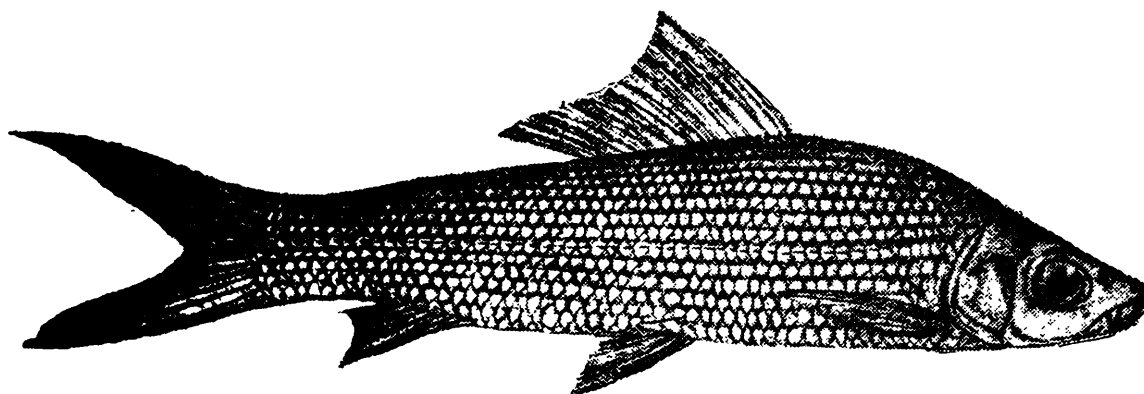


Fig. 57 : *Labeo dussumieri* (Valenciennes)

lateral lobe absent. Sometimes numerous pores on the snout, extending posteriorly as far as the orbits and below the nostrils. Barbels 2 pairs, very short. Dorsal fin inserted

between tip of snout and end of anal fin base, its upper edge concave. Caudal fin deeply forked. 5 to $5\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Body greyish, lightest beneath. Scales with a reddish centre, edged with a darker shade. Usually a dull diffused dark spot on either side of tail. Fins dusky.

Distribution : India : Western ghats up to North Canara, Andhra Pradesh. Sri Lanka.

Size : It attains at least 325 mm (13 inches) in total length.

Remarks : It is a common species occurring in Krishna river systems.

***Labeo fimbriatus* (Bloch, 1797)**

1797. *Cyprinus fimbriatus* Bloch, *Ichth.* 12 : 50, pl. 409 (type-locality : Madras).

1878. *Labeo fimbriatus*, Day, *Fish. India* : 536, pl. 126, fig. 3 ; 1889, *Fauua Br. India Fish*, 1 : 258.

1981. *Labeo fimbriatus*, Jayaram, *Handbk, Freshw. Fish. India* : 118, 120 (distribution and key of species).

Local name : *Yerra gandu meenu, Chitra Gandu meenu* (Telugu).

Common name : Fringe-lipped carp (English).

Material examined : (i) 1 ex., 102 mm TL. ; Majira river, Medak district, Andhra Pradesh ; R. P. Barman and party ; 12.12.84. (ii) 2 exs., 185 mm-188 mm TL., Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; 1.6.87.

Diagnostic features : D. 19-22 (3-4/15-18), P 17, V 9, A. 7 (2/5), C. 19, LL. 44-47.

Head length 6.25 to 6.50 and body depth 4.00 to 4.50 in total length. Eye diameter 3.75 to 4.50 in head length. Dorsal profile more convex than ventral profile. Lips thick,

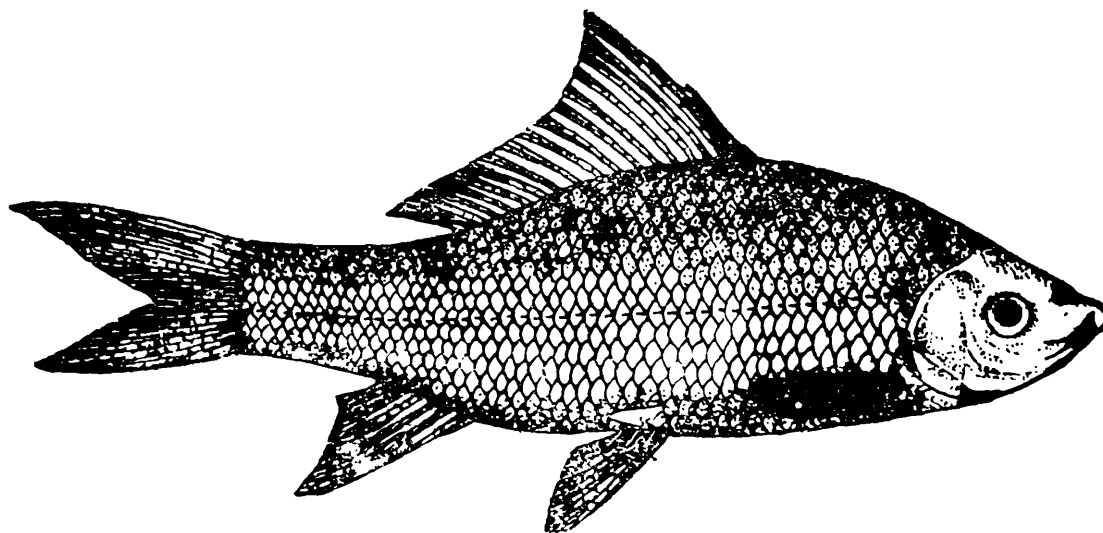


Fig. 58 : *Labeo fimbriatus* (Bloch)

continuous and fringed. A cartilaginous covering on the inner side of both jaws. Snout obtuse, somewhat swollen and studded with pores. Barbels 2 pairs, short. Dorsal fin originates nearer to tip of snout than to base of caudal fin which is deeply forked. 6 to 7 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Dorsal surface silvery, lighter on sides and below, Fins stained black. Sometimes a diffused dusky blotch at the base of caudal fin which is almost present in the young specimens.

Distribution : India : Punjab, Uttar Pradesh, Orissa, Madhya Pradesh, Maharashtra, Gujarat and South India. Nepal. Burma. Pakistan.

Size : It attains 457 mm ($1\frac{1}{2}$ feet) in total length.

Fishery information : It is a predominant fish of Andhra Pradesh and found in almost all the commercial catches of the river Godavari and Krishna. This fish has been designated as a threatened species of India.

***Labeo gonius* (Hamilton Buchanan, 1822)**

1822. *Cyprinus gonius* Hamilton Buchanan, *Fish. Ganges* : 292, 387 (type-locality : Freshwater rivers and ponds of Bengal).

1878. *Labeo gonius*, Day, *Fish. India* : 537, pl. 127, fig. 1 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 261.

1981. *Labeo gonius*, Jayaram, *Handbk. Freshw. Fish. India* : 118, 120 (distribution and key to species).

Local name : Mosoo (Telegu).

Material examined : 4 exs., 115 mm-135 mm TL. ; Godavari river, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 30.8.83.

Diagnostic features : D. 15-17 (2-3/13-14), P. 17, V. 9, A. 7 (2/5), C. 19, LL. 71-84.

Head length 5.00 to 5.50 and body depth 4.00 to 4.50 in total length. Eye diameter 4.50 to 5.00 in head length. Dorsal profile more convex than ventral profile. Lips thick,

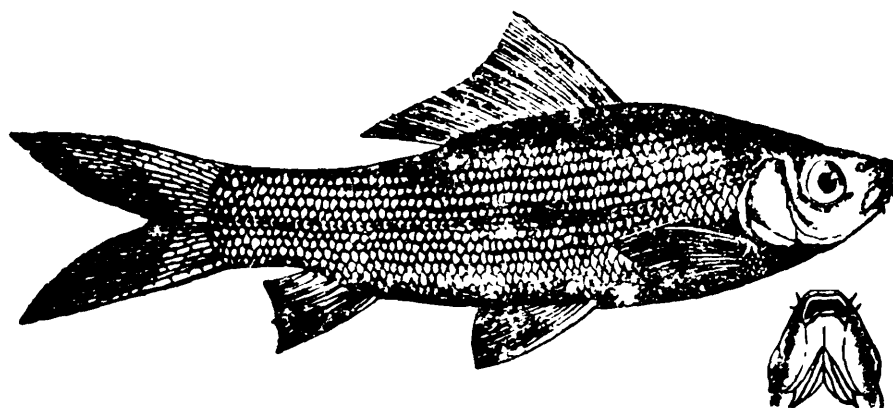


Fig. 59 : *Labeo gonius* (Hamilton Buchanan)

Top : Lateral view Bottom : Ventral view of head region

fringed, horny covering inside of both jaws. Snout with numerous pores. Barbels 2 pairs,

rostral and maxillary pair but short. Dorsal fin commences nearer to snout tip than the base of caudal fin. Pectoral fin length almost equal to head length. Pelvic fin originates below middle of dorsal fin. Caudal fin deeply forked. 9 to 13 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Dorsal surface greenish grey becoming light below. Scales darkest at their margins, many with red lunules on them.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh and Burma.

Size : It attains almost 1,524 mm (5 feet) in total length.

Fishery information : This fish is extensively used for stocking tanks.

Labeo kawrus (Sykes, 1841)

1841. *Chondrostoma kawrus* Sykes, *Trans. zool. Soc. Lond.*, 2 : 358, pl. 62, fig. 2 (type-locality : Poona, Maharashtra).

1878. *Labeo kawrus*, Day, *Fish. India* : 545, pl. 131, fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 272, 273.

1981. *Labeo kawrus*, Jayaram, *Handbk. Freshw. Fish. India* : 118, 119 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 11 (2/9), P. 17, V 9, A. 7 (2/5), C. 19, LL. 38.

Head length 5.50 to 6.00 and body depth 5.25 to 5.50 in total length. Eye diameter 3.50 to 3.75 in head length. Dorsal and ventral profiles almost equally convex. Snout very obtuse and overhanging the jaws. Lips continuous at the angle of mouth, the lower one very thin and reflected off the mandible which is rounded and has a thin cartilaginous covering, edges of lips smooth. Barbles 1 pair, maxillary, very short. Dorsal fin inserted

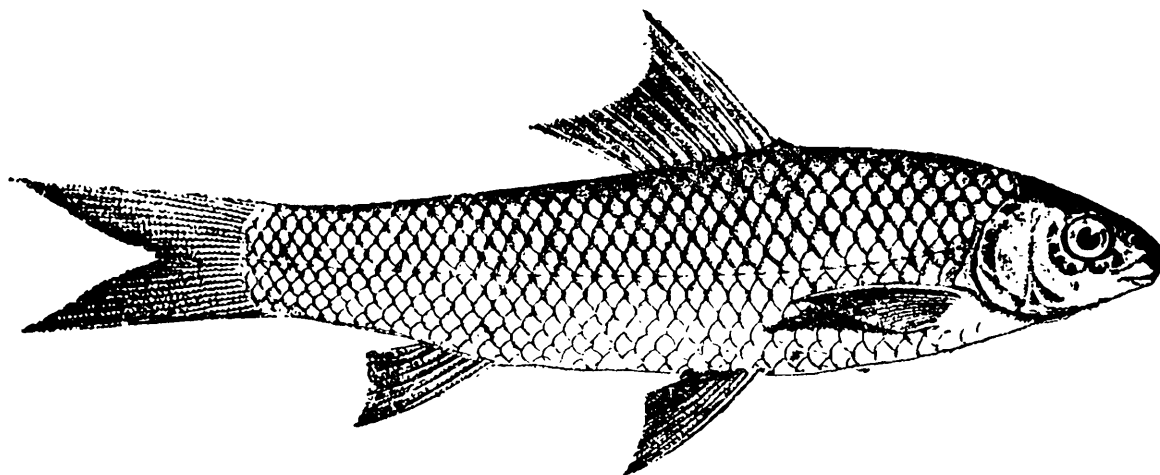


Fig. 60 : *Labeo kawrus* (Sykes)

between tip of snout and posterior extremity of base of anal fin, its upper edge concave. Pectoral fin almost equal to head. Caudal fin deeply forked. $4\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Body silvery, dorsal and caudal fins externally stained with grey. Sometimes a dark blotch on the scales near the commencement of lateral line.

Distribution : India : Maharashtra, Karnataka and Andhra Pradesh.

Size : It attains 175 mm (7 inches) in total length.

Remarks : It is a very common species of the Krishna river systems.

***Labeo pangusia* (Hamilton Buchanan, 1822)**

1822. *Cyprinus pangusia* Hamilton Buchanan, *Fish. Ganges* : 285, 386 (type-locality : Kosi river).

1878. *Labeo pangusia*, Day, *Fish. India* : 541, pl. 131, fig. 1 ; 1889, *Day Fauna Br. India, Fish.* 1 : 266

1981. *Labeo pangusia*, Jayaram, *Handbk. Freshw. Fish. India* : 118, 119 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by David (1963a) from Dummuguden weir and Rajamundry in the Godavari river, Andhra Pradesh.

Diagnostic features : D. 13 (2/11), P. 15, V. 9, A. 7(2/5), C. 19, LL. 40-42.

Head length 5.75 to 6.00 and body depth 4.50 in total length. Eye diameter 4.50 to 5.50 in head length. Dorsal profile more convex than ventral profile. Snout obtuse, covered with large pores, projecting over the jaw and having a very distinct lateral lobe. Lips not fringed, but thick, with a distinct inner fold which is not continued across the

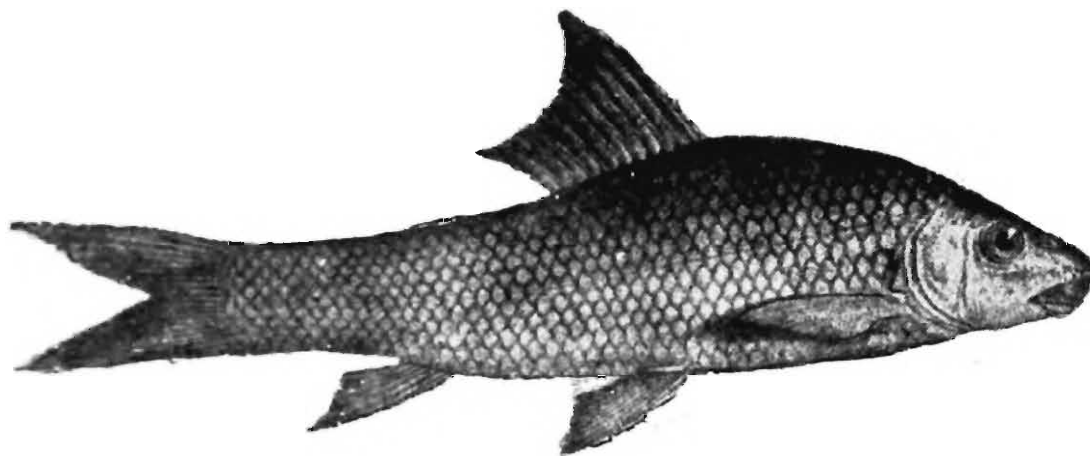


Fig. 61 : *Labeo pangusia* (Hamilton Buchanan)

lower jaw. A cartilaginous covering to inner surface of both lips. Barbels 1 short maxillary pair. Dorsal fin inserted distinctly nearer to tip of snout than to the base of caudal fin. Caudal fin deeply forked. $5\frac{1}{2}$ to 6 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Body dull green, becoming lighter on the sides and below. Sometimes the base of each scale has a dark spot.

Distribution : India : Assam, West Bengal, Deccan. Bangladesh. Pakistan and Burma.

Size : Largest recorded specimens 650 mm (25.6 inches) in total length.

Remarks : It appears to me it is a rare species in the Godavari river systems.

***Labeo porcellus* (Heckel, 1844)**

1844. *Tylognathus porcellus* Heckel, *Fish. Kashmir*, 4 : 385 (type-locality : Bombay, Maharashtra).

1877. *Labeo porcellus*, Day, *Fish. India* : 539, pl. 128, fig. 1 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 263.

1981. *Labeo porcellus*, Jayaram, *Handbk. Freshw. Fish. India* : 118, 121 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by David (1963a) from both the rivers of Godavari and Krishna, Andhra Pradesh.

Diagnostic features : D. 15-16 (2/13-14), P. 17, V. 9, A. 7 (2/5). C. 19, LL. 39.

Head length 6.00 and body depth 4.50 in total length. Eye diameter 5.00 in head length. Dorsal profile more convex than ventral profile. Snout rather projecting. Lips

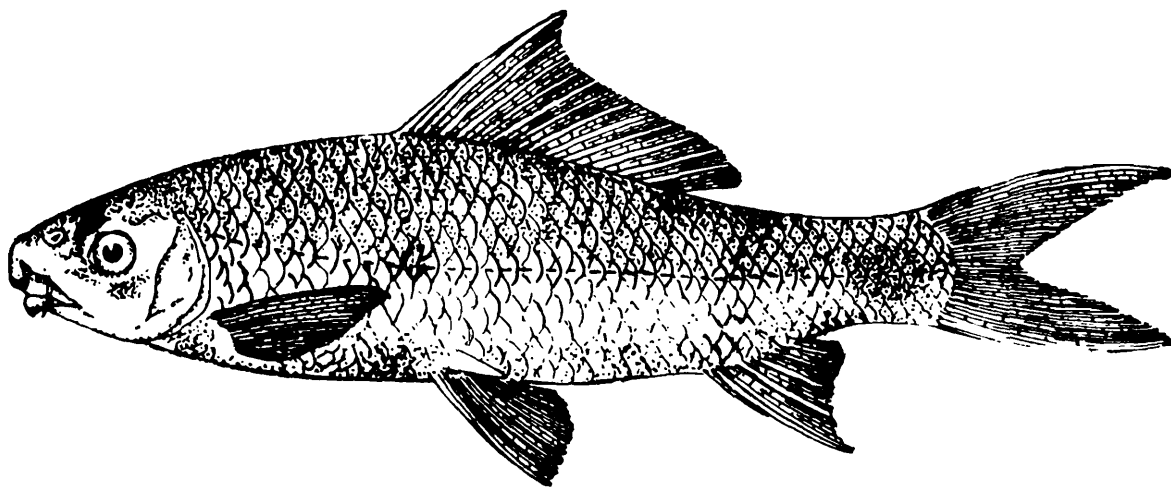


Fig. 62 : *Labeo porcellus* (Heckel)

thick, with a distinct inner fold to both jaws which have each a thin cartilaginous internal covering. Barbels 2 pairs, maxillary pair rather longer than rostral pair. Dorsal fin commences midway between the tip of snout and posterior end of anal fin base. 5 rows of scales between lateral line and pelvic fin base. Caudal fin forked.

Colour in alcohol : Dorsal surface greyish becoming dull white below. Most of the scales darkest at their edges. A dark spot, usually present at caudal fin base. Behind

the centre of opercle a bluish spot which may be continued on the shoulder. Fins greyish, darkest along their centres.

Distribution : India : Poona, Maharashtra and Andhra Pradesh. Sri Lanka.

Size : It attains 630 mm (26½ inches) in total length.

Remarks : It is a very common species occurring in both the Godavari and Krishna river systems.

Labeo potail (Sykes, 1841)

1841. *Cyprinus potail* Sykes, *Trans. zool. Soc. Lond.*, 2 : 354 (type-locality : Beema river, Maharashtra).

1878. *Labeo potail*, Day, *Fish. India* : 539, pl. 127, fig. 3 ; 1889, *Fauna Br. India, Fish.* 1 : 264.

1901, *Labeo potail*, Jayaram, *Handbk. Freshw. Fish. India* : 118, 121 (distribution and key to species).

Local name : *Baman-chappra* (Telegu).

Material examined : No specimen obtained by me. It was recorded by David (1963a) from both the rivers of Godavari and Krishna, Andhra Pradesh.

Diagnostic features : D. 13-14 (2/11-12), P. 17, V. 9, A (2/5), C. 19, LL. 39-40.

Head length 5.50 and body depth 4.00 to 4.50 in total length. Eye diameter 4.00 to 6.00 in head length. Dorsal profile more convex than ventral profile. Snout smooth or with

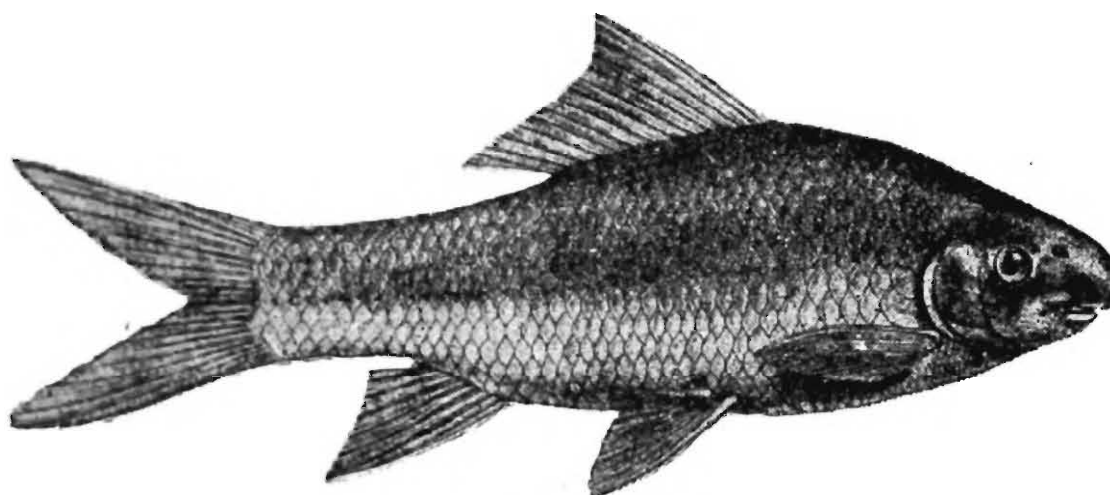


Fig. 63 : *Labeo potail* (Sykes)

pores, overhanging the mouth, with a slightly produced lateral lobe. Lobes labial fold entire, a deep groove existing across the chin. A cartilaginous covering to inner side of both jaws. Barbels 1 maxillary pair. Dorsal fin commences distinctly nearer to tip of snout than base of caudal fin which is deeply forked with upper lobe longer. 5½ rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Body greyish, each scale with a red mark. Fins stained grey

along their margins and in the centre of dorsal fin.

Distribution : India : Poona to Thungabhadra, Andhra Pradesh and Deccan.

Sizes : It attains 250 mm (10 inches) in total length.

Remarks : It is a very common species occurring in both the Godavari and Krishna river systems. This fish has been designated as a threatened species of India.

***Labeo rohita* (Hamilton Buchanan, 1822)**

1822. *Cyprinus rohita* Hamilton Buchanan, *Fish. Ganges*: 301, 388, pl. 36, fig. 85 (type-locality: freshwater rivers of Gangetic Provinces).

1877. *Labeo rohita*, Day, *Fish India*: 538, pl. 127, fig. 4; 1889, Day, *Fauna Br. India. Fish*, 1: 262.

1981. *Labeo rohita*, Jayaram, *Handbk. Freshw. Fish. India*: 118, 120 (distribution and key to species).

Local name : Nil.

Common name : Rohu (English).

Material examined : (i) 1 ex., 145 mm TL.; Godavari river, Khammam district, Andhra Pradesh; R. P. Barman and party; 30.8.83 (ii) 2 exs., 195 mm-197 mm TL.; Krishna river, Mahbubnagar district, Andhra Pradesh; R. P. Barman and party; 15.12.84 (iii) 3 exs., 210 mm-230 mm TL.; Kolleru Lake, West Godavari district, Andhra Pradesh; R. P. Barman and party; 5.6.87.

Diagnostic features : D. 15-16 (3/12-13), P. 17, V. 9, A. 7 (2/5), LL. 40-42.

Head length 4.50 to 5.00 and body depth 4.50 in total length. Eye diameter 4.00 to 6.00 in head length. Dorsal profile more convex than ventral profile. Lips thick, fringed, with a distinct inner fold above and below. Snout obtuse, depressed. Barbels a short, thin

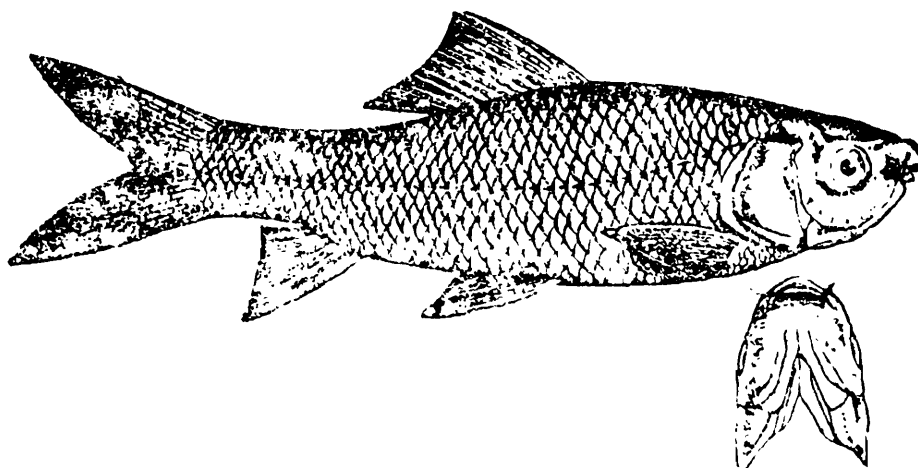


Fig. 64: *Labeo rohita* (Hamilton Buchanan)

Top: Lateral view Bottom: Ventral view of head region

maxillary pair and sometimes a rostral pair present. Dorsal fin originates almost midway between tip of snout and base of caudal fin, Caudal fin deeply forked. 6 to 6½ rows

of scales between lateral line base of pelvic fin.

Colour in alcohol : Dorsal surface bluish or brownish, becoming silvery on sides and ventral surface. Fins sometimes black.

Size : It attains 914 mm (3 feet) in total length.

Fishery information : This is one of the most commercially important fish of India. It is widely cultured and chiefly used in stocking tanks all over India. This is riverine in nature but can be cultivated in tanks, bherries, cannals and beels.

Genus Tor Gray, 1833-34.

Mahaseers

1833-34. *Tor* Gray, *Illustrations of Indian Zoology*, 2 : 96 (type-species : *Cyprinus tor* Hamilton=*Tor hamiltoni* Gray, monotypic),

1981. *Tor*, Jayaram, *Handbk. Freshw. Fish. India* : 123, 124 (genus characters and distribution).

Body elongated and compressed with rounded abdomen. Lips fleshy, continuous at the angle of mouth. Posterior lip with or without a median lobe and the post labial groove continuous, lip condition variable. Barbels 2 pairs, a pair each of maxillary and rostral. Dorsal fin inserted above pelvic fin, with 12 to 13 soft rays and a strong, stout, smooth spine. A scaly sheath present at the base of dorsal fin. Anal fin with 7 to 8 rays (5 branched). Caudal fin forked. Lateral line complete, with 23 to 28 scales.

Key to the species

Head length equal to body depth. Anal fin rays 9	...	<i>T. khudree</i>
Head length less than body depth. Anal fin rays 8	...	<i>T. mussullah</i>

Tor khudree (Sykes, 1838)

1838. *Barbus khudree* Sykes, *Proc. zool. Soc. Lond.* : 159 (type-locality : Mulla-Mutha river, Poona).

1981. *Tor khudree*, Jayaram, *Handbk. Freshw. Fish. India* : 124, 126 (distribution and key to species).

Local name : Kudls, Poomeen, Peruval (Telugu).

Common name : Kudree mahaseer (English).

Material examined : (i) 4 exs., 125 mm.-210 mm. TL. ; Godavari river, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 29.8.83. (ii) 1 ex., 168 mm. TL. ; Manjira river, Medak district, Andhra Pradesh ; R. P. Barman and party ; 12.12.84.

Diagnostic features : D. 13 (4/9), P. 15, V. 9, A. 9 (2/7), C. 19, LL. 25-27.

Head length 4.50 to 4.75 and body depth 4.30 to 4.60 in total length. Eye diameter 5.50 to 7.00 in head length. The lateral sides of snout and suborbital region tuberculated. Lips fleshy, thick with labial fold continuous. Barbels 2 pairs, longer than the orbit.

Dorsal fin commences opposite to pelvic fin, dorsal spine strong and smooth. 3 to 4 rows of scales between lateral line and base of pelvic fin. Caudal fin deeply forked.

Colour in alcohol : Dorsal surface dark olive becoming creamy, yellowish white beneath. Fins bluish grey, usually tipped yellowish pink.

Distribution : India : Uttar Pradesh, Madhya Pradesh, Orissa, Andhra Pradesh, Arunachal Pradesh and Peninsular India.

Size : It attains 1,447 mm. (4 feet and 9 inches) in total length.

Fishery information : This is an important fish for angling and good eating. It can be cultured in ponds and lakes. It is one of the game fishes of India.

Remarks : This species was recorded by me (in Datta and Barman, 1985) from Arunachal Pradesh.

Tor mussullah (Sykes, 1838)

1838. *Barbus mussullah* Sykes, *Proc. zool. Soc. Lond.*, : 154 (type-locality : Sisur on the Ghod river).

1981. *Tor mussullah*, Jayaram, *Handbk. Freshw. Fish. India* : 124, 125 (distribution and key to species).

Local name : Nil.

Material examined : 3 exs., 210 mm-235 mm TL. ; Krishna river, Mahbubnagar district, Andhra Pradesh ; R. P. Barman and party ; 15.12.84.

Diagnostic features : D. 13 (4/9), P. 16, V. 9, A. 8 (3/5), C. 19, LL. 25-26.

Head length 4.50 to 5.00 and body depth 3.50 to 3.75 in total length. Eye diameter 6.00 in head length. The lateral sides of snout and suborbital region tuberculated. Lips fleshy, thick with labial fold continuous. Barbels 2 pairs, maxillary pair longer than

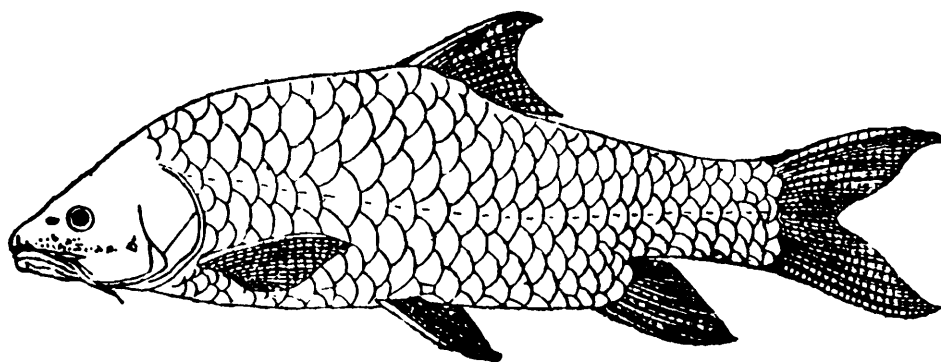


Fig. 65 : *Tor mussullah* (Sykes)

rostral pair. Dorsal fin origin opposite to pelvic fin, dorsal spine strong and smooth. $3\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin. Caudal fin forked.

Colour in alcohol : Dorsal surface dark bronze and reddish cream below. Young specimens rather silvery at sides shot with pink. Fins reddish grey with bright blue streaks.

Distribution : India : Peninsular India.

Size : It attains 1.219 mm (4 feet) in total length.

Remarks : It is an another game fish of India. This species is closely related to *Tor tor* (Hamilton). Hora (1942a) gave a redescription of this species.

Genus *Cirrhinus* Oken, 1817.

1817. *Cirrhinus* (Oken), Cuvier, *Regne Animal.*, 2 ed. 1 : 193 (type-species : *Cyprinus cirrhosus* Bloch).

1981. *Cirrhinus*, Jayaram, *Handbk. Freshw. Fish. India* : 126 (genus characters and key to species).

Body elongated and compressed with rounded abdomen. Mouth transverse. Upper lip fringed or entire not continuous with lower. Lower jaw sharp with a small tubercle at the symphysis. Barbels 2 pairs, 1 pair or absent. Dorsal fin with 10 to 19 soft rays and no spine. Anal fin with 7 to 8 rays. Caudal fin forked. Lateral line scales with 35 to 45 scales.

Key to the species

1. Dorsal fin with 8 to 9 branched rays	...	...	2.
Dorsal fin with 12 or more branched rays	...	...	3.
2. Dorsal fin almost equal to body depth. Lateral line scales 44 to 48	...	...	<i>C. fulungee</i>
Dorsal fin less than body depth. Lateral line scales 35 to 38	...	...	<i>C. reba</i>
3. Barbels 2 pairs	...	...	<i>C. cirrhosa</i>
Barbels 1 pair	...	...	4.
4. Dorsal fin with 17 to 19 rays. Lateral line scales 44 to 46	...	...	<i>C. horai</i>
Dorsal fin with 15 to 16 rays. Lateral line scales 40 to 45	...	...	<i>C. mrigala</i>

Cirrhinus cirrhosa (Bloch, 1797)

1797. *Cyprinus cirrhosa* Bloch, *Ichth.*, 12 : 52, fig. 411 (type-locality : the Cauvery).

1878. *Cirrhina cirrhosa*. Day, *Fish. India* : 547, pl. 131, fig. 3 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 277.

1981. *Cirrhinus cirrhosa*, Jayaram, *Handbk. Freshw. Fish. India* : 127 (distribution and key to species).

Local name : *Aruzu* (Telugu).

Common name : White carp (English).

Material examined : 2 exs., 125 mm–158 mm TL. ; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 31.5.87.

Diagnostic features : D. 17-19 (3-4/14-15), P. 19, V. 9, A. 8 (3/5), C. 19, LL. 42-44.

Head length 5.50 to 6.00 and body depth 4.50 to 5.00 in total length. Eye diameter 3.00 to 3.50 in head length. Upper lip entire. Barbels 2 pairs, maxillary pair equal to one third of the orbit and rostral pair slightly longer. Height of dorsal fin equal to body depth, its origin considerably in advance of pelvic fin and midway between tip of snout

and posterior end of anal fin base, first few dorsal rays often elongated in some large specimens. $5\frac{1}{2}$ to $6\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin. Caudal fin deeply forked or lunate.

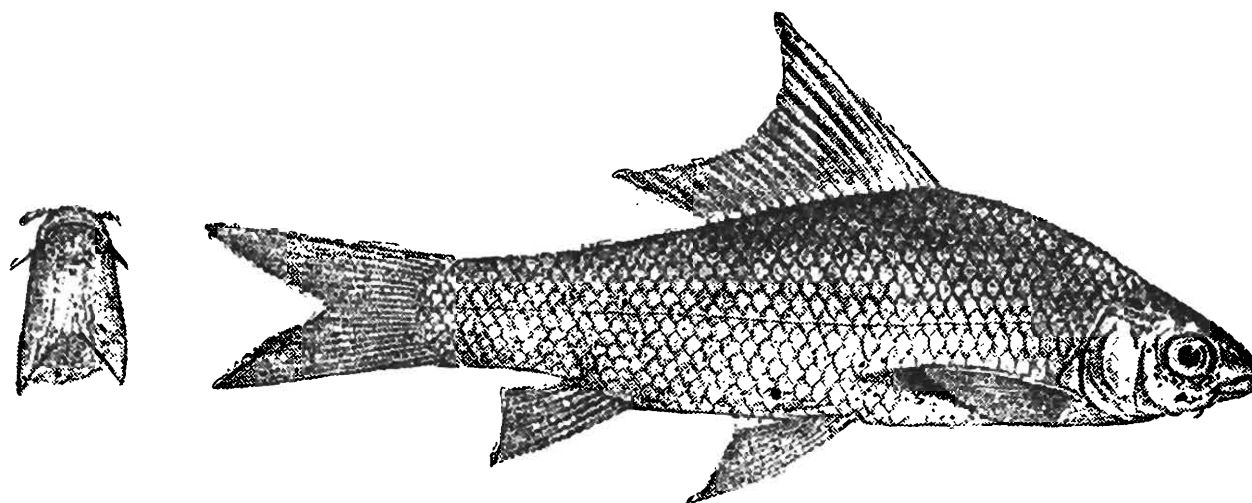


Fig. 66 : *Cirrhinus cirrhosa* (Bloch)

Left : Ventral view of head region Right : Lateral view

Colour in alcohol : Silvery, every scale having a red centre except along the abdomen where it is dull yellowish white. Dorsal, caudal and outer portions of pectoral and anal fins stained with grey.

Distribution : India : The Cauvery, Krishna, and Godavari river systems, South India.

Size : It attains 457 mm. ($1\frac{1}{2}$ feet) in total length.

Remarks : This fish has been designated as a threatened species of India.

***Cirrhinus fulungee* (Sykes, 1841)**

1841. *Chondrostoma fulungee* Sykes, *Trans. zool. Soc. Lond.*, 2 : 358 (type-locality : Poona waterways).

1878. *Cirrhina fulungee*, Day, *Fish. India* : 549. pl. 132, fig. 1 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 280.

1981. *Cirrhinus fulungee*, Jayaram, *Handbk. Freshw. Fish. India* : 127 (distribution and key to species).

Local name : Nil.

Material examined : 2 exs., 125 mm-140 mm. TL.; Krishna river, Mahbubnagar district, Andhra Pradesh ; R. P. Barman and party ; 15.12.84.

Diagnostic features : D. 10 (2/8), P. 15, V. 9, A. 7 (2/5), C. 19, LL. 44-48.

Head length 5.50 to 5.75 and body depth 5.25 to 5.50 in total length. Eye diameter 3.00 to 3.20 in head length. Upper lip entire. Lower jaw with a tubercle above the symphysis. Barbels 1 pair, only the rostral pair present. Dorsal fin almost equal to body depth, it commences midway between snout tip and posterior end of anal fin base. $6\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin. Caudal fin deeply forked.

Colour in alcohol : Dorsal surface brownish grey and silvery abdomen with a light bluish lateral band. Dorsal and caudal fin stained grey.



Fig. 67 : *Cirrhinus fulungee* (Sykes)

Distribution : India : Andhra Pradesh, Maharashtra, Madhya Pradesh, Karnataka and Tamil Nadu.

Size : It attains 304 mm (1 foot) in total length.

Remarks : It is a very common species of the Krishna river systems.

***Cirrhinus horai* Lakhmanan, 1966**

1966. *Cirrhinus horai* Lakhmanan, *J. zool. Soc. India* : 16 (1 & 2) : 59-64 (type-locality : River Godavari, Rajamundry, Andhra Pradesh).

1981. *Cirrhinus horai*, Jayaram, *Handbk. Freshw. Fish. India* : 127 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by Lakhmanan (1966) from the River Godavari.

Diagnostic features : D. 17-19 (2-3/15-16), P. 15-17, V. 9-11, A. 7 (2/5), C. 25-26, LL. 44-46.

Head length 5.50 to 6.30 and body depth 4.00 to 5.20 in total length. Eye diameter 2.80 to 4.80 in head length. Lower jaw with a symphysial knob, provided with sharp cutting edge with horny covering inside it. Barbels 1 pair, rostral, short. Dorsal fin situated in advance of pelvic fin, nearer to snout, being equidistant from snout tip and posterior margin of anal fin base. Dorsal fin ray elongated and height less than maximum depth of body. Caudal fin deeply forked. $5\frac{1}{2}$ to $6\frac{1}{2}$ rows of scales between lateral line and pelvic fin base.

Colour in alcohol : Dorsal surface silvery brown and ventral surface shining silvery.

Outer margins of dorsal and caudal fins black as dorsal fin rays. Pectoral and pelvic fins deep yellow but anal fin lighter. A conspicuous streak of orange colour along longest rays of lower lobe of caudal fin present.

Distribution : India : The river Godavari, Andhra Pradesh.

Size : It attains 395 mm (1 foot 3·7 inches) in total length.

Fishery information : This species appear in the commercial catches from the Godavari river along with *C. reba*, *C. mrigala*, *Labeo bata* and *Labeo fimbriatus*.

***Cirrhinus mrigala* (Hamilton Buchanan, 1822)**

1822. *Cyprinus mrigala* Hamilton Buchanan, *Fish. Ganges* : 279, 386, pl. 6, fig. 79 (type-locality : ponds and freshwater rivers of the Gangetic Provinces).

1878. *Cirrhina mrigala*, Day, *Fish. India* : 457, pl. 129, fig. 4 ; 1889. Day, *Fauna Br. India, Fish*, 1 : 278.

1981. *Cirrhinus mrigala*, Jayaram, *Hakdbk. Freshw. Fish. India* : 127 (distribution and key to species).

Local name : Yerra mosu. Bellalamosu (Telegu).

Common name : Mrigal (English).

Material examined : (i) 1 ex., 118 mm TL. ; Godavari river, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 8.12.14. (ii) 2 exs., 290 mm-295 mm TL. ; Manjira river, Medak district, Andhra Pradesh ; R. P. Barman and party ; 12.12.84. (iii) 5 exs., 125 mm-140 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 6.6.87.

Diagnostic features : D. 15-16 (3/12-13), P. 15, V. 9, A. 8 (3/5), C. 19, LL. 40-45.

Head length 5·00 to 5·25 and body depth 4·00 to 5·50 in total length. Eye diameter 3·50 to 4·00 in head length. Upper lip entire. Barbels 1 pair, rostral, present. Height of

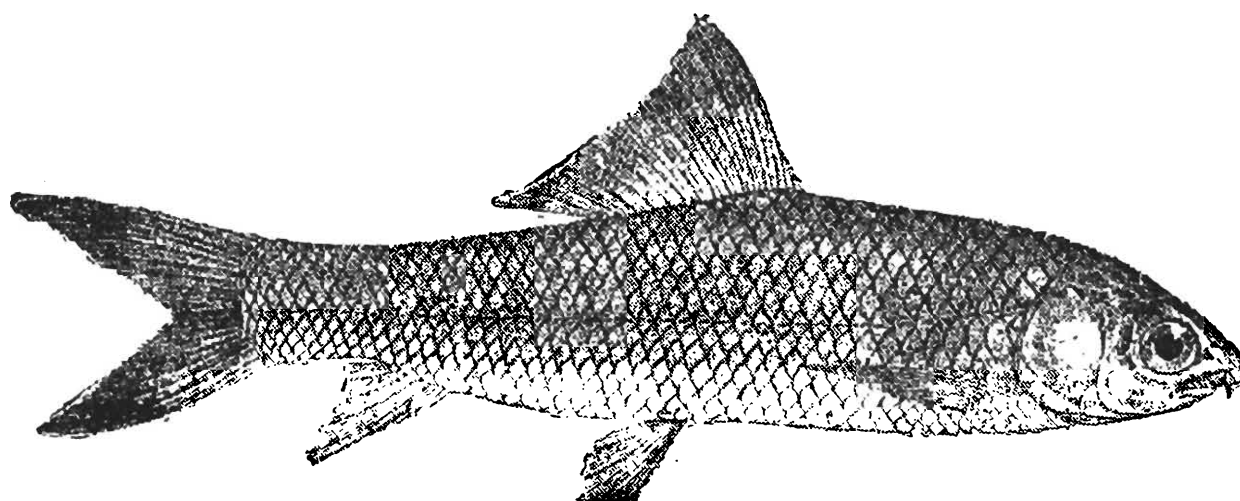


Fig. 68 : *Cirrhinus mrigala* (Hamilton Buchanan)

dorsal fin almost equal to body depth, its origin much in advance of pelvic fin origin,

nearer to snout tip than to caudal fin base. Caudal fin deeply forked. $5\frac{1}{2}$ to 6 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Dorsal surface silvery dark grey, sometimes having a coppery tinge. Pectoral, pelvic and anal fin orange stained with black.

Distribution : Throughout India, Pakistan, Bangladesh and Burma.

Size : It attains 914 mm (3 feet) in total length.

Fishery information : This species is very widely introduced into many river systems, reservoirs and tanks. In fact, it is an excellent species for stocking tanks and reservoirs all over India. Being a popular game fish it offers good sport on the rod.

Remarks : It is a very common species occurring in both the Godavari and Krishna river systems.

***Cirrhinus reba* (Hamilton Buchanan, 1822)**

1822. *Cyprinus reba* Hamilton Buchanan, *Fish. Ganges* : 280, 386 (type-locality : rivers and ponds of Bengal and Bihar).

1878. *Cirrhina reba*, Day, *Fish. India* : 549, pl. 130, fig. 3 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 279, fig. 96.

1981. *Cirrhinus reba*, Jayaram, *Handbk. Freshw. Fish. India* : 127 (distribution and key to species).

Local name : Arju, Yerra thoka mosu, Eele mosu, Chittahri, Chittrai (Telugu).

Common name : Reba (English).

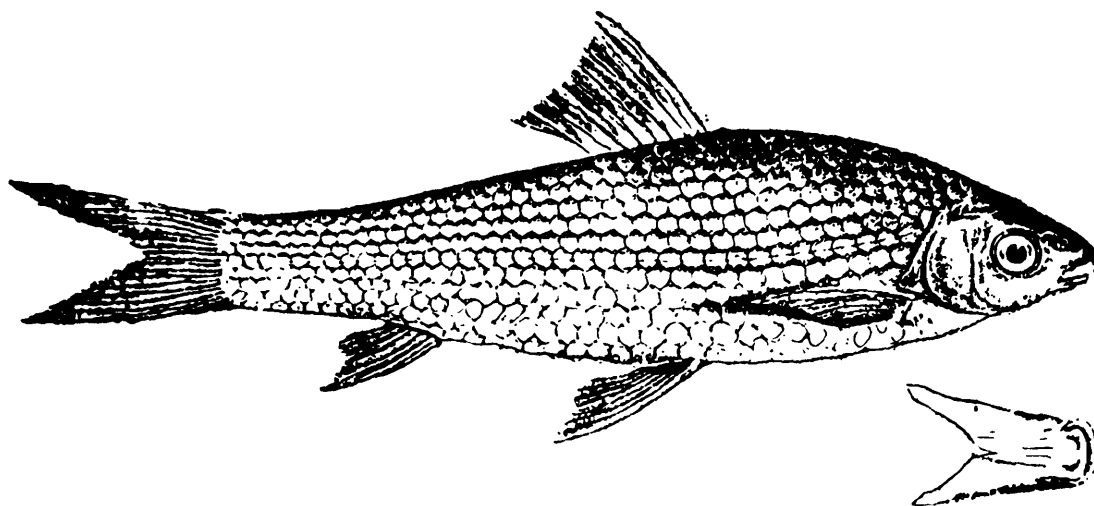


Fig. 69 : *Cirrhinus reba* (Hamilton Buchanan)
Top : Lateral view Bottom : Ventral view of head region

Material examined : (i) 1 ex., 197 mm TL. Manair Project, Karimnagar district, Andhra Pradesh ; R. P. Barman and party ; 4.9.83. (ii) 3 exs., 120 mm-126 mm TL. ; K. C Canal, Kurnool district, Andhra Pradesh ; R. P. Barman and party ; 9.12.85,

(iii) 22 exs., 117 mm-140 mm TL. ; Godavari river, Rajamundry, East Godavari district Andhra Pradesh ; R. P. Barman and party ; 31.5.87, 1.6.87, 3.6.87 (iv) 2 exs., 138 mm-158 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 6.6.87.

Diagnostic features : D. 10-11 (2-3/8-9), P. 16, V. 9, A. 8 (3/5), C. 19, LL. 35-38.

Head length 5.50 to 6.50 and body depth 5.00 to 5.45 in total length. Eye diameter 4.00 to 4.25 in head length. Upper lip fringed in young specimens and often entire in the adult. A thin cartilaginous layer covering inside of lower jaw. Barbels 1 pair, only the rostral pair present. Dorsal fin origin anterior to pelvic fin origin, nearer to tip of snout than to base of caudal fin. Caudal fin deeply forked. 5 to 6 rows of scales between lateral line and base of pelvic fin.

Colour in alcohol ; Silvery, scales generally darkest at their edges forming bluish longitudinal bands above lateral line. The young specimens have sometimes a leaden coloured lateral bands along the sides or even a black tip to the dorsal fin.

Distribution : Throughout India, Pakistan, Nepal and Bangladesh.

Size : It attains 304 mm (1 foot) in total length.

Fishery information : This species appear in the commercial catches of Tungabhadra, Nagarjunsagar and Nizamsagar reservoirs. It is a common species found almost all over Andhra Pradesh.

Genus *Osteocheilus* Günther, 1868.

1868. *Osteochilus* Günther, *Cat. Fish. Br. Mus.*, 7 ; 40 (type-species : *Rohita melanopleura* Bleeker).

1942. *Osteochilichthys*, Hora, *Rec. Indian Mus.*, 44 : 1-10 (revision).

1981. *Osteocheilus*, Jayaram, *Handbk. Freshw. Fish. India* : 127, 128 (genus characters and distribution).

Body short, deep with rounded abdomen. Lower lip broadly confluent with isthmus. No labial fold. Lower jaw with a sharp transverse bony edge, may or may not be covered by lip. Barbels 1 or 2 pairs or none. Dorsal fin inserted almost above tip of pectoral fin, with 13 to 21 (10 to 18 branched) soft rays and with a spine (subgenus *Kantaka* Hora) or without a spine (subgenus *Osteochilichthys*). Anal fin short with 7 to 8 rays (5 or 6 branched). Caudal fin forked. Lateral line complete with 33 to 43 scales.

Key to the species

Lateral line scales 39. Body depth 3.50 in total length.	...	<i>O. thomassi</i>
Lateral line scales 40 to 43. Body depth 4.00 to 5.00 in total length	...	<i>O. nashii</i>

***Osteochellus (Osteochilichthys) nashii* (Day, 1868)**

1868. *Barbus nashii* Day, *Proc. zool. Soc. Lond.* : 584 (type-locality : Coorg district, Karnataka).
 1889. *Scaphiodon nashii* Day, *Fauna Br. India, Fish*, 1 : 285.
 1981. *Osteochellus (Osteochilichthys) nashii*, Jayaram, *Handbk. Freshw. Fish Fish. India* : 129 (distribution key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by David (1963a) from the river Krishna, Andhra Pradesh.

Diagnostic features : D. 13-15 (2-3/11-12), P. 15, V. 9, A. 7 (2/5), C. 20, LL. 40-43.

Head length 5.25 to 6.00 and body depth 4.00 to 5.00 in total length. Eye diameter 3.00 to 4.00 in head length. Snout broadly acute, with papillae in adults, overhanging

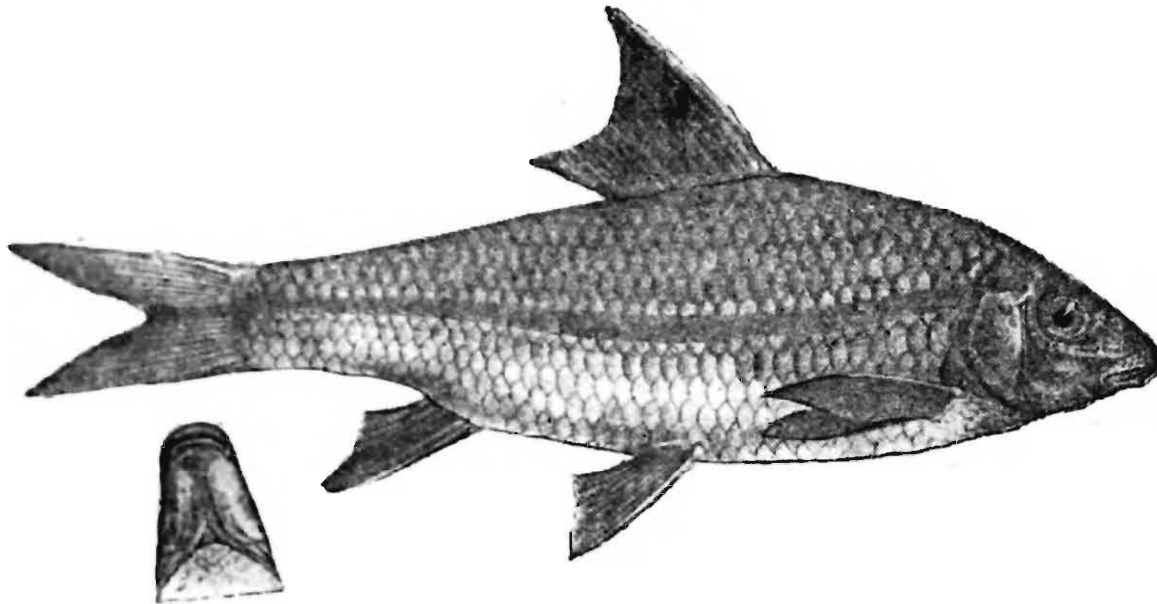


Fig. 70 : *Osteochellus nashii* (Day)
Top : Lateral view Bottom : Ventral view of head region

mouth. Mouth transverse. Lips thin, not continuous in adults. A thick internal horny covering to lower jaw in adults. Barbels absent. Dorsal fin origin nearer to snout than to caudal fin base, last undivided dorsal ray articulated. Pelvic fin origin below middle of dorsal fin. Caudal fin deeply forked. $4\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Reddish brown above, silvery below. A black band from eye to centre of caudal fin. Young specimens silvery grey superiorly and silvery below, with the lateral band terminating in a black blotch at the caudal fin base. Dorsal and anal fins with dark band.

Distribution : India : Karnataka and Andhra Pradesh,

Size : It attains at least 165mm ($6\frac{1}{2}$ inches) in total length.

Remarks : It is a common species of the Krishna river systems.

***Osteocheilus (Osteochilichthys) thomassi* (Day, 1877)**

1877. *Scaphiodon thomassi* Day, *Fish. India* : 551, pl. 134, fig. 1 (type-locality : South Canara).

1889. *Scaphiodon thomassi* Day, *Fauna Br. India, Fish*, 1 : 285.

1981. *Osteocheilus (Osteochilichthys) thomassi*, Jayaram, *Handbk. Freshw. India* : 129 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 14-15 (3/11-12), P. 16, V. 9, A. 8 (2/6), C. 19, LL. 39.

Head length 5.25 to 6.00 and body depth 3.50 in total length. Eye diameter 4.30 in head length. Snout obtuse with large pores, overhanging mouth. Mouth transverse.

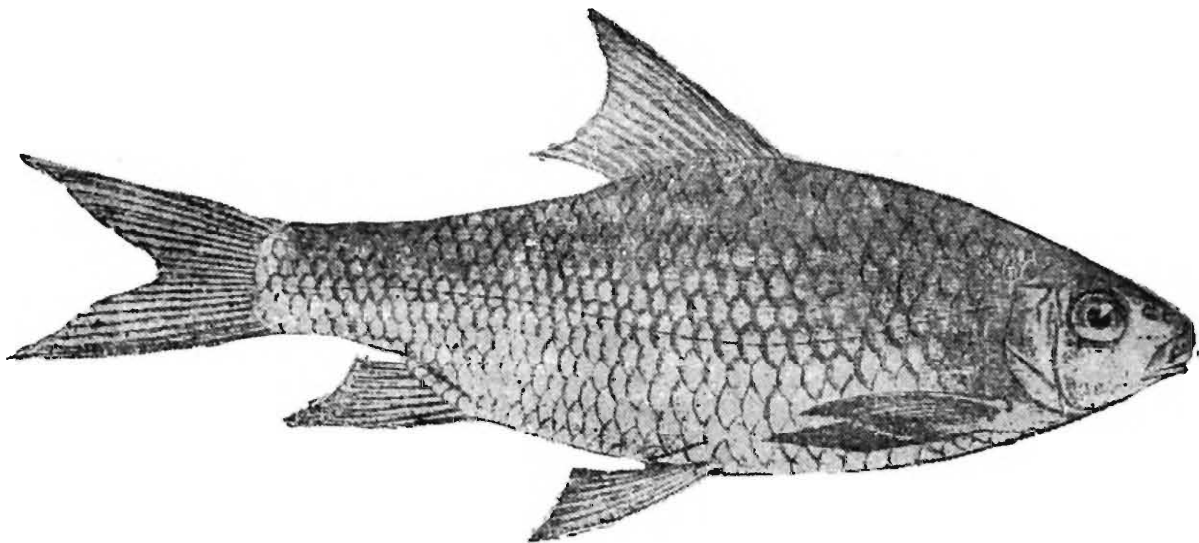


Fig. 71 : *Osteocheilus thomassi* (Day)

Lips not continuous, upper one fringed. A horny layer inside lower jaw. No barbels. Dorsal fin inserted nearer to snout than to caudal fin base, last undivided ray articulated. Pelvic fin origin below 4th or 5th dorsal fin ray. Caudal fin deeply forked. $4\frac{1}{2}$ rows of scales between lateral line and pelvic fin base.

Colour in alcohol : Dull silvery above and dull white below with a faint silvery lateral band. A dark band on dorsal fin.

Distribution : India : Karnataka and Andhra Pradesh.

Size : It attains at least 177 mm (7 inches) in total length.

Remarks : It is a common species of the Krishna river systems.

Genus *Catla* Valenciennes, 1844.

1844. *Catla* Valenciennes, *Hist. Nat. Poiss.*, 18 : 140 (type-species : *Cyprinus catla* Hamilton, by monotypy).

1981. *Catla*, Jayaram, *Handbk. Freshw. Fish. India* : 131 (genus characters and distribution).

Body deep, compressed with rounded abdomen. Mouth terminal without barbels. Upper lip absent. Lower jaw with a movable articulation at the symphysis, but without a prominent knob. Dorsal fin inserted above tip of pectoral fins, with 17 to 19 rays and no spine. Anal fin with 8 rays. Caudal fin forked. Lateral line complete, with 40 to 43 scales.

Only 1 species is known under the genus.

***Catla catla* (Hamilton Buchanan, 1822)**

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

1878. *Catla buechanani*, Day, *Fish. India* : 553, pl. 134, fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 287, fig. 99.

1981. *Catla catla*, Jayaram, *Handbk. Freshw. Fish. India* : 131 (distribution).

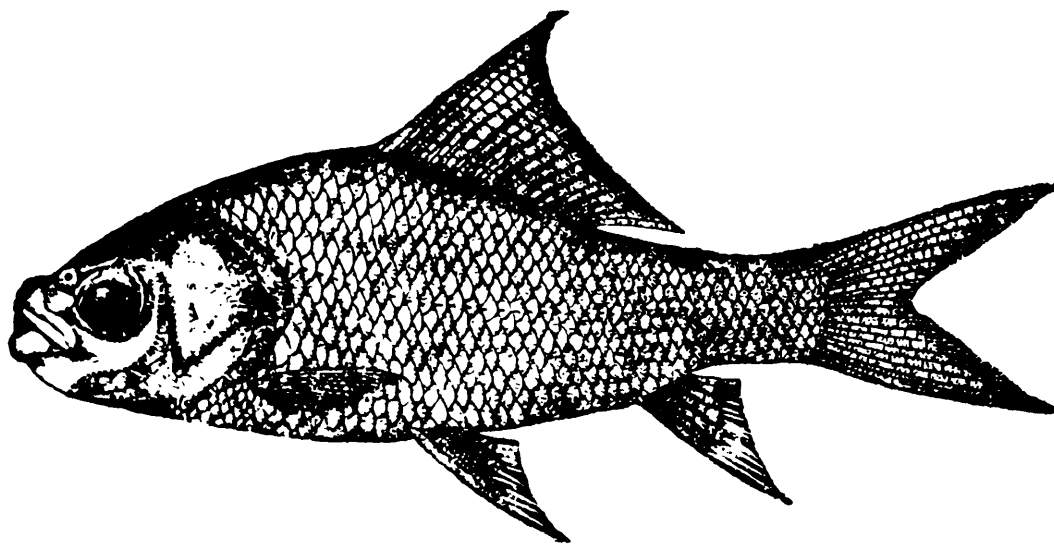


Fig. 72 : *Catla catla* (Hamilton Buchanan)

Local name : Botchee, Krishna botcha, Botcha (Telugu).

Common name : Catla (English).

Material examined : (i) 2 exs., 185 mm-310 mm TL. ; Manjira river, Medak district, Andhra Pradesh ; R. P. Barman and party ; 12.12.84. (ii) 2 exs., 124 mm-130

mm TL. ; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 1.6.87.

Diagnostic features : D. 17-19 (3-4/14-16), P. 21, V. 9, A. 8 (3/5), C. 19, LL. 40-43.

Head length 4.25 to 4.75 and body depth 3.00 to 3.50 in total length. Eye diameter 6.00 to 7.00 in head length. Dorsal profile more convex than ventral profile. Barbels absent. Dorsal fin inserted in advance of pelvic fin, nearer to tip of snout than to base of caudal fin. Caudal fin forked. $5\frac{1}{2}$ to $6\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Dorsal surface greyish, silvery on sides and ventral surface. Fins dark coloured.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Sri Lanka and Thailand.

Size : It attains 1,828 mm (6 feet) in total length.

Fishery information : This is one of the very important commercial fishes of India, Pakistan and Bangladesh. It is largely employed for stocking tanks. This fish is much esteemed as food when not exceeding two feet in length, larger ones are coarse. It resides in fresh or brackish water, being found within tidal influence.

Remarks : It is a very strong, active fish and often leaps over the seine of the fishermen, on account, when fishing for *Catla*, they usually follow the net in canoes and make a noise by shouting and splashing with their paddles (Hamilton, 1822).

Genus *Ctenopharyngodon* Steindachner, 1866.

Grass Carp, White Amur

1866. *Ctenopharyngodon* Steindachner, *Verh. zool. Bot. Ges. Wien.*, 16: 782 (type-species : *Ctenopharyngodon laticeps* Steindachner).

1981. *Ctenopharyngodon*, Jayaram, *Handbk. Freshw. Fish. India* : 131, 132 (genus descriptions and distribution).

Body more or less elongated, subcylindrical anteriorly and laterally compressed posteriorly, with rounded abdomen. Mouth terminal, cleft not extending to anterior border of the orbit. Upper jaw slightly longer than lower and protractile. Barbels absent. Dorsal fin inserted slightly in front of pelvic fins, nearer to snout tip than caudal fin base, with 10 rays (7 branched) and without a spine. Anal fin short, with 10 rays (8 branched). Caudal fin forked. Lateral line complete with 40 to 45 scales.

Ctenopharyngodon idella (Valenciennes, 1841)

1841. *Leuciscus idella* Valenciennes, *Hist. Nat. Poiss.*, 17 : 342 (type-locality : China).

1981. *Ctenopharyngodon idella*, Jayaram, *Handbk. Freshw. Fish. India* : 132 (distribution).

Local name : *Grass Carp* (English).

Material examined : No specimen was obtained me. This fish was introduced in various states of India along with Andhra Pradesh.

Diagnostic features : D. 10 (3/7), A. 11 (3/8), LL. 43-45.

Head length 4.00 to 4.50 and body depth 3.80 to 4.80 in standard length. Body elongated. Head broad with short rounded snout. Upper Jaw slightly longer than lower. Mouth small, subterminal. Barbels absent. Dorsal fin rounded, inserted somewhat ahead of pelvic fin base. Pelvic fins not reaching vent. Anal fin rounded. Lateral line running along the middle of body up to base of caudal peduncle. Caudal fin forked.

Colour in alcohol : Body dark grey above and silvery sides and abdomen. Fins dark. Base of each scale dark brown.

Distribution : Naturally found in Amur region (Siberia and Manchuria). China, U. S. S. R. lower reaches of River Amur. The first ever consignment of grass carp came

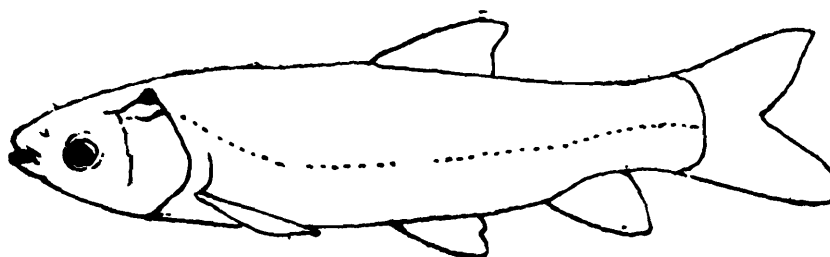


Fig. 73 : *Ctenopharyngodon idella* (Valenciennes)

to India from Hong Kong, originally brought to Hong Kong from mainland China and kept there stunted in ponds before being transplanted to India on 29th December, 1959 and thereafter was distributed to different states of India (Jhingran, 1983).

Size : Largest length reported is above 1200 mm (4 feet) in total length and weighing up to 32 kg.

Remarks : Grass carp, though a freshwater fish, is also able to tolerate slightly brackish water like silver carp. In Andhra Pradesh this exotic fish has been introduced in different districts by the State Fisheries Department.

Subfamily : GARRINAE

Mouth inferior. A suctional disc on ventral surface of head present or absent. Pectoral fin laterally inserted. Upper and lower lip may or may not be connected.

Key to the genera

Lower lip modified into a circular or elliptical sucking disc. Upper and lower lip continuous ... *Garra*
 Lower lip simple without any modification. Upper and lower lip not continuous ... *Crossocheilus*

Genus *Crossocheilus* van Hasselt, 1823.

1823. *Crossocheilus* van Hasselt, *Algem. Konst. Letterbode*, 2 : 132 (type-species : *Crossocheilus oblongus* van Hasselt).
 1981. *Crossocheilus*, Jayaram, *Handbk. Freshw. Fish, India* : 133-134 (genus characters and distribution).

Body somewhat elongated, with rounded abdomen. Upper and lower lip not continuous. Lower lip without any suctional disc. Barbels 1 pair, rostral. Dorsal fin inserted in the middle of pectoral and pelvic fins, considerably nearer to snout tip than to caudal fin base, with 10 to 11 soft rays and without any spine. Anal fin with 7 rays. Caudal fin deeply forked. Lateral line complete with 38 to 40 scales.

2 species are known under the genus from the Indian subcontinent, 1 species known from Andhra Pradesh.

Crossocheilus latius latius (Hamilton Buchanan, 1822)

1822. *Cyprinus latius* Hamilton Buchanan, *Fish. Ganges* : 345, 393 (type-locality : the Tista, North Bengal).
 1877. *Cirrhina latia*, Day, *Fish. India* : 548, pl. 130, fig. 4 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 279.
 1981. *Crossocheilus latius latius*, Jayaram, *Handbk. Freshw. Fish. India* : 134 (distribution and key to species).

Local name : Nil.

Material examined : (i) 1 ex., 160 mm TL. ; Godavari river, Karimnagar district, Andhra Pradesh ; R. P. Barman and party ; 2.9.83 (ii) 1 ex., 90 mm TL. ; Nizam sagar, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 9.12.84.

Diagnostic features : D. 10-11 (3/7-8), P. 15, V. 9, A. 7 (2/5), C. 19, LL. 38-40.

Head length 6.00 to 6.50 and body depth 5.50 to 7.00 in total length. Eye diameter 3.50 to 5.00 in head length. Snout overhanging mouth, with a small lateral lobe. Upper lip deeply indented on the edge. Lower lip with a sharp horny covering. Barbels 1 pair, rostral and sometimes another a short maxillary pair. Dorsal fin inserted in the middle of snout tip and caudal fin base in the young specimens but nearer to snout tip in the adult specimens. Caudal fin deeply forked, upper lobe sometimes the longer. $3\frac{1}{2}$ to $4\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin.

Colour in alcohol : Dorsal surface brownish olive and lighter on sides, with irregular black spots. Dorsal and caudal fins yellowish and other fins orange.

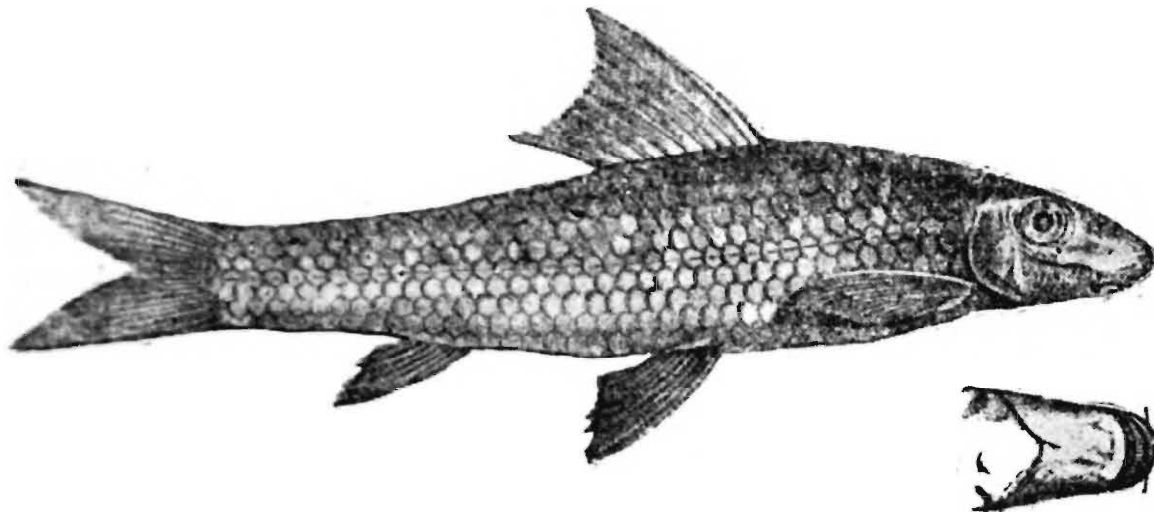


Fig. 74 : *Crossochellus latius latius* (Hamilton Buchanan)
Top : Lateral View Bottom : Ventral view of head region

Distribution : India : the Himalayas, Uttar Pradesh, Maharashtra, Punjab, Bihar, West Bengal, Orissa and Deccan.

Size : It attains 200 mm (8 inches) in total length.

Fishery information : This fish has less fishery value, usually consumed by the local poor people. In Andhra Pradesh this fish is found in the river Krishna and Gobavari.

Remarks : This species is highly variable in respect of head length and body depth. It has much the character of a loach or of a *Garra*, adhering to stones in river beds (Shaw and Shebbeare, 1937).

Genus *Garra* Hamilton Buchanan, 1822.

1822. *Garra* Hamilton Buchanan, *Fish. Ganges* : 343, 393 (type-species : *Garra lamta* Hamilton Buchanan).

1964. *Garra*, Menon, *Mem. Indian Mus.*, 14 : 173-260 (revision).

1981. *Garra*, Jayaram, *Handbk. Freshw. Fish. India* : 134-135 (genus description and distribution).

Body elongated, subcylindrical, compressed with rounded abdomen. A proboscis may be present. A suctorial disc of semi-cartilaginous pad present on the chin, formed on the lower lip. Jaws sub-equal. Barbels 1 or 2 pairs. Dorsal fin inserted slightly before pelvic fins, with 9 to 12 rays and no spine. Anal fin with 6 to 8 rays. Paired fins horizontal, not plaited. Lateral line complete with 32 to 40 scales. Caudal fin emerginate or forked,

Menon (1964) revised the fishes of this genus.

Key to the species

1. Proboscis present, well-developed with well-defined lateral tubercular area ...	2.
Proboscis absent ...	3.
2. Body depth less than 5 times in standard length ...	<i>G. gotyla gotyla</i>
Body depth about 5 times or more in standard length ...	<i>G. gotyla stenorhynchus</i>
3. Lateral line scales 34 or fewer ...	4.
Lateral line scales 35 to 38 ...	<i>G. mcClellandi</i>
4. Distance of vent from base of anal fin less than 4 times in that between anterior origins of anal and pelvic fins ...	<i>G. mullya</i>
Distance of vent from base of anal fin more than 4 times, but less than 5 times in that between anterior origins of pelvic and anal fins ...	<i>G. lamta</i>

***Garra gotyla gotyla* (Gray, 1832)**

1832. *Cyprinus gotyla* Gray, III. Ind. Zool., London, 1, pl. 88, figs. 3, 3a. (type-locality : Northern India).

1964. *Garra gotyla gotyla*, Menon, Mem. Indian Mus., 14 : 233, pl. 13 figs. 1-4 (revision).

1981. *Garra gotyla gotyla*, Jayaram, Handbk. Freshw. Fish. India : 136, 137 (distribution and key to species).

Local name : Nil.

Common name : Stone sucker (English).

Material examined : 1 ex., 150 mm TL. ; a stream at Mosampet village, Mahbubnagar district, Andhra Pradesh ; R. P. Barman and party ; 15.12.84.

Diagnostic features : D. 10 (3/7-8), P. 15, V. 9, A. 7 (2/5), C. 17, LL. 32-35.

Head length 3.52 to 4.20 and body depth 3.70 to 5.00 in standard length. Eye diameter 3.00 to 6.28 in head length. Snout with a well-developed median proboscis and a transverse lobe at the tip. The free extremity of the proboscis, the transverse lobe and the



Fig. 75 : *Garra gotyla gotyla* (Gray)

lateral sides of head in front of nostrils are covered with several large spiny tubercles. Barbels 2 pairs, anterior pair equal to or shorter than eye diameter and posterior pair much smaller. Dorsal fin inserted ahead of pelvic fin origin. Caudal fin forked.

Colour in alcohol : Bluish grey above and pale yellow below.

Distribution : India : Assam, all along the Himalayas, the Chota-Nagpur plateau and the Vindhya-Satpura mountains of the Indian Peninsula. Nepal, Burma, Pakistan and Bangladesh.

Size : It attains at least 152 mm (6 inches) in total length.

Remarks : It is being recorded here for the first time from Andhra Pradesh.

***Garra gotyla stenorhynchus* (Jerdon, 1849)**

1849. *Gonorhynchus stenorhynchus* Jerdon, *Madras, J. Lit. Sci.*, 15 : 310 (type-locality : Bhavani river, Nilgiris)

1964. *Garra gotyla stenorhynchus*, Menon, *Mem. Indian Mus.*, 14 : 236-238 (revision).

1981. *Garra gotyla stenorhynchus*, Jayaram, *Handbk. Freshw. Fish. India* : (distribution and key to species).

Local name : *Kalgawa* (Telugu).

Common name : Stone sucker (English).

Material examined : 2 exs., 125 mm-155 mm TL. ; Krishna river, Guntur district, Andhra Pradesh, R. P. Barman and party ; 13.6.86.

Diagnostic features : D. 10-11 (3/7-8), D. 15, V. 9, A. 7 (2/5), C. 17, LL. 32-35.

Head length 3.85 to 4.50 and body depth 3.79 to 5.34 in standard length. Eye diameter 3.65 to 5.50 in head length. Snout with a well-developed median proboscis and a transverse lobe at the tip. The free extremity of the proboscis, the transverse lobe and



Fig. 76 : *Garra gotyla stenorhynchus* (Jerdon)

the lateral sides of head in front of nostrils are covered with several large horny turbercles. Barbels 2 pairs, anterior pair equal to or shorter than eye diameter and posterior pair much shorter. Dorsal fin inserted ahead of pelvic fin origin. Caudal fin forked.

Colour in alcohol : Bluish grey above and pale below. A black spot present anteriorly to upper angle of gill openings and a row of well-developed dark spots at the base of branched dorsal fin rays.

Distribution : India : the Cauvery and Krishna river systems.

Size : It attains at least 155 mm (6 inches) in total length.

Remarks : This species is closely related to *G. gotyla* but can be easily separated by its more elongated body.

***Garra lamta* (Hamilton Buchanan, 1822)**

1822. *Cyprinus lamta* Hamilton Buchanan, *Fish. Ganges* : 343-393 (type-locality : Tinau river at Butwal, Nepal).

1964. *Garra lamta*, Menon, *Mem. Indian Mus.*, 14 : 208-212 (revision).

1981. *Garra lamta*, Jayaram, *Handbk. Freshw. Fish. India* : 136, 138 (distribution and key to species).

Local name : *Taati goraka, Thati goraka* (Telugu).

Common name : Stone sucker (English).

Material examined : No specimen obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 10-11 (3/7-8), P. 15, V. 9, A. 7 (2/5), C. 17, LL. 31-34.

Head length 3.58 to 4.33 and body depth 3.56 to 4.48 in standard length. Eye diameter 3.71 to 5.33 in head length. Snout rounded, smooth, tip marked off by a deep transverse groove, transverse lobe at the tip and sides of snout in front of nostrils covered

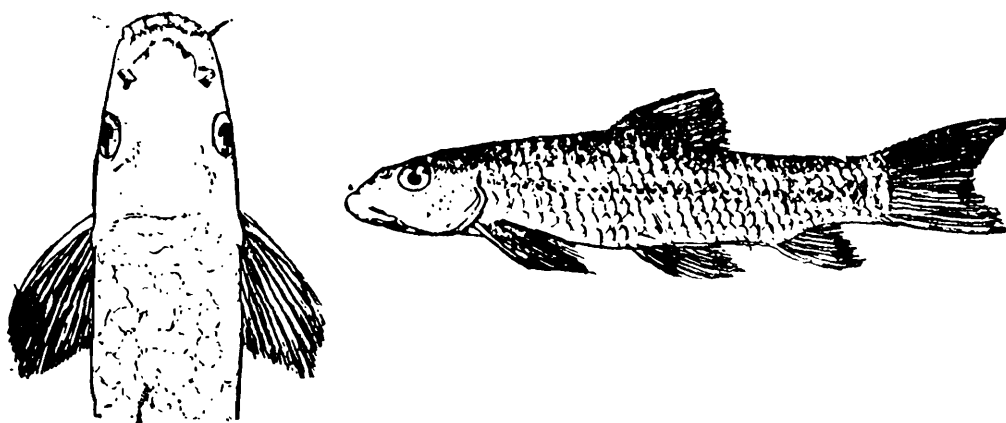


Fig. 77 : *Garra lamta* (Hamilton Buchanan)
Left : Dorsal view of head region Right : Lateral view

by horny tubercles arranged in bilaterally symmetrical patches. Barbels 2 pairs, rostral pair equal to or slightly shorter than eye diameter and maxillary pair shorter than rostral pair. Dorsal fin inserted ahead of pelvic fin. Caudal fin forked.

Colour in alcohol : Dark grey above and paler below. A broad lateral band from gill openings to caudal fin base, broader above and below by incomplete dark narrow lateral stripes, especially in posterior half of body. A black spot on upper angle of gill openings and a black blotch at caudal fin base.

Distribution : India : Darjeeling and Kumaon Himalayas, Assam, Sikkim and Andhra Pradesh, Nepal and Pakistan,

Size : It attains 152 mm (6 inches) in total length.

Remarks : This species is closely related to *G. mullya* but can be easily separated by the relative position of their vents.

***Garra mcClellandi* (Jerdon, 1849)**

1849. *Gonorrhynchus mcClellandi* Jerdon, *Madras, J. Lit. Sci.*, 15 : 309 (type-locality : Bhavani river at base of Nilgiri Hills and also in the Manan toddy river).

1964. *Garra mcClellandi*, Menon, *Mem. Indian Mus.*, 14 : 228-230 (revision).

1981. *Garra mcClellandi*, Jayaram, *Handbk. Freshw. Fish. India* : (distribution and key to species).

Local name : Nil.

Common name : Stone sucker (English).

Material examined : 2 exs., 198 mm-217 mm TL. ; Kinnersoni reservoir, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 28.8.83.

Diagnostic features : D. 10-11 (2-3/8). P. 15, V. 9, A. 6-7 (1-2/5), C. 17, LL. 35-38.

Head length 4.47 to 4.58 and body depth 4.30 to 5.67 in standard length. Eye diameter 3.40 to 4.90 in head length. Snout conical, smooth, tip marked off by a transverse groove, tubercles on transverse lobe at the tip, on the sides in front of orbit

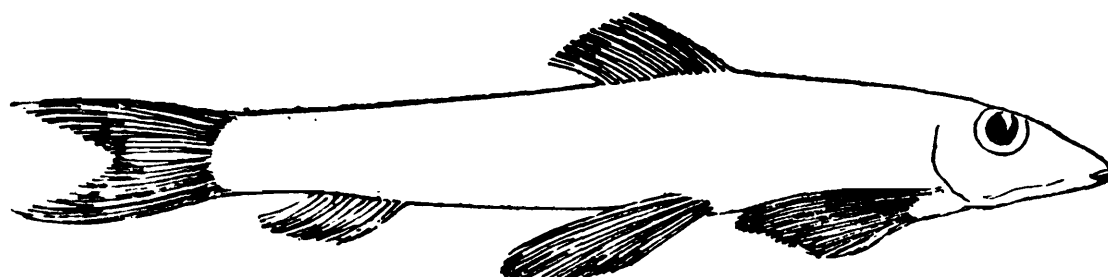


Fig. 78 i *Garra mcClellandi* (Jerdon)

and in the inter-nasal region, arranged in bilaterally symmetrical patches. Barbels 2 pairs, rostral pair shorter and maxillary pair much shorter. Dorsal fin inserted ahead of pelvic fin. Caudal fin forked.

Colour in alcohol : Dark grey above and paler below. A black spot behind the upper angle of gill openings.

Distribution : India : Cauvery drainage, Nilgiri district.

Size : It attains at least 174 mm (7 inches) in total length.

Remarks : The systematic position of this species is discussed by Silas, 1958b. It is being recorded here for the first time from Andhra Pradesh.

Garra mullya (Sykes, 1841)

1841. *Chondrostoma mullya* Sykes, *Trans. zool. Soc. Lond.*, 2 : 359, pl. 62, fig. 3 (type-locality : Poona waterways).
1964. *Garra mullya*, Menon, *Mem. Indian Mus.*, 14 : 212-216 (revision).
1981. *Garra mullya*, Jayaram, *Handbk. Freshw. Fish. India* : 136, 137 (distribution and key to species).

Local name : Nil.

Common name : Stone sucker (English).

Material examined : 11 exs., 77 mm-97 mm TL. Phuland river, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 7.12.84.

Diagnostic features : D. 10-11 (3/7-8), P. 15, V. 9, A. 7 (2/5), C. 17, LL. 32-34.

Head length 3.71 to 5.00 and body depth 3.82 to 4.32 in standard length. Eye diameter 3.75 to 5.12 in head length. Snout rounded, smooth, with the tip marked off by a deep transverse groove, the transverse lobe at the tip and sides of snout in front of

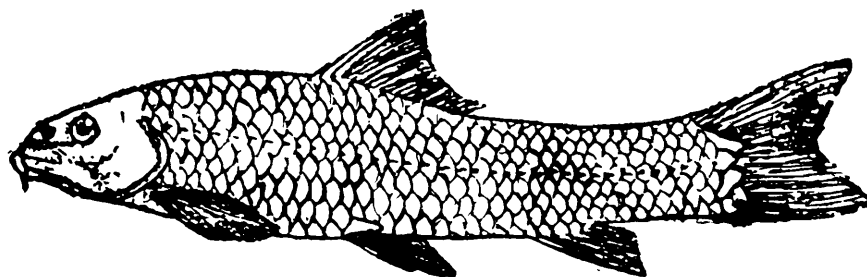


Fig. 79 : *Garra mullya* (Sykes)

nostrils are covered by horny tubercles. Barbels 2 pairs, rostral pair equal to or slightly shorter than eye diameter and maxillary pair shorter than rostral pair. Dorsal fin inserted ahead of pelvic fins. Caudal fin almost truncate.

Colour in alcohol : Dorsal surface olivaceous green and pale yellow below. A black spot on the upper angle of gill openings and a black spot at the caudal fin base. Fins tipped yellow.

Distribution : India : Throughout India except Assam and the Himalayas.

Size : It attains 127 mm (5 inches) in total length.

Remarks : It is the most widely distributed species of the genus in the Indian Peninsula. It is most closely related to *Garra lamta*.

Family : HOMALOPTERIDAE

Head and anterior part of body depressed, ventral surface flattened. Body covered with small cycloid scales. Head and part or whole of ventral surface without scales. Jaws and palate edentate. Gill openings either greatly restricted and situated above base of pectoral fins or of moderate size extending to ventral surface for a short distance. Gill openings united with the isthmus. Paired fin inserted horizontally and 2 rays of pectoral fins simple (subfamily Homalopterinae) or paired fins not inserted horizontally and only outermost ray of pectoral fin simple (Subfamily Noemacheilinae). Outer rays of paired fins provided with adhesive pads on ventral surface. Lateral line complete or incomplete. Swimbladder in two connected lateral parts (Subfamily Homalopterinae) or Swimbladder reduced to two connected lateral parts and a small posterior part (Subfamily Noemacheilinae).

Subfamily : NOEMACHEILINAE

Body generally cylindrical and compressed. No spine under or before the orbit. Anterior nostril simple or tubular. Upper part of caudal peduncle may be with an adipose keel. Dorsal fin moderately long with 7 to 20 rays.

Genus Noemacheilus van Hasselt, 1823.

1823. *Noemacheilus* van Hasselt, *Alg. Konst. Letterbode*, 2 (35) : 133 (type-species : *Noemacheilus fasciatus* van Hasselt).

1987. *Noemacheilus*, Menon, *Fauna of India, Pisces*, 4 (1) : 36-219 (revision).

Body elongated and almost cylindrical. No preorbital spine on head. Barbels 2 or 3 or 4 pairs. Dorsal fin inserted opposite to pelvic fins, with 8 to 20 soft rays and without any spine. Anal fin with 6 to 8 soft rays. Caudal fin emarginate, truncate, or lunate. Scales minute. Lateral line complete or incomplete.

Menon (1987) revised the fishes of the genus *Noemacheilus* van Hasselt and put it under the family Homalopteridae.

Key to the species

1. Barbels 4 pairs	...	...	<i>N. eyezardi</i>
Barbels 3 pairs	...	...	2.
2. Lateral line incomplete	...	...	3.
Lateral line complete	...	...	5.
3. Caudal fin slightly emarginate	...	...	<i>N. moreh</i>
Caudal fin deeply emarginate	...	...	4.
4. Body marked by varying number of vertical bands, separated by wider interspaces	...	...	<i>N. denisoni denisoni</i>

Body marked by 12 to 13 vertical bands, separated by narrower interspaces	...	<i>N. denisoni dayi</i>
5. Body depth 4.75 in total length	...	<i>N. botia</i>
Body depth 8.00 to 9.00 in total length	...	6.
6. Caudal fin slightly emarginate	...	<i>N. striatus</i>
Caudal fin deeply emarginate	...	<i>N. anguilla</i>

Noemacheilus anguilla Annandale, 1919

1919. *Noemacheilus anguilla* Annandale, *Rec. Indian Mus.*, 16: 127, pl. 1, fig. 3, pl. 3, fig. 1 (type-locality: Yenna river, Krishna drainage at Medha, Satara district, Maharashtra).

1987. *Noemacheilus anguilla*, Menon, *Fauna of India, Pisces*, 4 (1): 154-156 (revision).

Local name : Nil.

Material examined : No specimen was obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 11 (3/8), P 14, V. 8, A. 6 (2/4), C. 19.

Head length 5.30 to 5.50 and body depth 9.00 in total length. Head narrow, conical and snout bluntly pointed. Eyes large, situated dorsally near middle of head. Barbels 3 pairs, outer rostral longest extending almost to margin of the orbit and maxillary



Fig. 80 : *Noemacheilus anguilla* Annandale

reaching to perpendicular from middle of the orbit. Dorsal fin short, a little higher than the body, with its upper margin nearly straight but sloping rapidly downwards and backwards. Caudal fin deeply emarginate, lobes pointed. Scales small, absent from head, hardly distinguishable on the ventral surface of body. Lateral complete or nearly so.

Colour in alcohol : Head and body dull golden yellow. Numerous transverse bars of dark olive green, usually broader than interspaces, across the back. A row of large blackish spots running along the mid-lateral line and sometimes coalescing, extending to caudal fin. Fins yellowish. Dorsal fin with an anterior scarlet border and caudal fin broadly edged both above and below with red.

Distribution : India : Maharashtra, Karnataka and Andhra Pradesh.

Size : It attains 57 mm (2.2 inches) in total length.

Remarks : In Andhra Pradesh this species is found in both the rivers of Krishna and Godavari.

Noemacheilus botia (Hamilton Buchanan, 1822)

1822. *Cobitis botia* Hamilton Buchanan, *Fish. Ganges* : 350, 394 (type-locality : rivers of northern parts of Bengal).

1987. *Noemacheilus botia*, Menon, *Fauna of India, Pisces*, 4 (1) ; 141-144 (revision).

Local name : *Buddulchey* (Telugu).

Common name : Striped loach (English).

Material examined : 4 exs., 45 mm-65 mm TL. ; Phulang river, Nizamabad district, Andhra Pradesh : R. P. Barman and party : 7.12.84.

Diagnostic features : D. 12-14 (3/9-11), P. 12, V. 8, A. 8 (3/5), C. 18.

Head length 4.50 to 5.50 and body depth 4.75 in total length. Eye diameter 3.75 to 4.00 in head length. Barbels 3 pairs, maxillary pair extending to below posterior margin

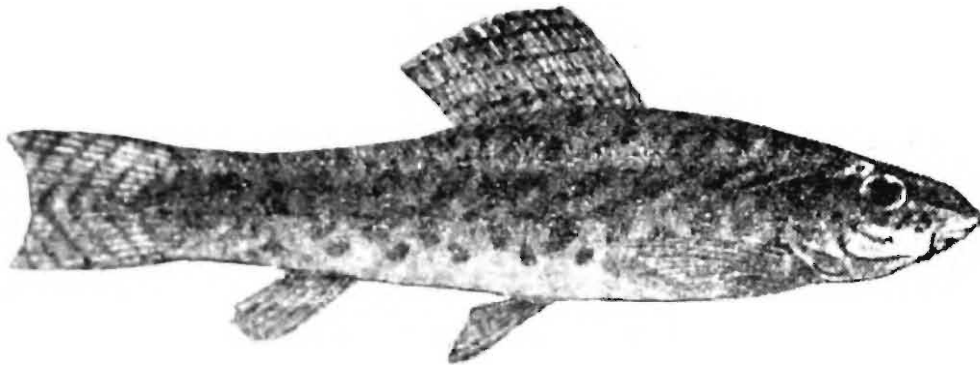


Fig. 81 : *Noemacheilus botia* (Hamilton Buchanan)

of the orbit. Dorsal fin inserted slightly nearer to snout tip than to base of caudal fin. Caudal fin slightly emarginate. Lateral line complete.

Colour in alcohol : Body greyish with 10 to 14 short vertical bars on lateral line and a number of irregular blotches above it, occasionally forming bands over back. Dorsal fin orange with rows of black spots and caudal fin with about 7 irregular bars bent at an angle. A black ocellus on the superior part of the caudal fin base.

Distribution : India : Throughout North India, Andhra Pradesh. Pakistan, Bangladesh. Nepal, Burma and Sri Lanka.

Size : It attains at least 76 mm (3 inches) in total length.

Remarks : It is very common species found in both the rivers of Krishna and Godavari in Andhra Pradesh.

Noemacheilus denisoni denisoni Day, 1867

1867. *Nemachilus denisoni* Day, *Proc. Zool. Soc. Lond.*, : 287 (type-locality : Bhawani river, base of Nilgiris).

1987. *Noemacheilus denisoni denisoni*, Menon, *Fauna of India, Pisces*, 4 (1) : 93-99 (revision).

Local name : Nil.

Material examined : (i) 1 ex., 49 mm TL. ; Phulang river, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 7.12.84. (ii) 2 exs., 50 mm-53 mm TL. ; Cuddapah district, Andhra Pradesh ; R. P. Barman and party ; 5.12.85.

Diagnostic features : D. 11 (3/8), P. 11, V. 7, A. 7 (2/5), C. 18.

Head length 5.00 to 5.50 and body depth 6.50 in total length. Eyes situated in anterior half of head, diameter one sixth of head length. Barbels well-developed, maxillary extend to the opercle, rostral pairs are shorter. Dorsal fin inserted midway between snout

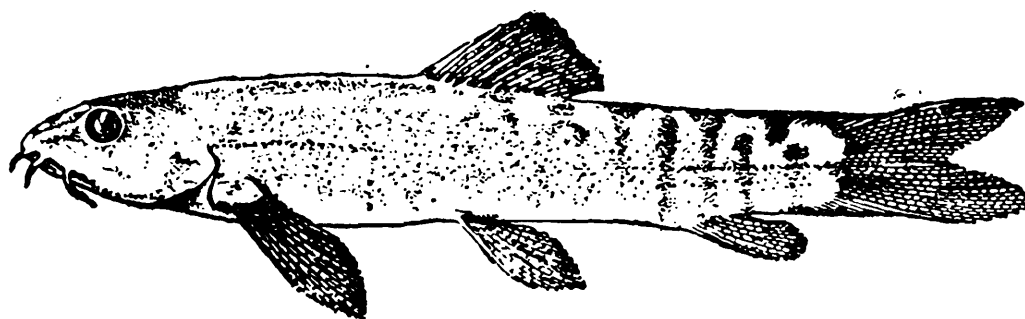


Fig. 82 : *Noemacheilus denisoni denisoni* Day

tip and caudal fin base or slightly nearer to snout tip. Caudal fin deeply emarginate, lobes rounded. Lateral line incomplete, ending in front of dorsal fin or slightly longer.

Colour in alcohol : Body marked with varying number of brown vertical bands from dorsal to ventral surface, bands broader than light interspaces, better marked behind dorsal fin. A blackish band at base of caudal fin and a blackish spot at base of dorsal fin present. Dorsal and caudal fins banded with varying rows of well marked brownish spots.

Distribution : India : Maharashtra, Karnataka, Kerala, Madhya Pradesh, Andhra Pradesh and Rajasthan.

Size : It attains 52 mm (2 inches) in standard length.

Remarks : It is one of the very common species of the Deccan. In Andhra Pradesh it is found in both the rivers of Krishna and Godavari.

Noemacheilus denisoni dayi Hora, 1935

1935. *Nemachilus dayi* Hora, *Rec. Indian Mus.*, 37 : 57 (type-locality : hills near Raniganj, Chota-Nagpur).

1987. *Noemacheilus denisoni dayi*, Menon, *Fauna of India, Pisces*, 4 (1) : 99-101. (revision).

Local name : Nil.

Material examined : No specimen was obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 11 (3/8), P. 11, V. 7, A. 7 (2/5), C. 18.

Head length 5.25 to 5.50 and body depth 6.00 in total length. Eyes situated in middle of head, its diameter one fifth of head length. Barbels well developed, all almost equal to eye diameter. Dorsal fin inserted midway between snout tip and caudal fin base or slightly nearer to caudal fin base, its height almost equal to head length. Caudal fin slightly shorter than head length, lobes rounded, deeply emarginate. Lateral line incomplete, ending at the origin or middle of dorsal fin.

Colour in alcohol : 12 to 13 broad vertical bands with an equal number of narrow pale interspaces on body, very characteristic of this species. A black band at base of caudal fin and a blackish spot at base of dorsal fin origin present. Dorsal fin with two rows and caudal fin with four rows of well marked spots.

Distribution : India : Chota Nagpur plateau and Bastar, Madhya Pradesh and Andhra Pradesh.

Size : It attains 73.5 mm (3 inches) in standard length.

Remarks : It is a common species found in both the rivers of Krishna and Godavari in Andhra Pradesh.

Noemacheilus everzardi Day, 1878

1878. *Nemachilus evezardi* Day, *Fish. India* : 613, pl. 153, fig. 11 (type-locality : Poona).

1987. *Noemacheilus everzardi*, Menon, *Fauna of India, Pisces*, 4 (1) : 191-193 (revision).

Local name : Nil.

Material examined : No specimen was obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 10 (3/7), P. 11, V. 8, A. 7 (2/5), C. 18.

Head length 5.30 and body depth 6.00 in total length. Eye just before the middle of head length and rather minute. Barbels 4 pairs, well developed, one pair of nasal, reaching to opposite hind edge of the orbit, two pairs of rostral and one pair maxillary. Dorsal fin



Fig. 83 : *Noemacheilus everzardi* Day

inserted opposite to pelvic fins and midway between anterior border of the orbit and caudal fin base, upper edge of dorsal fin slightly convex. Caudal fin rounded, equal to or slightly shorter than head length. Lateral line incomplete, ending above middle of pectoral fin,

Colour in alcohol : Body greenish or yellowish with 9 to 18 brown vertical stripes from back to ventral side. Shape of these stripes variable, some interrupted or incomplete, some more or less curved and oblique and others are "V" or "Y" shaped. Big round spots on head. A vertical dark stripe at base of caudal fin and a small black spot at base of dorsal fin origin present. 3 to 4 rows of spots on caudal fin and 2 to 3 rows of spots on dorsal fin present.

Distribution : India : Western Ghats : Krishna and Godavari basins ; Satpura range : Pachmari Hills and Andhra Pradesh.

Size : It attains 36 mm ($1\frac{1}{2}$ inches) in standard length.

Remarks : In Andhra Pradesh it is found in both the rivers of Krishna and Godavari.

Noemacheilus moreh (Sykes, 1841)

1841. *Cabitis moreh* Sykes, *Trans. Zool. Soc. Lond.*, 2 : 266 (type-locality : Western Ghats).

1878. *Nemacheilus sinuatus*, Day, *Fish. India* : 615, pl. 156. fig. 3 ; 1889, Day, *Fauna Br. India*, *Fish.* 1 : 228

1959. *Noemacheilus botia aureus*, Misra, *Rec. Indian Mus.*, 57 : 172 (Deccan, Deolali, Poona, Orissa).

1987. *Noemacheilus moreh*, Menon, *Fauna of India, Pisces*, 4 (1) 145-147 (revision).

Local name : Nil.

Material examined : No specimen was obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 12-13 (3/9-10), P. 12, V. 8, A. 8 (3/5), C. 18.

Head length 5.00 and body depth 6.00 in total length. Eyes large, situated in middle of head. Barbels well developed, inner rostral shorter than outer, outer rostral extending to margin of the orbit, maxillary reaching to below posterior edge of the orbit. Dorsal fin inserted nearer to snout tip than caudal fin base, its height less than head length. Caudal fin shorter than head length, slightly emarginate. Lateral line incomplete, ending opposite to the posterior end of dorsal fin.

Colour in alcohol : Body olive, with irregular vertical brown bands, having shorter intermediate ones. A black ocellus at the upper portion of caudal fin base. Dorsal fin with 3 or 4 rows of black spots. Caudal fin orange with 4 angulate bars.

Distribution : India : Maharashtra, Tamil Nadu and Andhra Pradesh.

Size : It attains 44 mm (2.8 inches) in standard length.

Remarks : In Andhra Pradesh it is found in both the rivers of Krishna and Godavari.

Noemacheilus striatus Day, 1867

1867. *Nemachilus striatus* Day, *Proc. Zool. Soc. Lond.* : 347 (type-locality : Wynad).

1987. *Noemacheilus striatus*, Menon, *Fauna of India, Pisces*, 4 (1) : 113-114 (revision).

Local name : Nil.

Material examined : No specimen was obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 11-12 (2/9-10), P. 11, V. 8, A. 7 (2/5), C. 17.

Head length 5.50 to 7.00 and body depth 8.00 to 9.00 in total length. Eyes situated in middle of head. Barbels well developed, the inner rostrals slightly longer than eye

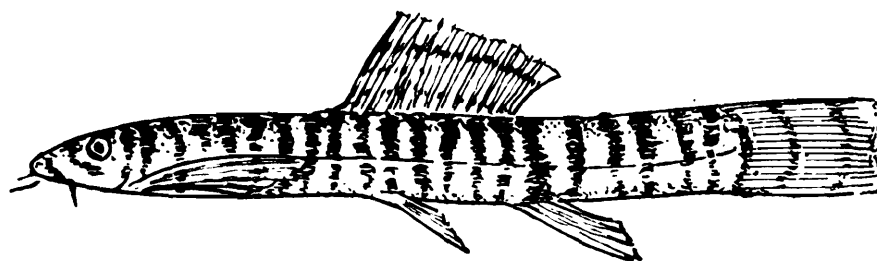


Fig. 84 : *Noemacheilus striatus* Day

diameter and other two pairs much longer. Dorsal fin inserted slightly in advance of pelvic fins, nearer to snout tip than to caudal fin base. Caudal fin equal to or slightly shorter than head length, slightly emarginate. Lateral line complete.

Colour in alcohol : 16 to 20 vertical bands, wider than the ground colour, encircle body. A black band at base of caudal fin present. Dorsal fin with a black edge with a light external margin and a dark base. One or two rows of bands across dorsal fin. Two rows of spots on caudal fin and dull black spots on the anal fin.

Distribution : India : Kerala, Karnataka and Andhra Pradesh.

Size : It attains 65 mm (2½ inches) in total length.

Remarks : In Andhra Pradesh this species is available in both the rivers of Krishna and Godavari.

FAMILY COBITIDAE

Loaches

Body worm-like to fusiform. Mouth subterminal. Lips thick, fleshy and papillated. One row of pharyngeal teeth. Jaws and palate edentate. Barbels present. An erectile spine near the orbit present. Vertical fins spineless. Pelvic fins may be absent. Lateral line either absent or incomplete or complete. Body with small cycloid scales when present, usually immersed in mucous, sometimes present on head. Gill membranes free from each other. Swimbladder entirely or partially enclosed in a bony capsule.

Subfamily COBITINAE

Body oblong to cylindrical. A spine under or before the orbit. Anterior nostrils tubular or simple. No ridge on upper part of caudal peduncle. Dorsal fin long with 8 to 30 rays.

Genus *Lepidocephalus* Bleeker, 1858.

1858. *Lepidocephalus* Bleeker, *Nat. Tijdschr. Ned. Inde*, 15 : 303 (type-species : *Cobitis macrochir* Bleeker).
 1981. *Lepidocephalus*, Jayaram, *Handbk. Freshw. Fish. India* : 180 (genus characters and distribution).

Body elongated and moderately compressed. Mouth inferior and narrow. Eyes small, superior, in anterior half of head. Lips thick, fleshy, continuous at angle of mouth ; lower lip interrupted in middle. Jaws and palate without teeth. Barbels 3 pairs, one pair rostral, one or two maxillary, two pairs of barbel-like mental lobes. A large erectile bifid spine below or in front of the orbit. Dorsal fin inserted slightly ahead of pelvic fins, with 8 to 9 soft rays and without a spine. Inner ray of pectoral fin in males ossified as a flat osseous vertical plate-like structure. Anal fin with 7 to 8 rays. Caudal fin truncate or slightly emarginate. Scales small. Lateral line absent.

8 species are known under the genus in the Indian subcontinent, 2 species are found in Andhra Pradesh.

Key to the subgenera*

Dorsal and pelvic fins inserted in second half of body. Scales present on head	...	<i>Lepidocephalus</i>
Dorsal and pelvic fins inserted in first half of body. Scales absent on head	...	<i>Lepidocephalichthys</i>

Key to the species of the subgenus *Lepidocephalichthys*

25 to 30 rows of scales between anal fin base and back. Body depth 5.75 to 7.00 in total length	...	<i>L. guntea</i>
30 to 40 rows of scales between anal fin base and back. Body depth 7.00 to 9.00 in total length	...	<i>L. thermals</i>

Lepidocephalus (*Lepidocephalichthys*) *guntea* (Hamilton Buchanan, 1822)

1822. *Cobitis guntea* Hamilton Buchanan, *Fish. Ganges* : 353, 394 (type-locality : ponds and freshwater rivers of Bengal).

* After Nalbant, T. 1963.

1878. *Lepidocephalichthys guntea*, Day, *Fish, India* : 609, pl. 155, fig. 4 and pl. 156, fig. 12 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 220, fig. 80.

1981. *Lepidocephalus (Lepidocephalichthys) guntea*, Jayaram, *Handbk. Freshw. Fish. India* : 181, 182 (distribution and key to species).

Local name : Uchchal (Telugu).

Common name : Loach (English).

Material examined : (i) 3 exs., 78 mm-82 mm TL. ; Godavari river, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 29.8.83, (ii) 17 exs., 46 mm-85 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 7.6.87.

Diagnostic features : D. 8-9 (2/6-7), P. 8, V. 7-8, A. 7 (2/5), C. 16.

Head length 5.75 to 6.75 and body depth 5.75 to 7.00 in total length. Eye diameter 4.00 to 4.66 in head length. A suborbital spine present. Barbels 3 pairs, 2 rostral and 1 maxillary pair, all longer than the orbit. Dorsal fin origin nearer to snout tip than to caudal base, slightly behind the pelvic fin origin. Body with imbricated scales. Scales on head in patches below and behind the orbit and the upper part of the operculum. Scales

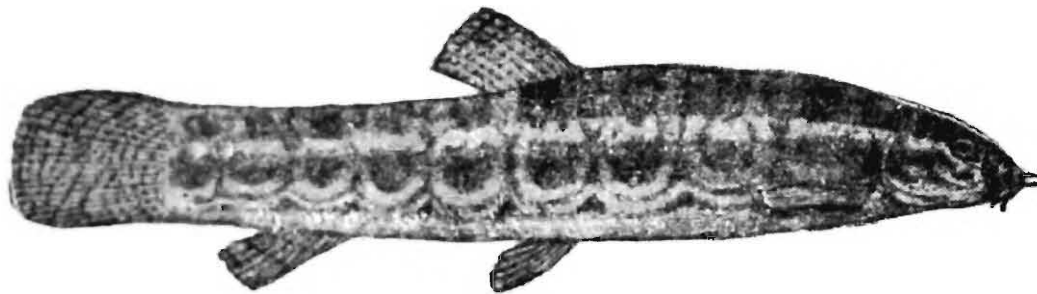


Fig. 85 : *Lepidocephalus (Lepidocephalichthys) guntea* (Hamilton Buchanan)

extend anteriorly beyond isthmus on ventral side of the head. 25 to 30 rows of scales between the back of body and base of anal fin. Mental lobe well developed and produced into one or two projections. Caudal fin convex or cut square with rounded corners.

Colour in alcohol : Colouration of this species is very variable depending on age, size and sex of this fish. Generally dirty yellowish with a series of about 10 to 12 dark spots, connected with one another through a dark band along lateral sides of body. Fins, specially dorsal and caudal, with rows of dark spots. A dark spot on the upper part of caudal fin base.

Distribution : India : Throughout except Karnataka, Kerala and south of Krishna. Nepal. Bangladesh. Pakistan and Burma.

Size : It attains 96 mm (4 inches) in total length.

Fishery information : Economic importance of this fish is less, generally eaten by poor local people.

Lepidocephalus (Lepidocephalichthys) thermalis (Valenciennes, 1846)

1846. *Cobitis thermalis* Valenciennes (in Cuvier and Valenciennes), *Hist. Nat. Poiss.* 18 : 78 (type-locality : Malabar).
 1878. *Lepidocephalichthys thermalis*, Day, *Fish. India* : 610, pl. 155, fig. 3 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 221.
 1981. *Lepidocephalus (Lepidocephalichthys) thermalis*, Jayaram, *Handbk. Freshw. Fish. India* : 181, 182 (distribution and key to species).

Local name : *Asira* (Telugu).

Common name : Lesser loach (English).

Material examined : No specimen obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 8 (2/6), P. 7, V. 7, A. 7 (2/5), C. 16.

Head length 5.50 to 6.00 and body depth 7.00 to 9.00 in total length. Eye almost in the anterior half of the head. Barbels 3 pairs, the longest pair extending to below the anterior margin of the orbit. Dorsal fin origin nearer to caudal fin base than to snout tip,



Fig. 86 : *Lepidocephalus (Lepidocephalichthys) thermalis* (Valenciennes)

slightly in advance or opposite pelvic fin origin. Mental lobe well developed and provided with a small barbel-like prolongation. A small patch of scales on head behind suborbital spine. Scales extend anterior to pectoral fin base but may not be reaching isthmus on ventral side of head. About 30 rows of scales between anal fin base and back of body. Caudal fin slightly emarginate or truncated with pointed corners.

Colour in alcohol : Body sandy with irregular blotches of about 8 to 10 separate spots along lateral sides. A small black spot on upper part of caudal fin base. Dorsal fin with spots or bars and caudal fin with 4 bands.

Distribution : India : Peninsular India and Sri Lanka.

Size : It attains 100 mm (4 inches) in total length.

Remarks : It is a common fish of the Peninsular India.

Order : SILURIFORMES

Body without true scales, naked or covered with bony plates. Adipose fin usually present. Spines often present at the front of the dorsal and pectoral fins, if present only

single in each fin. The second, third and fourth vertebrae of the Weberian apparatus are fused to a single ossification called a "complex vertebra". The Weberian apparatus of catfishes is described in detail by Alexander (1964) and Chardon (1968). 1 to 4 pairs of whisker-like sensory barbels on the upper and lower jaw. Caudal skeleton of catfishes is variably developed, the number of principal rays differing considerably. Principal caudal rays 18 or fewer (most with 17). Swimbladder, when well-developed, is divided into an anterior and posterior segments by a partition, not a constriction as in most characoids and cyprinoids.

These catfishes are important commercially and are a popular sports fish and valued food item. They are also widely used as a tropical aquarium fish. Most are confined to freshwater but some are marine. An unusually well defined order comprising 13 families known from the Indian subcontinent (Jayaram, 1981). 7 families under this order are represented from Andhra Pradesh.

Key to the families

1. Adipose dorsal fin absent	...	...	2.
Adipose dorsal fin present as a smooth, short or long, high or low (exception <i>Clupisoma garua</i> (Hamilton). <i>Schilbeidae</i> where it may be absent in adult)	...	...	4.
2. Nasal barbels absent. No accessory respiratory organs	...	...	<i>Siluridae</i>
Nasal barbels present. Accessory respiratory organs present or gills or in the body cavity	...	...	3.
3. Dorsal fin long with 62 to 76 rays. Accessory respiratory organs on gills present	...	...	<i>Clariidae</i>
Dorsal fin short with 6 to 7 rays. Accessory respiratory organs as a tubular air-sac in the body cavity	...	...	<i>Heteropneustidae</i>
4. Nostrils close together, slit-like, separated by nasal barbels with very little interspace between the two	...	...	<i>Sisoridae</i>
Nostrils wide apart, separated by some interspace	...	...	5.
5. Anal fin short with less than 20 rays (8 to 16). Paired fins horizontally inserted	...	...	<i>Bagridae</i>
Anal fin long with more than 20 rays (24 to 90). Paired fins inserted laterally	...	...	6.
6. Nasal barbels always present (exception <i>Silonia</i> Swainson, with 40 to 46 anal fin rays and caniniform teeth on jaws)	...	...	<i>Schilbeidae</i>
Nasal barbels absent. (Anal fin with 30 to 34 rays and villiform teeth on jaws)	...	...	<i>Pangasiidae</i>

Family : BAGRIDAE

Bagrid catfishes

Rayed dorsal fin short with 6 to 8 rays and a spine. Adipose dorsal fin present and highly variable in size, it is not confluent with either rayed dorsal or with caudal fin. Nostrils widely separated, above angle of mouth, anterior tubular on tip of snout, posterior nearer to the orbit than to snout tip and with nasal barbels. Barbels 6 or 8, generally well developed. Paired fins inserted horizontally. Pectoral fins with a strong spine, usually

serrated. Anal fin short or moderately long with 8 to 16 rays, not confluent with caudal fin. Caudal fin forked.

6 genera are known from the Indian subcontinent, 3 genera are available in Andhra Pradesh.

Key to the genera

1. Barbels 3 pairs. Lateral line with well developed scutes along anterior quarters	<i>Rita</i>
Barbels 4 pairs. Lateral line without any scutes, simple	...
2. Interneural shield in between occipital process and basal bone of dorsal fin present	<i>Aorichthys</i>
Interneural shield absent	... <i>Mystus</i>

Genus *Rita* Bleeker, 1859.

1859. *Rita* Bleeker, *Acta. Soc. Indo-Neerl.* 4: 60 (type-species: *Pimelodus rita* Hamilton, by tautonymy).

1966. *Rita*, Jayaram, *Int. Rev. ges. Hydrobiol.* 51 (3): 434 (revision of genus).

Head large and depressed. Mouth subterminal, transverse and moderately wide. Eyes subcutaneous and dorsolateral. Teeth villiform. 3 pairs of barbels, the nasal, the maxillary and the mandibular. Nasal barbels minute or small with a valve-like base. Rayed dorsal fin origin above half of pectoral fin, with 6 to 7 rays and a spine. Adipose dorsal fin low and short. Pectoral fins with 7 to 10 rays and a spine serrated along both the edges. Pelvic fins with 7 to 8 rays. Anal fin short, with 8 to 13 rays. Lateral line with well developed scutes along anterior quarters, rather uniformly distinguishable. Caudal fin forked.

4 species are known under this genus from the Indian subcontinent, 2 species are found in Andhra Pradesh.

Key to the species

Teeth on palate in one patch. Teeth on prevomer mixed with molariform and villiform	...	...	<i>R. gogra</i>
Teeth on palate in two pear-shaped patches	...	...	<i>R. kuturnee</i>

Rita gogra (Sykes, 1841)

1841. *Phractocephalus gogra* Sykes, *Trans. zool. Soc. Lond.*, 2: 374, pl. 66, fig. 1 (type-locality: Beema river and Mola river at Poona).

1878. *Rita pavementata*, Day, *Fish. India*: 455, pl. 103, fig. 3; 1889, Day, *Fauna Br. India, Fish*, 1: 167.

1981. *Rita gogra*, Jayaram, *Handbk. Freshw. Fish. India*: 190, 191 (distribution and key to species).

Local name : *Banki yeddu* (Telegu).

Common name : Rita (English).

Material examined : 3 exs., 125 mm-140 mm TL. ; Godavari river, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 29.8.83.

Diagnostic features : D. 1/6/0, P. 1/10, V. 8, A. 12-13 (4/8-9), C. 17.

Head length 3.75 to 4.00 and body depth 6.00 in total length. Eye diameter 5.00 to 6.00 in head length. Snout length 3.00 in head length. Mouth transverse, upper jaw longer, cleft not extending to anterior margin of the orbit. Teeth on palate in a single patch but composed of villiform and molariform types. Barbels 3 pairs, maxillary pair

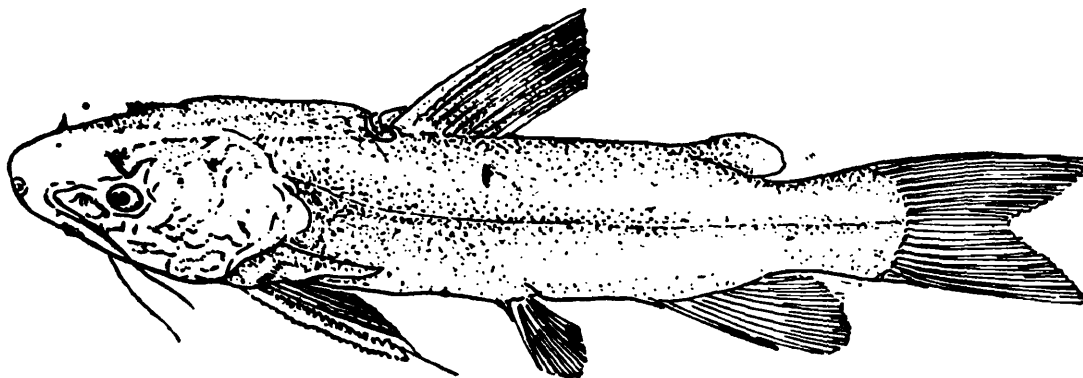


Fig. 87 : *Rita gogra* (Sykes)

reaching the pectoral fin base, mandibular pair extend a little further and nasal pair very short with a valve-like base. Dorsal spine of moderate strength and finely serrated posteriorly. Pectoral spine stronger, denticulated on both sides, slightly longer than dorsal spine. Caudal fin forked, lobes subequal, pointed.

Colour in alcohol : Body dull yellowish with dark or black fins. Eyes bright violet and barbels black.

Distribution : India : Gajarat and rivers of the Deccan up to the River Krishna.

Size : It grows 260 mm (10.3 inches) in total length.

Remarks : This species secretes mucous which helps it to survive out of water by cutaneous respiration for sometime.

***Rita kuturnee* (Sykes, 1841)**

1841. *Phractocephalus kuturnee* Sykes. *Trans. zool. Soc. Lond.*, 2 : 372, pl. 65, fig. 3 (type-locality : Beema river at Pairgaon).

1878. *Rita hastata*, Day, *Fish. India* : 456, pl. 103, fig. 4 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 168.

1981. *Rita kuturnee*, Jayaram, *Handbk. Freshw. Fish. India* ; 190, 191 (distribution and key to species).

Local name : Bondu (Telegu).

Common name : Rita (English).

Material examined : 2 exs., 130 mm-145 mm TL. ; Krishna river, Mahbubnagar district, Andhra Pradesh ; R. P. Barman and party ; 16.12.84.

Diagnostic features : D. 1/6/0, P. 1/10, V. 8, A. 13-14 (5/8-9), C. 19.

Head length 4.25 to 4.75 and body depth 5.50 to 6.00 in total length. Eye diameter 4.50 to 5.00 in head length. Mouth transverse, upper jaw longer, cleft not reaching anterior margin of orbit. Teeth villiform or cardiform rows in both jaws. Barbels 3 pairs,

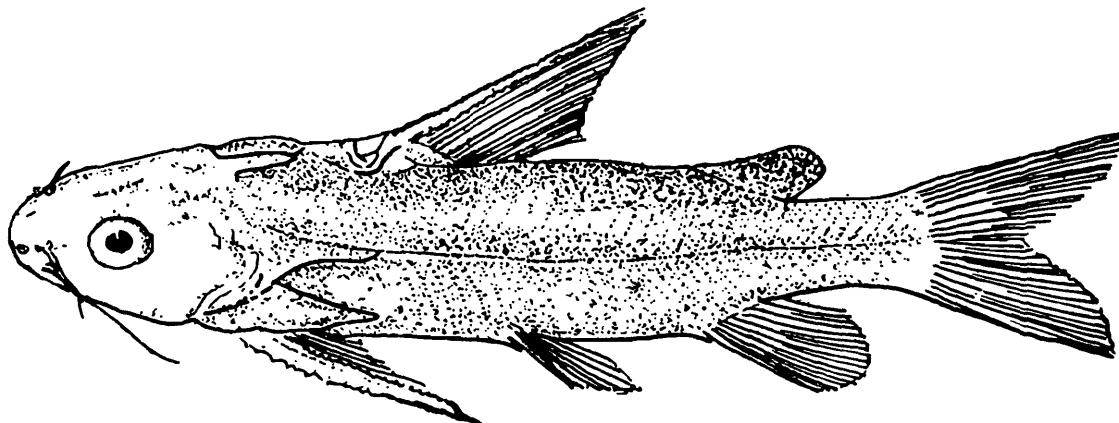


Fig. 88 : *Rita kuturnee* (Sykes)

maxillary pair reaching pectoral fin base, mandibular pair extends to hind border of the orbit and nasal pair extends to first third of the orbit. Dorsal spine strong, serrated, equal to or slightly longer than head. Pectoral spine serrated, stronger and slightly longer than dorsal spine.

Colour in alcohol : Dorsal surface brownish and silvery on sides.

Distribution : India : Madhya Pradesh and Krishna, Tungabhadra, Godavari river systems. Burma.

Size : It grows 304 mm (1 foot) in total length.

Remarks : This species is very common in the Godavari and Krishna river systems and their tributaries.

Genus *Mystus* Scopoli, 1777.

1777. *Mystus* Scopoli, *Introductio ad. historiam* : 451 (type-species : *Bagrus halepensis* Valenciennes = *Mystus pelusius* (Solander), by subsequent selection.

1981. *Mystus* Jayaram, *Handbk. Freshw. Fish India* : 195, 196 (genus character and distribution).

Mouth terminal, transverse and moderately wide. 4 pairs of barbels, one each of maxillary, nasal and two of mandibular ; maxillary barbels extend beyond dorsal fin. Rayed dorsal fin inserted above last quarter of pectoral fin, with 7 rays and a spine,

Adipose dorsal fin low, of varying length. Pectoral fin with 6 to 10 rays and a spine serrated along inner edge with antrorse teeth. Pelvic fins with 6 rays. Anal fin short, with 9 to 16 rays. Caudal fin forked. Lateral line complete, simple. Interneural shield in between basal bone of dorsal fin and occipital process absent.

Key to species

1. Occipital process reaching basal bone of dorsal fin	...	2.
Occipital process not reaching basal bone of dorsal fin	...	7.
2. Adipose dorsal fin commencing almost after rayed dorsal fin	...	3.
Adipose dorsal fin short, commencing after an interspace from rayed dorsal fin	...	5.
3. Maxillary barbels reach base of pelvic fins. Head length not more than 5 times in total length	...	<i>M. tengara</i>
Maxillary barbels reach anal fin or beyond. Head length more than 5 times in total length	...	4.
4. Maxillary barbels reach anal fin. Interorbital width less than 3.0 (2.0 to 3.0) in head length.	...	<i>M. bleekeri</i>
No dark spot at the base of dorsal fin	...	<i>M. cavasius</i>
Maxillary barbels reach caudal fin or beyond. Interorbital width more than 3.0 (3.0 to 4.0) in head length. A dark spot at the base of dorsal fin	...	6.
5. Body with a dark blotch at the base of caudal fin	...	<i>M. vittatus</i>
Body without a dark blotch at the base of caudal fin	...	...
6. Median longitudinal groove almost touching base of occipital process. Pectoral spine with 10-14 internal denticulations and pectoral fin with 9 rays	...	<i>M. armatus</i>
Median longitudinal groove extending between orbit and occipital process. Pectoral spine with 16 internal-denticulations and pectoral fin with 6 rays	...	<i>M. montanus</i>
7. Median longitudinal groove on head reaching base of occipital process	...	8.
Median longitudinal groove on head not reaching base of occipital process	...	9.
8. Body with 10 black circular solid spots along lateral line. Body depth 6.50 to 8.50 in total length	...	<i>M. punctatus</i>
Body with several clusters of small vertical spots along anterior half of lateral line. Body depth 6.00 to 6.80 in total length	...	<i>M. menoda menoda</i>
9. A dark spot present at the base of caudal fin	...	<i>M. malabaricus</i>
No dark spot present at the base of caudal fin.	...	<i>M. gulio</i>

Mystus armatus (Day, 1865)

1865. *Hypselobagrus armatus* Day, *Proc. zool. Soc. Lond.*: 289 (type-locality : Cochin, Malabar).
 1878. *Macrones armatus* Day, *Fish. India*: 450; pl. 101, fig. 3 (Malabar, the Wynad range of hills); 1889, Day, *Fauna Br. India, Fish*, 1: 161.
 1981. *Mystus armatus*, Jayaram, *Handbk Freshw. Fish. India*: 196, (200 distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by Rahimullah (1944) from Andhra Pradesh.

Diagnostic features : D. 17/0, P. 1/9, V. 6, A. 11 (3/8), C. 17.

Head length 5.50 and body depth 5.50 in total length. Eye diameter 4.00 to 5.00 in head length. Snout length 3.10 in head length. Mouth terminal, transverse, upper jaw longer. Median longitudinal groove almost touching base of occipital process. Occipital process extending basal bone of dorsal fin. Barbels 4 pairs, maxillary barbels

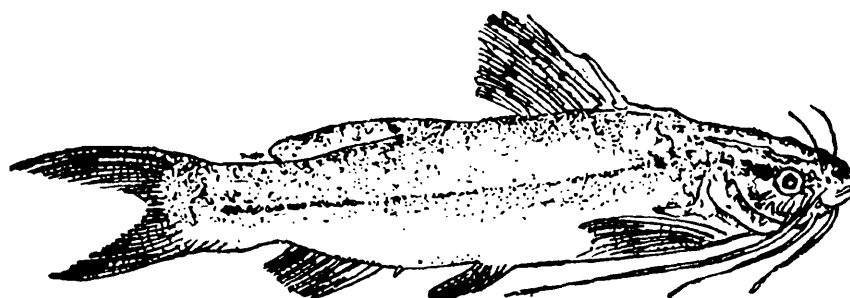


Fig. 89 : *Mystus armatus* (Day)

extending posterior margin of the pelvic fin, outer mandibular extends posterior border of pectoral spine, inner mandibular shorter and nasal extends to hind border of the orbit. Rayed dorsal fin as high as body with a finely serrated or entire spine, origin nearer to adipose dorsal fin origin than to tip of snout. Pectoral spine strong with 10 to 14 internal denticulations. Pelvic fin not reaching anal fin. Caudal fin forked, upper lobe longer.

Colour in alcohol : Dorsal surface leaden brown, lighter beneath, with or without a brown band along the side. A dark blotch at the base of caudal fin. Upper half of dorsal fin darkish and a dark band along the anal fin.

Distribution : India : Wynaad range of hills, Western Ghats and Andhra Pradesh. Burma.

Size : It attains 108 mm ($4\frac{1}{2}$ inches) in total length.

Remarks : It is found in freshwater as well as brackish waters and is a common fish of the Krishna and Godavari river systems.

***Mystus bleekeri* (Day, 1877)**

1877. *Macrones bleekeri* Day, *Fish. India* : 451, pl. 101, fig. 1 (type-locality : Sind, Jamuna, upper waters of Ganges, Burma).

1889. *Macrones bleekeri* Day, *Fauna Br. India, Fish.* 1 : 162.

1981. *Mystus bleekeri*, Jayaram, *Handbk. Freshw. Fish. India* : 196, 199 (distribution and key to species).

Local name : Narjella (Telegu).

Material examined : 1 ex., 85 mm TL. ; Godavari river, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 29.8.83. (ii) 4 exs., 80 mm-127 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party 9.6.87.

Diagnostic features : D. 1/7-8/0, P. 1/9-10, V. 6, A. 9-10 (3/6-7), C. 17.

Head length 5.25 to 5.50 and body depth 5.00 to 5.50 in total length. Eye diameter 4.00 to 4.50 in head length. Snout somewhat obtuse, length 3.00 in head length. Mouth terminal, transverse, upper jaw longer. The median longitudinal groove on head shallow, extending to base of occipital process which is not grooved, twice as long as broad at its base, touching basal bone of dorsal fin. Barbels 4 pairs, maxillary pair reaching anal fin.

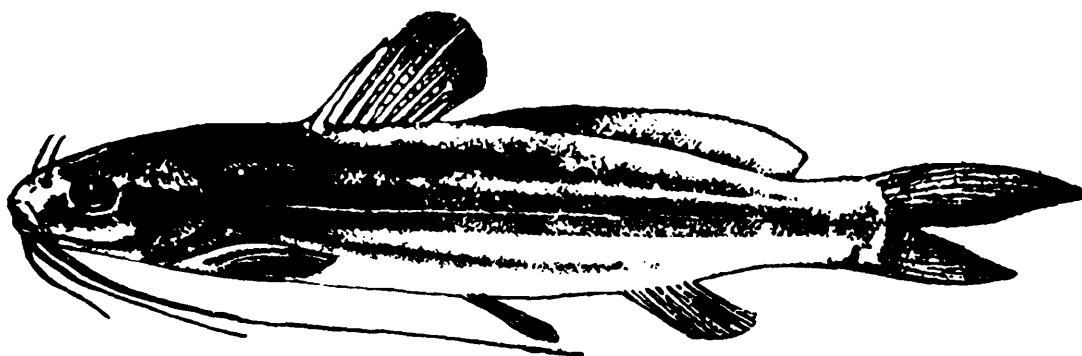


Fig. 90 : *Mystus bleekeri* (Day)

Rayed dorsal fin almost as high as body with a smooth or finely serrated spine. Pectoral spine serrated, stronger than that of dorsal spine. Adipose dorsal fin commences just behind rayed dorsal fin. Caudal fin forked with pointed lobes, the upper being the longer.

Colour in alcohol : Body brownish grey with two light longitudinal bands, one above and the other below lateral line. Sometimes a dark shoulder spot and a dark band along the middle of anal fin.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma and Malaya.

Size : This species grows at least 98 mm ($3\frac{1}{2}$ inches) in total length.

Remarks : This species descends the upper reaches of the tidal rivers of Bengal. It is a very common species occurring in both the rivers of Godavari and Krishna.

***Mystus cavasius* (Hamilton Buchanan, 1822)**

1822. *Pimelodus cavasius* Hamilton Buchanan, *Fish. Ganges* : 203, 379, pl. 11, fig. (type-locality : Gangetic Provinces).

1877. *Macrones cavasius* Day, *Fish. India* : 447, pl. 100, fig. 1 ; 1889, *Day Fauna Br. India Fish*, 1 : 155.

1981. *Mystus cavasius*, Jayaram, *Handbk. Freshw. Fish. India* : 196, 199 (distribution and key to species).

Local name : *Thella jella, Muti jella, Nahara Jella* (Telugu).

Common name : Dwarf cat-fish (English).

Material examined : 3 exs., 150mm-155 mm TL. ; Wyra reservoir, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 29.8.83. (ii) 2 exs., 130 mm-140 mm TL. ; Phulang river, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 7.12.84. (iii) 4 exs., 145 mm-165 mm TL. ; Krishna river, Visakhapatnam district, Andhra Pradesh ; R. P. Barman and party ; 10.12.87.

Diagnostic features : D. 17/0, P. 1/8, V. 6, A. 11/13 (4/7-9), C. 16.

Head length 6.00 to 6.25 and body depth 5.50 to 6.00 in total length. Eye diameter 3.25 to 3.50 in head length. Snout rather obtuse, 3.10 in head length. Mouth terminal, transverse, upper jaw longer. The median groove rather wide, extending to the base of occipital process. Occipital process narrow, 3 or 4 times as long as wide at its base and reaching basal bone of dorsal fin. Barbels 4 pairs, maxillary pair reaching beyond

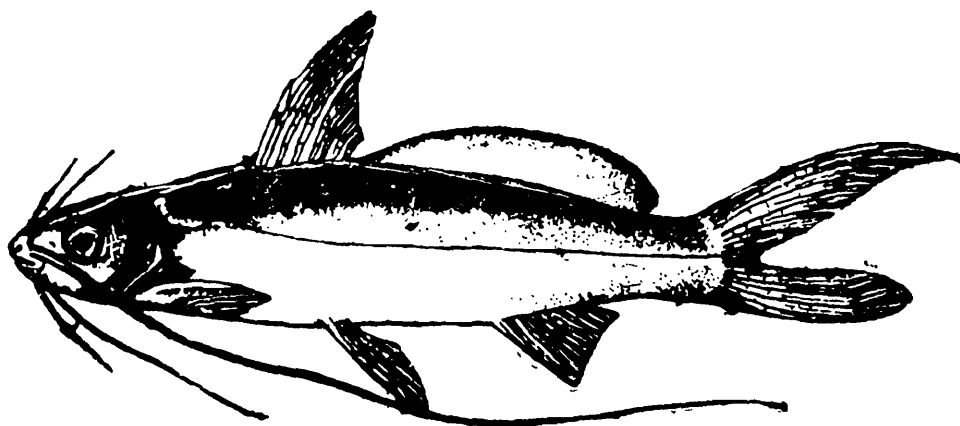


Fig. 91 : *Mystus cavasius* (Hamilton Buchanan)

base of caudal fin. Rayed dorsal fin higher than body, with a weak entire or finely serrated spine, almost equal to head excluding snout. Pectoral spine serrated equal to, but stronger than dorsal spine. Adipose dorsal fin originates just behind rayed dorsal fin. Caudal fin forked pointed, upper lobe longer.

Colour in alcohol : Dorsal surface leaden, becoming yellowish along abdomen and cheeks. Maxillary barbels, dorsal and caudal fins dusky, pectoral, pelvic and anal fin dull white. Generally a black spot covering the basal bone of dorsal fin present. Sometimes a bluish band along lateral line.

Distribution : Throughout India, Pakistan, Bangladesh, Burma, Thailand, Malayasia, Java, Sumatra, Borneo and China.

Size : It grows almost 475 mm (1½ feet) in total length.

Remarks : It is one of the predominant species found in both the rivers of Krishna and Godavari throughout Andhra Pradesh.

***Mystus gullo* (Hamilton Buchanan, 1822)**

1822. *Pimelodus gullo* Hamilton Buchanan, *Fish. Ganges* : 201, 379, pl. 23, fig. 66 (type-locality : higher parts of the Gangetic estuaries where the water is not very salty).
 1877. *Macrones gullo*, Day, *Fish. India* : 445, pl. 99, fig. 2 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 151, fig. 64.
 1981. *Mystus gullo*, Jayaram, *Handbk. Freshw. Fish. India* : 196, 200 (distribution and key to species).

Local name : Nil.

Common name : Long whiskered catfish (English).

Material examined : (i) 3 exs., 80 mm-115 mm TL. ; Godavari river, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 29.8.83. (ii) 2 exs., 73 mm-82 mm TL. ; Godavari river, Warangal district, Andhra Pradesh ; R. P. Barman and party ; 31.8.83. (iii) 2 exs., 115 mm-120 mm TL. ; Srikakulam district, Andhra Pradesh ; R. P. Barman and party ; 3.12.87. (iv) 5 exs., 120 mm-145 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 5.6.87.

Diagnostic features : D. 17/0, P. 1/8-9, V. 6, A. 12-15, (3-4/9-11) C. 17.

Head length 4.20 to 4.70 and body depth 5.00 to 5.75 in total length. Eye diameter 5.00 to 6.00 in head length. Snout broad, somewhat depressed, 3.10 in head length. Mouth terminal, transverse, upper jaw longer. The median longitudinal groove on head

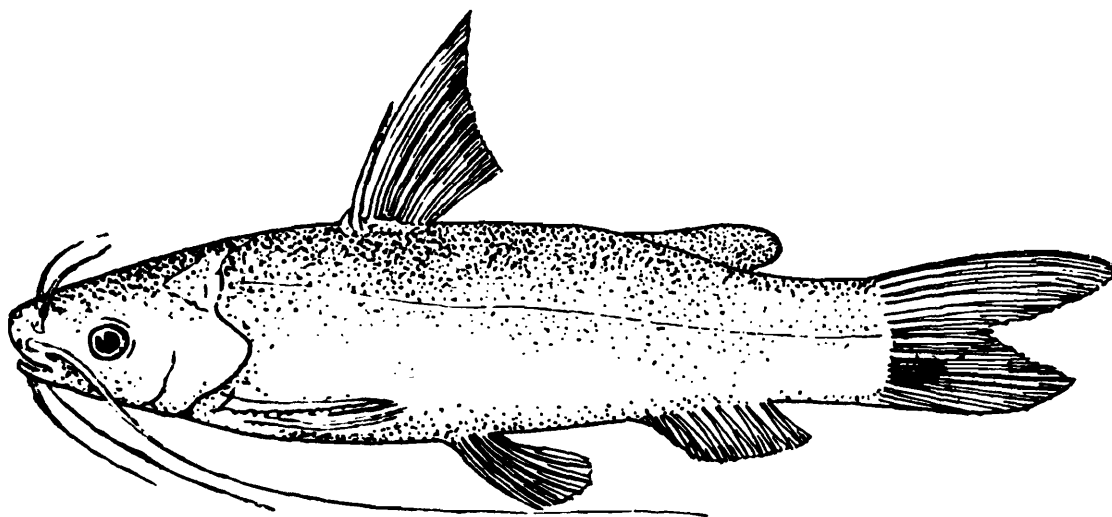


Fig. 92 : *Mystus gullo* (Hamilton Buchanan)

lanceolate, reaching to hind border of the orbit. Occipital process rounded posteriorly, half longer than wide at its base, with a wide interspace between it and the basal bone of dorsal fin. Barbels 4 pairs, maxillary pair reaching middle or end of pelvic fin. Dorsal spine half as long as head, strong, serrated, Pectoral spine strong, serrated, as long as head without snout. Caudal fin forked, upper lobe longer.

Colour in alcohol : Dorsal surface deep bluish brown becoming dull white beneath. Outer half of fins and maxillary barbels dark.

Distribution : Throughout India, Pakistan, Bangladesh, Sri Lanka, Burma, Thailand, Malayasia, Java, Sumatra and Borneo.

Size : This species grows 457 mm ($1\frac{1}{2}$ feet) in total length.

Remarks : It is a predominant species found in both the rivers of Krishna and Godavari throughout Andhra Pradesh. It is found in seas, estuaries and tidal waters.

***Mystus malabaricus* (Jerdon, 1849)**

1849. *Bagrus malabaricus* Jerdon, *Madras. J. Sci.*, 15 : 338 (type-locality : Mountain streams of Malabar).

1878. *Macromes malabaricus*, Day, *Fish. India* : 450, pl. 101, fig. 3 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 160.

1981. *Mystus malabaricus*, Jayaram, *Handbk. Freshw. Fish. India* : 196, 203 (distribution and key to species).

Local name : Jella (Telugu).

Common name : Jerdon's Cat-fish (English).

Material examined : Recorded by Mahmood and Rahimullah (1947b) from Nizamabad, Andhra Pradesh.

Diagnostic features : D. 17/0, P. 19, V. 6, A. 10-11 ($2\frac{3}{8}$), C. 18.

Head length 4.75 to 5.50 and body depth 6.00 to 7.00 in total length. Eye diameter 3.50 to 4.50 in head length. Mouth terminal, transverse, upper jaw longer. Median longitudinal groove extending to midway between posterior margin of the orbit and the base of occipital process which is not reaching basal bone of dorsal fin. Barbels 4 pairs, the

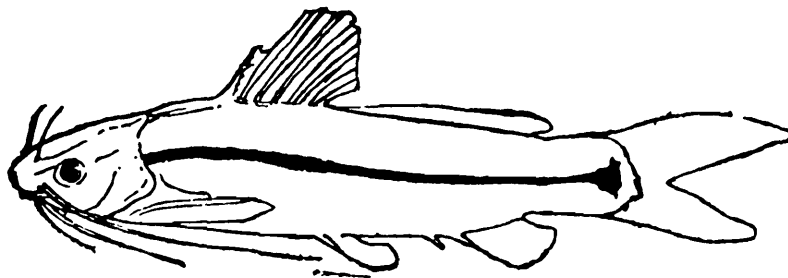


Fig. 93 : *Mystus malabaricus* (Jerdon)

nasal extends to the hind border of the orbit, the maxillary reach to the middle or end of the pelvic fin, the external mandibular extends to the end of the pectoral fin while the internal are a little shorter. Rayed dorsal fin almost equal to body depth, with a weak spine finely serrated or entire internally and with one denticulation externally, origin nearer to adipose dorsal fin origin than to tip of snout. Pectoral spine strong, internally with

about 8 to 10 strong denticulations, roughened externally. Pelvic fin not reaching anal fin. Caudal fin forked with upper lobe longer.

Colour in alcohol : Deep leaden, generally with a dark blotch on the shoulder surrounded by a lighter edge, another at the base of caudal fin. A dark band along lateral line terminating in the caudal blotch.

Distribution : India : Andhra Pradesh, Western Ghats from Kerala, Karnataka and Maharashtra.

Size : It attains 152 mm (6 inches) in total length.

Remarks : It is a common species of the Godavari river systems.

***Mystus menoda menoda* (Hamilton Buchanan, 1822)**

1822. *Plmelodus menoda* Hamilton-Buchanan, *Fish. Ganges* : 203, 379, pl. 1, fig. 72 (erroneously given as *Mugil corsula* in the text ; type-locality : Kosi river, Mahananda).

1877. *Macrones corsula*, Day, *Fish. India* : 446, pl. 100, Fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 153.

1981. *Mystus menoda menoda*, Jayaram, *Handbk. Freshw. Fish, India* : 196, 201 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was mentioned by Jayaram, Venkateswarlu and Ragunathan (1982) from the Peninsular India.

Diagnostic features : D. 1/7/0, P. 1/9, V. 6, A. 11-13 (3-5/8), C. 17.

Head length 4.00 to 4.60 and body depth 6.00 to 6.80 in total length. Eye diameter 5.25 to 7.00 in head length. Snout length 3.50 in head length. Mouth terminal, transverse, upper jaw longer. Median longitudinal groove reaching occipital process in the young specimens and not so far in the adult specimens. The occipital process long, not reaching basal bone of dorsal fin. Barbels—the nasal extend to below the middle of the orbit,

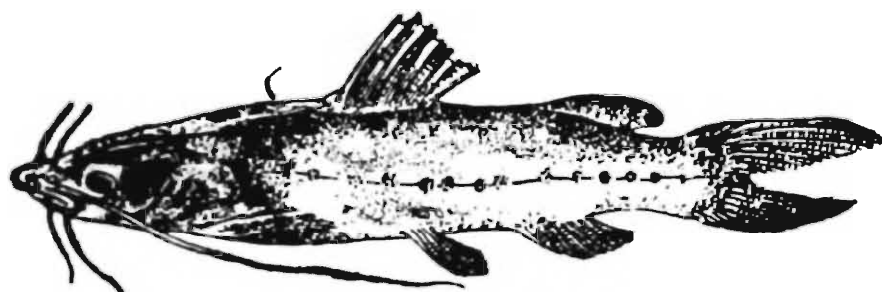


Fig. 94 : *Mystus menoda menoda* (Hamilton Buchanan)

maxillary reaching to pelvic fin end, outer mandibular extends to pectoral fin base and inner mandibular extends to posterior extremity of preopercle, Rayed dorsal fin as high as body,

with a spine serrated internally in its upper half, origin nearer to adipose dorsal fin base than to tip of snout. Pectoral fin low, not reaching pelvic fin with a strong spine equal to head and with 20 to 23 serrations internally rugose externally. Pelvic fin not reaching anal fin. Caudal fin forked, upper lobe longer usually with prolongation.

Colour in alcohol : Greyish brown above, dull white below. Several vertical spots along anterior part of lateral line.

Distribution : India : From Orissa through West Bengal and Assam, Cauvery and Krishna river systems. Bangladesh. Nepal. Burma.

Size : It attains at least 305 mm (1 foot) in total length.

Remarks : Though it is usually found in the North India but it is also available in the Krishna river systems, Peninsular India.

***Mystus montanus* (Jerdon, 1849)**

1849. *Bigrus montanus* Jerdon, *Madras J. Lit. Sci.*, 15 (2): 338 (type-locality: Manantoddy, Wynaad).

1877. *Macrones montanus*, Day, *Fish. India* : 449, pl. 101, fig. 4 ; 1889, Day, *Fauna Br. India*, Fish, 1 : 159.

1981. *Mystus montanus*, Jayaram, *Handbk. Freshw. Fish. India* : 197, 201 (distribution and key to species).

Local name : Nil.

Material examined : (i) 2 exs., 85 mm TL. ; Godavari river, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 28.8.89. (ii) 1 ex., 197 mm TL. ; Manair Project, Karimnagar district, Andhra Pradesh ; R. P. Barman and party ; 4.9.83.

Diagnostic features : D. 17/0, P. 1/6, V. 6, A. 12 (3/9), C. 19.

Head length 5.00 and body depth 6.00 in total length. Eye diameter 3.50 to 4.00 in head length. Snout length 2.80 in head length. Mouth terminal, transverse, upper jaw

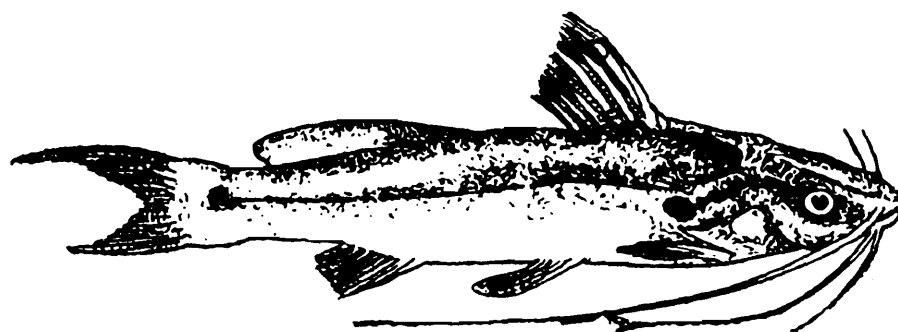


Fig. 95 : *Mystus montanus* (Jerdon)

longer. Median longitudinal groove reaching midway between the orbit and occipital base. Occipital process narrow, 4 times as long as broad at its base, reaching to the basal bone of the dorsal fin. Rayed dorsal fin equal to body depth, with a weak spine,

denticulated internally ; nearer to adipose dorsal fin origin than to tip of snout. Pectoral fin not reaching pelvic fin, with a strong spine having 16 denticulations internally. Pelvic fin not reaching anal fin. Caudal fin forked, with upper lobe longer.

Colour in alcohol : Body with a bluish shoulder spot, a dark spot at caudal fin base. One or two light bands along sides of body above lateral line. Fins tipped green.

Distribution : India : Assam, Madhya Pradesh, Kerala.

Size : It grows 115 mm ($4\frac{1}{2}$ inches) in total length.

Remarks : This species is being recorded here for the first time from Andhra Pradesh.

***Mystus punctatus* (Jerdon, 1849)**

1849. *Bagrus punctatus* Jerdon, *Madras J. Lit. Sci.*, 15 : 339 (type-locality ; Cauvery river, W. Ghats).

1877. *Macrones punctatus*, Day, *Fish. India* : 445, pl. 100, fig. 3 (Bhawani river at base of Nilgiri hills).

1981. *Mystus punctatus*, Jayaram, *Handbk. Freshw. Fish. India* : 197, 201 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by Govind and Rajagopal (1975) from Nagarjun sagar Dam, build across the Krishna river.

Diagnostic features : D. 17/0, P. 17, V. 6, A. 11-13 (3-4/8-9), C. 17.

Head length 4.50 to 5.00 and body depth 6.50 to 8.50 in total length. Eye diameter 5.50 to 7.00 in head length. Snout length 3.50 in head length. Mouth terminal, transverse, upper jaw longer. Median longitudinal groove almost touching the base of occipital process which is narrow, not reaching the basal bone of dorsal fin. Barbels 4 pairs,

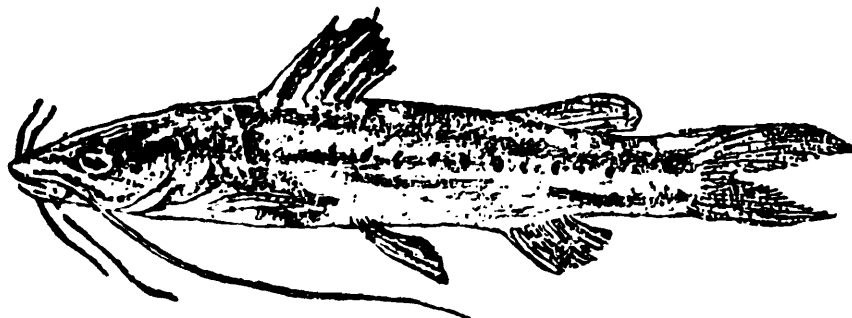


Fig. 96 : *Mystus punctatus* (Jerdon)

maxillary reaching middle or end of pelvic fins, outer mandibular extend beyond pectoral fin base, inner ones shorter, not reaching pectoral fin base and nasal extend to hind border of the orbit. Rayed dorsal fin higher than body depth, with a moderately strong spine, serrated internally in its upper third, origin almost midway between adipose dorsal fin origin and tip of snout. Pectoral fin not reaching pelvic fin, with a strong spine roughened

externally, denticulated internally with 15 to 16 teeth. Pelvic fin not reaching anal fin. Caudal fin forked, with upper lobe slightly longer.

Colour in alcohol : Body greyish above becoming yellowish on sides and white below. 10 black round spots on lateral line. Pelvic fin yellowish, other fins dusky.

Distribution : India : Gujarat, Maharashtra, Kerala, the Cauvery, the Bhawani river at the base of Nilgiri Hills, Karnataka and Andhra Pradesh.

Size : Largest recorded specimen 1650 mm ($3\frac{1}{2}$ feet) in total length, weighing 58.5 kg. weight.

Fishery information : This fish forms an important freshwater fishery at Tunghabhadra river and reservoir.

***Mystus tengara* (Hamilton Buchanan, 1822)**

1822. *Pimelodus tengara*, Hamilton Buchanan, *Fish. Ganges* : 183, 377, pl. 23, fig. 60 (type-locality : ponds of India).

1878. *Macrones tengara*, Day, *Fish. India* : 447, pl. 101, fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 156.

1981. *Mystus tengara*, Jayaram, *Handbk. Freshw. Fish. India* : 197, 199 (distribution and key to species).

Local name : Jella (Telegu).

Material examined : No specimen obtained by me. It was recorded by Rahimullah (1943a, 1944) from Andhra Pradesh.

Diagnostic features : D. 17/0, P. 1/8, V. 6, A. 11-13 (2-3/9-10), C. 19.

Head length 4.30 and body depth 5.30 in total length. Eye 3.50 in head length. Snout length 4.00 in head length. Mouth terminal, transverse, upper jaw longer. Median longitudinal groove on head extending the base of occipital process which reaches basal bone of dorsal fin. Barbels 4 pairs, the nasal are almost equal to head, the maxillary reach the base of the pelvic fin, the external mandibular reach the base of pectoral fin, while the internal are shorter. Rayed dorsal fin equal to body depth with a spine slightly serrated anteriorly in its upper third, and posteriorly in its whole extend, origin nearer to adipose dorsal fin origin than to tip of snout. Pectoral spine almost equal to head, stronger than that of dorsal, smooth externally and with about 13 denticulations internally. Pelvic fin not reaching anal fin. Caudal fin forked with upper lobe longer.

Colour in alcohol : Bright yellow with a black shoulder spot and about five black longitudinal lines. Some specimens with mandibular barbels white with black streak.

Distribution : India : Generally found in the north India, Andhra Pradesh, Bangladesh. Pakistan.

Size : It attains 100 mm (4 inches) in total length.

Remarks : It is a very common species occurring in both the Godavari and Krishna river systems.

***Mystus vittatus* (Bloch, 1797)**

1797. *Silurus vittatus* Bloch, *Ichth. Hist. nat.*, 11 : 40, pl. 371, fig. 2 (type-locality : Tranquebar, S. India).
 1877. *Macrones vittatus*, Day, *Fish. India* : 448, pl. 98, fig. 3 and pl. 99, fig. 4 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 157.
 1981. *Mystus vittatus*, Jayaram, *Handbk. Freshw. Fish. India* : 197, 201 (distribution and key to species).

Local name : Sukujellah, Errajela (Telugu).

Common name : Striped dwarf cat-fish (English).

Material examined : (i) 2 exs., 190 mm-202 mm TL. ; Kinnersoni reservoir, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 28.8.83 (ii) 3 exs., 65 mm-78 mm TL. ; Phulong river, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 7.12.84. (iii) 7 exs., 78 mm-81 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 7.6.87.

Diagnostic features : D. 17/0, P. 1/9, V. 6, A. 9-12 (2-3/7-9), C. 17.

Head length 4.50 to 5.00 and body depth 5.00 to 5.25 in total length. Eye diameter 4.00 to 6.00 in head length. Snout length 4.00 in head length. Mouth terminal, transverse, the upper jaw longer. Median longitudinal groove reaching to posterior margin of the orbit. Occipital process three times as long as wide as its base, reaching the basal bone of dorsal fin or with a short interspace. Barbels 4 pairs, maxillary pair reaching pelvic fin

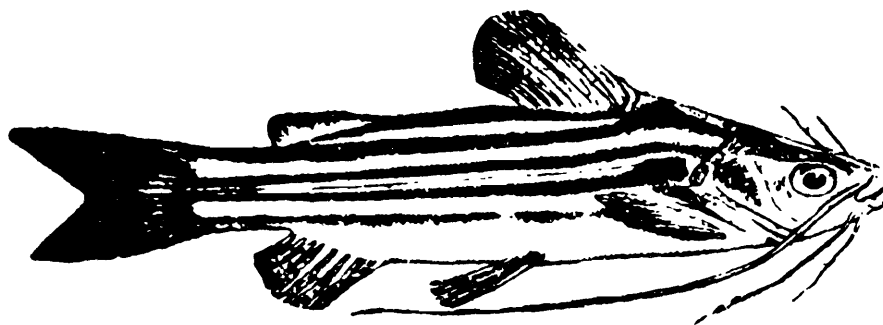


Fig. 97 : *Mystus vittatus* (Bloch)

base or anal origin, outer mandibular pair extends to middle of pectoral fin, inner mandibular pair extends to pectoral fin base or to gill opening and nasal pair extends to hind border of orbit. Rayed dorsal fin equal to head in young specimens or less than head in adult specimens, with a spine serrated internally, origin nearer to adipose dorsal fin origin than to tip of snout or midway between them. Pectoral fin not reaching pelvic fins, with a

spine having 16 internal denticulations. Pelvic fin reaching or not reaching anal fin. Caudal fin forked, with upper lobe longer.

Colour in alcohol : Body silvery grey or golden with 2 or more light bluish or silvery lateral bands. Fins usually black tipped.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma, Sri Lanka, Thailand and Malaya.

Size : It grows 177 to 203 mm (7 to 8 inches) in total length.

Fishery information : It is a widely distributed species found throughout Andhra Pradesh within tidal influence also.

Genus *Aorichthys* Wu, 1939

1939. *Aorichthys* Wu, *Sinensia*, 10 : 131 (proposed originally as substitute name for *Aoria* Jerdon, 1919 preoccupied in Insecta=*Macrones* Dumeril, 1856 preoccupied in Insecta, Type species : *Pimelodus aor* Hamilton, by subsequent designation).

1981. *Aorichthys*, Jayaram, *Handbk. Freshw. Fish. India* : 204 (genus characters and distribution).

Body elongated and compressed. Abdomen rounded. Snout spatulate or rounded. A distinct interneural shield in between basal bone of dorsal fin and occipital process. Barbels 4 pairs, one each of maxillary, nasal and two of mandibular; maxillary barbels extends beyond dorsal fin. Rayed dorsal fin origin above last quarter of pectoral fin, with 7 soft rays and a spine. Adipose fin low and long. Pectoral fins with 9 to 10 soft rays and a spine serrated along inner edge with antrose teeth. Pelvic fins with 6 rays. Anal fin short with 11 to 13 rays. Caudal fin forked. Lateral line complete and simple.

2 species are known from Andhra Pradesh under the genus as well as from the Indian subcontinent.

Key to the species

Maxillary barbels extending beyond caudal fin. Snout rounded. Caudal fin with 17 rays	<i>A. aor</i>
Maxillary barbels extending anal fin. Snout spatulate. Caudal fin with 19 to 21 rays	<i>A. seenghala</i>
...	...

Aorichthys aor (Hamilton Buchanan, 1822)

1822. *Pimelodus aor* Hamilton Buchanan, *Fish. Ganges* : 205, 379, pl. 20, fig. 68 (type-locality : Rivers of Bengal and upper parts of Gangetic estuaries).

1878. *Macrones aor*, Day, *Fish. India* : 444 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 149.

1981. *Aorichthys aor*, Jayaram, *Handbk. Freshw. Fish, India* : 205 (distribution and key to species).

Local name : *Thella jella*, *Mukul jella* (Telugu).

Common name : Long whiskered cat-fish (English).

Material examined : 3 exs., 155 mm-170 mm TL. ; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 1.6.87.

Diagnostic features : D. 1/7/0, P. 1/9-10, V. 6, A. 11-13 (3-4/8-9), C. 17.

Head length 4.50 to 5.00 and body depth 6.50 to 7.50 in total length. Eye diameter 5.00 to 8.00 in head length. Snout broad, depressed and rounded. Width of gape of mouth less than half head length. Mouth terminal, transverse and upper jaw longer. Barbels 4 pairs, maxillary pair extend to caudal fin base or beyond. Rayed dorsal fin with

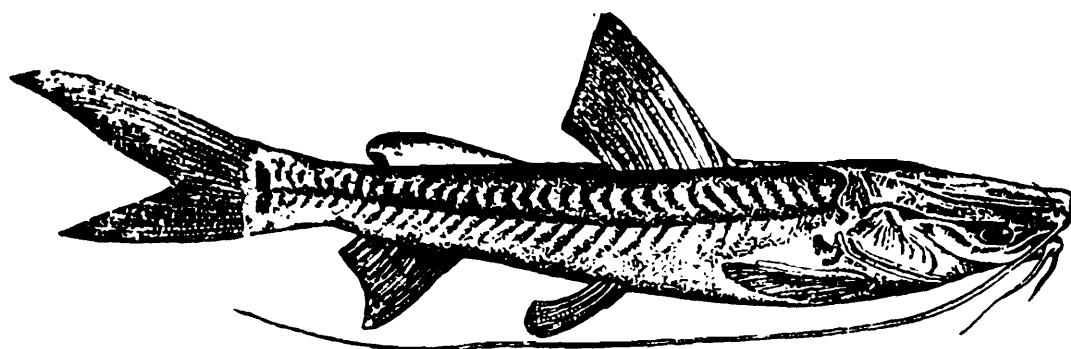


Fig. 98 : *Aorichthys aor* (Hamilton Buchanan)

a weak spine, almost equal to head, finely serrated with 4 to 5 teeth internally. Pectoral spine stronger than of dorsal spine but shorter and finely serrated anteriorly and denticulated posteriorly. Pelvic fin not reaching anal fin. Caudal fin forked with pointed lobes, 3 or 4 outer rays in the upper lobe being produced.

Colour in alcohol : Dorsal surface bluish leaden becoming white on abdomen. Fins yellowish, stained with dark externally in both dorsal and caudal fins. A black spot almost equal to eye diameter on posterior lower end of adipose dorsal fin.

Distribution : India : Ganga, Jamuna, Brahmaputra, Mahanadi, Narmada, Tapti, Cauvery, Krishna and Godavari river systems. Pakistan. Bangladesh and Burma.

Size : It attains 900 mm (3 feet) in total length.

Fishery information : It is a common predominant cat-fish of heavier and larger variety of considerable commercial value.

***Aorichthys seenghala* (Sykes, 1839)**

1839. *Platystoma seenghala* Sykes, *Trans. zool. Soc. Lond.*, 2 : 371, pl. 65, fig. 2 (type-locality : Mota Mula river, Poona).

1878. *Macrones seenghala*, Day, *Fish. India*, : 444, pl. 99, fig. 1 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 150.

1981. *Aorichthys seenghala*, Jayaram, *Handbk. Freshw. Fish. India* : 205 (distribution and key to species).

Local name : . . Multi jella, Seenghala, Nara jella, Keeru jella (Telugu).

Common name : Giant river cat-fish (English).

Material examined : 2 exs., 165mm.-180mm. TL. ; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 3.6.87.

Diagnostic features : D. 17/0, P. 10 (1/9), V. 6 (1/5), A. 11-12 (3/8-9), C. 19-21

Head length 4.50 and body depth 7.50 to 8.00 in head length. Eye diameter 7.00 to 8.00 in head length. Snout spatulate. Width of gape of mouth equals to one third of the head length. Mouth terminal, transverse and upper jaw longer. Barbels 4 pairs,

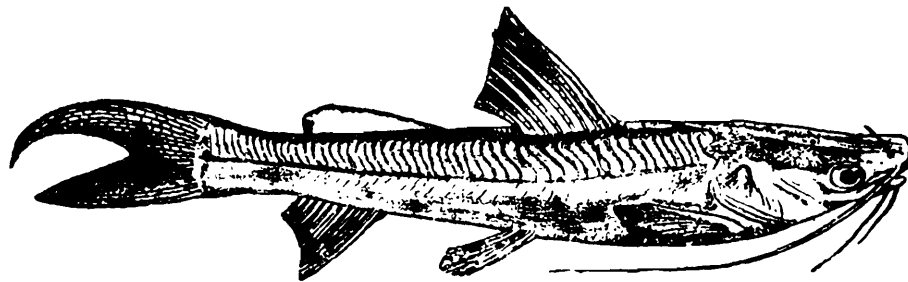


Fig. 99 : *Aorichthys seenghala* (Sykes)

maxillary pair extending to middle or just behind rayed dorsal fin. Dorsal spine weak, rugose and equal to head. Pectoral spine stronger than dorsal spine, anteriorly serrated posteriorly. Pelvic fin not reaching anal fin. Caudal fin forked, equal to head, upper lobe longer with 3 rays slightly produced. Lateral line straight.

Colour in alcohol : Dorsal surface brownish grey and silvery on sides and abdomen. A rounded black spot on hind end of base of adipose dorsal fin.

Distribution : India : The Indus, Ganga, Yamuna, Brahmaputra, Mahanadi, Narmada, Tapti, Cauvery, Krishna and Godavari river systems. Pakistan, Bahgladesh and Burma.

Size : It attains at least 914 mm (3 feet) in total length.

Fishery information : This fish is one of the frequently obtained larger and heavier catfish similar to *A. aor* (Hamilton) of India and Pakistan. It inhabits the larger rivers and is caught extensively in the commercial catches fetching attractive price for the fishermen.

Remarks : This species is very closely related to *A. aor* and chiefly identified by its much shorter maxillary barbels.

Family : SILURIDAE

Sheatfishes

Body elongated and compressed. Skin scaleless, either smooth or covered with osseous plates or scattered tubercles. Rayed dorsal fin short with 4 to 5 soft rays not preceded by a spine. Adipose fin absent. Paired fins laterally inserted. Pectoral fin with

a strong spine, occasionally serrated. Anal fin very long, extending from just posterior to anal opening to caudal fin or confluent with it. Pelvic fins small, sometimes absent. Caudal fin deeply forked, lobes rounded or pointed or cut square. Lateral line straight and complete.

The siluroid or scaleless fishes are popularly known as Cat-fishes, owing to most of them being provided with feelers or long barbels arranged around the mouth. They mostly prefer muddy to clear water and the more developed barbels, the more these fishes appear to be adapted for an inland or muddy freshwater residence.

3 genera are known from the Indian subcontinent, 2 genera are found in Andhra Pradesh under this family.

Haig (1950) made a classification of the fishes of this family.

Key to the genera

Gape of the mouth very wide, extending beyond the orbits posteriorly. Anal fin with 86 to 89 rays	...	...	...	...	...	<i>Wallago</i>
Gape of the mouth not wide, not extending beyond the orbits posteriorly. Anal fin with 52 to 75 rays	...	...	...	...	...	<i>Ompok</i>

Genus *Ompok* Lace'pe'de, 1803.

1803. *Ompok* Lace'pe'de, *Hist. Nat. Poiss.*, 5 : 49 (type-species : *Ompok siluroides* Lace'pe'de, by monotypy).
 1822. *Callichrous* Hamilton, *Fish. Ganges* : 19 (type-species : *Silurus bimaculatus* Bloch).
 1950. *Ompok*, Haig, *Rec. Indian Mus.*, 48 : 103 (synonymy and review).
 1981. *Ompok*, Jayaram, *Handbk. Freshw. Fish. India* : 207-209 (genus characters and distribution).

Body elongated and compressed. Abdomen rounded. Mouth superior, cleft oblique, not extending to anterior margin of the orbit. Barbels 2 pairs, one pair each of maxillary and mandibular. Dorsal fin origin above last half of pectoral fin, with 4 to 5 soft rays and without any spine. Adipose dorsal fin absent. Pectoral fin with 11 to 14 rays and a weak spine, serrated or smooth. Pelvic fin with 7 to 10 rays. Anal fin long with 52 to 75 rays, extending close to caudal fin, free from it or narrowly connected to it. Caudal fin forked. Lateral line complete.

3 species are known from the Indian subcontinent as well as from Andhra Pradesh also under the genus.

Key to the species

1. Maxillary barbels longer than head, extending up to or beyond anal fin	...	...	...	<i>O. bimaculatus</i>
Maxillary barbels shorter than head, not extending up to anal fin	...	...	...	2.
2. Anal fin with 52 to 56 rays	...	...	...	<i>O. pabda</i>
Anal fin with 66 to 71 rays	...	...	...	<i>O. pabo</i>

Ompok bimaculatus (Bloch, 1797)

1797. *Silurus bimaculatus* Bloch, *Syst. Ichth.*, 11 : 17, pl. 369 (type-locality : Malabar).
 1877. *Callichrous bimaculatus*, Day, *Fish. India* : 476, pl. 110, figs. 4 and 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 331, fig. 57.
 1981. *Ompok bimaculatus*, Jayaram, *Handbk. Freshw. Fish. India* : 208, 209, fig. 102A (distribution and key to species).

Local name : *Duku dumu*, *Theenuva* (Telegu).

Common name : Butter Cat-fish (English).

Material examined : (i) 3 exs., 94 mm-122 mm TL. ; Krishna river, Kurnool district, Andhra Pradesh ; R. P. Barman and party ; 9.12.85. (ii) 5 exs., 145 mm-163 mm TL. ; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 1.6.87. (iii) 5 exs., 106 mm-140 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 5 to 7.6.87.

Diagnostic features : D. 4, P. 13-15 (1/12-14), V. 8-9, A. 61-75 (2-3/59-72), C. 17-18.

Head length 5.00 to 7.00 and body depth 4.88 to 5.50 in total length. Eye diameter. 4.00 to 5.75 in head length. Barbels 2 pairs, maxillary pair reach the middle of the pectoral or the commencement of anal fin. Dorsal fin short, without any spine, its origin in advance

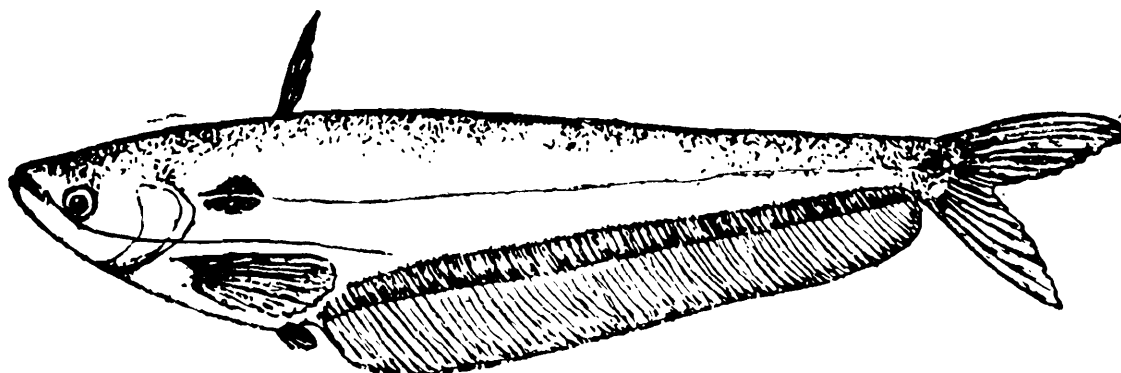


Fig. 100 : *Ompok bimaculatus* (Bloch)

of pelvic fin, considerably nearer to snout tip than to caudal fin base. Pectoral fin with a moderately strong spine, serrated or entire. Anal fin very long, ceases close to, but not continuous with the forked caudal fin.

Colour in alcohol : Silvery shot with purple, a black spot on the superior angle of gill openings. Caudal fin often tipped with black.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma, Sri Lanka, Thailand, Malaya, Vietnam, East Indies, Sumatra, Java, Borneo and China.

Size : It attains at least 457 mm (1½ feet) in total length.

Fishery information : It is a good eating fish found almost all over Andhra Pradesh.

Ompok pabda (Hamilton Buchanan, 1822)

- 1822.** *Silurus pabda* Hamilton Buchanan, *Fish. Ganges* : 950, pl. 25, fig. 47 (type-locality : Bengal).
1877. *Callichrous pabda*, Day, *Fish. India* : 479, pl. 111, figs. 2 and 3 ; 1889, *Fauna Br. India, Fish*, 1 : 133.
1981. *Ompok pabda*, Jayaram, *Handbk. Freshw. Fish. India* : 208-209 (distribution and key to species).

Local name : Gogli (Telugu).

Common name : Butter Cat-fish (English).

Material examined : No specimen obtained by me. It was recorded by Mahmood and Rahimullah (1947b) from Nizamabad district, Andhra Pradesh.

Diagnostic features : D. 4-5, P. 12-14 (1/11-13), V. 7-8, A. 52-56 (2-3/50-53), C. 17-19.

Head length 5.00 to 5.25 and body depth 5.00 to 5.25 in total length. Eye diameter 5.00 in head length. Lower jaw very prominent. Barbels 2 pairs, maxillary pair shorter than head, extending middle or end of pectoral fin and mandibular pair reach hind edge of

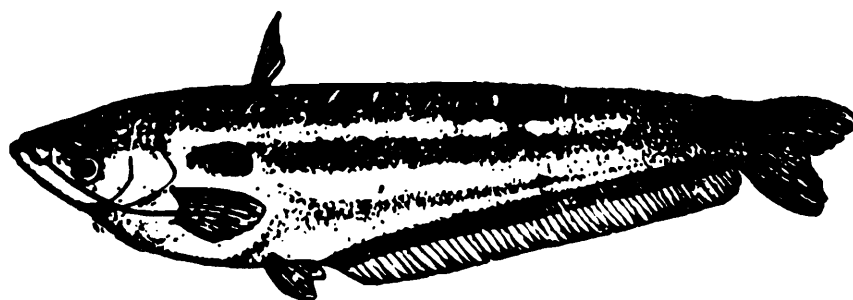


Fig. 101 : *Ompok pabda* (Hamilton Buchanan)

the orbit. Dorsal fin short, without any spine, its origin in advance of pelvic fin origin and considerably nearer to tip of snout than to base of caudal fin. Pectoral fin with a spine, may be serrated internally, sometimes rather strongly or feebly or entirely smooth. Anal fin very long not confluent with caudal fin which is forked.

Colour in alcohol : Usually silvery glossed with gold having a dark spot on the superior angle of gill openings. Sometimes another dark spot present close to base of caudal fin.

Distribution : India : the Indus, Ganga, Brahmaputra and Krishna and Gadavari river systems. Bangaldesh. Pakistan and Burma.

Size : It attains 172 mm (7 inches) in total length.

Fishery information : It is an esteemed food fish, usually known for its taste as "Butter fish." In Andhra Pradesh it is found in the rivers Krishna and Godavari.

Ompok pabo (Hamilton Buchanan, 1822)

1822. *Silurus pabo* Hamilton Buchanan, *Fish. Ganges*, : 153, pl. 17, fig. 48 (type-locality : Brahmaputra river, Assam).
 1877. *Callichrous pabo*, Day, *Fish. India*, : 477, pl. 110, fig. 6; 1889, Day, *Fauna Br. India, Fish*, 1: 132.
 1981. *Ompok pabo*, Jayaram, *Handbk. Freshw. Fish. India*, : 209 (distribution and key to species).

Local name : Nil.

Common name : Butter Cat-fish (English).

Material examined : No specimen obtained by me. This is found in both the rivers of Krishna and Godavari (David, 1963a).

Diagnostic features : D. 5, P. 1/14, V. 9-10, A. 66-71 (3/63-68), C. 17.

Head length 5.00 to 5.25 and body depth 5.00 to 5.50 in total length. Snout depressed, length 3.50 in head length. Eye subcutaneous, lateral, diameter 4.00 to 4.50 in head length. Mouth oblique, lower jaw longer. Teeth villiform, in band on jaws, vomerine teeth in 2 short separate transverse patches. Barbels 2 pairs, maxillary pair reaching a little

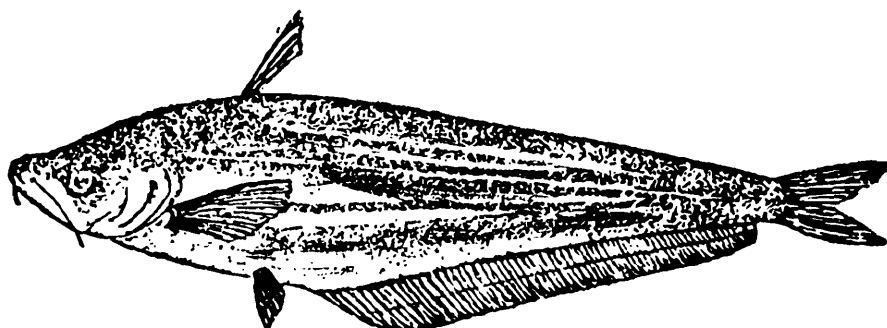


Fig. 102: *Ompok pabo* (Hamilton Buchanan)

beyond posterior border of orbit and mandibular pair equal to eye diameter. Dorsal fin short. Pectoral fin with a moderately strong spine feebly serrated or entire internally. Anal fin long, not united with caudal fin. Caudal fin deeply forked, upper lobe slightly longer.

Colour in alcohol : Body silvery grey above, lighter below. Humeral spot present.

Distribution : India : The Ganga, the Yamuna, the Brahmaputra, the Krishna and Godavari river systems. Pakistan. Bangladesh and Burma.

Size : It attains 168 mm (7 inches) in total length.

Remarks : In Andhra Pradesh this fish is available in both the rivers of Krishna and Godavari, where this species is very common.

Genus Wallago Bleeker 1851,

1851. *Wallago* Bleeker, *Nat. Tijdschr. Ned. Inde*, 2 : 202 (type-species : *Wallago dinema* Bleeker, by original description).
 1950. *Wallago*, Haig, *Rec. Indian Mus.*, 48 : 101 (review and synonymy).
 1981. *Wallago*, Jayaram, *Handbk. Freshw. Fish. India* : 209, 210 (genus characters and distribution).

Body elongated, compressed with rounded abdomen. Mouth subterminal, oblique, cleft extending beyond the orbits posteriorly. Jaws subequal, lower jaw longer and conspicuous. Barbels 2 pairs, one pair each of maxillary and mandibular. Dorsal fin inserted above half of pectoral fin, with 5 soft rays and no spine. Pectoral fin with 13 to 15 soft rays and a weak, smooth spine. Pelvic fin with 8 to 10 rays. Anal fin long with 86 to 93 rays, free from caudal fin which is forked. Lateral line complete.

***Wallago attu* (Schneider, 1801)**

1801. *Silurus attu* Schneider, *Syst. Ichth. Bloch* : 378, pl. 75, (type-locality : Malabar).
 1877. *Wallago attu*, Day, *Fish. India* : 479, pl. 111, fig. 4, 1889, Day, *Fauna Br. India, Fish*, 1 : 126, fig. 54.
 1981. *Wallago attu*, Jayaram, *Handbk. Freshw. Fish. India* : 210 (distribution).

Local name : *Valuga, Wallagah, Valaga* (Télegu).

Common name : Freshwater Shark (English).

Material examined : 2 ex., 240 mm-250 mm TL., Manjira river, Medak district, Andhra Pradesh ; R. P. Barman and party ; 12.12.84.

Diagnostic features : D. 5, P. 14-16 (1/13-15), V. 8-10, A. 86-93 (4/82-89), C. 17.

Head length 5.00 to 5.50 and body depth 6.50 in total length. Eye diameter 7.00 to 8.00 in head length. Dorsal profile nearly straight. Snout rather produced. Cleft of mouth extending posterior margin of the orbit. Lower jaw more prominent. Barbels 2



Fig. 103 : *Wallago attu* (Schneider)

pairs, maxillary pair twice as long as head and mandibular pair equal to snout. Dorsal fin short, spineless ; origin above or a little in advance of pelvic fin origin. Pectoral fin spine moderately strong and finely serrated. Anal fin very long not confluent with caudal fin which is forked.

Colour in alcohol : Body uniformly silvery grey becoming lighter below. Fins sometimes covered with fine dots.

Distribution : Throughout India, Pakistan, Bangladesh, Burma, Sri Lanka, Thailand, Java, Sumatra, Borneo and China.

Size : It attains at least 1, 828 mm (6 feet) in total length.

Fishery information : This species inhabits large rivers, tanks and lakes. It is one of the large sized, voracious predatory cat fishes which thrives well in rivers and tanks specially in jheels with grassy margin. The fish perhaps prefers muddy tanks subject to periodical flooding from a nallah or rivers. It is very destructive to all other kinds of fishes as it is predatory by nature, destroying fry and small fishes. It is called the freshwater shark. Though offered to the goddess Kali by the Hindus, it is considered as unclean by many and is therefore avoided.

Family SCHILBEIDAE

Schilbid catfishes

Body elongated and compressed. Nostrils widely separated. Barbels 2 to 4 pairs, fairly well developed. Dorsal fin present with a short base of 5 to 7 soft rays and a spine or absent. Adipose dorsal fin usually present, may be absent. Paired fins inserted laterally. Pectoral fin with a strong spine, usually serrated. Anal fin very long with 40 to 46 rays and not confluent with caudal fin. Caudal fin forked. Lateral line generally complete, simple.

Key to the subfamilies

Dorsal fin absent	...	...	...	<i>Ailinae</i>
Dorsal fin present	...	...	...	<i>Schilbeinae</i>

Subfamily AILINAE

Dorsal fin and spine absent. Adipose dorsal fin very small. Teeth on vomer minute, Anal fin very long.

Genus *Ailia* Gray, 1831.

1831. *Ailia* Gray, III. *Indian Zool.*, 1 : 85 (type-species : *Ailia bengalensis* Gray).

1871. *Aillichthys* Day, *Proc. zool. Soc. Lond.* : 712 (type-species : *A. punctata* Day).

1981. *Ailia*, Jayaram, *Handbk. Freshw. Fish. India* : 212, 213 (genus characters and distribution).

Body elongated and compressed. Snout overhanging. Mouth terminal, moderately wide. Upper jaw slightly longer. Barbels 4 pairs, one each of maxillary, nasal and two of mandibular, all of almost equal length and longer than head. Rayed dorsal fin absent. A small adipose fin present posteriorly. Pectoral fin with 13 to 16 soft rays and a spine, smooth or serrated along inner edge with antrorse teeth. Pelvic fin with 6 soft rays. Anal fin long, with 58 to 90 soft rays, separated from the caudal fin. Caudal fin forked. Lateral line complete, simple.

2 species are known under the genus from the Indian subcontinent, 1 species is found in Andhra Pradesh.

***Ailia colla* (Hamilton Buchanan, 1822)**

1822. *Malapterurus colla* Hamilton Buchanan, *Fish. Ganges*: 158, 375 (type-locality: freshwater rivers of Bengal, Ganges).

1877. *Ailia colla*, Day, *Fish. India*: 488, pl. 114, fig. 4; 1889, Day, *Fauna Br. India, Fish*, 1: 134, fig. 58.

1981. *Ailia colla*, Jayaram, *Handbk. Freshw. Fish. India*: 213, 214 (distribution and key to species).

Local name : *Puttull, Buns putta, Vella kalada* (Telugu).

Common name : *Ailia* (English).

Material examined : No specimen obtained by me. It was recorded by Misra (1976b) from Andhra Pradesh.

Diagnostic features : D. 0, P. 1/14, V. 6, A. 59-75, C. 19.

Head length 6.00 to 7.00 and body depth 5.25 to 6.00 in total length. Eye diameter 3.50 to 3.75 in head length. Snout pointed, length 3.10 in head length. Mouth inferior, cleft of mouth extending below to middle of the orbit. Upper jaw longer. Barbels 4 pairs, extending origin of anal fin. Teeth villiform in jaws and in two small patches on vomer.

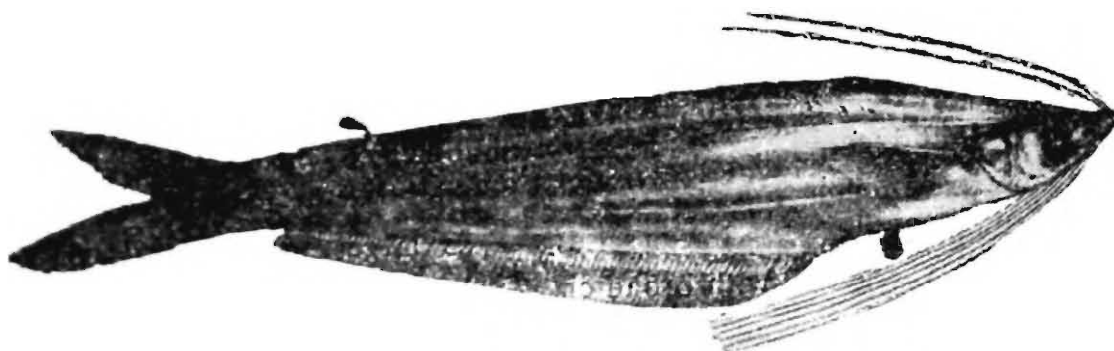


Fig. 104 : *Ailia colla* (Hamilton Buchanan)

Dorsal fin absent. A small posterior adipose dorsal fin present. Pectoral spine slender, finely serrated internally, extending beyond pelvic fin, almost to anal fin origin. Anal fin long. Caudal fin deeply forked, lower lobe longer.

Colour in alcohol : Body silvery, smooth. Some of the fins tipped grey.

Distribution : India : up to the Krishna river systems. Pakistan. Nepal and Bangladesh.

Size : It attains 305 mm (1 foot) in total length.

Fishery information : This fish is considered excellent eating and much esteemed as food fish. It is a surface or mid-water fish and lives in shoals in large rivers.

Subfamily : SCHILBEINAE

Dorsal fin and spine present. Adipose dorsal fin vestigial, small, may be absent. Teeth on vomer large. Anal fin moderate.

Key to the genera

1. Barbels 2 pairs, one of maxillary, one of mandibular, either of pair may become vestigial or absent	...	...	...	<i>Silonia</i>
Barbels 4 pairs	...	...	...	2.
2. Teeth on palate in 4 small distinct patches. Caudal fin bent downwards from caudal peduncle onwards.	...	...	...	<i>Proeutropiichthys</i>
Teeth on palate in 2 extensive patches. Caudal fin normal, not bent downwards	...	...	...	3.
3. Cleft of mouth oblique, extending up to middle of the orbit	...	...	...	<i>Eutropiichthys</i>
Cleft of mouth not oblique, extending only to anterior margin of the orbit or even shorter	...	...	...	<i>Pseudeutropius</i>

Genus *Pseudeutropius* Bleeker, 1862.

1862. *Pseudeutropius* Bleeker, *Versl. Akad. Amsterdam*, 14 : 398 (type-species : *Pseudeutropius brachypterus* Bleeker).

1981. *Pseudeutropius*, Jayaram, *Handbk. Freshw. Fish. India* : 216, 217 (genus characters and distribution).

Body elongated and compressed. Part of abdomen somewhat keeled. Teeth small, villiform, in narrow bands on jaws and palate ; those on latter in 2 small widely separated patches, occasionally connected by a linear series. Eyes large, ventrolateral, partly below and behind level of cleft of mouth with broad circular adipose lids. Barbels 4 pairs, one each of maxillary, nasal and two of mandibular. Rayed dorsal fin inserted above half of pectoral fin, with 5 to 6 soft rays and a spine. Adipose fin short. Pectoral fin with 7 to 9 soft rays and a spine serrated along both margins. Pelvic fin with 6 soft rays. Anal fin with 33 to 46 rays, not confluent with caudal fin. Caudal fin forked. Lateral line complete, simple.

2 species known under the genus, 1 species is available in Andhra Pradesh.

***Pseudeutropius atherinoides* (Bloch, 1794)**

1794. *Silurus atherinoides* Bloch, *Natuges. Ausland Fische*, 8: 48, pl. 371, fig. 1 (type-locality: Tranquebar).
 1877. *Pseudeutropius atherinoides*, Day, *Fish. India*: 473, pl. 109, fig. 2; 1889, Day, *Fauna Br. India, Fish*, 1: 141.
 1981. *Pseudeutropius atherinoides*, Jayaram, *Handbk. Freshw. Fish. India*: 217 (distribution and key to species).

Local name : *Akku jella* (Telugu).

Material examined : (i) 4 exs., 90 mm-105 mm TL.; a tank at Rajamundry, East Godavari district, Andhra Pradesh; R. P. Barman and party; 31.5.87. (ii) 17 exs., 65 mm-78 mm TL.; Kolleru Lake, West Godavari district, Andhra Pradesh; R. P. Barman and party; 4.6.87, 9.6.87.

Diagnostic features : D. 1/5-6/0, P. 1/7, V. 6, A. 33-41 (3/30-38), C. 17.

Head length 5.00 to 5.50 and **body depth** 4.50 to 5.50 in total length. **Eye diameter** 2.60 to 3.00 in head length. **Snout length** 2.50 to 3.25 in head length. **Mouth terminal**, upper jaw slightly longer. **Teeth** on palate in two narrow separate crescentic bands. **Barbels** 4 pairs, one pair nasal, slightly longer than head; one pair maxillary, extending

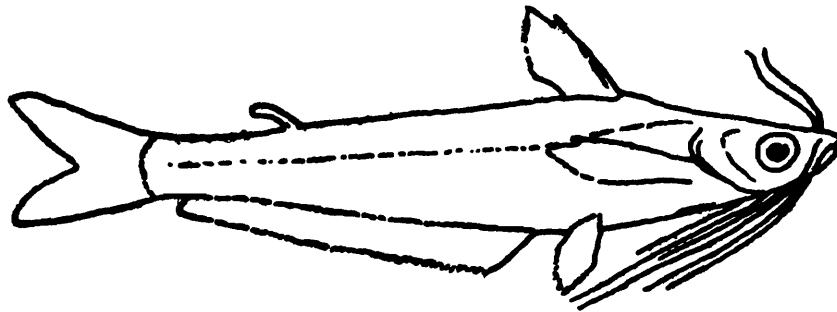


Fig. 105 : *Pseudeutropius atherinoides* (Bloch)

base of anal fin and two pairs of mandibular, rather longer than head. **Dorsal spine** two-thirds as long as head, anteriorly rugose, finely serrated posteriorly. **Pectoral spine** rather longer and stronger than that of dorsal spine with about ten denticulations internally. **Caudal fin** deeply forked, upper lobe slightly longer.

Colour in alcohol : Body silvery, dorsal surface greenish with three or four longitudinal bands on sides formed by black dots. A pale golden stripe along lateral line ending in a rounded black spot at caudal fin base. Usually a black spot at nape and in front of dorsal fin base present.

Distribution : Throughout India except Kerala and Assam, Pakistan, Nepal, Bangladesh and Burma.

Size : It attains 150 mm (6 inches) in total length.

Fishery information : This fish is of not much value as a food item despite its wide distribution. However, for its bright colour and small size this species attract the attention of aquarists. This species is found in both the Krishna and Godavari river systems, Andhra Pradesh.

Genus *Proeutropilichthys* Hora, 1937.

1937. *Proeutropilichthys* Hora, *Curr. Sci.*, 5 : 353 (type-species : *Eutropius macrophthalmus* Blyth, by original designation).
 1981. *Proeutropilichthys*, Jayaram, *Handbk. Freshw. Fish. India* : 218 (genus characters and distribution).

Body elongated and compressed. Part of abdomen somewhat keeled. Teeth small, villiform in bands on jaws and in four oval patches forming a semilunar band on palate. Nostrils close together with nasal barbel between them. Barbels 4 pairs, one each of maxillary, nasal and two of mandibular. Rayed dorsal fin inserted above last quarter of pectoral fin, with 6 to 7 soft rays and a spine. Adipose fin short. Pectoral fin with 10 to 11 soft rays and a serrated spine. Pelvic fin with 6 soft rays. Anal fin with 42 to 52 rays. Caudal fin deeply forked, bent downwards from caudal peduncle. Lateral line complete, simple.

This genus is represented by a single species in the Indian region.

Proeutropilichthys taakree (Sykes, 1841)

1841. *Hypophthalmus taakree* Sykes, *Trans. zool. Soc. Lond.* ; 2 : 369, pl. 64, fig. 4 (type-locality : Bhima river, near Pairgaon).
 1877. *Pseudeutropius taakree*, Day, *Fish. India* : 471, pl. 109, fig. 4 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 138.
 1981. *Proeutropilichthys taakree*, Jayaram, *Handbk. Freshw. Fish. India*, : 218 (distribution).

Local name : *Siriva-jella* (Telegu).

Material examined : 4 exs., 143 mm-177 mm TL. ; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; R. P. Barman and Party ; 1.6.87.

Diagnostic features : D. 1/6-7/0, P. 1/10-11, V. 6, A. 42-52 (3-4/39-48), C. 17.

Head length 5.80 to 6.30 and body depth 5.00 to 6.00 in total length. Eye diameter 2.70 to 3.00 in head length. Mouth terminal, cleft of mouth extends to opposite below the middle of the orbit. Teeth small, villiform in bands on jaws and in four oval patches forming a semilunar band on palate. Barbels 4 pairs, one pair nasal less than half of head, one pair maxillary extending to anal fin, two pairs mandibular slightly longer than head. Dorsal spine smooth anteriorly, serrated posteriorly. Pectoral spine stronger, serrated internally and almost equal to head. Caudal fin deeply forked, bent downwards from caudal peduncle.

Colour in alcohol : Body silvery with a gloss of green along back. Caudal fin stained with grey at its edges.

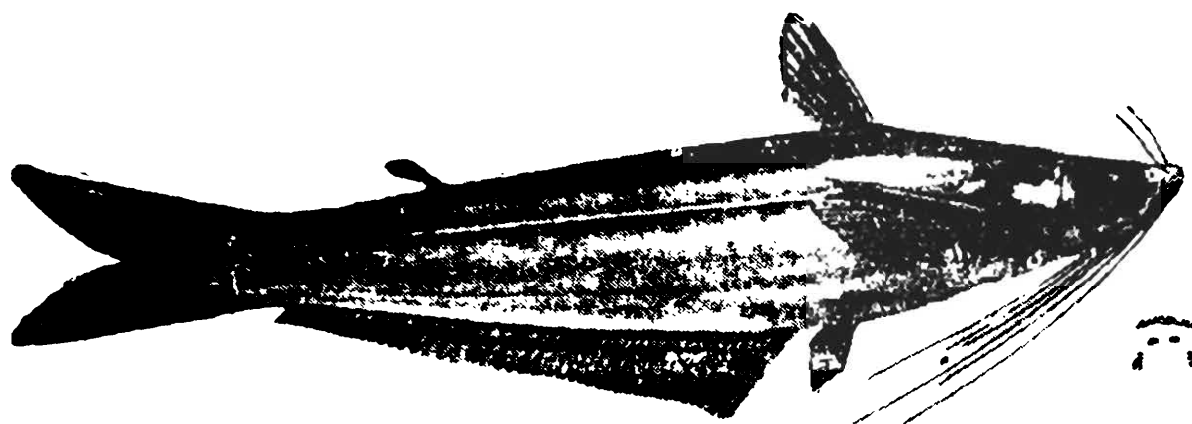


Fig. 106 : *Proeutropiichthys taakree* (Sykes)
Top : Lateral view Bottom : Dentition pattern

Distribution : India : the Yamuna, Madhya Pradesh, the Beema river near Paigaoon, Poona, Maharashtra ; Tungabhadra river, and Cauvery river, Karnataka ; Krishna and Godavary river, Andhra Pradesh and Orissa. Burma.

Size : It attains 457 mm ($1\frac{1}{2}$ feet) in total length.

Fishery Information : This species is found in freshwater as well as in the tidal waters. It is of good taste and value. In Andhra Pradesh, it is found in the Krishna and Godavari river systems.

Genus *Eutropiichthys* Bleeker, 1862.

1862. *Eutropiichthys* Bleeker, *Versl. Akad. Amsterdam*, 14 : 398 (type-species : *Pimelodus vacha* Hamilton Buchanan).

1981. *Eutropiichthys*, Jayaram, *Handbk. Freshw. Fish. India* : 222, 223 (genus characters and distribution).

Body and head compressed. Mouth subterminal, transverse, ascending wide, extending to below the orbit or slightly beyond. Barbels 4 pairs, one pair each of maxillary, nasal and two of mandibular. Rayed dorsal fin inserted above half of pectoral fins, with 7 soft rays and 1 spine. Adipose fin short. Pectoral fin with 10 to 16 soft rays and 1 smooth spine. Pelvic fin with 6 soft rays. Anal fin long with 38 to 54 rays. Caudal fin deeply forked. Lateral line complete, simple.

3 species are known under the genus from the Indian subcontinent, 1 species is found in Andhra Pradesh.

Eutropiichthys goongwaree (Sykes, 1841)

1841. *Hypophthalmus goongwaree* Sykes, *Trans. zool. Soc. Lond.*, 2 : 369, tab. 64, fig. 3 (type-locality : Mota Mola river, Deccan).
 1877. *Pseudeutropius goongwaree*, Day, *Fish. India* : 471, pl. 109, fig. 3 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 137, fig. 60.
 1981. *Eutropiichthys goongwaree*, Jayaram, *Handbk. Freshw. Fish. India* : 224 (distribution and key to species).

Local name : Nil.

Common name : Vacha (English).

Material examined : No specimen obtained by me. It was recorded by Jayaram (1981) from Andhra Pradesh.

Diagnostic features : D. 1/7/0, P. 1/13, V. 6, A. 54 (3/51), C. 17.

Head length 5.00 and body depth 5.00 in total length. Eye diameter 2.75 in head length. Snout length 4.50 in head length. Cleft of mouth extends to below first third of the orbit, upper jaw longer. Teeth on palate interrupted in the middle and teeth on upper jaw in a long curved band without any patch below. Barbels 4 pairs, one pair nasal reach

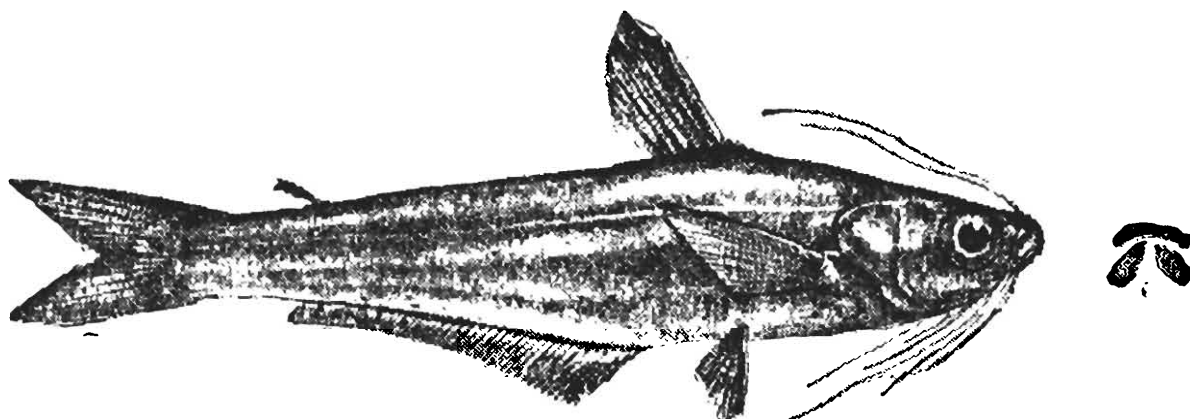


Fig. 107 : *Eutropiichthys goongwaree* (Sykes)
 Left : Lateral view Right : Dentition pattern

base of dorsal fin, one pair maxillary reach anal fin and two pairs mandibular almost equal to head. Dorsal spine somewhat slender, almost equal to head and very finely serrated posteriorly. Pectoral spine slightly longer, stronger and rather strongly denticulated internally. Caudal fin deeply forked with pointed lobes.

Colour in alcohol : Body silvery greenish along dorsal surface.

Distribution : India : Maharashtra, Andhra Pradesh, Tamil Nadu and West Bengal. ~~Burma.~~

Size : It attains 305 mm (1 foot) in total length.

Fishery information : The fish is found in both the Krishna and Godavari river systems, Andhra Pradesh.

Genus *Silonia* Swainson, 1839.

1839. *Silonia* Swainson, *Nat. Hist. Fish. Animal.*, 2: 305 (type-species: *Pimelodus silondia* Hamilton, by subsequent designation).
 1840. *Silundia* Valenciennes, *Hist. nat. Poiss.*, 15: 49 (type species: *Pimelodus silondia* Hamilton Buchanan, *tautotypic*).
 1952. *Silonia*, Silas, *Proc. nat. Inst. Sci. India*, 18 (5): 433 (*Silonopangasius* synonymised).
 1981. *Silonia*, Jayaram, *Handbk. Freshw. Fish. India*: 224, 225 (distribution and key to species).

Body elongated, compressed with rounded abdomen. Mouth anterior, wide and obliquely directed upwards. Barbels 2 pairs, one of maxillary, small, in a groove; one of mandibular; either of the pair may become vestigial or absent. Rayed dorsal fin inserted above half of pectoral fin, with 7 rays and a spine. Adipose dorsal fin short, posteriorly free. Pectoral fin with 11 to 13 soft rays and a strong spine serrated along both edges. Pelvic fin with 6 rays. Anal fin long with 40 to 50 rays. Caudal fin deeply forked. Lateral line complete, indistinct.

Silonia childreni (Sykes, 1841)

1841. *Agentosus childreni* Sykes, *Trans. zool. Soc. Lond.*, 2: 375 (type-locality: Mota Mola river, Poona).
 1852. *Silonia childreni* Sykes, *Proc. nat. Inst. Sci. India*, 18 (5): 433 (as a synonym of *Silonia*).
 1877. *Silundia sykesii* Day, *Fish. India*, : 487, pl. 114, fig. 2; 1889, Day, *Fauna Br. India, Fish*, 1: 144.
 1942. *Silonopangasius childreni* Hora and Misra, *J. Bombay nat. Hist. Soc.*, 43: 222 (Poona).
 1981. *Silonia childreni*, Jayaram, *Handbk. Freshw. Fish. India*: 225 (distribution and key to species).

Local name : *Wan-jow* (Telegue)

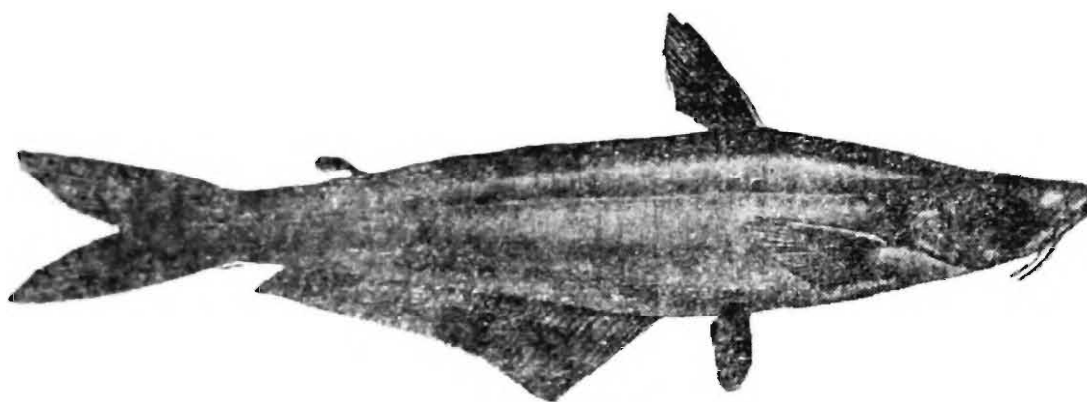


Fig. 108 : *Silonia childreni* (Sykes)

Material examined : No specimen obtained by me. It was recorded by Mahmood and Rahimullah (1947b) from Andhra Pradesh.

Diagnostic features : D. 17/0, P. 1/12, V. 6, A. 44-50(2-3/42-47), C. 19.

Head length 5.25 and body depth 5.75 in total length. Eye diameter 3.50 in head length. Snout length 3.50 in head length. Mouth wide, cleft not extending to front margin of the orbit. Lower jaw longer, curved upwards in the middle. Barbels 2 pairs, the maxillary pair reach opercle or even of pectoral fin and the mandibular pair equal to the orbit. Dorsal spine weak, roughened anteriorly, finely serrated posteriorly. Pectoral spine longer and stronger than dorsal spine, serrated internally and roughened externally. Caudal fin deeply forked, lower lobe rather longer.

Colour in alcohol : Dorsal surface dusky green, sides and abdomen silvery. Caudal fin with band of light and red tint.

Distribution : India : the rivers of Kerala, the Cauvery, the Krishna and the Godavari river systems.

Size : It attains 180 mm (7 inches) in total length.

Fishery information : This species forms a major freshwater fishery in the Tunghabhadra reservoir being a shoaling fish.

Remarks : The long maxillary barbels of this species serves to identify it from *Silonia silondia* (Hamilton). *S. childreni* has been designated as threatened species of India.

Family PANGASIIDAE

Body elongated and compressed. Teeth on premaxillaries, mandible and prevomer. Nostrils widely separated, anterior ones wide, situated along anterior margin of snout ; posterior with a lip situated at some distance behind anterior nostrils. Barbels 2 pairs, moderately developed. Nasal barbels absent. Rayed dorsal fin far forward with a pungent spine. Adipose dorsal fin present, small, never confluent with caudal fin. Paired fins inserted laterally. Pectoral fin with a strong, serrated spine. Anal fin long with 28 to 44 rays, not confluent with caudal fin. Caudal fin forked. Lateral line complete, simple.

This family was previously included among the family Schilbeidae. The recent workers, viz. Tilak (1964), Greenwood et al. (1966) and Jayaram (1981) have treated this family as a distinct from Schilbeidae.

Only 1 genus is known under this family from the Indian subcontinent.

Genus *Pangasius* Valenciennes, 1840.

1840. *Pangasius* Valenciennes, (in Cuvier and Valenciennes) *Hist. Nat. Poiss.*, 15 : 45 (type-species : *Pimelodus pangasius* Hamilton, by original designation).

1981. *Pangasius*, Jayaram, *Handbk. Freshw. Fish. India* : 226-227 (genus characters and distribution).

Body elongated, compressed with rounded abdomen. Head blunt and granulated,

Mouth subterminal, horizontal or slightly ascending. **Barbels** 2 pairs, one each of maxillary and mandibular. **Nasal barbels** absent. **Rayed dorsal fin** inserted above last quarter of pectoral fins, with 6 to 7 soft rays and a strong serrated spine. A very small **adipose fin** present. **Pelvic fins** with 6 rays. **Anal fin** long, with 30 to 34 rays. **Caudal fin** forked. **Lateral line** complete, simple.

1 species is known under the genus from the Indian subcontinent as well as from Andhra Pradesh.

***Pangasius pangasius* (Hamilton Buchanan, 1822)**

1822. *Pimelodus pangasius* Hamilton Buchanan, *Fish. Ganges* : 163, 376, pl. 33, fig. 52 (type-locality : estuaries of Bengal).
 1877. *Pangasius bichanani*, Day, *Fish. India* : 470, pl. 108, fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 142, fig. 61.
 1981. *Pangasius pangasius*, Jayaram, *Handbk. Freshw. Fish. India* : 227 (distribution).

Local name : Choluva jella, Banku jella (Telugu).

Common Name : Pangash (English).

Material examined : 2 exs., 170 mm-182 mm TL. ; Godavari river, Rajmundry, East Godavari district, Andhra Pradesh ; R.P. Barman and party ; 31.5.87.

Diagnostic features : D.8-9 (2/6-7), P.13-14 (1/12-13), V.6, A.30-34 (4-5/26-29), C.19.

Head length 4.50 to 6.00 and **body depth** 5.00 to 6.50 in total length. **Eye diameter** 3.00 to 5.00 in head length. **Snout** obtusely rounded, length 2.20 to 3.30 in head length. **Mouth** inferior, upper jaw slightly longer. and partly exposed. **Palatine teeth** in a crescentic row, **vomerine patches** separate from or nearly confluent with those on palate. **Barbels** 2 pairs, one each of maxillary and mandibular, maxillary pair extending to pectoral

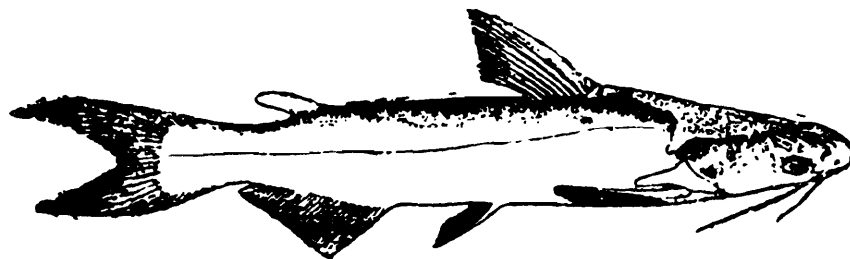


Fig. 109 : *Pangasius pangasius* (Hamilton Buchanan)

fin base. **Dorsal spine** strong and serrated. **Pectoral spine** strong, serrated and equal to dorsal spine. **Lateral line** complete and simple. **Caudal fin** deeply forked, lobes pointed, upper lobe slightly longer.

Colour in alcohol : Body silvery, darkest above, shot with purple on sides. Cheeks and under surface of head shot with gold.

Distribution : Throughout India, Pakistan, Bangladesh, Burma, Thailand, Malaya, Vietnam and Indonesia.

Size : It attains 1,219 mm (4 feet) in total length.

Remarks : This fish is a foul feeder and descends tidal rivers and estuaries.

David (1963b) created a new subspecies of *P. pangasius* based on juvenile specimens of this species from the Godavari-Krishna river systems, Andhra Pradesh. From the description of the new subspecies, *P. pangasius godavarii*, it appear to me that the new subspecies is nothing but a juvenile forms of *P. pangasius*. Because the juvenile form of any species usually show some morphometric measurements variations which may mislead the systematists. A more detailed systematic study is required to establish it as a separate subspecies of *P. pangasius*.

P. pangasius has been designated as a threatened species of India.

Family SISORIDAE

Sucker Catfishes

Body short or elongated, with head and anterior part of body depressed and tail compressed or entire body compressed. An adhesive apparatus in thoracic region present or absent. Nostrils close together, slit-like, separated by nasal barbel of varying length. Barbels 4 pairs, usually well developed, in some genera thick, fleshy with broad bases. Rayed dorsal fin base short, with or without a spine. Adipose dorsal fin present and usually large (confluent with caudal fin in some genera and consisting of a small spine in the elongate *Sisor*). Paired fins inserted horizontally, may or may not be plaited. Pectoral fin with or without a spine, denticulated either on inner or outer margin or on both. The outermost ray of pelvic fins thick, pinnate. Anal fin short, not confluent with caudal fin. Caudal fin deeply forked, emarginate, truncate or rounded. Lateral line present, complete. Mostly small forms occurring in mountain rapids.

Key to the genera

1. Ventral surface of body provided with an adhesive apparatus with or without a central pit or depression on thorax *Glyptothorax*
 Ventral surface of body normal without any adhesive apparatus 2.
2. Gill membranes confluent with each other and also with isthmus. Pectoral fin with 8 to 9 rays without any soft prolongation. Caudal fin deeply forked without any soft filamentous prolongation *Nangra*
 Gill membranes free from each other up to base of isthmus and overlapping, free from isthmus. Pectoral fin with 13 rays and with soft prolongation. Caudal fin deeply forked and with soft filamentous prolongation *Bagarius*

Genus Bagarius Bleeker, 1853.

1853. *Bagarius* Bleeker, *Verh. Bat. Gen.*, 25 : 121 (type-species : *Pimelodus bagarius* Hamilton).

1981. *Bagarius*, Jayaram, *Handbk. Freshw. Fish, India* : 237, 238 (genus characters and distribution).

Body elongated, flattened up to pelvic fin. Head depressed, its upper surface osseous. Mouth ventral, wide and crescentic ; upper jaw longer. Nostrils approximating, the posterior provided with a barbel. Barbels 4 pairs, one pair each of maxillary, nasal and two of mandibular ; maxillary barbels with broad bases. Rayed dorsal fin inserted above base of pectoral fin with 6 rays and a smooth spine with an elongated soft termination of varying length. Pectoral fin with 13 rays and a spine serrated along inner edge and also with a soft prolongation. Pelvic fin with 6 rays. Anal fin short, with 12 to 15 rays. Caudal fin deeply forked, upper lobe longer and both lobes produced into soft filamentous prolongations. Lateral line complete.

Only 1 species is known under the genus from the Indian subcontinent, this species is found in Andhra Pradesh.

***Bagarius bagarius* (Hamilton Buchanan, 1822)**

1822. *Pimelodus bagarius* Hamilton Buchanan, *Fish. Ganges* : 186, 378, pl. 7, fig. 62 (type-locality : the Ganges and its tributaries).

1877. *Bagarius yarrellii*, Day, *Fish. India* : 495, pl. 115, fig. 3 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 194, fig. 71.

1981. *Bagarius bagarius*, Jayaram, *Handbk. Freshw. Fish. India* : 238 (distribution).

Local name : *Raati jella, Guddi chepa* (Telugu).

Common name : *Bagarius, Goonch* (English).

Material examined : 1 ex., 300 mm TL. ; Krishna river, Kurnool district, Andhra Pradesh ; R. P. Barman and party ; 9.12.85.

Diagnostic features : D. 1/6/0, P. 1/12, V. 1/5, A. 12-15 (3/9-12), C. 17.

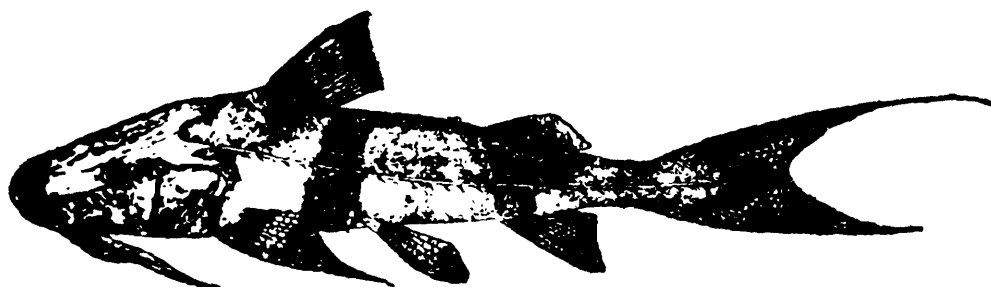


Fig. 110 : *Bagarius bagarius* (Hamilton Buchanan)

Head length 3.75 and body depth 5.00 in total length (without prolonged caudal fin ray). Eye diameter 7.70 to 11.20 in head length. Snout length 2.30 in head length.

Mouth inferior, crescentic, upper jaw longer. Teeth in jaws pointed, of unequal in size, palate edentulous. Barbels 4 pairs, maxillary barbels with broad bases. Rayed dorsal fin inserted above base of pectoral fin, dorsal spine smooth with an elongated soft termination of varying length. Pectoral spine stronger than and equal to dorsal spine, serrated. Caudal fin deeply forked, its upper lobe prolonged and both lobes produced into soft filamentous structures.

Colour in alcohol : Body scarbrous, greyish yellow with large irregular brown and black markings and cross bands. Fins with black bases and usually a dark band.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh Burma, Thailand, Malaya, Vietnam, East Indies and Tonkin.

Size : It attains at least 1,828 mm (6 feet) in total length.

Fishery information : This is very common fish of the rivers Krishna and Godavari. It is often termed a "freshwater shark" partly on account of its voracity and partly because of its underhung mouth and general ugliness.

B. bagarius has been designated as a threatened species of India.

Genus *Nangra* Day, 1877.

1877. *Nangra* Day, *Fish. India* : 493 (type-species : *Pimelodus nangra* Hamilton).

1941. *Nangra*, Hora and Law, *Rec. Indian Mus.*, 43 : 9 (as a synonym of *Gagata* Bleeker).

1972. *Nangra*, Jayaram, *J. zool. Soc. India*, 23 (2) : 171 (genus resurrection from the synonymy of *Gagata*).

1981. *Nangra*, Jayaram, *Handbk. Freshw. Fish. India* : 240, 241 (genus characters and distribution).

Gill openings rather wide, membranes confluent with each other and also with isthmus. Body short, compressed with rounded abdomen. Mouth ventral, transverse and narrow. Barbels 4 pairs, one pair each of maxillary, nasal and two of mandibular ; maxillary barbels with stiff bases, may be very long ; mandibular pair of barbels inserted on a transverse line at different levels. A pair of finger-like processes in between inner mandibular pair may be present. Rayed dorsal fin inserted above tip or last quarter of pectoral fin, with 6 to 10 rays and a spine. Adipose fin of moderate length. Pectoral fin with 8 to 9 rays and a spine serrated either along inner edge or along both edges. Pelvic fin with 6 rays. Anal fin with 11 to 13 rays. Caudal fin forked. Lateral line complete, may be with pores on anterior half.

The genus is represented by 4 species in the Indian subcontinent, 2 species are found in Andhra Pradesh.

Key to the species

A pair of finger-like processes in between bases of inner mandibular barbels present. Maxillary barbels reaching posterior border of the orbit				...	...	<i>N. viridescens</i>
No finger-like processes in between bases of inner mandibular barbels. Maxillary barbels reaching half of the length of pectoral fin				...	...	<i>N. itchkeeg</i>

Nangra itchkeea (Sykes, 1840)

1840. *Phractocephalus itchkea* Sykes, *Trans. zool. Soc. Lond.*, 2 : 373, pl. 67, fig. 1 (type-locality : rivers of the Deccan).
 1877. *Gagata itchkeea*, Day, *Fish. India.* : 492, pl. 115, fig. 1 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 209.
 1981. *Nangra itchkeea*, Jayaram, *Handbk. Freshw. Fish. India* : 241 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 2/6/0, P. 1/8, V. 1/5, A. 3-4/9-10, C. 19.

Head length 4.50 to 5.00 and body depth 5.50 to 6.00 in total length. Snout rounded, projecting over mouth, 2.80 to 3.80 in head length. Eyes subcutaneous, diameter 2.20 to 2.70 in head length. Nostrils close together, midway between snout tip and anterior margin of the orbit, separated from each other by a flap bearing nasal barbels. Barbels 4 pairs, maxillary barbels with stiff bases, extending half of the length of pectoral fins, the outer and inner mandibulars nearly equal in length, not in a transverse line behind the lower lip, the latter being placed slightly in advance of the former, reaching to pectoral fin base, the nasal barbels small, 2.00 in eye diameter. Teeth villiform in jaws, palate edentate. Median longitudinal groove on head extending to base of occipital process. The occipital process long, narrow, 3 times as long as broad at its base, separated from the basal bone of dorsal fin by a short distance. Rayed dorsal fin with an entire, strong spine. Pectoral fin with a strong spine, roughened externally, serrated internally. Caudal fin forked with pointed lobes, upper slightly longer or equal to head.

Colour in alcohol : Body smooth. Yellowish bronze above, becoming silvery on sides and abdomen. Some dark blotches along the back descending to half way down the sides. A black blotch on each lobe of caudal and another on dorsal fin.

Size : It attains 85mm (3½ inches) in total length.

Fishery information : This species occurs in both the rivers of Krishna and Godavari, Andhra Pradesh.

Nangra viridescens (Hamilton Buchanan, 1822)

1822. *Pimelodus viridescens* Hamilton Buchanan, *Fish. Ganges* : 173, 376, pl. 10, fig. 56 (type-locality : rivers of the northern parts of Bengal).
 1877. *Nangra punctata* Day, *Fish. India* : 494, pl. 115, fig. 8 (type-locality : Sone river at Birbhum).
 1877. *Nangra viridescens* Day, *Fish. India* : 494, pl. 115, fig. 7.
 1889. *Nangra punctata* Day, *Fauna Br. India, Fish*, 1 : 212, fig. 76.
 1889. *Nangra viridescens* Day, *Fauna Br. India, Fish*, 1 : 212
 1981. *Nangra viridescens*, Jayaram, *Handbk. Freshw. Fish. India* : 241 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. It was recorded by Rahimullah (1943a) from Andhra Pradesh.

Diagnostic features : D. 1/6/0, P. 1/8, V. 1/5, A. 3-4/8, C. 18-21

Head length 4.20 to 4.50 and body depth 5.80 to 6.30 in total length. Head covered with minute spine like structures. Snout broad, rounded, 2.80 to 3.00 in head length, overhanging mouth. Eyes subcutaneous, dorsolateral, diameter 3.50 to 4.10 in head length. Nostrils close together, nearer to snout tip than to anterior margin of the orbit, separated

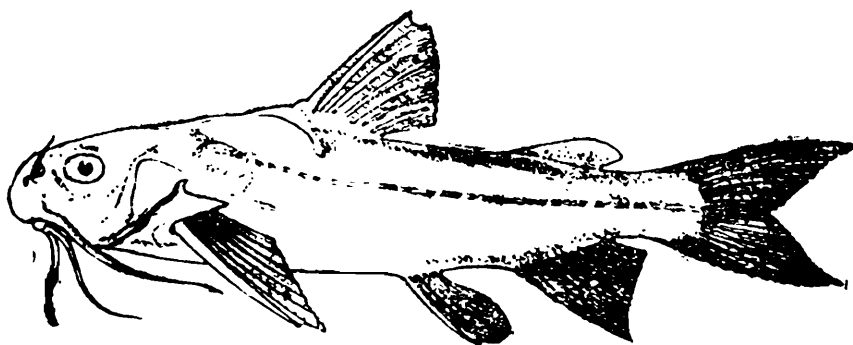


Fig. 111 : *Nangra viridescens* (Hamilton Buchanan)

from each other by a flap bearing nasal barbels. Barbels 4 pairs, maxillary pair with stiff basal portions, reaching posterior border of the orbit, outer and inner mandibular pairs much shorter, their bases wide apart, thinner in advance of outer, the nasal pair minute, rudimentary. Teeth villiform in jaws, palate edentate. Median longitudinal groove on head extending to base of occipital process. The occipital process long, club-shaped, 4 times as long as broad at its base, separated from the basal bone of dorsal by a short interspace. Rayed dorsal fin with a small, strong entire spine. Pectoral fin with a strong spine smooth externally and strongly denticulated internally. Caudal fin deeply forked, lobes subequal.

Colour in alcohol : Coppery glossed with gold on sides. A black blotch on occiput, 3 or 4 along the back descending half way down the sides. A black band on dorsal fin. Some black markings on caudal fin.

Distribution : India : the Yamuna, West Bengal, Assam, Bihar, Maharashtra, Andhra Pradesh and the Cauvery river systems. Bangladesh. Nepal.

Size : It attains 85 mm (3½ inches) in total length.

Fishery information : This species occurs in the Krishna and Godavari river systems, Maharashtra and Andhra Pradesh.

Genus Glyptothorax Blyth, 1860.

1860. *Glyptothorax* Blyth, *J. Asiat. Soc. Beng.*, 29 : 154 (type-species : *Glyptothorax trilineatus* (Blyth))
 1981. *Glyptothorax*, Jayaram, *Handbk. Freshw. Fish. India*, : 252, 253 (genus characters and distribution).

Head depressed and covered with soft skin. Ventral surface of body provided with an adhesive apparatus with or without a central pit or depression on thorax. Barbels 4 pairs, one pair each of maxillary, nasal and two of mandibular. Maxillary pair with broad bases. Rayed dorsal fin inserted above half of pectoral fin, with 5 to 7 soft rays and a spine. A short adipose fin present. Pectoral fin with 6 to 11 soft rays and a strong, broad spine, serrated with antrorse teeth along inner edge. Fins may be enveloped in skin. Pelvic fins with 6 soft rays. Paired fins may be plaited below. Anal fin with 7 to 14 soft rays. Caudal fin forked. Lateral line complete, simple.

27 species are known under the genus in the Indian subcontinent, 1 species is found in Andhra Pradesh.

***Glyptothorax lonah* (Sykes, 1841)**

1841. *Bagrus lonah* Sykes, *Trans. zool. Soc. Lond.*, 2 : 371 (type-locality : Deccan).
 1877. *Glyptosternum lonah*, Day, *Fish. India* : 496, pl. 113, fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 196, fig. 72.
 1981. *Glyptothorax lonah*, Jayaram, *Handbk. Freshw. Fish, India* : 254, 257 (distribution and key to species).

Local name : Nil.

Material examined : No specimen obtained by me. This is available in both the rivers of Krishna and Godavari, Deccan (Jayaram, 1981).

Diagnostic features : D. 1/6/0, P. 1/9, V. 6, A. 11-14 (3-4/8-10), C. 15-17.

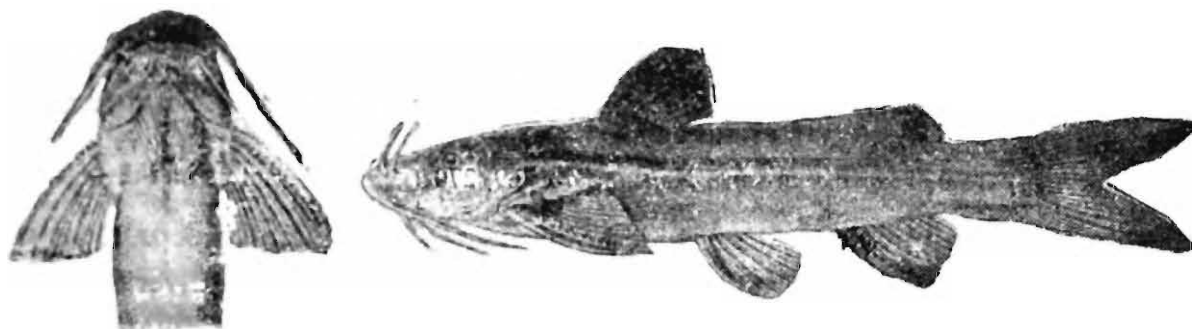


Fig. 112 : *Glyptothorax lonah* (Sykes)

Left : Ventral view of head region showing adhesive apparatus Right : Lateral view

Head length 5.00 to 5.25 and body depth 6.50 to 7.25 in total length. Eye diameter 10.00 in head length. Snout length 2.00 in head length. Mouth inferior, upper jaw

longer. Teeth villiform in crescentic band in jaws, palate edentate. The thoracic adhesive apparatus longer than broad, without a central pit. The occipital process almost or quite 4 times as long as broad, reaching basal bone of dorsal fin. Barbels 4 pairs, one pair nasal reach half way to orbit, maxillary pair reach beyond pectoral fin and outer mandibular pair to gill opening and inner mandibular pair shorter. Dorsal spine weak and smooth. Pectoral spine not as long as head, considerably shorter, serrated internally and roughened externally. Caudal fin forked, with lower lobe slightly longer.

Colour in alcohol : Body yellowish brown, banded with black. Fins yellow, dorsal, anal and caudal fin with black bands. Skin tuberculated.

Distribution : India : Orissa, the Krishna and Godavari river systems, Deccan and the Cauvery.

Size : It attains 150 mm (6 inches) in total length.

Remarks : This fish is of limited fishery value and of local use only.

Family CLARIIDAE

Air breathing Catfishes

Body elongated and compressed. Barbels 4 pairs, well developed. Dorsal fin base very long, usually with more than 30 rays, not preceded by a spine, separated or continuous with caudal fin. Adipose dorsal fin absent. Paired fins inserted horizontally. Pectoral fin with a strong spine, may be serrated, in some genera fin vestigial. Anal fin long, not confluent with caudal fin. Caudal fin rounded. Lateral line present, complete. Air breathing labyrinthic organ arising from gill arches.

2 genera known under the family from the Indian subcontinent, 1 genus is found in Andhra Pradesh.

Genus *Clarias* Scopoli, 1777.

1777. *Clarias* Scopoli, *Introductio ad historiam Naturalam*.: 445 (type-species: *Clarias orontis* Günther).

1981. *Clarias*, Jayaram, *Handbk. Freshw. Fish. India* : 269, 270 (genus characters and distribution).

Body elongated, compressed with rounded abdomen. Head greatly depressed, covered with osseous plates dorsally and laterally forming a cask covering a diverticulum of the gill cavity. Barbels 4 pairs, one pair each of maxillary, nasal and two of mandibular. An accessory respiratory dendritic branchial organ attached to second to fourth branchial arches present. Dorsal fin very long, with 62 to 77 soft rays and no spine, originating from near occiput and extending to and not continuous with caudal fin. Adipose dorsal fin absent. Pectoral fin with 7 to 11 soft rays and a strong serrated spine, covered by

skin. Pelvic fin with 6 rays. Anal fin long, with 45 to 63 rays. Caudal fin round. Lateral line complete, simple.

2 species are known under the genus from the Indian subcontinent, 1 species is found in Andhra Pradesh.

***Clarias batrachus* (Linnaeus, 1758)**

1758. *Silurus batrachus* Linnaeus, *Syst. Nat.*, ed. 10, 1 : 305 (type-locality : Asia, Africa).
 1877. *Clarias magur*, Day, *Fish. India* : 485, pl. 112, figs. 5 and 5A ; 1889, Day, *Fauna Br. India, Fish.*, 1 : 115, figs 48, 49.
 1981. *Clarias batrachus*, Jayaram, *Handbk. Freshw. Fish. India* : 270 (distribution and key to species).

Local name : *Marpoo, Marpulu* (Telegu).

Common name : Air breathing Catfish (English).

Material examined : (i) 2 exs., 110 mm-115 TL. ; Phulang river, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 8.12.84. (ii) 1 ex., 160 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; 5.6.87.

Diagnostic features : D. 62-76, P. 1/8-11, V. 6, A. 45-58, C. 14-17.

Head length 5.50 to 6.25 and body depth 6.50 to 7.50 in total length. Eye diameter 8.00 to 10.00 in head length. Snout length 3.50 in head length. Mouth terminal, transverse, upper jaw longer. Barbels 4 pairs, maxillary pair extending base or

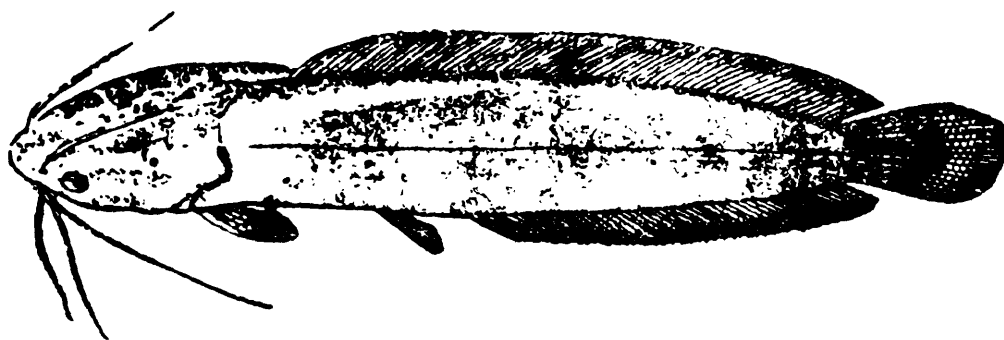


Fig. 113 : *Clarias batrachus* (Linnaeus)

middle of pectoral fins. Teeth on jaws and palate. Dorsal fin long and without any spine, commencing from occipital to and not continuous with caudal fin. Pectoral fin spine serrated, enveloped in skin. Lateral line complete. Caudal fin almost rounded.

Colour in alcohol : Body dingy green or dark brownish above and lighter below. Vertical fins usually with reddish margins.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Sri Lanka, Burma, Thailand, China, Vietnam, Malacca, Philippines, Java, Bali, Lombok, Sumatra, Singapore and Borneo,

Size : It attains 457 mm. ($1\frac{1}{2}$ feet) in total length.

Fishery information : It is one of the most predominant catfishes of India and Pakistan. It is found in fresh, brackish, marshy or muddy waters throughout Andhra Pradesh. As a food it is highly nourishing for its believed rejuvenating vigor.

This fish lives long after its removal from its native element, being amphibious.

Family HETEROPNEUSTIDAE (SACCOBRANCHIDAE)

Airsac Catfishes

Body elongated and laterally compressed. Barbels 4 pairs, well developed. Rayed dorsal fin short and without a spine. Adipose fin absent or represented by a low ridge. Paired fins horizontally inserted. Pectoral fin with a strong serrated spine. Anal fin long, just reaching or united with caudal fin. Caudal fin almost rounded. Lateral line complete. A long air sac, serving as a lung, extends posteriorly from the gill chamber. The pectoral spines have an associated venom gland and the fish is considered dangerous to persons wading in their territory.

This family is represented by a single genus in the Indian subcontinent.

Genus *Heteropneustes* Miiller, 1840.

- 1840. *Heteropneustes* Miiller, *Arch. Anat. Physiol.* : 115 (type-species : *Silurus fossilis* Bloch).
- 1840. *Saccobranhus* Valenciennes, *Hist. Nat. Poiss.*, 15 : 399 (type-species : *Silurus singio* Hamilton).
- 1981. *Heteropneustes*, Jayaram, *Handbk. Freshw. Fish. India* : 273 (genus characters and distribution).

Body elongated, compressed with rounded abdomen. Head greatly depressed, covered with thin skin. Barbels 4 pairs, one pair each of maxillary, nasal and two of mandibular. Rayed dorsal fin short, with 6 to 8 soft rays and no spine, inserted above tip of pectoral fin. Adipose fin absent or represented by a low ridge. Pectoral fin with 7 to 8 soft rays and a strong serrated spine. Pelvic fins with 6 rays. Anal fin long with 60 to 79 rays, almost reaching caudal fin which is almost rounded. Lateral line complete.

This genus is represented by 2 species in the Indian region, 1 species is found in Andhra Pradesh.

Heteropneustes fossilis (Bloch, 1794)

- 1794. *Silurus fossilis* Bloch, *Naturg. Ausland. Fische*, 8 : 46, pl. 370, fig. 2 (type-locality : Tranquebar).
- 1877. *Saccobranhus fossilis*, Day, *Fish. India* : 486, pl. 114, fig. 1 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 125, fig. 53.
- 1981. *Heteropneustes fossilis*, Jayaram, *Handbk. Freshw. Fish. India* : 273, 274 (distribution and key to species).

Local name : *Ingilayee, Mapu jella, Marpu* (Telegu).

Common name : Stinging catfish (English).

Material examined : (i) 1 ex., 208 mm TL. ; Godavari river, Karimnagar district, Andhra Pradesh ; R. P. Barman and party ; 4.9.83. (ii) 9 exs., 93 mm-120 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 4 to 5.6.87.

Diagnostic features : D. 6-7, P. 1/7, V. 6, A. 60-79, C. 19.

Head length 5.50 to 7.00 and body depth 5.00 to 8.00 in total length. Eye diameter 10.25 in head length, 2.00 to 3.00 in snout length. Snout length 3.40 in head length. Barbels 4 pairs, maxillary pair extending to middle pectoral fin or even pelvic fin base. Rayed dorsal fin short, inserted above tip of pectoral fin and without any spine.

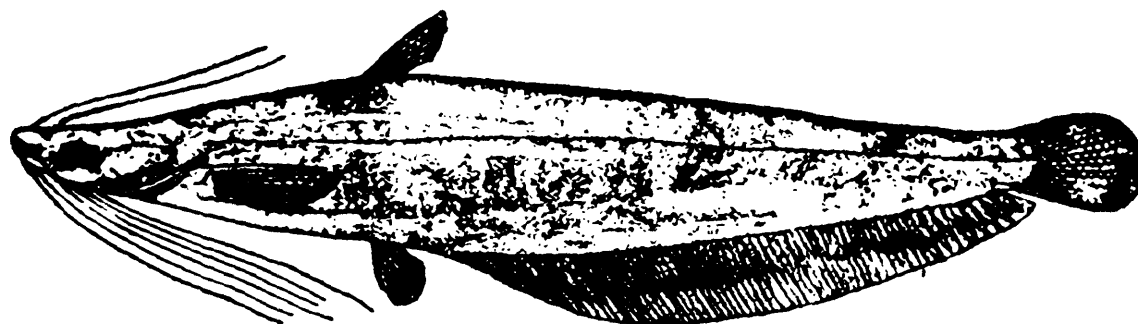


Fig. 114 : *Heteropneustes fossilis* (Bloch)

Pectoral spine serrated equal to head. Anal fin long, not united with caudal fin which is almost rounded. Lateral line complete.

Colour in alcohol : Body leaden, sometimes with two longitudinal yellowish bands. Young specimens reddish brown.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma, Sri Lanka, Thailand, China and Vietnam.

Size : It attains 304 mm (1 foot) or more in total length.

Fishery information : As food the flesh is esteemed for its invigorating qualities and the tanks are usually stocked with these fishes during the rainy season.

Order ATHERINIFORMES

Branchiostegal rays 4 to 15. Margin of upper jaw formed solely by premaxillaries. Baudelot's ligament to basicranium present. Upper jaw protractile in many species. Teeth in both jaws, also in the superior and inferior pharyngeal bones. Upper and lower pharyngeal bone well developed. Ceratohyal and epihyal joined together by dorsal lamella,

Fin spines present or absent. A single spineless dorsal fin. Pelvic fins abdominal, subabdominal or thoracic. Caudal skeleton with two large triangular hypural plates, never more than four. Swimbladder physoclistic. Lateral line may be absent. Head and body with scales. Ctenoid scales in relatively few species.

Key to the families

1. Jaws produced into long and pointed beak-like structure	...	...	<i>Belonidae</i>
Jaws not produced into beak-like structure	...	...	2.
2. Caudal peduncle longer than head. Lateral line present, complete	...	...	<i>Poeciliidae</i>
Caudal peduncle shorter than head. Lateral line absent	...	...	<i>Cyprinodontidae</i>

Family BELONIDAE

Garfishes, Neddlefishes

Body elongated, rather slender with both upper and lower jaws extended into a long beak. Teeth on jaws and palate edentate in Indian species. Head and body with small cycloid scales. Gill openings wide. Branchiostegal rays 12 to 15. Dorsal and anal fins posterior in position. No spines in fins. Dorsal fin usually with 10 to 26 soft rays and anal fin usually with 14 to 23 soft rays. Lateral line low down.

The family is represented by 2 genera in the Indian subcontinent, 1 genus is found in Andhra Pradesh.

Genus *Xenentodon* Regan 1911.

1911. *Xenentodon* Regan, *Ann. Mag. nat. Hist.*, (8) 7 : 332 (type-species : *Belone cancila* Hamilton).
 1981. *Xenentodon*, Jayaram, *Handbk. Freshw. Fish. India* : 291 (genus characters and distribution).

Body elongated, subcylindrical or compressed with rounded abdomen. Snout sharply pointed. Both jaws prolonged into a beak, the upper formed by premaxillaries, with fine rugosities. Dorsal fin generally inserted above anal fin, with 15 to 18 soft rays and without any spine. Anterior dorsal rays vary in elevation, sometimes forming a lobe to the fin and no finlets. Anal fin with 15 to 19 soft rays. Caudal fin truncate or forked. Lateral line double.

The genus is represented by 1 species in the Indian subcontinent, this species is found in Andhra Pradesh.

Xenentodon cancila (Hamilton Buchanan, 1822)

1822. *Esox cancila* Hamilton Buchanan, *Fish. Ganges* : 213, 380, pl. 27, fig. 70 (type-locality : Gangetic Provinces).

1877. *Belone cancila*, Day, *Fish. India*, 511, pl. 118, fig. 5; 1889, Day, *Fauna Br. India, Fish*, 1: 420, fig. 136.

1981. *Xenentodon cancila*, Jayaram, *Handbk. Freshw. Fish. India* : 292 (distribution).

Local name : *Vadla mukku, Korasa, Kaduru* (Telugu).

Common name : Freshwater garfish (English).

Material examined : (i) 3 exs, 168 mm-171 mm TL.; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh; R. P. Barman and party; 31.5.87. (ii) 2 exs., 232 mm-240 TL.; Kolleru Lake, West Godavari district, Andhra Pradesh; R. P. Barman and party; 9.6.87.

Diagnostic features : D. 15-18 (2-3/13-15), P. 11, V. 6, A. 16-18 (2-3/14-16), C. 15.

Head length 2.60 to 2.75 and body depth 8.00 to 12.00 in total length. Eye diameter 3.00 to 3.20 from hind edge of opercle. Both jaws produced into a beak with fine rugosities. A deep median, longitudinal groove on upper surface of head. A row of large, widely separated villiform teeth in jaws, with an external row of numerous one; no teeth on

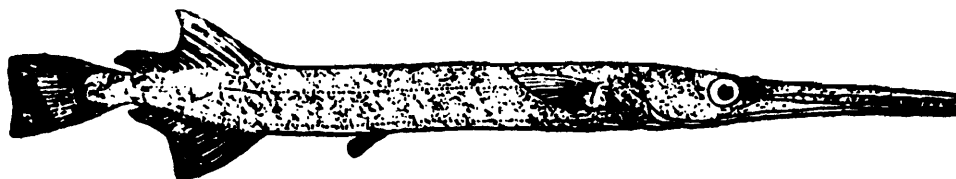


Fig. 115 : *Xenentodon cancila* (Hamilton Buchanan)

vomer. Dorsal fin inserted opposite to anal fin, very nearer to caudal fin base. Pelvic fin commences nearer to caudal fin base than to posterior margin of the orbit. Lateral line not keeled. 20 to 30 rows of scales between lateral line and base of dorsal fin. Caudal fin truncate.

Colour in alcohol : Dorsal surface greenish grey and lighter below with ventral surface whitish. A dark edged silvery stripe from opposite the orbit to middle of caudal fin base. Usually 4 or 5 lateral blotches between pectoral and anal fin bases.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma, Sri Lanka, Thailand, Malaya, Borneo and Sumatra.

Size : It attains 304 mm (1 foot) in total length.

Remarks : It is a predominant species of the Godavari and Krishna river systems.

Family CYPRINODONTIDAE

Killifishes

Body moderately elongated and compressed small fishes. Head and body with scales. Margin of the upper jaw formed solely by the premaxillaries. Barbels absent. A single

soft-rayed spineless dorsal fin inserted in the posterior half of the body. Pelvic fin bases (when fins are present) relatively far apart. Lateral line absent. Typical members of the family have a flattened head. Mouth opens upward, an adaptation for feeding at the surface.

These killifishes are also called topminnows and toothed carp. This large family of small fishes is represented most abundantly in warm climates. Many species are valued for mosquito control. Killifishes travel in schools, generally in the shallows. Some species are used as bait and many tropical species are kept in aquariums. Cyprinodontids are egg layers. Many species live in brackish as well as freshwater.

The family is represented by 3 genera in the Indian subcontinent, 2 genera are found in Andhra Pradesh.

Key to the genera

Anal fin rays 15 to 18.	Gill membranes free.	Upper jaw protractile.	A deep transverse fold across snout	...	...	...	<i>Aplocheilus</i>
Anal fin rays 20 to 24.	Gill membranes united.	Upper jaw not protractile.	No fold across snout	...	...	...	<i>Oryzias</i>

Genus *Aplocheilus* McClelland, 1839.

1839. *Aplocheilus* McClelland, *Asiat. Res.*, 19 : 301 (type-species: *Aplocheilus chrysostigmus* McClelland).

1981. *Aplocheilus*, Jayaram, *Handbk. Freshw. Fish. India* : 294, 295 (genus characters and distribution).

Fishes with more or less elongated and compressed body. Abdomen rounded. Upper surface of head and nape broad and depressed. Upper jaw protractile. Barbels absent. Dorsal fin origin above or behind posterior end of anal fin, with 7 to 11 soft rays and no spine. Pelvic fin relatively far apart. Anal fin with 15 to 18 soft rays. Caudal fin rounded. Scales cycloid, 27 to 34 in lateral series. Lateral line absent.

The genus is represented by 3 species in the Indian subcontinent, all these 3 species are found in Andhra Pradesh.

Key to the species

- Pelvic fins without any prolonged ray *A. panchax*
 Pelvic fin rays prolonged 2.
- Each scale spotted red along side. One or two rows of red spots along base of anal fin. Anal fin with 17 to 18 soft rays *A. rubrostigma*
 A golden green spot in the centre of each scale. 8 to 10 vertical black bands along sides. Anal fin with 15 to 17 soft rays *A. lineatus*

***Aplocheilichthys lineatus* (Valenciennes, 1846)**

1846. *Panchax lineatus* Valenciennes, *Hist. Nat. Poiss.*, 18 : 381 (type-locality : Bombay).

1877. *Haplocheilichthys lineatus*, Day, *Fish. India* : 522, pl. 121, fig. 6 ; 1889, Day, *Fauna Bh. India, Fish.*, 1 : 416.

1981. *Aplocheilichthys lineatus*, Jayaram, *Handbk. Freshw. Fish. India* : 295 (distribution and key to species).

Local name : Nil.

Common name : Striped top-minnow (English).

Material examined : 3 exs., 45mm-50 mm TL. ; Nagarjun sagar left canal, Nalgonda district, Andhra Pradesh ; 16.6.86.

Diagnostic features : D. 8-9, P. 15, V. 6, A. 15-18, C. 19, LL. 32-34.

Head length 4.25 to 4.70 and body depth 5.00 to 5.50 in total length. Eye diameter 3.25 to 3.50 in head length. Jaws almost equal. Maxilla extends to below the first third of the orbit. Teeth on vomer. Dorsal fin inserted above the hind portion of anal fin

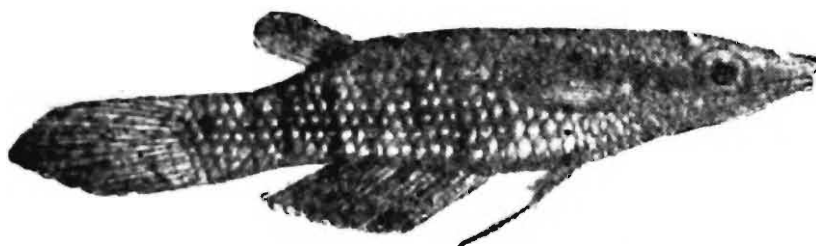


Fig. 116 : *Aplocheilichthys lineatus* (Valenciennes)

rays. Pelvic fin with the second ray prolonged and reaching to half of the anal fin. Caudal fin rounded with middle rays elongated.

Colour in alcohol : Body colour varies with season and sex. Male specimen generally with 8 to 10 vertical bands passing from sides to abdomen. Female specimen with dorsal surface reddish brown, yellowish on sides and below.

Distribution : India : freshwater and brackish waters along the coast of Bombay, Gujarat, Wynaad, Malabar, Travancore-Cochin, Coorg, Madras and Coromandal. Sri Lanka.

Size : It attains 102 mm (4 inches) in total length.

Remarks : This fish is common in the rivers, tanks and paddy fields and even in tidal waters. It is an important well known larvicidal fish.

***Aplocheilichthys panchax* (Hamilton Buchanan, 1822)**

1822. *Esox panchax* Hamilton Buchanan, *Fish. Ganges* : 211, 380, pl. 3, fig. 69 (type-locality : ditches and ponds of Bengal).

1877. *Haplocheilus panchax*, Day, *Fish, India* : 523, pl. 121, fig. 3 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 417.

1981. *Aplocheilus panchax*, Jayaram, *Handbk. Freshw. Fish. India* : 295 (distribution and key to species).

Local name : Nil.

Common Name : Lesser top minnow, Panchax minnow (English).

Material examined : (i) 19 exs., 37 mm-51 mm TL ; Nagarjun sagar left canal, Nalgonda district, Andhra Pradesh ; R. P. Barman and party ; 16.6.86. (ii) 5 exs., 33 mm-39 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 7.6.87

Diagnostic features : D.7-11, P.15, V.6, A.15-17, C.13, LL.31-34.

Head length 4.00 to 4.30 and body depth 4.75 to 5.00 in total length. Eye diameter 3.30 in head length. Lower jaw longer and maxilla extending to below first

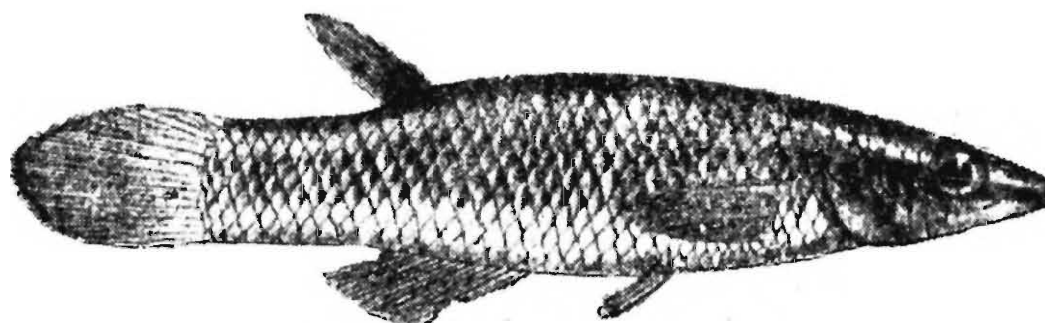


Fig. 117 : *Aplocheilus panchax* (Hamilton Buchanan)

third of the orbit. No teeth on vomer. Dorsal fin inserted above the last anal fin rays. Pelvic fin small without any elongated ray. Caudal fin rounded.

Colour in alcohol : Dorsal surface greenish and dull white beneath. Fins yellow. Lower third of dorsal fin with a larger black spot. Dorsal, caudal and anal fin edged with orange. A white occipital spot present.

Distribution : India : Assam, Tripura, West Bengal, Bihar Uttar Pradesh, Punjab, Orissa, Andhra Pradesh, Madhya Pradesh, Gujarat and Andamans. Bangladesh. Pakistan. Burma. Sri Lanka. Thailand to Malay Archipelago.

Size : It attains 89 mm. ($3\frac{1}{2}$ inches) in total length.

Remarks : It is also one of the well known indigenous larvivorous fish. It thrives well in fresh and brackish waters and perennial breeder.

***Aplocheilus rubrostigma* Jerdon, 1849**

1849. *Aplocheilus rubrostigma* Jerdon, *Madras J. Lit. Sci.*, 15 : 331 (type-locality : Malabar coast).

1877. *Haplocheilus rubrostigma*, Day, *Fish. India* : 522, pl. 121, fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 416.

1981. *Aplochellus rubrostigma*, Jayaram, *Handbk. Freshw. Fish. India* : 295 (distribution and key to species).

Local name : Nil.

Material examined : 4 exs., 40 mm-45 mm TL. ; Nellore district, Andhra Pradesh ; R. P. Barman and party ; 29.11.85.

Diagnostic features : D.8, P.15, V.6, A.17-18, C.15, LL.33.

Head length 4.75 and body depth 5.50 in total length. Eye diameter 3.25 in head length. Pelvic fin with its second ray elongated and extending to the middle of the anal

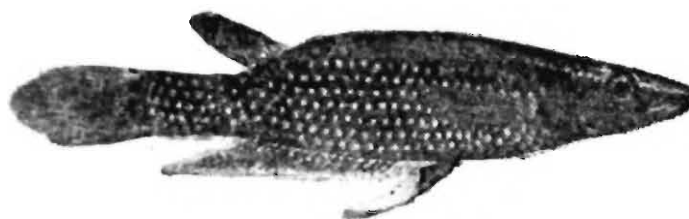


Fig. 118 : *Aplochellus rubrostigma* (Jerdon)

fin. Anal fin much lower in front and increasing in length to the last ray. Central caudal fin rays rather prolonged.

Colour in alcohol : Body reddish brownish above, becoming yellowish on the sides and below. Each scale along the side with a red central spot. A row, sometimes two, of red spots along the base of the anal fin, some on the dorsal and few dark spots on the caudal fin. A silver occipital spot.

Distribution : India : Kerala and Coromondal coast.

Size : It attains at least 75 mm (3 inches) in total length.

Remarks : It is a common species of the Coromondal coast.

Genus *Oryzias* Jordon and Snyder, 1906.

1906. *Oryzias* Jordon and Snyder, *Proc. U. S. nat. Mus.*, 31, No. 1486 : 289 (type-species : *Poecilia latipes* Temminck and Schlegel).

1981. *Oryzias*, Jayaram, *Handbk. Freshw. Fish, India* : 296 (genus characters and distribution).

Head and anterior part of nape depressed and flattened. Lower jaw upturned, upper jaw short, not protractile. Teeth villiform on jaws and palate edentate. Barbels absent. Dorsal fin inserted above hind border of anal fin, with 6 to 7 soft rays and without any spine. Anal fin with 20 to 24 soft rays. Caudal fin rounded. Lateral line curved above pectoral fin, with about 27 scales.

Only 1 species is known under the genus in the Indian subcontinent, this species is found in Andhra Pradesh.

Oryzias melanostigma (McClelland, 1839.)

1839. *Aplocheilus melastigmus* McClelland, *Asiat. Res.*, 19 : 301, 427, pl. 42, fig. 3 (type-locality : tanks in Calcutta).
 1877. *Haplochilus melanostigma*, Day, *Fish. India* : 522, pl. 121, fig. 4 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 415.
 1981. *Oryzias melanostigma*, Jayaram, *Handbk. Freshw. Fish, India* : 296 (distribution).

Local name : *Chukku chepa, Ilisa* (Telegu).

Common name : Estuarine top minnow (English).

Material examined : No specimen obtained by me. It was recorded by David (1963a) from the rivers Krishna and Godavari, Andhra Pradesh.

Diagnostic features : D. 6-7, P. 15, V. 6, A. 20-24, C. 15, LL. 27.

Head depressed, length 4.25 and body depth 3.75 to 4.00 in total length. Eye diameter 3.00 in head length. Cleft of mouth not extending to below the orbit. Teeth villiform on jaws, absent on palate and vomer. Lower jaw upturned, upper jaw short, not protractile. Barbels absent. Dorsal fin inserted above posterior end of anal fin. Pectoral fin equal to head. Pelvic fin small, without any elongated ray. Caudal fin rounded. Lateral line curved above pectoral fin.

Colour in alcohol : Dorsal surface dull green and dull white below, with a narrow dark band along middle of side ending in a spot at the centre of the base of caudal fin. Anal fin white edged.

Distribution : India : West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Kerala. Pakistan. Bangladesh. Burma and Sri Lanka.

Size : It attains about 38 mm ($1\frac{1}{2}$ inches) in total length.

Remarks : It is a good larvicidal fish and is a common fish of both the Godavari and Krishna river systems.

Family POECILIDAE**Livebearers**

Body short, cylindrical and laterally compressed. Head and body with scales. Mouth oblique, small, cleft not extending to anterior margin of the orbit. Premaxillaries slightly protractile, mandible prominent. A single dorsal fin without any spine. Anal fin with first 3 rays unbranched. Male specimen with elongated anterior anal fin rays (gonopodium, primarily formed from the 3rd, 4th and 5th rays) with internal fertilization.

These little fishes are closely related to killifishes or cyprinodonts, differing from them mainly in bringing forth their young alive rather than laying eggs. Livebearers are hardy and included among them are some of the most popular aquarium fishes.

The fishes of this family are represented by 2 genera in the Indian region, both the genera, viz. *Gambusia* and *Lebistes* are known with 1 species each in Andhra Pradesh.

Key to the genera

Teeth conical and fixed	...	...	...	<i>Gambusia</i>
Teeth spatuliform and movable	...	...	...	<i>Lebistes</i>

Genus *Gambusia* Poey, 1854.

1854. *Gambusia* Poey, *Mem. Hist. Nat. Cuba*, 1 : 382 (type-species : *Gambusia punctata* Poey).

1981. *Gambusia*, Jayaram, *Handbk. Freshw. Fish, India* : 296, 297 (genus characters and distribution).

Body cylindrical, compressed with rounded abdomen. Lower jaw slightly upturned, upper jaw shorter than lower. Dorsal fin inserted in the middle of body in males and midway between anterior border of the orbit and caudal fin tip in females, with 6 to 12 soft rays and without any spine. Anal fin with 8 to 10 rays. Anal fin of male is modified to form an intromittant organ for introducing sperm into the female. Caudal fin rounded. Lateral line complete, with 28 to 32 scales.

One species is known under this genus in the Indian subcontinent, this species is found in Andhra Pradesh.

***Gambusia affinis patruelis* (Baird and Girard, 1853)**

1853. *Heterandria patruelis* Baird and Girard, *Proc. Acad. nat. Sci. Philad.*, 6 : 390 (type-locality : Rio Sabinal, Texas).

1981. *Gambusia affinis patruelis*, Jayaram, *Handbk. Freshw. Fish. India* : 297 (distribution).

Local name : Nil.

Common name : Mosquito fish (English).

Material examined : 14 exs. 30 mm-39 mm TL. ; K. C. Canal, Kurnool district, Andhra Pradesh ; R. P. Barman and party ; 9.12.85.

Diagnostic features : D. 6-12, P. 13, V. 6, A. 8-10, C. 19, LL. 32.

Head length 3.60 to 4.00 and body depth 3.50 to 4.00 in standard length. Eye diameter 3.00 in head length. Dorsal fin inserted in middle of body in males and midway between front border of orbit and caudal fin tip in females. Anal fin of male with anal process, longer than head. Female specimens are larger than male specimens.

Colour in alcohol : Body usually uniform brownish olive with lateral sides irregularly dotted black. 2 or 3 cross bands of dots on dorsal and caudal fin.

Distribution : India : Introduced throughout India, Pakistan, Bangladesh, Sri Lanka, Burma, Thailand, Malaya, Philippines, Hawaii and Formosa. Native of coastal waters of the United States from New Jersey southwards.

Size : The female specimen grows up to 60 mm ($2\frac{1}{2}$ inches) and male specimen grows up to 40 mm ($1\frac{1}{2}$ inches) in total length.

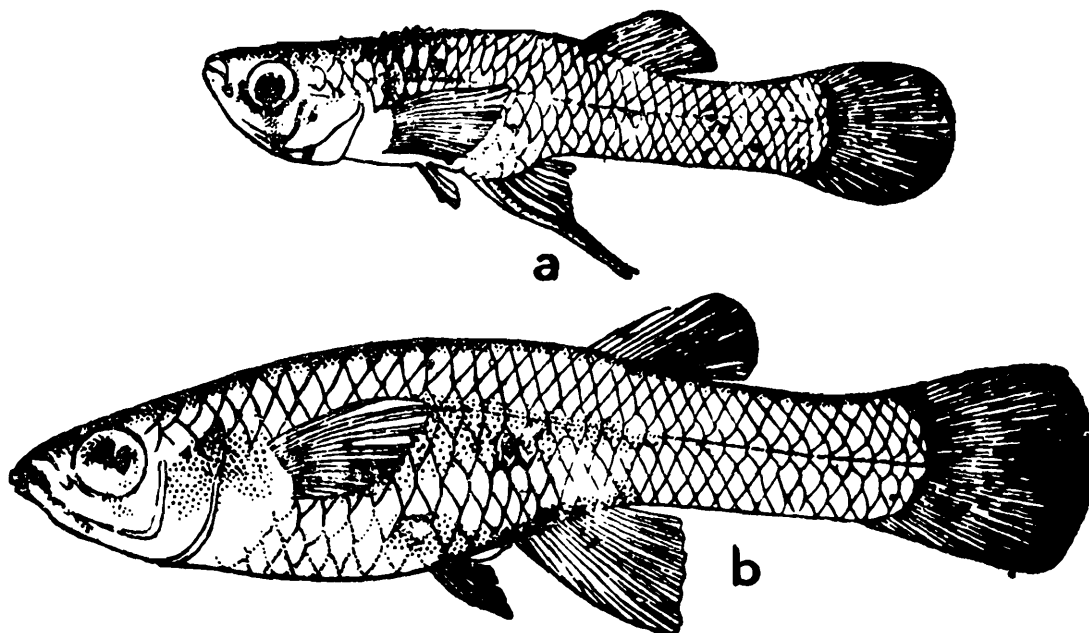


Fig. 119 : *Gambusia affinis patruelis* (Baird and Girard)
a : Male b : Female

Remarks : It is one of the exotic fishes of India introduced throughout India for larvicidal use.

Genus *Lebistes* Filippi, 1861.

1861. *Lebistes* Filippi, *Arch. Zool. Anat. Fisiol.*, 1 : 69 (type-species : *Lebistes poeciloides* Filippi, by original description).
1981. *Lebistes*, Jayaram, *Handbk. Freshw. Fish. India* : 297, 298 (genus characters and distribution).

This genus is closely related to *Gambusia* Poey but the fishes of the genus *Lebistes* differ mainly in having movable spatuliform teeth. The anal fin rays are almost equal to length of gonopodium in male specimen of this genus. Eyes situated on the dorsal profile of head. Caudal fin elongated. Body generally with black spots and brilliant colouration.

Lebistes reticulatus (Peters)

1981. *Lebistes reticulatus*, Jayaram, *Handbk. Freshw. Fish. India* : 298 (distribution).

Local name : Nil.

Common name : Guppy (English).

Material examined : 9 exs., 28 mm-35 mm TL. ; K. C. Canal, Kurunool district, Andhra Pradesh ; R. P. Barman and party ; 9.12.1985.

Diagnostic features : D. 6-12, P. 13, V 6, A. 8-10, C. 19. LL. 27-28.

Head length 4.50 to 5.00 and body depth 5.50 to 5.75 in total length. Eye diameter 2.50 to 3.00 in head length. Dorsal fin inserted nearer to base of caudal fin than to tip of snout. Anal fin rays of male specimen more or less equal to length of gonopodium. Eyes dorsal lateral in position. Caudal fin elongated. Female specimens are larger than male specimens.

Colour in alcohol : Body grey green coloured with dark dorsal surface and silvery ventral surface. Male specimens have large dark spots on their lateral sides, together with combinations of red, blue, green and yellow markings.

Distribution : The Guppy, a fish native to the tropical America and west Indies, was introduced into India, specially well established in South India.

Size : The female specimen attains up to 60 mm ($2\frac{1}{2}$ inches) and male specimen up to 40 mm ($1\frac{1}{2}$ inches) in total length.

Remarks : This fish has been found to occur only in urban and suburban areas, mainly in open drains and shallow, following waters, where it faces little competition from other fishes. It is one of the mosquito larvivorous fishes, introduced in throughout India.

Order CHANNIFORMES

Body elongated with cycloid scales. Head with plate-like scales. Branchiostegal rays 5. Suprabranchial accessory respiratory organ well-developed, enabling these fishes to breathe for a long time out of water. A single long dorsal fin and a similar long anal fin present, without any spine. Pelvic fin thoracic or absent. Lateral line abruptly curved or almost interrupted. Swimbladder very long, present. Physoclistic fishes.

Family CHANNIDAE

Murrels

Body elongated with large cycloid scales. Head with plate-like scales. Cephalic pits present. Suprabranchial organ for air breathing present. Lower jaw protruding beyond the upper jaw. A single long dorsal and a similar anal fin present, both spineless and free from caudal fin. ~~Dorsal fin with 29 to 55 rays, inserted almost above pectoral fin and anal fin with 21 to 36 rays.~~ Pelvic fin usually present, with 6 rays. Lateral line abruptly curved or almost interrupted with 37 to 110 scales. Caudal fin rounded.

The fishes of this family are generally known as the murrels or snake headed fishes, account for an important freshwater fishery throughout Andhra Pradesh because of their pleasant tasting fatless flesh. These fishes are found even in small ponds and are available almost round the year. Besides, the fact that they breed in confined water bodies, make them popular in aquaculture also.

Genus *Channa* Scopoli, 1777.

Snake headed fishes

1777. *Channa* Scopoli, *Introd. Hist. Nat.* : 459 (type-species : *Channa orientalis* Bloch and Schneider).
 1793. *Ophicephalus* Bloch, *Naturg. Ausland. Fische*, 7 : 137 (type-species : *Ophicephalus punctatus* Bloch).
 1981. *Channa*, Jayaram, *Handbk. Freshw. Fish. India* : 305, 306 (genus character and distribution).

Genus characters are same of those of the family.

Key to the species

1. 5 to 6 rows of scales between the orbit and angle of preopercle.	12 to 13 predorsal scales	2.
9 to 17 rows of scales between the orbit and angle of preopercle.	15 to 22 predorsal scales	3.
2. Pelvic fin less than half length of pectoral fin. Pectoral fin spotted		... <i>C. orientalis</i>
Pelvic fin more than half length of pectoral fin. Pectoral fin plain		... <i>C. punctatus</i>
3. Predorsal scales 18 to 20. Lateral line with peninsula of darker colour extending into yellow		
...	...	... <i>C. striatus</i>
Predorsal scales 15 to 16. No such colour markings on lateral line. A black white-edged ocellus on basal portion of caudal fin ...	...	... <i>C. marulius</i>

Channa marulius (Hamilton Buchanan, 1822)

1822. *Ophiocephalus marulius* Hamilton Buchanan, *Fish. Ganges* : 65, 367, pl. 17, fig. 19 (type-locality : ponds and freshwater rivers of Bengal).
 1878. *Ophiocephalus marulius*, Day, *Fish. India* : 363, pl. 76, fig. 4 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 360.
 1981. *Channa marulius*, Jayaram, *Handbk. Freshw. Fish. India* : 306, 307 (distribution and key to species).

Local name : *Poola malle, Poola matta, Pula chepa, Sowarah* (Telegu).

Common name : Giant snake-head murrel (English).

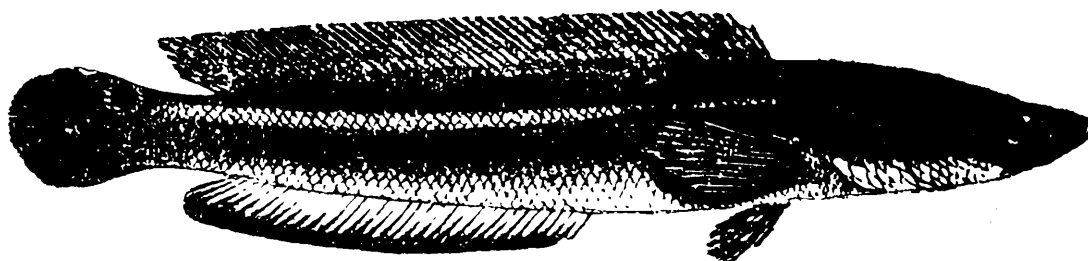


Fig. 120 : *Channa marulius* (Hamilton Buchanan)

Material examined : (i) 5 exs., 95 mm-135 mm TL. ; Godavari river, Khammam

district, Andhra Pradesh ; R. P. Barman and party ; 28.8.83. (ii) 7 exs., 105 mm- 150 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 7.6.87.

Diagnostic features : D. 45-55, P. 18, V. 6, A. 28-36, C. 14, LL. 60-70.

Head length 4.00 to 5.00 and body depth 7.00 to 7.50 in total length. Eye diameter 5.00 to 7.00 in head length. Maxilla extending below half of the orbit. Teeth villiform. Pelvic fin two-third as long as pectoral fin. 10 rows of scales between the orbit and angle of preopercle. 16 predorsal scales. Cephalic pits multiple.

Colour in alcohol : Usual dorsal surface greyish green becoming lighter below. Young specimens with a brilliant, orange, lateral band and adult specimen with 5 to 6 cloudy bands below lateral line. A prominent black circular spot at the superior angle of the base of caudal fin.

Distribution : Throughout India, Pakistan, Bangladesh, Burma, Sri Lanka, Thailand and China.

Size : It grows 1,219 mm (4 feet) in total length.

Fishery information : This fish forms an important element in the freshwater fishery in the Telengana area of Andhra Pradesh. The fry of this species is in great demand in local markets in and around Hyderabad for culture. It is usually found in large lakes and rivers and attains a larger size than other three species available in the state.

***Channa orientalis* Schneider, 1801.**

1801. *Channa orientalis* Schneider, *Syst. Ichth. Bloch.* : 496, pl. 90, fig. 2 (type-locality : India).

1822. *Ophiocephalus gachua* Hamilton, *Fish. Ganges* : 68, 367, pl. 21, fig. 21 (type-locality : ponds and ditches of Bengal).

1878. *Channa orientalis*, Day *Fish. India* : 368, pl. 78, fig. 2 ; 1889, Day, *Fauna Br. India*, 2 : 365.

1981. *Channa orientalis*, Jayaram, *Handbk. Freshw. Fish. India* : 306, 307 (distribution and key to species).

Local name : *Yerra matta, Kora matta, Burada matta, Tali matta* (Telegu).

Common name : Brown snake head murrel (English).

Material examined : (i) 2 exs., 85 mm-91 mm TL. ; Nizam sagar, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 9.12.84. (ii) 2 exs., 102 mm-110 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; 7.6.87.

Diagnostic features : D. 32-37, P. 14, V. 6, A. 21-23, C. 12-14, LL. 40-45.

Head length 3.50 to 4.50 and body depth 6.50 to 8.00 in total length. Eye diameter 5.00 to 6.00 in head length. Maxilla extends below posterior margin of the orbit. Dorsal fin long, origin just behind pectoral fin origin. Anal fin commences behind tip of pectoral fin. 5 to 6 rows of scales between the orbit and angle of preopercle and predorsal scales 12 to 13. Pelvic fin less than half length of pectoral fin.

Colour in alcohol : Dorsal surface dirty greenish becoming dull white or brown on sides and abdomen. Some darkish spots on body and fins. Pectoral fin with vertical bars on its rays.

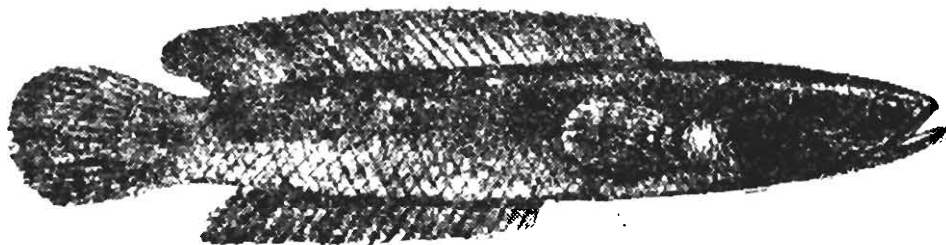


Fig. 121 : *Channa orientalis* Schneider

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma and Sri Lanka.

Size : It attains at least 203 mm (8 inches) in total length.

Remarks : It is the smallest species under the genus and occurs usually with *C. punctatus* throughout Andhra Pradesh.

***Channa punctatus* (Bloch, 1793)**

1793. *Ophicephalus punctatus* Bloch, *Naturg. Ausland. Fische*, 7 : 139, pl. 358 (type-locality : Malabar coast).
 1878. *Ophiocephalus punctatus*, Day, *Fish. India* : 367, pl. 78, fig. 1 ; 1889, Day, *Fauna Br. India, Fish*, 2 : 364.
 1981. *Channa punctatus*, Jayaram, *Handbk. Freshw. Fish. India* : 306, 307 (distribution and key to species).

Local name : *Mitta, Matta gidasa, Kodhadhalau, Curru meenu, Mittah* (Telugu).

Common name : Green snake head murrel (English).

Material examined : (i) 2 exs., 102 mm-104 mm TL. ; Ramappa reservoir, Warangal district, Andhra Pradesh ; R. P. Barman and party ; 31.8.83. (ii) 2 exs., 215 mm-245 mm TL. ; Kinnersoni reservoir, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 28.8.83. (iii) 2 exs., 91 mm-94 mm TL. ; Nizam sagar, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 9.12.84. (iv) 6 exs., 98 mm-148 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 4.6.87, 5.7.87, 6.7.87.

Diagnostic features : D. 29-32, P.17, V. 6, A. 21-23, C. 12, LL. 37-40.

Head length 3.30 to 3.60 and body depth 5.50 to 7.00 in total length. Eye diameter 7.00 to 8.50 in head length. Lower jaw longer and maxilla extends below or posterior margin of the orbit. Pelvic fin three-fourth as long as pectoral fin. 5 rows of scales between the orbit and angle of preopercle. 12 predorsal scales. Cephalic pits simple.

Colour in alcohol : Dorsal surface greenish grey becoming yellow below. A dark stripe along with side of head and several short cross bands from back to middle of body. Fins spotted.

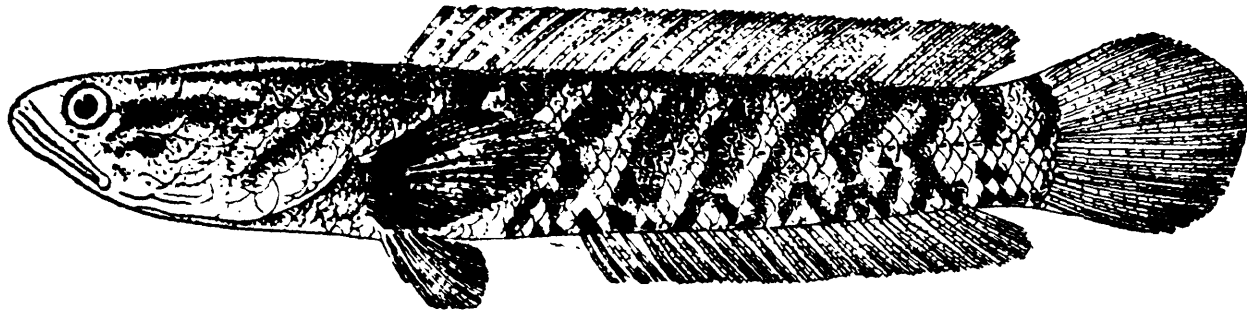


Fig. 122 : *Channa punctatus* (Bloch)

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, :Burma, Sri Lanka, Malaya, China, Tahiti, Posynesia.

Size : This species grows 304 mm (1 foot), in total length.

Fishery information : This fish is the most common species found throughout Andhra Pradesh and almost round the year. The commercial catches chiefly comes from the irrigation channels.

***Channa striatus* (Bloch, 1793)**

1793. *Ophicephalus striatus* Bloch, *Naturg. Ausland. Fische*, 2 : 141, pl. 359 (type-locality : Malabar).

1878. *Ophiocephalus striatus*, Day, *Fish. India* : 366 ; 1889, Day, *Fauna Br. India, Fish*, 2 : 363.

1981. *Channa striatus*, Jayaram, *Handbk. Freshw. Fish. India* : 307 (distribution and key to species).

Local name : Korra meenu, Burada`matta, Matta savudalu, Sowarh (Telugu).

Common name : Striped snake head murrel (English).

Material examined : (i) 2 exs., 170 mm-185 mm TL. ; Manair project, Karimnagar, district, Andhra Pradesh ; R. P. Barman and party ; 4.9.83. (ii) 6 exs., 152 mm-170 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 6.6.87.

Diagnostic features : D.37-45, P.17, V.6, A.23-26, C.13, LL. 50-57.

Head length 3.25 to 4.00 and body depth 6.00 to 8.00 in total length. Eye diameter 6.00 to 7.00 in head length. Lower jaw longer, maxilla extending to below posterior margin of the orbit. 9 rows of scales between the orbit and angle of preopercle. 18 to 20 predorsal scales. Cephalic pits multiple. Lateral line curves below the twelfth dorsal fin ray.

Colour in alcohol : Dorsal surface dark greyish or blackish becoming dirty-white.

or yellowish white below. Grey or black lateral bands sides to abdomen. Young specimens have sometimes a large black ocellus at the end of base of dorsal fin.

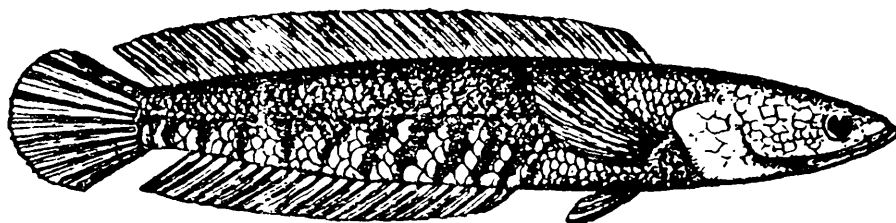


Fig. 123 : *Channa striatus* (Bloch)

Distribution : Throughout India, Pakistan, Bangladesh, Sri Lanka, Burma, China, Philippines, Malaya Archipelago and Thailand.

Size : This species grows 914 mm (3 feet) in total length.

Fishery information : This species is commonly represented in commercial catches. It inhabits lakes and large ponds. This species is of great demand for stocking tanks and lakes immediately after the south-west monsoon in the markets of Hyderabad.

Remarks : This species takes a bait very readily, specially a frog and is said to rise to a salman fry.

Order SYNBRANCHIFORMES

Body eel-like and laterally compressed. Scales absent, if present, with small scales, arranged in a longitudinal rows. Humeral arch may or may not be attached to the skull. Margin of upper jaw formed by the premaxillaries, the maxillaries being internal and parallel to them. Gill membranes united and small gill opening as slit or pore under the head or throat. Branchiostegal rays 4 or 6. Vertical fins rudimentary in the form of mere folds of rayless ridge. Pectoral and pelvic fins absent. Accessory respiratory organs may be present. Swimbladder absent. No ribs. Lateral line present.

Family SYNBRANCHIDAE

Swamp-eels

Eel-like in body shape. Scales, if present, minute. Gill membranes united and attached to isthmus. Dorsal and anal fins vestigial or reduced to a rayless mere folds of skin. Caudal fin reduced or absent. Pectoral and pelvic fins absent. Barbels absent. Palatine teeth, when present, in a single row or a narrow band. Humeral arch may be attached to the skull. Margin of the upper jaw formed of the premaxillaries, the maxillaries

being internal and parallel to them. Eyes small and covered by dense skin. No swim-bladder and ribs. An accessory respiratory organ may be present or absent.

Genus *Ophisternon* McClelland, 1845.

1845. *Ophisternon*, McClelland, *J. nat. Hist. Calcutta*, 5 : 197 (type-species : *O. bengalensis* McClelland, by monotypy) ; 1916 Rosen and Greenwood, *Bull. Am. Mus. nat. Hist.*, 157 : 50 (revision).
1981. *Ophisternon* Jayaram, *Handbk. Freshw. Fish. India* : 310, 311 (genus character and distribution).

Body elongated and eel-like. Branchiostegal rays six. Gill membranes not attached to the isthmus, having a single transverse opening. Branchial arches 4 with well developed gills. Palatine teeth in a band. No scales and accessory breathing-sac.

***Ophisternon bengalensis* McClelland. 1845**

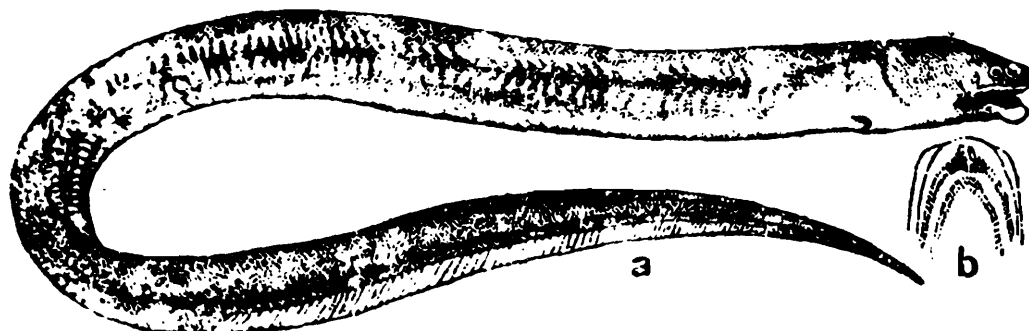
1845. *Ophisternon bengalensis* McClelland, *J. nat. Hist., Calcutta*, 5 : 197, 220, pl. 11, figs. 1, 2 (type-locality : fresh & brackish waters of Calcutta).
1878. *Synbranchus bengalensis*, Day, *Fish. India* : 657, pl. 167, fig. 1 ; 1889, Day, *Fauna Br. India, Fish.* 1 : 71, fig. 29.
1981. *Ophisternon bengalensis*, Jayaram, *Handbk. Freshw. Fish. India* : 311 (distribution).

Local name : Nil.

Common name : Pygmy eel (English).

Material examined : Dutt & Murty (1976a) recorded this species from Kolleru Lake, W. Godavari district, Andhra Pradesh.

Diagnostic features : Head length 9.00 to 12.00 in the distance between tip of snout and anus. Eye diameter about one twentieth in head length. Snout anteriorly rounded. Upper jaw rather longer. Cleft of month extending to some distance posterior to the orbits.



124. *Ophisternon bengalensis* McClelland
a. Lateral view b. Dentition pattern

Teeth in upper jaw fine and pointed, with an edentulous interspace at the symphysis and palatine teeth in bands. A single transverse, vertical gill opening. Accessory respiratory

organ absent. Dorsal fin originates ahead of anal fin which is situated in the last fourth or fifth of the total length. Caudal fin hardly conspicuous. All fins low. Scales absent. Lateral line prominent.

Colour in alcohol : Body dirty brownish red becoming lighter below in the estuarines forms and in the clear water this fish greenish or blackish green, the ventral surface being lighter.

Distribution : Throughout India, Pakistan, Bangladesh to Malaya Archipelago and Australia and tropical America.

Size : It attains several feet in length.

Order PERCIFORMES

Body rarely elongated, with scales commonly ctenoid. Fins, usually with spines. Dorsal fin two in number, the first one being spiny. Pectoral fin inserted high on the sides. Pelvic fin thoracic or jugular, with one spine and five soft rays, sometimes fewer. Caudal fin never with more than 17 principal rays, often fewer. Head and cheeks with muciferous canals, pores. Weberian apparatus absent and the first vertebra is free. Fishes of this order is physoclists. Lateral line, when present continuous (exception *Chanda* Hamilton). Bones of head usually with numerous pungent spines.

The order Perciformes is the most diversified of all fish orders and it is the largest vertebrate order. Perciformes dominate in vertebrate ocean life and are the dominant fish group in many tropical and subtropical fresh waters.

Key to the families

1. Pelvic fins united with a membrane or frenum across their base, forming a sucking disc ... *Gobiidae*
- Pelvic fins may be close but not united as above, may be apart ... 2.
2. An accessory respiratory organ in the form of a cavity above the third or upper portion of the first branchial arch present ... 3.
- No such accessory respiratory organ present ... 5.
3. First ray of pelvic fin produced into a long filament. Pelvic fins inserted behind pectoral fin base ... 4.
- First ray of pelvic fin not produced into a long filament. Pelvic fin inserted below base of pectoral fin ... *Anabantidae*
4. Lateral line vestigial, rudimentary or absent ... *Belontiidae*
- Lateral line complete and continuous ... *Osphronemidae*
5. Spinous and soft portion of dorsal fin well separated ... *Mugilidae*
- Spinous and soft portion of dorsal fin continuous ... 6.

6. A forwardly directed recumbent spine ahead of dorsal fin present	...	<i>Chandidae</i>
No recumbent spine ahead of dorsal fin present	...	7.
7. Maxilla extends anterior border of the orbit. Two nostrils on each side of head present	...	<i>Nandidae</i>
Maxilla not extending anterior border of the orbit. Single nostril on each side of head present	...	<i>Cichlidae</i>

Family CHANDIDAE

Glass fishes

Body short, oblong, laterally compressed and somewhat translucent. Scales small, deciduous cycloid on head and body. Branchiostegal rays 6. Mouth fairly large. Teeth fine in jaws and on roof on mouth, the upper outer row sometimes enlarged and canine-like. Lower limb of preopercle with a double serrated edge and operculum with a poorly developed spine. Dorsal fin with two continuous, a spinous and a soft part. The first dorsal fin with 7 spines and a procumbent spine and the second dorsal fin with one spine and 9 to 17 soft rays. Anal fin with 3 spines and 9 to 16 soft rays. Caudal fin forked. Lateral line complete, interrupted, incomplete or absent.

Genus *Chanda* Hamilton Buchanan, 1822.

1822. *Chanda* Hamilton Buchanan, *Fish. Ganges* : 103, 270 (type-species : *Chanda nalua* Hamilton).
 1971. *Chanda*, Talwar, *Bull. zool. Surv. India, Nomencl.*, 28 (3-4) : 104-105 (*Chanda nama* Hamilton proposed as type species).
 1981. *Chanda*, Jayaram, *Handbk. Freshw. Fish. India* : 317, 318 (genus, character and distribution).

Body short, compressed somewhat diaphanous. Abdomen rounded. Lower limb of the preopercle provided with a double serrated edge, operculum without a prominent spine. Two dorsal fins continuous, the first dorsal fin with 7 spines and the second dorsal fin with one spine and 9 to 17 soft rays. A forwardly directed recumbent spine in front of the dorsal fin base. Anal fin with 3 spines and 9 to 17 soft rays. Caudal fin forked. Lateral line complete, incomplete, interrupted or absent. Scales cycloid, small or moderate, frequently deciduous.

4 species known from the Indian subcontinent, 2 species are found in Andhra Pradesh.

Key to the species

Lateral line indistinct, discontinuous or absent. A dark blotch on dorsal fin's upper edge present. Body depth 2.25 to 3.00 in total length	...	...	<i>C. nama</i>
Lateral line distinct. No such colour blotch on dorsal fin. Body depth 2.25 to 2.50 in total length	...	...	<i>C. ranga</i>

Chanda nama Hamilton Buchanan, 1822

1822. *Chanda nama* Hamilton Buchanan, *Fish, Ganges* : 109, 371 (type-locality : ponds throughout Bengal).
 1875. *Ambassis nama*, Day, *Fish, India* : 50, pl. 14, fig. 5 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 484, fig. 149.
 1981. *Chanda nama*, Jayaram, *Handbk. Freshw. Fish. India* : 317, 318, fig. 178 (distribution and key to species).

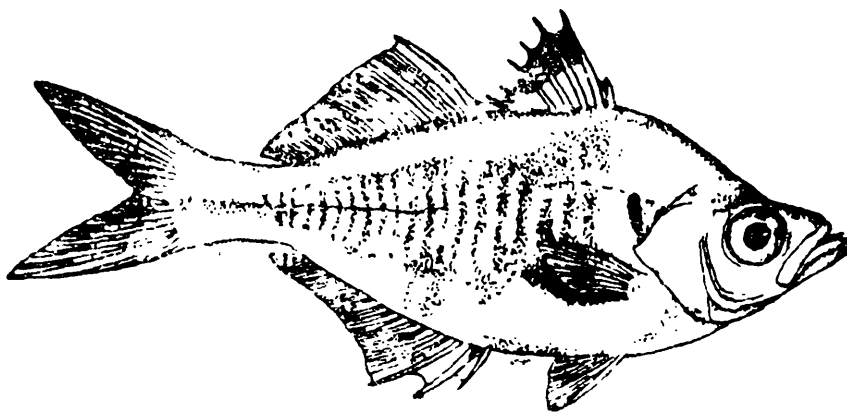
Local name : *Akku rati*, *Aku rati* (Telugu).

Common name : Indian Glass fish (English).

Material examined : (i) 12 exs., 70mm-80 mm TL. ; Kamalapuram tank, Anantapur district, Andhra Pradesh ; R. P. Barman and party ; 7.12.85. (ii) 3 exs., 60 mm-75 mm TL. ; Godavari river, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 31.5.87.

Diagnostic features : D. 7/1/13-17, P. 13, V. 6, A. 3/14-17, C. 17.

Head length 4.00 to 4.50 and body depth 2.75 to 3.66 in total length. Eye diameter 3.00 to 3.75 in head length. Lower jaw longer than upper, maxilla extending to below middle of the orbit. Preorbital slightly serrated. Vertical border of preopercle entire



125. *Chanda nama* Hamilton Buchanan

except near angle. Sub and interopercles entire. 2 or 3 large crooked canines on either side of the lower jaw. Two dorsals united at their base, first dorsal with 7 spines and a recumbent spine present. Lateral line indistinct, complete. Scales minute. Caudal fin deeply forked.

Colour in alcohol : Yellowish olive, covered all over with minute dots. Fins orange, upper half of first dorsal deep black and a dark upper edge to second dorsal fin. Caudal fin dark with a light outer margin and anal fin with a black mark over the bases of spines.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh and Burma.

Size : It attains to about 100 mm (4 inches) in total length.

Remarks : This species shows a considerable local variations which have caused its being described under more than one name. Day (1875) gave the body depth of this species 2.75 to 3.00 in total length. Specimens of Andhra Pradesh shows a comparatively narrower body depth having 3.63 to 3.66 in total length.

Chanda ranga Hamilton Buchanan, 1822

1822. *Chanda ranga* Hamilton Buchanan, *Fish. Gauges* : 113, 371, pl. 16, fig. 38 (type-locality : freshwaters of all parts of the Gangetic Provinces).

1875. *Ambassis ranga*, Day, *Fish. India* : 51, pl. 14, fig. 6 ; 1889, Day, *Fauna Br. India, Fish*, 1 : 485.

1981. *Chanda ranga*, Jayaram, *Handbk. Freshw. Fish. India* : 318 (distribution and key to species).

Local name : Sarawa (Telugu).

Common name : Indian glass fish (English).

Material examined : (i) 2 exs., 28 mm-33 mm TL. ; Manair Project, Karimnagar district, Andhra Pradesh ; R. P. Barman and party ; 4.9.83. (ii) 3 exs., 70 mm-82 mm TL. ; Godavari river, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 1.6.87. (iii) 6 exs., 65 mm-83 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 9.6.87.

Diagnostic features : D. 7/1/13-15, P. 11, V. 6, A. 3/14-16, C. 17.

Head length 3.25 to 4.00 and body depth 2.25 to 2.50 in total length. Eye diameter 2.50 in head length. Maxilla extending to below middle of the orbit. Vertical limb of

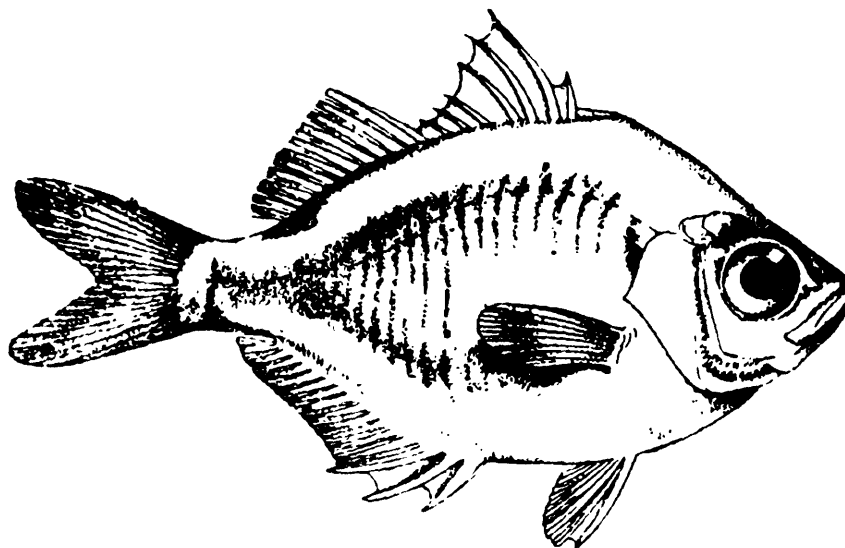


Fig.126 : *Chanda ranga* Hamilton Buchanan

preopercle entire or finely serrated. Sub and interopercle entire. Preorbital serrated. Teeth all small villiform in jaws, vomer and palate. 2 dorsal fins united at their base, first dorsal fin with 7 spines and a recumbent dorsal spine present. Caudal fin emarginate.

Colour in alcohol : Olive, with a dark mark composed of spots on the shoulder being the remains of a band present in the young stage. The margins of the vertical fins are usually grey.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma, Malaya and Thailand.

Size : It grows 102 mm (4 inches) in total length.

Remarks : Both *C. nama* and *C. ranga* closely resemble each other particularly in their young stages. However, they can be easily separated having 2 or 3 canines in the lower jaw of *C. nama* which are absent in *C. ranga*. Further body depth deeper in *C. ranga* than *C. nama*.

C. ranga is a very common species found almost throughout Andhra Pradesh.

Family NANDIDAE

Leaf fishes

Branchiostegal rays 5 or 6. Body oblong and compressed. Head usually large and covered with scales. Mouth usually large and highly protrussible. Teeth on jaws and palate. Operculum armed with a spine, Dorsal fin continuous with a spinous and a soft portion. Pelvic fin thoracic, without scaly auxillary process. Anal fin with 3 spines. Caudal fin rounded. Lateral line interrupted or absent.

3 genera are known under this family from the Indian subcontinent; 1 genus is found in Andhra Pradesh.

Genus *Nandus* Valenciennes, 1831.

1831. *Nandus* Valenciennes, (in Cuvier and Valenciennes), *Hist. Nat. Poiss.*, 7: 481 (type-species : *Nandus marmoratus* Cuvier).

1981. *Nandus*, Jayaram, *Handbk. Freshw. Fish. India* : 335, 336 (genus characters and distribution).

Body oblong and compressed. Abdomen rounded. Head large and compressed. Mouth terminal, very protractile, cleft very wide, extending to below posterior border of the orbits. Operculum with one spine. Dorsal fin inserted above pectoral fin base, with 12 to 14 spines and 11 to 13 soft rays, spinous portion longer than soft part. Anal fin with 3 spines and 7 to 9 soft rays. Caudal fin square shaped, Scales of moderate size, ctenoid. Lateral line interrupted at about 36th scales, 46 to 57 scales along lateral line.

Only 1 species is known under the genus throughout India, this species found in Andhra Pradesh.

***Nandus nandus* (Hamilton Buchanan, 1822)**

- 1822.** *Colus nandus* Hamilton Buchanan, *Fish. Ganges* : 96, pl. 30, fig. 32 (type-locality : ponds of Gangetic Provinces).
1875. *Nandus marmoratus*, Day, *Fish. India* : 129, pl. 32, fig. 1 ; 1889, Day, *Fauna Br. India, Fish*, 2 : 82.
1981. *Nandus nandus*, Jayaram, *Handbk. Freshw. Fish. India* : 336 (distribution).

Local name : Septi (Telugu).

Common name : Nandus (English).

Material examined : (i) 2 exs., 110 mm-124 mm TL. ; Godavari river, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 28.8.83. (ii) 6 exs., 93 mm-132 mm TL. ; Godavari river, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 31.5.87 to 3.6.87. (iii) 8 exs., 93 mm-104 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 4.6.87 to 9.6.87.

Diagnostic features : D. 12-14/11-13, P. 16. V 1/5, A. 3/7-9, C. 15, LL. 46-57.

Head large, compressed, length 3.00 to 3.25 and body depth 3.00 to 3.35 in total length. Eye diameter 4.00 to 6.00 in head length. Mouth terminal, very protractile, gape wide, extending to below posterior margin of the orbit. One opercular spine present.

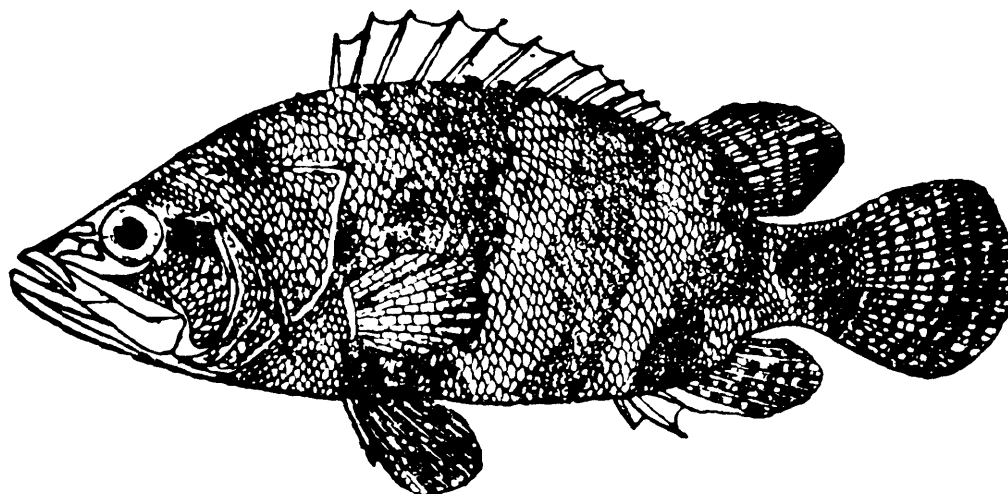


Fig.127: *Nandus nandus* (Hamilton Buchanan)

Villiform teeth on jaws, palate and on tongue. Dorsal fin origin above pectoral fin base, spinous portion longer than soft portion. Lateral line interrupted at 36th scale. Caudal fin rounded or cut square.

Colour in alcohol : Body greenish brown with brassy reflections. 3 broad patchy marbled bands over body and a fourth one across free portion of tail. Narrow bands of spots across soft parts of dorsal, anal and caudal fins.

Distribution : Throughout India, Pakistan, Bangladesh, Nepal, Burma, Malaya and Thailand.

Size : It grows at least 177 mm (7 inches) in total length.

Remarks : This is a piscivorous fish preying upon small carps in paddy fields and ditches. It is very tenacious of life. This fish is very common almost throughout Andhra Pradesh.

Family CICHLIDAE

Body moderately deep and compressed. Head and body with slightly ctenoid scales. One nostril on each side of head. Dorsal fin single with a spinous and a soft portions united. Generally 7 to 25 spines and 5 to 30 soft rays in the dorsal fin. Anal fin with 3 (in majority of species) to 15 spines and 4 to 15 soft rays. Lateral line interrupted, generally 20 to 50 scales in the lateral line but the number may exceed 100.

Cichlids form an important group of relatively large and often colourful aquarium fishes. The majority of species are known from Africa. This is the second largest family of perciform fishes.

Key to the genera

Anal fin with 3 or 4 spines. Scales cycloid (rarely indistinctly ctenoid)...	<i>Oreochromis</i> (= <i>Tilapia</i>)
Anal fin with 12 to 15 spines. Scales slightly ctenoid	... <i>Etroplus</i>

Genus *Etroplus* Cuvier, 1830.

1830. *Etroplus* Cuvier, *Hist. Nat. Poiss.*, 5 : 486 (type-species : *Etroplus meleagris* Cuvier).

1981. *Etroplus*, Jayaram, *Handbk. Freshw. Fish. India* : 337, 338 (genus descriptions and distribution).

Body elevated and compressed with rounded abdomen. Snout spout-like. Dorsal fin inserted above base of pectoral fin, with 17 to 22 spines and 8 to 15 soft rays, spinous part longer than soft part. Anal fin with 12 to 15 spines and 6 to 11 soft rays. Caudal fin lunate or emarginate. Scales very slightly ctenoid, of moderate size and extending to base of soft dorsal and anal fin. Lateral line interrupted or abruptly ceasing, with 30 to 40 scales. Body with circular spots or vertical bands.

3 species are known under the genus in the Indian subcontinent, 2 species are found in Andhra Pradesh.

Key to the species

Body with 1 to 3 dark circular blotches along sides. Dorsal fin with 8 to 10 soft rays and anal fin with 8 to 9 soft rays	...	...	...	<i>E. maculatus</i>

Body with vertical bands. Dorsal fin with 14 to 15 soft rays and anal fin with 11 to 12 soft rays *E. suratensis*

***Etroplus maculatus* (Bloch, 1785)**

1785. *Chaetodon maculatus* Bloch, *Syst. Ichth.*, pl. 427, fig. 2 (type-locality : not given).
 1877. *Etroplus maculatus*, Day, *Fish. India* : 415, pl. 89, fig. 4 ; 1889, Day, *Fauna Br. India, Fish.* 2 : 429
 1981. *Etroplus maculatus*, Jayaram, *Handbk. Freshw. Fish. India* : 339 (distribution and key to species).

Local name : *Burakasu, Chilla kasu, Duvvena chepa* (Telugu).

Common name : Pearl spot, Spotted etroplus (English).

Material examined : (i) 2 exs., 75 mm-88 mm TL. ; Godavari river, Warangal district, Andhra Pradesh ; R. P. Barman and party ; 31.8.83. (ii) 17 exs., 44 mm-94 mm TL. ; Nagarjun sagar, Nalgonda district, Andhra Pradesh ; R. P. Barman and party ; 16.6.86, (iii) 5 exs., 80 mm-89 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 6.6.87 and 9.6.87.

Diagnostic features : D. 17-22/8-10, P. 17, V. 8, A. 12-15/8-9, C. 16, LL. 35.

Head length 3.50 to 3.60 and body depth 2.25 to 2.50 in total length. Eye diameter 3.00 in head length. Body elevated and compressed. Teeth trilobate, but not quite touching

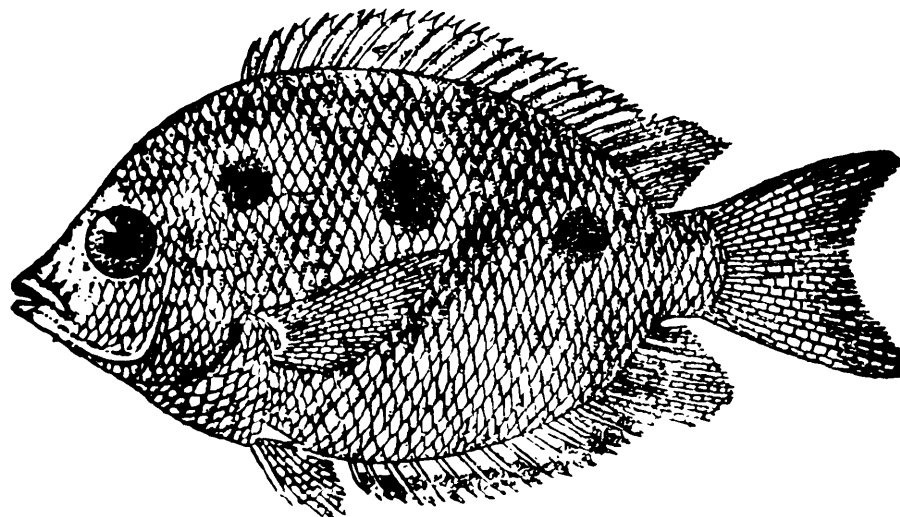


Fig.128:*Etroplus maculatus* (Bloch)

one another. Caudal fin lunate.

Colour in alcohol : Dorsal surface yellowish with greenish colour. About 15 to 17 horizontal lines of deep golden spots and few others on dorsal, anal and abdomen, Three dark blotches along the lateral line, the middle one the largest.

Distribution : India : Tamil Nadu, Kerala, S. Kanara and Andhra Pradesh. Sri Lanka.

Size : It attains 76 mm (3 inches) in total length.

Remarks : It is a very common species found almost throughout Andhra Pradesh.

***Etroplus suratensis* (Bloch, 1785)**

1785. *Chaetodon suratensis* Bloch, *Syst. Ichth.*, pl. 217 (type-locality : Surat).

1877. *Etroplus suratensis*, Day, *Fish. India* : 415, pl. 89, fig. 6 ; 1889, Day, *Fauna Br. India, Fish*, 2 : 430.

1981. *Etroplus suratensis*, Jayaram, *Handbk. Freshw. Fish. India* : 339 (distribution and key to species).

Local name : *Cahimara*, *Duvvena chepa* (Telegu).

Common name : Banded pearl spot etroplus (English).

Material examined : (i) 5 exs., 46 mm-65 mm TL. ; Koil sagar, Mahbubnagar district, Andhra Pradesh ; R. P. Barman and party ; 16.12.84 (ii) 5 exs., 103 mm-198 mm T.L ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 5.6.87 to 9.6.87.

Diagnostic features : D. 18-19/14-15, P. 17, V 8, A. 12-13/11-12, C. 16, LL. 35-40.

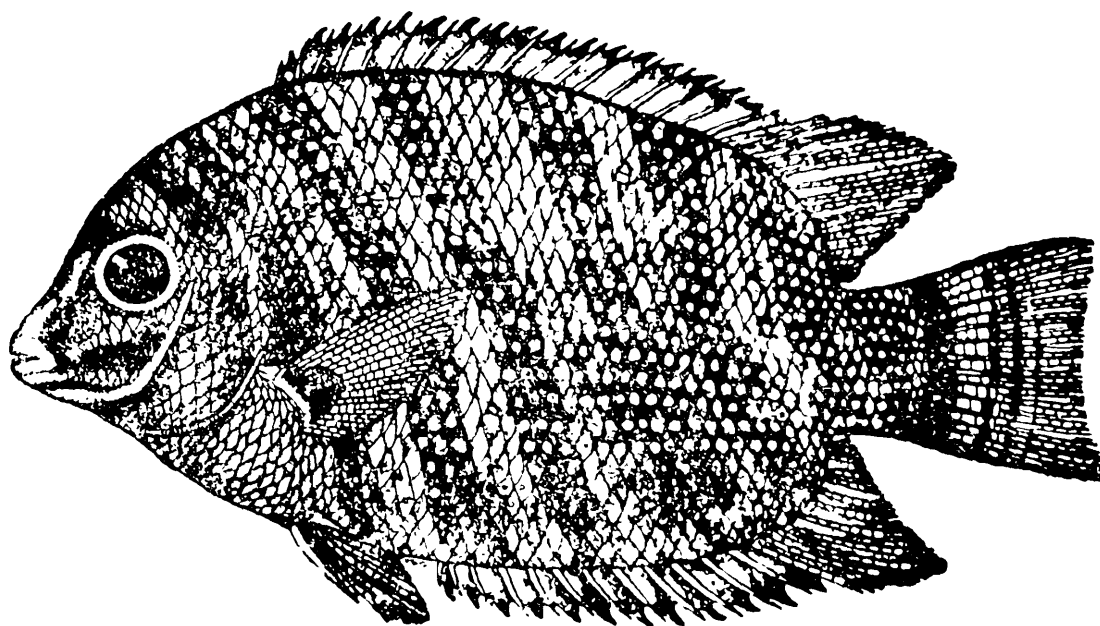


Fig. 129: *Etroplus suratensis* (Bloch)

Head length 3.75 to 4.25 and body depth 2.10 to 2.25 in total length. Eye diameter 3.00 to 4.00 in head length. Body elevated and compressed. Cleft of mouth small. Teeth in single row in each jaw, compressed and lobate. Caudal fin slightly emarginate,

Colour in alcohol : Light green colour with 8 vertical bands. Scales above lateral line with a central pearl spot.

Distribution : India : Gujarat, Kerala, Tamil Nadu, Orissa and Andhra Pradesh. Sri Lanka.

Size : It attains 190 mm ($7\frac{1}{2}$ inches) in total length.

Remarks : It is also a very common species available almost all over Andhra Pradesh.

Genus *Oreochromis* Günther, 1889.

1889. *Oreochromis* Günther, *Proc. zool. Soc. Lond.* : 70 (type-species : *Oreochromis hunteri* Gunther).

1849. *Tilapia* A. Smith, *III. zool. S. Afr. Fish.* (type-species : *Chromis nilotica* Valenciennes).

1983. *Oreochromis*, Trewavas, *Br. Mus. nat. Hist.* No. 878 : 1 (raised from *Tilapia* A. Smith).

Body somewhat elongated with rounded abdomen. Mouth terminal, cleft extending up to anterior margin of the orbit. Teeth in two or more series, the outer bicuspid and others tricuspid. Palate edentate. Dorsal fin inserted above pectoral fin base, with 15 to 16 spines and 10 to 11 soft rays. Spinous part longer than soft part which may be prolonged with a filamentous tip. Anal fin with 3 spines (rarely 4). Caudal fin rounded, may be truncate in the young specimens. Lateral line incomplete, upper one with 18 to 21 and lower one with 10 to 15 cycloid scales.

***Oreochromis mossambica* (Peters, 1852)**

1852. *Tilapia mossambica* Peters, *Monatsb. Akad. Wiss. Berlin* : 681 (type-locality : rivers on east coast of Africa from Algoa Bay in South Africa to West Sheboli river in Somaliland).

1983. *Oreochromis mossambica*, Trewavas, *Br. Mus. nat. Hist.* No. 878 : 1 (placed this species under the genus *Oreochromis* Günther, 1889).

Local name : *Tilapia* (Telegu).

Common name : *Tilapia* (English).

Material examined : No specimen was obtained by me. It has been introduced in Andhra Pradesh by the State Fisheries Department of Andhra Pradesh.

Diagnostic features : D. 15-16/11-12, P. 12-13, V. 1/5, A. 3/10, C. 17, LL. 28-36 (interrupted).

Head length 4.00 and body depth 3.25 in total length. Eye diameter 5.00 in head length. Cleft of mouth short, lower jaw slightly longer. Small teeth in several series. Dorsal fin origin above pectoral fin base, spinous part longer than soft part which may be prolonged with a filamentous tip. Lateral line incomplete or interrupted. Caudal fin subtruncate.

Colour in alcohol : Body greenish olive to golden. Each scale with a dark centre.

Vertical fins blackish with indistinct white spots. Young specimens with an ovate black spot behind base of last dorsal spine.

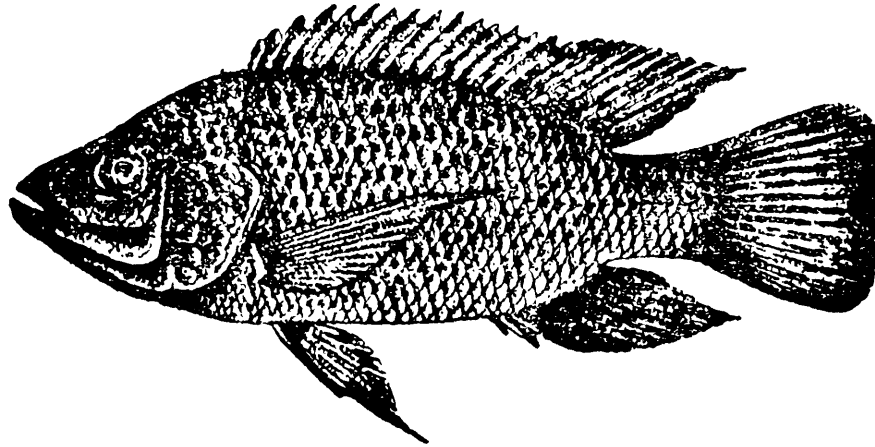


Fig.130: *Oreochromis mossambica* (Peters)

Distribution : A native freshwater fish from Southern Africa that has been introduced throughout India, Pakistan and Sri Lanka. East Africa to Natal.

Size : It attains 230 mm (9 inches) in total length.

Remarks : It is a prolific breeder almost round the year. It is a native of the rivers of the east coast of Africa and was first brought to India from Bangkok in 1952 and today it is one of the most commonly known exotic food fish all over India.

Trewavas (1983) placed this species under the genus *Oreochromis* Günther, instead of its well known popular genus *Tilapia* A. Smith. Nelson (1983) is in favour of retaining its popular genus *Tilapia* as per the opinion of Robins et al (1980) in recognising *T. mossambica* under the genus *Tilapia*. I have followed Trewavas (1983) in this work.

Family MUGILIDAE

Mulletts

Body usually silvery, oblong to fairly elongated fishes. Mouth moderate in size, terminal or inferior, premaxillae protractile and teeth small or absent. Head and body with scales. Branchiostegal rays 4 to 6. Lateral line absent or very faint. Opercles with or without a spine. Two short, widely separated dorsal fin, the first one with 4 slender spines. Pelvic fin subabdominal, with one spine and five branched soft rays. Anal fin with 3 spines. Caudal fin moderately forked, emarginate or truncate.

These fishes are distributed throughout the seas of India, some ascending tidal rivers or being found in estuaries. The young specimens generally enter large rivers and are found in the watercourses intersecting paddy-fields and in inundated localities. Most of

the species are suitable for culture either in enclosed coastal waters or in freshwater bodies. The maximum landings of mullets are from Gujarat, followed by Andhra Pradesh, Tamil Nadu and Maharashtra.

As a rule these fishes, when of sufficient size, are esteemed as food by both Europeans and natives in their fresh state.

Key to the genera

1. Eyes bulging and placed in line with dorsal profile of head. Upper lip not forming anterior border of head, but inferior to a fleshy snout ... *Rhinomugil*
 Eyes not bulging and projecting above the level of dorsal profile of head. Upper lip forming anterior border of head, not inferior to snout ... 2.
- 2 Maxilla markedly exposed posteriorly when the mouth is closed. Nostrils close together ... *Liza*
 Maxilla not exposed posteriorly when the mouth is closed. Nostrils widely apart ... *Mugil*

Genus *Mugil* Linnaeus, 1758.

1758. *Mugil* Linnaeus, *Systema Naturae*, (ed.), 1 : 316 (type-species : *Mugil cephalus* Linnaeus).

1981. *Mugil*, Jayaram, *Handbk. Freshw. Fish. India* : 341 (genus character and distribution).

Head flattened dorsally, scaled and compressed. Abdomen rounded. Adipose eyelids well developed, covering most of eye in adult specimens. Lips thin. Jaws equal. A large symphysial knob at the tip of lower jaw present. No spine on operculum. Maxilla not fixed anteriorly. Maxilla and premaxilla not hooked downwards posteriorly, maxillary hidden when the mouth is closed. Nostrils widely separated, the anterior one nearer to upper lip than to posterior nostril and above the level of the centre of the orbit. Scales cycloid. Caudal fin forked.

Mugil cephalus Linnaeus, 1758.

1758. *Mugil cephalus* Linnaeus, *Systema Naturae*, (ed. 10), 1 : 361 (type-locality : 'European Ocean').

1877. *Mugil oeur*, Day, *Fish. India* : 353, pl. 75, fig. 3 ; 1889 Day, *Fauna Br. India*, Fish, 2 : 348, fig. 114.

1981. *Mugil cephalus*, Jayaram, *Handbk. Freshw. Fish. India* : 342 (distribution and key to species).

Local name : *Kathi parenga* (Telugu)

Common name : Flat head grey mullet (English).

Material examined : 2 exs., 145 mm-175 mm TL. ; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; R. P Barman and party ; 1.6.87.

Diagnostic features : D. 4/1/8, P. 15, V. 6, A. 3/8, C. 15, LL. 38-42.

Head length 4.50 to 4.75 and body depth 5.25 to 5.75 in total length. Eye diameter 4.70 in head length, with broad anterior and posterior adipose eyelids, both reaching pupil.

Lips thin, lower lip with a symphysial knob. Teeth distinct in both jaws. Preorbital slender, neither notched nor bent. First dorsal fin origin midway between snout tip and caudal fin base. Pectoral fin short, not reaching origin of first dorsal fin, with long auxillary

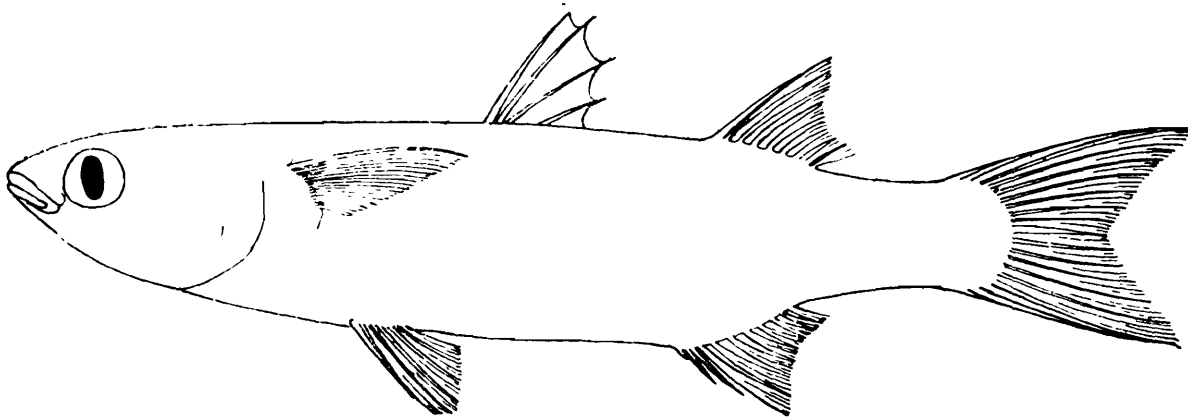


Fig. :31. *Mugil cephalus* Linnaeus

scale. Anal fin origin opposite second dorsal fin. Predorsal scales 23. Caudal fin forked, with pointed lobes.

Colour in alcohol : Dorsal surface olive green and silvery on sides, shading into white below. 6 to 7 indistinct longitudinal brown bars down flanks, a dark purple blotch at base of pectoral fin.

Distribution : India : East and West coasts of India, ascending tidal rivers and estuaries. Pakistan. Bangladesh. Burma. Sri Lanka. Actually this species is distributed throughout the world in temperate and tropical waters.

Size : It attains at least 914 mm (3 feet) in total length.

Remarks : This species is common in estuaries, even far from the sea, extending into freshwater. It is the most common and widely distributed species of the mullets in India. I have collected this species from the River Godovari, East Godavari district, Andhra Pradesh.

The season for capturing these fishes along the western coasts of India commences about the middle of November when they swarm close in shore in order to enter estuaries and mouths of large rivers to deposit their ova. They continue to be very numerous until February.

Genus *Liza* Jordon and Swain, 1884.

1884. *Liza* Jordon and Swain, *Proc. U. S. nat. Mus.*, 7 : 261 (type-species: *Mugil captio* Cuvier).

1981. *Liza*, Jayaram, *Handbk. Freshw. Fish. India* : 342 (genus character and distribution).

Generally preorbital bone broad, notched and denticulate. No spine on operculum. Maxillary fixed anteriorly and exposed posteriorly when the mouth is closed. Nostrils close together, anterior nostril above level of the centre of the orbit. Adipose eyelids absent or a rim around the eye or to iris only. Lips thin, without fleshy lobes and papillae. Large symphyseal knob at the front of lower jaw present. Generally teeth present on vomer, palatines, pterygoids and tongue, sometimes absent from vomer and palatines. Scales ctenoid or cycloid, but with no dilations on hind margin. Caudal fin forked.

***Liza parsia* (Hamilton Buchanan, 1822)**

1822. *Mugil parsia* Hamilton Buchanan, *Fish. Ganges* : 215, 380, pl. 17, fig. 71 (type-locality : fresh-water rivers of Bengal).

1877. *Mugil parsia*, Day, *Fish. India* : 350, pl. 75, fig. 2 ; 1889, Day, *Fauna Br. India*, Fish, 2 : 344.

1981. *Liza parsia*, Jayaram, *Handbk. Freshw. Fish. India* : 343 (distribution and key to species).

Local name : *Bonthalu* (Telugu).

Common name : Goldspot mullet (English).

Material examined : 4 exs., 83 mm-130 mm TL. ; Godavari river, Rajamundry East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 1.6.87.

Diagnostic features : D. 4/1/8, P. 14, V 6, A. 3/8-9, C. 14, LL. 34-35.

Head length 4.50 to 5.50 and body depth 4.30 to 5.00 in total length. Eye with adipose lids, diameter 3.50 to 4.25 in head length. Preorbital slightly bent and serrated.

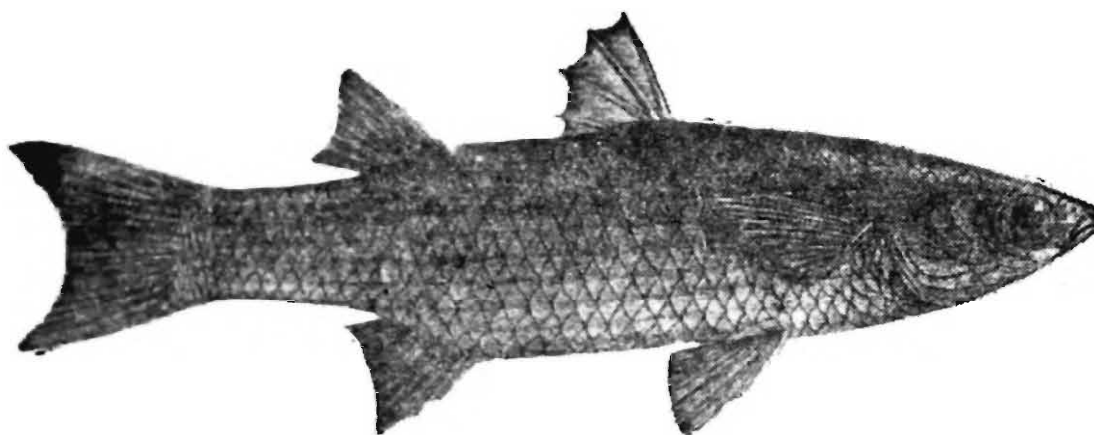


Fig. 132. *Liza parsia* (Hamilton Buchanan)

Upper lip moderately thick, forming almost front end of snout. Teeth distinct in upper jaw. First dorsal fin commences almost midway between tip of snout and caudal base. Predorsal scale 18-22. Caudal fin slightly forked.

Colour in alcohol : Body greenish olive becoming lighter below. A golden spot on upper portion of operculum. Edge of both dorsal fins dusky. Caudal fin base yellowish,

Distribution : India : West and East coasts of India, entering tidal rivers and estuaries. Pakistan. Bangladesh. Burma. Sri Lanka. Malaya Archipelago. Thailand. Phillippines. Malanesia. Queensland.

Size : It grows 152 mm (6 inches) in total length.

Remarks : I have collected this species from the River Godavari at Rajamundry , East Godavari district, A. P. It is a common species of the Krishna river system.

Genus *Rhinomugil* Gill, 1863.

1863. *Rhinomugil* Gill, *Proc. Acad. nat. Sci. Philad* , 15 : 169 (type-species : *Mugil corsula* Hamilton).

1981. *Rhinomugil*, Jayaram, *Handbk. Freshw. Fish. India* : 345, 346 (genus character and distribution).

Fairly elongated and compressed fishes. Abdomen rounded. Head long, slightly depressed anteriorly. Snout flat, short, overhanging. Mouth distinctly ventral and protrusible. Eyes bulging, dorsolateral, in anterior half of head. Adipose eyelids absent. Lips thin, upper lip not forming tip of snout or part of dorsal profile, but conspicuously ventral, overhung by snout. Symphysial knob present at the lower jaw. Teeth indistinct. No spine on operculum. Widely separated two dorsal fins, first dorsal origin in between pelvic and anal fin, with 4 spines and second dorsal fin with 8 rays. Anal fin with 3 spines and 9 rays. Scales ctenoid, 48 to 52 along lateral series. Caudal fin emarginate.

Rhinomugil corsula (Hamilton Buchanan, 1822)

1822. *Mugil corsula* Hamilton-Buchanan, *Fishes Ganges* : 221, 381, pl. 9, fig. 97 (type-locality : rivers of Gangetic provinces in the southern parts of Bengal).

1877. *Mugil corsula*, Day, *Fish. India* : 354, pl. 71, fig. 6 ; 1889 Day, *Fauna Br. India, Fish.* 2 : 349.

1981. *Rhinomugil corsula*, Jayaram, *Handbk. Freshw. Fish. India* : 446 (distribution).

Local name : *Mazhugu meen* (Tamil).

Common name : *Corsula mullet* (English).

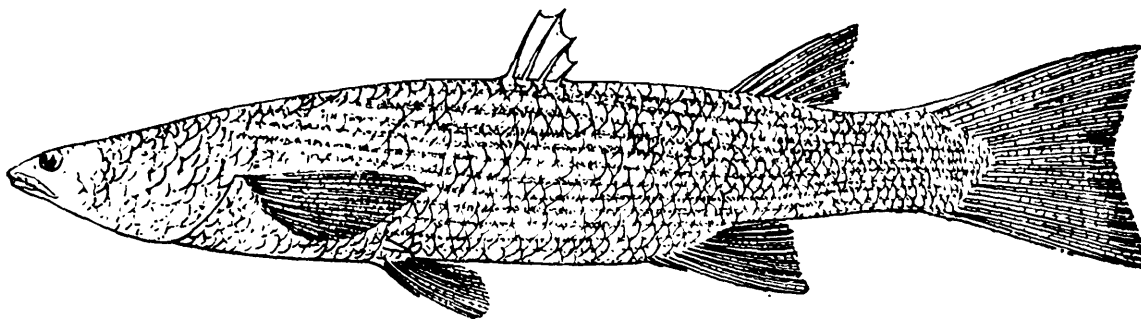


Fig. 133 : *Rhinomugil corsula*(Hamilton Buchanan)

Material examined : (i) 1 ex., 200 mm TL. ; Wyra reservoir, Khammam district,

Andhra Pradesh ; R. P. Barman and party ; 28.8.83. (ii) 1 ex., 70 mm TL. ; a pond at Mosampet village, Mahbubnagar, Andhra Pradesh ; R. P. Barman and party ; 15.12.84.

Diagnostic features : D. 4/1/7-8, P. 15, V. 6, A. 3/9, C. 15, LL. 48-52.

Head slightly depressed anteriorly, length 4.50 to 4.80 and body depth 6.00 to 6.50 in total length. Eye diameter 7.00 in head length. Eyes, bulging, dorsolateral, in anterior half and without adipose eyelids. Mouth distinctly ventral and protrussible. Snout flat, short and overhanging. Maxilla extending below the middle of the orbit. Teeth—a single row in either jaw. Preorbital not notched, serrated. Opercle without spine. Two dorsal fins well separated, first dorsal fin in between pelvic and anal fin. Dorsal profile almost straight, upper jaw longer and overhung by snout. Upper lip thick. Predorsal scales 28. Caudal fin slightly emarginate.

Colour in alcohol : Dorsal surface dull brown becoming lighter below. Dorsal and caudal fin tinted grey. Eye golden.

Distribution : India : Punjab, Uttar Pradesh, Bihar, West Bengal, Orissa, Gujarat, Tamil Nadu (introduced), Andhra Pradesh (introduced). Pakistan and Bangladesh.

Size : It grows 457 mm. ($1\frac{1}{2}$ feet) in total length.

Remarks : This species is found in estuaries and freshwaters far above the tidal influence. These fishes swim with their eyes just above the surface of the water, giving the appearance of a number of tadpoles. In case of disturbance they dive down with great rapidity.

Family GOBIIDAE

Gobies

Branchiostegal raye 5. Body varying from oblong to very elongated, eel-like in some genera. Head usually with mucous canals and open pores. Two dorsal fins united with each other or separated narrowly by a notch or well separated, with 2 to 8 soft flexible spines and or soft rays. First dorsal fin may be absent. The second or soft-rayed dorsal fin and the anal fin mirror each other in size and shape. The bases of their pelvic fins, when well developed, united usually forming an adhesive or sucking disc with which they hold onto the bottom. Anal fin short or long continuous with caudal fin. Lateral line absent, exposed pit organs present. Scales cycloid or ctenoid (rarely absent).

This is the largest family of marine fishes. They often the most abundant fishes in freshwater or oceanic islands.

Key to the genera

Some fleshy flaps on inner edge of pectoral girdle present	...	...	<i>Awaous</i>
No such fleshy flaps on inner edge of pectoral girdle present	...	...	<i>Glossogobius</i>

Genus *Awaous* Valenciennes, 1837.

1837. *Awaous* Valenciennes, *Hist. Nat. Poiss.*, 12 : 97 (type-species : *Gobius ocellaris* Valenciennes).
 1981. *Awaous*, Jayaram, *Handbk. Freshw. Fish. India* : 356, 357 (genus characters and key to species).

Body elongated, posteriorly compressed with subcylindrical abdomen. Head short, elongated, scaled above behind the orbits. Mouth oblique, cleft extending to anterior border of the orbit. Lips thick. Jaws subequal, upper jaw prominent. Two dorsal fins, separated by a notch, first dorsal fin inserted above base of pectoral fin, with 6 rays ; second dorsal fin with 9 to 11 rays. Pectoral fin without free silk-like rays, base scaled. Pelvic fin united, oblong. Anal fin moderate with 10 rays. Some fleshy flaps on inner edge of pectoral girdle. Caudal fin obtuse. Scales ctenoid, breast and belly scaled, 50 to 60 scales along lateral series.

2 species are known under this genus in the Indian subcontinent, 1 species is found in Andhra Pradesh.

Awaous stamineus (Valenciennes, 1842)

1842. *Gobius stamineus* Valenciennes, *Zool. Voy. Bonite* : 179, pl. 51, fig. 5 (type-locality : backwaters of Madras).
 1876. *Gobius striatus*, Day, *Fish. India* : 292, pl. 62, fig. 6 ; 1889, Day, *Fauna Br. India*, *Fish.* 2 : 262-263.
 1981. *Awaous stamineus*, Jayaram, *Handbk. Freshw. Fish. India* : 357 (distribution and key to species).

Local name : Nil.

Common name : Scribbled goby (English).

Material examined : No specimen obtained by me. It was recorded by David (1963a) from Andhra Pradesh.

Diagnostic features : D. 6/1/10. P. 15, A. 10, LL. 56-60.

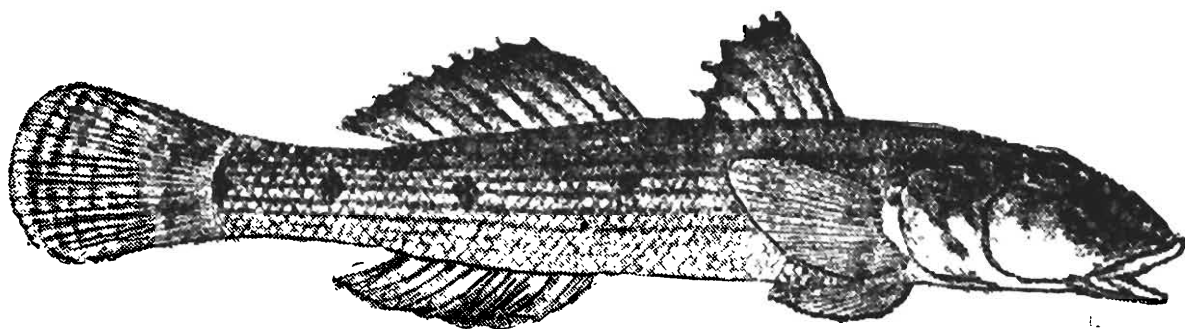


Fig. 134 : *Awaous stamineus* (Valenciennes)

Head length 4.00 to 4.25 and body depth 5.50 to 6.50 in total length. Eye diameter 6.00 to 7.00 in head length, not prominent, directed upwards and outwards. Body elongated

and sides compressed. Snout elongated, cheeks inflated. Barbels absent. Cleft of mouth almost horizontal, maxilla extending to nearly below anterior border of the orbit. No canine teeth. First dorsal spines weak, not filamentous, three-fourth height of body; second dorsal rays of about same height; last dorsal ray divided to its root, it only reaches halfway to caudal fin base. Caudal fin slightly rounded. Scales ctenoid, those anterior to dorsal fin smaller than the rest on the body; none on head.

Colour in alcohol: Generally light fulvous, with a bluish tinge along the sides, becoming dirty white beneath. Some irregular bands pass from the back towards the middle of the body. Some thin black lines proceed upwards on the abdomen opposite to anal fin. Cheeks glossed with silver. Pectoral, pelvic and anal fins whitish yellow. Both dorsal fins diaphanous, with 5 or 6 rows of brown dots. Caudal fin with 8 or 9 vertical rows of spots in its upper half or two thirds.

Distribution: India: rivers and estuaries of India. Malaya, Bangladesh, Philippines, Hawaii and East Indies.

Size: This species grows up to 150 mm (6 inches) in total length.

Fishery information: Economic importance of this fish is less although large specimens are sometimes eaten. This species is available in both the Krishna and Godavari river systems.

Genus *Glossogobius* Gill, 1860.

1860. *Glossogobius* Gill, *Proc. Acad. nat. Sci. Philad.*, (1859): 146 (type-species: *Gobius platycephalus* Richardson, by original designation).
 1981. *Glossogobius*, Jayaram, *Handbk. Freshw. Fish, India*: 357, 358 (genus characters and distribution).

Body generally elongated, anteriorly cylindrical, compressed. Head depressed, pointed, scaled above behind the orbits. Tongue bilobate. Gill openings continued far forward below isthmus narrow. Two dorsal fins, separated by a short interspace, first dorsal fin with 6 flexible spines and second dorsal fin with one spine and 6 to 10 soft rays, not elongated. Pelvic fins united, forming a sucking disc. Anal fin with one spine and 8 to 9 soft rays. Caudal fin oblong to rounded. Scales ctenoid on body and cycloid on head, 28 to 36 scales along lateral series.

2 species are known under the genus in the Indian subcontinent as well as from Andhra Pradesh.

Key to the species

Body depth 7.25 to 8.25 in total length. 7 to 9 rows of scales in a transverse series. First dorsal fin with two ocelli. Iris of eye with a process in pupil *G. biocellatus*

Body depth 5.00 to 6.50 in total length. 9 to 14 rows of scales in a transverse series. First dorsal fin with one black spot or without it. Iris without process in pupil ... *G. giuris*

***Glossogobius biocellatus* (Valenciennes, 1837)**

1837. *Gobius biocellatus* Valenciennes, *Hist. nat. Poiss.*, 12 : 73 (type-locality : coasts of India).

1877. *Gobius biocellatus*, Day, *Fish. India* : 289, pl. 63, fig. 8 ; Day, 1889, *Fauna Br. India, Fish.* 2 : 258.

1981. *Glossogobius biocellatus*, Jayaram, *Handbk. Freshw. Fish. India* : 358 (distribution and key to species).

Local name : Bullee-kokah, Isika dondu (Telegu).

Common name : Bar-eyed goby (English).

Material examined : 2 exs., 110 mm-133 mm TL. ; Godavari river at Rajamundry, E. Godavari district, Andhra Pradesh ; R. P. Barman and party, 3.6.87.

Diagnostic features : D. 6/1/9, P. 19, V. 1/5, A. 1/8, C. 15, LL. 28-30.

Head length 3.50 to 4.25 and body depth 7.25 to 8.25 in total length. Eye diameter 4.00 to 5.50 in head length. Gape of mouth rather oblique, lower jaw longer, the maxilla extends to below the middle of the orbit. A large open pore in posterior third of inter-orbital space. Several rows of fine warts on the cheeks. Teeth—a pair, recurved and

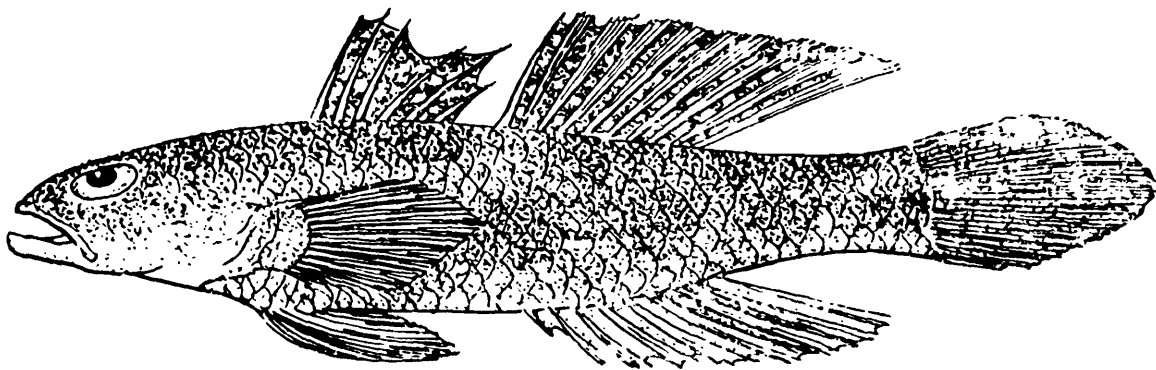


Fig. 135 : *Glossogobius biocellatus* (Valenciennes)

canine-like, in lower jaw in large specimens. First dorsal spines weak, the fifth slightly the longest, the first as high as the second dorsal, the last ray of which is equal to head. Scales ctenoid, none on cheeks, some operculum, much smaller than those on rest of body, where they are angular.

Colour in alcohol : Generally greyish brown, with some large irregular blotches along the sides. A slight brownish line along the middle of each row of scales. Dorsal fin usually yellowish, with a greyish tinge, and several irregular whitish lines along its lower half. Usually a black blotch with a white edge between its fifth and sixth spines. Second dorsal

with several rows of irregular white spots. Pectoral, pelvic and anal fins greyish. Caudal fin dark grey, with some lines of dark spots.

Distribution : Coasts of India as high as Sind, extending to the Malaya Archipelago.

Size : Largest specimen collected from Godavari River, Rajamundry, East Godavari district, Andhra Pradesh is 133 mm (5.2 inches) in total length.

Glossogobius giuris (Hamilton Buchanan, 1122)

1822. *Gobius giuris* Hamilton-Buchanan, *Fish. Ganges* : 51, 366, pl. 33, fig. 15 (type-locality : ponds and freshwater rivers of Gangetic provinces).

1877. *Gobius giuris*, Day, *Fish. India* : 294, pl. 67, fig. 1 ; Day, 1889, *Fauna Br. India, Fish*, 2 : 266.

1981. *Glossogobius giuris*, Jayaram, *Handbk. Freshw. Fish. India* : 358 (distribution and key to species).

Local name : *Bullee-kokah, Isika dondu* (Telugu).

Common name : Bar-eyed goby (English).

Material examined : (i) 2 exs., 118 mm-150 mm TL. ; Godavari river, Karimnagar district, Andhra Pradesh ; 4.9.89. (ii) 3 exs., 82 mm-86 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 7.6.87.

Diagnostic features : D. 6/1/8-9, P. 20, V. 1/5, A. 1/8-9, C. 17, LL. 30-34.

Head depressed, pointed, length 3.50 to 4.25 and body depth 5.00 to 6.50 in total length. Eye diameter 6.00 to 8.00 in head length. Snout pointed. Lower jaw longer, the maxilla extends to below anterior margin of the orbit. Tongue bilobate. Gill openings

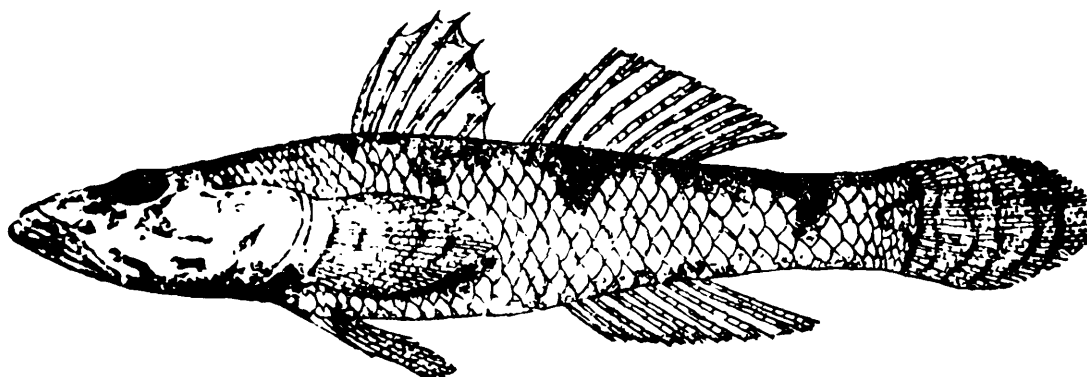


Fig. 136 : *Glossogobius giuris* (Hamilton Buchanan)

continued far forward below isthmus narrow. Two dorsal fins separated by a short interspace, first dorsal fin inserted above half of three-fourth of pectoral fin. Pelvic fins united, oblong. Caudal fin oblong to rounded.

Colour in alcohol : Dorsal surface olive to dusky green and lighter below. Body with

two alternately rows of 4 to 6 blotches, Sometimes a dark blotch on first dorsal fin.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma, Sri Lanka, East and South coasts of Africa, Mauritius, Malaya, Thailand, China, Japan, Philippines, and Australia.

Size : This species grows up to 304 mm (1 foot) in total length.

Fishery information : It is one of the important commercial fishes and is available throughout Andhra Pradesh.

Family ANABANTIDAE

Climbing gouramies

Body laterally compressed, somewhat elongated. Head and body covered with ctenoid scales. Upper jaw only weakly protrusible. Suprabranchial organ well-developed. Branchiostegal rays 6. A long dorsal fin with spinous and soft part. First ray of pelvic fin not produced into a long filament. Pelvic fin inserted below base of pectoral fin. Anal fin with spines and soft rays. A cavity above the third or the upper portion of the first branchial arch contains an elaborate apparatus consisting of thin laminae of bones, which are covered over by a vascular mucous membranes for respiratory purposes, enabling the fish to survive outside the water for a considerable period. Lateral line interrupted. Swimbladder bifid posteriorly with either extremity produced.

Genus *Anabas* Cuvier, 1817.

1817. *Anabas* Cuvier, *Le Regne Animal.*, 2 : 339 (type-species : *Perca scandens* Daldorf, by Monotypy).

1981. *Anabas*, Jayaram, *Handbk. Freshw. Fish. India* : 378, 379 (genus character and distribution).

Body oblong, compressed. Abdomen rounded. Single dorsal fin, inserted above pectoral fin base, with 16 to 18 spines and 8 to 10 soft rays. Anal fin with 8 to 10 spines and 9 to 11 soft rays. Number of spines in dorsal and anal fins variable. Caudal fin rounded. Lateral line interrupted with 21 to 29 ctenoid scales. Swimbladder present or absent.

Key to the species

Body depth 3.50 to 4.00 in total length. Pectoral fin long with 14 to 15 rays. Dorsal fin with 8 to 10 soft rays	...	...	...	<i>A. testudineus</i>
Body depth 3.00 to 3.50 in total length. Pectoral fin short, with 14 to 16 rays. Dorsal fin, with 9 to 10 soft rays	...	...	...	<i>A. oligolepis</i>

Anabas oligolepis Bleeker, 1835

1835. *Anabas oligolepis* Bleeker, *Nat. Tijdschr. Nederl. Indie*, 8 : 161-162.

1981. *Anabas oligolepis*, Jayaram, *Handbk. Freshw. Fish. India* : 379 (distribution and key to species).

Local name : Nil.

Common name : Climbing perch (English).

Material examined : It was recorded by Rao (1968) from Andhra Pradesh. No specimen was obtained by me.

Diagnostic features : D. 16-18/9-10 ; P. 14-15 ; V 1/5 ; A. 9-11/9-11 ; C. 15-17 ; LL. 23-28.

Head length 3.20 to 3.90 and body depth 3.00 to 3.50 in total length. Body depth almost equal to head length. Body comparatively deeper and more compressed and snout length relatively longer than that of *A. testudineus*. Maxilla extends to below half diameter of the orbit. Villiform teeth in jaws, a patch of teeth on vomer and pharyngeal teeth present. Preorbital strongly spinous, 9 to 13 spines, first spine longest. Preopercular smooth, edge of opercular, subopercular and interopercular strongly spinous. Dorsal fin origin above, slightly in front of or behind pectoral fin origin. Height of soft dorsal longer than that of spinous dorsal fin. Caudal and pectoral fin relatively shorter. Bases of soft dorsal, soft anal and caudal scaly. Scales large. Lateral line interrupted.

Colour in alcohol : Dorsal surface and flanks greenish and pale yellow on abdomen. Usually more than 4 vertical bands on flanks which may disappear with age. A distinct dark spot present on caudal fin base.

Distribution : India : Orissa, West Bengal and Andhra Pradesh.

Size : It grows up to 203 mm (8 inches) in total length.

Remarks : The question of the validity of *A. oligolepis* was neglected for a long time, until Rao (1968) recorded and described both *A. testudineus* and *A. oligolepis* from Bhimavaram in Andhra Pradesh. The former species was distinguished by its less deep body, longer pectoral fin, shorter snout and dark spot at caudal base which however, fades with age.

Dutt and Ramaseshaiah (1980) recognised *A. testudineus* and *A. oligolepis* as two distinct species in having 48 chromosomes in *A. testudineus* vs. 46 chromosomes in *A. oligolepis*. The labyrinthine plates (air breathing organ) are more convoluted in *A. testudineus*. Dutt and Ramaseshaiah (1983) made a taxonomic and biometric studies on both the species and recognised as two different species.

Anabas testudineus (Bloch, 1792)

1792. *Anthias testudineus*, Bloch, *Naturg. Ausland. Fische*, 6: 121, pl. 322; type-locality: Japan ("East Indies").
1877. *Anabas scandens*, Day, *Fish. India*: 370, pl. 78, fig. 3; 1889, Day, *Fauna Br. India, Fish*, 2: 367.
1981. *Anabas testudineus*, Jayaram, *Handbk. Freshw. Fish. India*: 379 (distribution and key to species).

Local name : Nil.

Common name : Climbing perch (English).

Material examined : (i) 2 exs., 110 mm-135 mm TL.; Godavari river, East Godavari district, Andhra Pradesh; R.P. Barman and party; 1.6.87. (ii) 5 exs., 125 mm-260 mm TL.; Kolleru Lake, West Godavari district, Andhra Pradesh; R.P. Barman and party 5.6.87.

Diagnostic features : D. 17-18/8-10, P. 14-15, V. 1/5, A. 9-10/9-11, C. 17, LL. 21-29.

Head length 3.50 to 4.00 and body depth 3.50 to 4.00 in total length. Eye diameter 4.50 to 5.00 in head length. Lower jaw slightly longer, opercle and preorbital serrated, the former spinate. Teeth villiform in jaws and teeth on palate. Dorsal fin originate

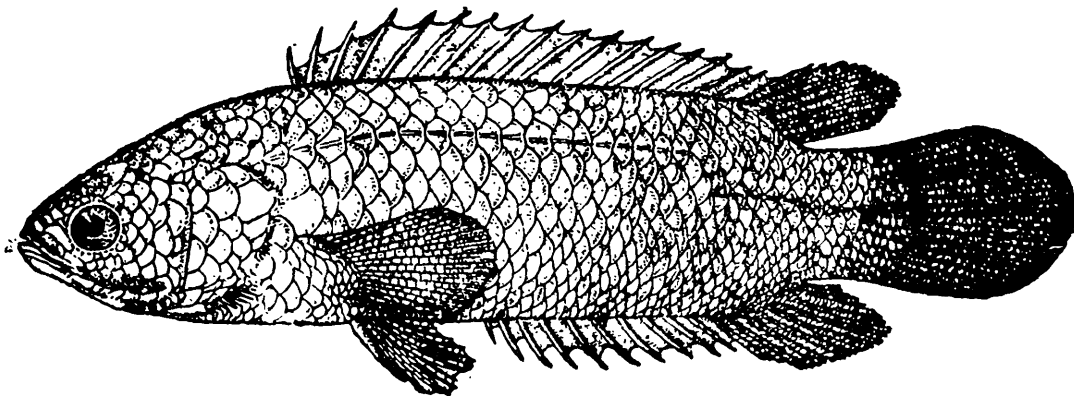


Fig. 137 : *Anabas testudineus* (Bloch)

above, slightly ahead or behind pectoral origin. Height of soft dorsal longer than spinous part of dorsal fin. Pelvic fin originate behind pectoral fin origin. Bases of soft dorsal, soft anal and caudal fin scaly. Scale large. A single dorsal fin longer than anal fin, spinous part much longer than soft part. Lateral line interrupted. Caudal fin round.

Colour in alcohol : Dorsal surface light to dark green and greenish yellow to orange below. Body with 4 wide cross bands in juvenile specimens. A black spot on caudal base invariably present in juveniles but generally fades with age.

Distribution : Throughout India, Pakistan, Bangladesh, Burma, Sri Lanka, Malaya, Malaya Archipelago, Thailand, Vietnam, China, Philippines, Polynesia and Singapore.

Size : It attains at least 203 mm (8 inches) in total length.

Remarks : This fish flourishes well in canals, ditches, lakes, ponds and swamps, although it is available in other freshwater areas such as streams. It can survive in oxygen deficient water because of its accessory respiratory organ. It can also go on dry land and by means of lateral movements of tail and paired fins, it is able to cross some dry patches and even climbs trees. Because of this peculiar habit this fish is known as "Indian climbing perch".

Family BELONTIDAE

Body short, compressed, anteriorly depressed to a slight extent. Head and body covered with ctenoid scales. Branchiostegal rays 5 or 6. A suprabranchial cavity present. A single dorsal fin with spines and soft rays. First ray of pelvic fin modified into a filiform ray or with few rays. Pelvic fin inserted behind base of pectoral fin. Anal fin with spines. Lateral line vestigial, rudimentary or absent.

Key to the subfamilies

Lateral line vestigial or incomplete. Branchiostegal rays 6. Suborbital shelf formed by suborbital 2 to 5	...	...	...	<i>Macropodinae</i>
Lateral line absent. Branchiostegal rays 5. Suborbital shelf formed by second suborbital only	...	...	...	<i>Trichogasterinae</i>

Subfamily MACROPODINAE

Metapterygoid not articulating with symplectic process of hyomandibular. Suprabranchial cavity not supported by epipleurals. No supraoccipital crest. Epiotics do not extend foramen magnum. 6 branchiostegal rays articulating with ceratohyal. Suborbital shelf formed by suborbital 2 to 5. Lateral line incomplete or vestigial (Liem, 1963, 1965).

2 genera are known under the subfamily in the Indian subcontinent, 1 genus is found in Andhra Pradesh.

Genus *Macropodus* Lace'pe'de, 1802.

- 1802. *Macropodus* Lace'pe'de, *Hist. nat. Poiss.*, : 416 (type-species: *Macropodus viridiauratus* Lace'pe'de).
- 1829. *Polycanthus* (Kuhl) Cuvier, *Regne Animal.*, 2, ed. 2 : 221 (type-species: *Trichapodus colisa* Hamilton Buchanan).
- 1981. *Macropodus*, Jayaram, *Handbk. Freshw. Fish. India* : 381, 382 (genus characters and distribution).

Body oblong, compressed with rounded abdomen. Mouth terminal, small and little protractile. A suprabranchial organ present. Single dorsal fin, inserted above half of

pectoral fin, with 14 to 17 spines and 5 to 10 soft rays ; spinous part longer than soft part. Pelvic fin with 1 spine and 5 well developed soft rays, some of which generally elongated. Anal fin with 14 to 19 spines and 9 to 12 soft rays. Caudal fin lanceolate. Scales rather large, ctenoid. Lateral line interrupted, sometimes partially or even entirely absent.

2 species are known under the genus in the Indian subcontinent, 1 species is found in Andhra Pradesh,

Macropodus cupanus Valenciennes, 1831

1831. *Macropodus cupanus* Valenciennes, *Hist. Nat. Poiss.*, 7 : 357 (type-locality : Arian Coupang river, Pondicherry).

1889. *Polycanthus cupanus*, Day, *Fauna Br. India*, Fish, 2 : 367.

1981. *Macropodus cupanus*, Jayaram, *Handbk. Freshw. Fish. India* : 382 (distribution and key to species).

Local name : *Hebbuti* (Telugu).

Common name : Paradise fish (English).

Material examined : No specimen obtained by me. This species is available along the coasts of Coromondal of India (Jayaram, 1981).

Diagnostic features : D. 14-17/5-7, P 10, V. 1/5, A. 16-19/9-11, C. 13, LL. 29-32.

Head length 4.00 to 5.00 and body depth 4.00 in total length. Eye diameter 4.00 to 5.00 in head length. Opercle non-spinate, serrated ; preorbital serrated. Teeth conical on

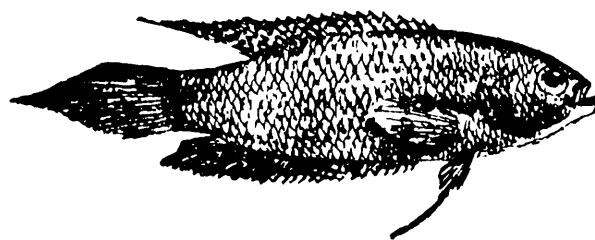


Fig. 138 : *Macropodus cupanus* Valenciennes

jaws and palate edentate. Dorsal spines not so high as soft rays. Outer ray of pelvic fin slightly produced. Caudal fin wedge-shaped. Lateral line incomplete, with 29 to 32 scales.

Colour in alcohol : Greenish with the prolonged pelvic ray scarlet. A round dark spot at the base of caudal fin present and numerous small spots on head.

Distribution : India : Ditches, paddy-fields and shallow waters along the coasts of India. Sri Lanka, Malaya Archipelago.

Size : It attains 76 mm (3 inches) in total length.

Remarks : In Andhra Pradesh this fish is found in both the rivers of Krishna and

Godavari. This species is known to be a larvicidal fish. It lurks under stones or amongst weeds.

Subfamily TRICHOGASTERINAE

Metapterygoid not reaching symplectic process of hyomandibular. Suprabranchial cavity not supported by epipleurals. No supraoccipital crest. Epiotics reach foramen magnum. 5 branchiostegal rays articulating with ceratohyal. Suborbital shelf formed by second suborbital only. Lateral line absent.

2 genera are known under the subfamily in the Indian subcontinent, 1 genus is found in Andhra Pradesh.

Genus Colisa Cuvier, 1831.

1831. *Colisa* Cuvier, *Hist. Nat. Poiss.*, 7 : 359 (type-species : *Colisa vulgaris* Cuvier).

1981. *Colisa*, Jayaram, *Handbk. Freshw. Fish. India* : 383 (genus characters and distribution).

Body elevated and compressed. Mouth upturned, terminal, cleft small and jaws slightly protractile. A suprabranchial organ present. A single dorsal fin inserted above from near pectoral fin base, with 15 to 18 spines and 7 to 13 soft rays. Anal fin with 15 to 20 spines and 11 to 19 soft rays. Pelvic fin in the form of single elongated, filiform ray. Caudal fin slightly emarginate or truncate. Lateral line when present interrupted, with 27 to 31 scales.

4 species are known under the genus in the Indian subcontinent, 1 species is found in Andhra Pradesh.

***Colisa fasciata* (Schneider, 1801)**

1801. *Trichogaster fasciatus* Schneider, *Syst. Ichth. Bloch* : 164, pl. 36 (type-locality : Tranquebar).

1877. *Trichogaster fasciatus*, Day, *Fish. India* : 374, pl. 78, fig. 6 ; 1889, Day, *Fauna Br. India, Fish*, 2 : 372, fig. 123.

1981. *Colisa fasciata*, Jayaram, *Handbk. Freshw. Fish. India* : 383, 384 (distribution and key to species).

Local name : Kun-gee (Telugu).

Common name : Banded colisa (English).

Material examined : (i) 37 exs., 35 mm-41 mm TL. ; Manair Project, Karimnagar district, Andhra Pradesh ; R. P. Barman and party ; 4.9.83 (ii) 34 exs., 37 mm-51 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 7.6.87.

Diagnostic features : D. 15-17/9-13, P. 10, V. 1, A. 15-18/14-19, C. 15, LL. 29-31.

Head length 3.75 to 4.25 and body depth 2.75 to 3.25 in total length. Eye diameter 3.25 to 5.50 in head length. Lower limb of preopercle serrated. Last dorsal spine longest

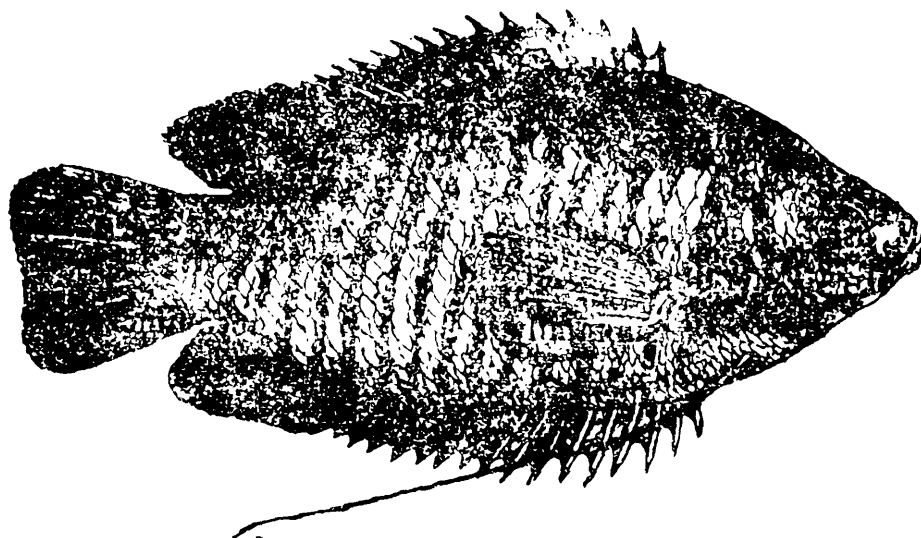


Fig. 139 : *Colisa fasciata* (Schneider)

and equal to postorbital length of head. Soft parts of dorsal and anal fins produced to a varying degree. Caudal fin notched or cut square.

Colour in alcohol : Dorsal surface greenish or bluish becoming dirty white below. Body with 14 or more orange coloured vertical bands descend obliquely downwards from back to belly and bordered by blue bands. Dorsal and caudal fins spotted with orange. Young specimen with a black spot at caudal fin base.

Distribution : India : North India and Coromondal coast as far as the river Krishna, Pakistan, Nepal, Bangladesh and Burma.

Size : It attains 125 mm (5 inches) in total length.

Remarks : In Andhra Pradesh, it is found in both the rivers of Krishna and Godavari. This species is more abundantly found in beels and marshy areas than lakes, ponds and rivers. It is a popular fish both as food and aquarium fish for its brilliantly coloured vertical bands and rapid growth. This species is considered as a larvivorous fish (Hora and Mukerji, 1938).

Family : OSPHRONEMIDAE

Goramies

Body moderately elevated, compressed with rounded abdomen. Head and body with otenoid scales. Mouth small, oblique, terminal and protractile. A suprabranchial organ present. A single dorsal fin inserted above tip of pectoral fin, with 11 to 14 spines and 11

to 12 soft rays ; spinous portion longer than soft part. Outer ray of pelvic fin much elongated, extending beyond caudal fin. Anal fin with 9 to 12 spines and 19 to 21 soft rays. Caudal fin rounded. Lateral line complete and straight, with 30 to 33 scales. Swimbladder simple.

Only 1 genus is known under the family.

Genus *Osphronemus* Lacépède, 1802.

1802. *Osphronemus* Lacépède, *Hist. nat. Poiss.*, 3 : 116 (type-species : *O. gouramy* Lacépède).

1981. *Osphronemus*, Jayaram, *Handbk. Freshw. Fish. India* : 384, 385 (genus characters and distribution).

Genus characters are same of those of the family characters.

***Osphronemus goramy* Lacépède, 1802**

1802. *Osphronemus goramy* Lacépède, *Hist. Nat. Poiss.*, 3 : 116, 117, pl. 8, fig. 2 (type-locality : Mauritius).

1889. *Osphronemus olfax*, Day, *Fauna Br. India, Fish*, 2 : 369.

1981. *Osphronemus goramy*, Jayaram, *Handbk. Freshw. Fish. India* : 385 (distribution).

Local name : *Gourami* (Telegu).

Common name : *Gauramy* (English).

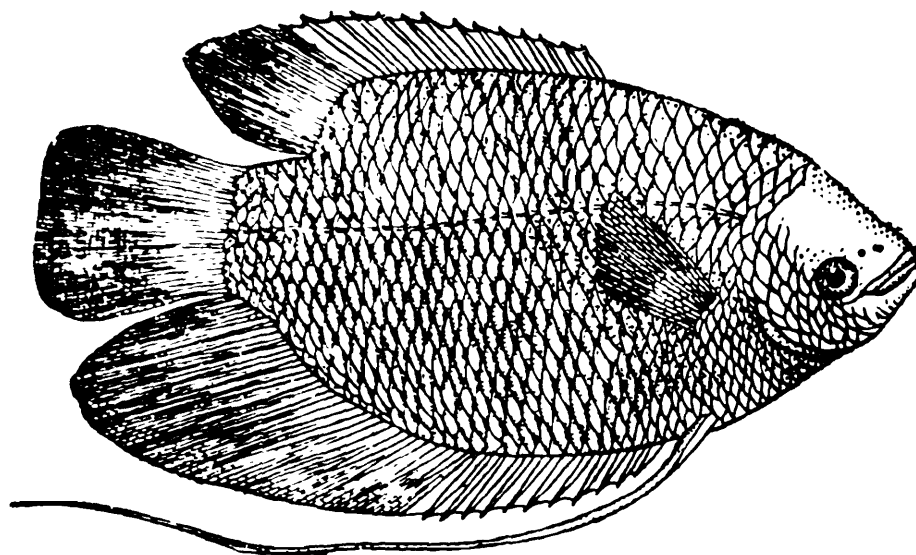


Fig. 140 : *Osphronemus goramy* Lacépède

Material examined : No specimen obtained by me. It was recorded by Jhingran (1983) from Andhra Pradesh.

Diagnostic features : D. 11-14/11-12, A. 9-12/19-21, LL. 30-33.

Head length 4.00 and body depth 3.00 in total length. Eye diameter 4.00 in head length. Operculum without any spine, preorbital serrated. Villiform teeth on jaws, none on palate. A single dorsal fin, shorter than anal fin, spinous part longer than soft part. Outer rays of pelvic fin much elongated, reaching beyond caudal fin. Caudal fin rounded.

Colour in alcohol : Greenish brown becoming lighter below. 8 cross bands on body in the young specimens.

Distribution : Throughout India, Pakistan, Sri Lanka, Mauritius, Seychelles, Malaya, Malaya Archipelago, Thailand, China, Philippines (introduced) and Australia (introduced).

Size : It attains at least 609 mm. (2 feet) in total length.

Remarks : It is an exotic species from Melanesia, introduced in different parts of India and Pakistan. The male fish is known to build nests for its young hatchlings and eggs. Admirably suited for cultivation in small ponds, in gardens and in plantations. These fishes do not thrive in brackish or saline waters. It is a vegetable feeder and eats with relish water lilies and other flowering plants.

Order MASTACEMBELIFORMES

Body eel-like, compressed and elongated with minute scales. Snout elongated and supported by a cartilaginous rod and ending in a sensitive tip flanked by the tubular anterior nostrils which are thus remote from the posterior. Palatines flake-like fused to the vomer. Dorsal and anal fins long preceded by 7 to 40 detached depressible dorsal spines and 1 to 3 anal spines. Pelvic fin absent. Caudal fin short either confluent with dorsal and anal or narrowly separated.

Family MASTACEMBELIDAE

Spiny eels

Eel-like body, compressed, elongated and covered with minute scales. Mouth non-protractile. Snout elongated and supported by a cartilaginous rod. Nostrils tubular, anteriorly placed on the sensitive snout. Upper jaw formed by dentigerous premaxilla and edentate maxilla. Branchiostegal rays 6. Preoperculum with or without spines. Dorsal fin with 7 to 40 detached depressible spines. Anal fin with 1 to 3 spines. Pelvic fin and girdle absent. Pectoral fin with 17 to 27 rays. Caudal fin short, either confluent with dorsal and anal or narrowly separated. Caudal fin homocercal.

Key to the genera

Preorbital spine present. Snout conical without any prolongation of the upper jaw and not transversely striated ventrally Mastacembelus
Preorbital spine absent. Snout with a concave prolongation of the upper jaw consisting of a paired series of toothed bony plates and transversely striated ventrally ... Macrognathus

Genus *Macrognathus* Lace'pe'de, 1800.

- 1800.** *Macrognathus* Lace'pe'de, *Hist. Nat. Poiss.*, 2 : 283 (type-species: *Ophidium aculeatum* Bloch).
1981. *Macrognathus*, Jayaram, *Handbk. Freshw. Fish. India* : 387, 388 (genus character and distribution).

Body elongated, eel-like and compressed. A long fleshy snout, concave below and transversely striated. Cleft of mouth narrow and inferior. Preorbital spine absent. Dorsal fin inserted far behind pectoral fin tip, with 14 to 22 detached, depressible spines and 42 to 58 soft rays. Anal fin with 3 spines and 42 to 58 soft rays. Dorsal and anal fins not confluent with the caudal fin which is rounded. Scales small and cycloid. Lateral line present. Swimbladder elongated.

***Macrognathus aculeatus* (Bloch, 1795)**

- 1795.** *Ophidium aculeatum* Bloch, *Naturg. Ausland. Fische*, pl. 159, fig. 2 (type-locality : not mentioned).
1878. *Rhynchobdella aculeata*, Day, *Fish. India* : 338, pl. 72, fig. 1 ; 1889, Day, *Fauna Br. India, Fish*, 2 : 331.
1981. *Macrognathus aculeatus*, Jayaram, *Handbk. Freshw. Fish, India* : 387, 389, fig. 199 (distribution and key to species).

Local name : *Bommidai* (Telugu).

Common name : Lesser spiny eel (English).

Material examined : (i) 4 exs., 135 mm-145 mm TL. ; Phulang river, Nizamabad district, Andhra Pradesh ; R. P. Barman and party ; 8.12.84. (ii) 3 exs., 130 mm-158 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 6.6.87, 7.6.87.

Diagnostic features : D. 16-20/44-54, P. 23, A. 2-3/44-52, C. 15.

Head length 5.00 to 6.00 and body depth 8.00 to 10.00 in total length. Eye one diameter apart. Body elongated, cylindrical and eel-like. Cleft of mouth narrow. Snout long, fleshy, trilobed with transverse striations inferiorly. No preorbital spine. Teeth in jaws minute. A single long dorsal fin with 13 to 20 stumpy free spines. Anal fin with 2 or 3 spines. Caudal fin not united with dorsal and anal fins. 19 to 23 rows of scales between lateral line and first ray of soft dorsal fin. Scales on head larger than those on body.

Colour in alcohol : Dorsal surface brownish or olive, marbled and yellowish below. A light band above lateral line. 3 to 9 large white or buff-edged ocelli along base of soft dorsal fin. Caudal fin vertically barred.

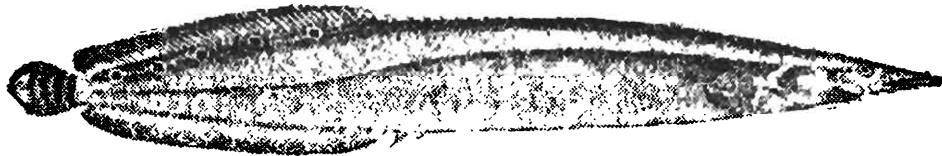


Fig. 141 : *Macrogathus aculeatus* (Bloch)

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma, Sri Lanka, Malaya Archipelago, Thailand, Vietnam and China.

Size : It attains 377 mm (15 inches) in total length.

Fishery information : This is a very common species and forms a fishery of considerable importance particularly during June-July throughout Andhra Pradesh.

Genus *Mastacembelus* Scopoli, 1777.

1777. *Mastacembelus* Scopoli, *Introd. Hist. Nat.*, : 458 (type-species : *Ophidium mastacembelus* Solander).

1981. *Mastacembelus*, Jayaram, *Handbk. Freshw. Fish. India* : 388 (genus character and distribution).

Body elongated, eel-like and compressed. Mouth inferior, cleft narrow. A long fleshy appendage to the snout, which is not transversely striated below. Preorbital spine present. Dorsal fin inserted above middle of pectoral fin, with 24 to 39 detached, depressible spines and 50 to 90 soft rays. Anal fin with 3 spines and 31 to 98 soft rays. Dorsal and anal fins may or may not be confluent with the caudal fin, which is rounded. Scales small and cycloid. Lateral line present. Swimbladder elongated.

Key to the species

Caudal fin confluent with vertical fins and with 17 to 21 rays.	Dorsal fin with more than 100 spines and soft rays	...	...	...	<i>M. armatus armatus</i>
Caudal fin not confluent with vertical fins and with 11 to 16 rays.	Dorsal fin with not exceeding 100 spines and soft rays	...	...	...	<i>M. pancalus</i>

Mastacembelus armatus armatus Lacépède, 1800

1800. *Macrogathus armatus* Lacépède, *Hist. Nat. Poiss.*, 2 : 283, 286 (type-locality : not mentioned).

1878. *Mastacembelus armatus*, Day, *Fish. India* : 340, 73, fig. 2 ; 1889, Day, *Fauna Br. India, Fish*, 2 : 334.

1981. *Mastacembelus armatus armatus*, Jayaram, *Handbk. Freshw. Fish. India* : 388, 389 (distribution and key to species).

Local name : *Mudi Bommidai* (Telugu).

Common name : Spiny eel (English).

Material examined : (i) 1 ex. 154 mm TL. ; Manair Project, Karimnagar, Andhra Pradesh ; R. P. Barman and party ; 4.9.83. (ii) 2 exs., 173 mm-205 mm TL. ; Godavari river, Rajamundry, East Godavari district, Andhra Pradesh ; R. P. Barman and party ; 1.6.87.

Diagnostic features : D. 32-39/74-90, P. 23, A. 3/75-88, C. 17-21.

Head length 6.50 to 7.50 and body depth 11.00 to 12.00 in total length. Eye one diameter apart. Body elongated, cylindrical and eel-like. Cleft of mouth narrow. A long fleshy appendage to snout, not transversely striated inferiorly. Snout trilobed. A preorbital spine present. Teeth in jaws minute. A single, long dorsal fin with 32 to 39 stumpy free



Fig. 142 : *Mastacembelus armatus armatus* Lacépède

spines, origin or soft part behind anal fin origin. Anal fin with 3 spines. 30 rows of scales between lateral line and base of first dorsal fin ray. Head and body scales similar.

Colour in alcohol : Dorsal surface brownish and lighter below. A row of black spots along base of soft dorsal fin.

Distribution : Throughout India, Pakistan, Bangladesh, Nepal, Sri Lanka, Burma, Thailand, Vietnam, Tonkin, Hainan Island, South China, Malaya, Sumatra and Java.

Size : This species grows at least 609 mm (2 feet) in total length.

Fishery information : It is one of the most common species found in the commercial catches throughout Andhra Pradesh. This is a good eating fish generally known for its oily taste.

Remarks : This is a large size fish compared to other members of the genus. It is also a hardy fish and can withstand extreme drought by keeping itself buried inside the mud and silt months together till the onset of the monsoon rains.

***Mastacembelus pancalus* (Hamilton Buchanan, 1822)**

1822. *Macrogathus pancalus* Hamilton Buchanan, *Fish. Ganges* : 30, 364 (type-locality : the tanks of the Gangetic Provinces).

1878. *Mastacembelus pancalus*, Day, *Fish. India* : 340, pl. 72, fig. 4; 1889, Day, *Fauna Br. India, Fish*, 2 : 333.
 1981. *Mastacembelus pancalus*, Jayaram, *Handbk. Freshw. Fish. India* : 389 (distribution and key to species).

Local name : *Parparaal* (Telegu).

Common name : Spiny eel (English).

Material examined : (i) 3 exs., 112 mm-127 mm TL. ; Wyra reservoir, Khammam district, Andhra Pradesh ; R. P. Barman and party ; 29.8.83. (ii) 2 exs., 110 mm-122 mm TL. ; Godavari river, Warangal district, Andhra Pradesh ; R. P. Barman and party ; 31.8.83. (iii) 4 exs., 125 mm-140 mm TL. ; Kolleru Lake, West Godavari district, Andhra Pradesh ; R. P. Barman and party ; 4.6.87.

Diagnostic features : D. 24-26/30-42, P. 19, A. 3/31-45, C. 11-16.

Head length 5.00 to 5.50 and body depth 6.50 to 7.00 in total length. Eye one diameter apart. Body elongated, cylindrical and eel-like. Cleft of mouth narrow. A long fleshy appendage to trilobed snout which is without transversely striations inferiorly. A



Fig. 143 : *Mastacembelus pancalus* (Hamilton Buchanan)

preorbital spine present. Teeth in jaws minute. A single, long dorsal fin with 24 to 26 stumpy free spines, commencement of soft dorsal fin behind anal fin origin. Anal fin with 3 spines. Caudal fin not united with dorsal and anal fins. 18 rows of scales between lateral line and base of first dorsal fin ray.

Colour in alcohol : Dorsal surface greenish olive and yellowish below. Scales with yellowish white spots. Usually hind part of body vertically striped.

Distribution : Throughout India, Pakistan and Bangladesh.

Size : It grows at least 177 mm (7 inches) in total length.

Fishery information : It is also another common fish found in commercial catches throughout Andhra Pradesh.

Remarks : This species is found in streams, ponds and water logged localities almost throughout Andhra Pradesh.

S U M M A R Y

Andhra Pradesh is the fifth largest state of India in respect of geographical dimension and population. This state also ranks fifth after Kerala, Maharashtra, Tamil Nadu and Gujarat in terms of fish landings which accounts eight percent of the total fish landings in the Indian states. Andhra Pradesh having 34 rivers is generally known as the river state. The largest river Godavari and the second largest river Krishna of the Indian Peninsula pass through this state. Besides these two major river systems, there are many smaller rivers, reservoirs, lake (particularly Kolleru Lake), tanks and ponds scattered throughout the state provide an immense opportunity for the development of fish and fisheries in the economy of the state.

An attempt has been undertaken in this present study to provide an up to date classification, nomenclature and distributional records, along with the descriptions of all the known freshwater fishes of Andhra Pradesh. Seven field surveys were undertaken from 1983 to 1987 covering almost all the important fishing centres of Andhra Pradesh for the collection and study of all the available fishes throughout the state. In the preparation of the present work, I have made use of all the earlier informations available in literature in addition to incorporating all the informations I have been able to collect through my extensive field surveys and continued studies. The fish collections show that a wide range of both riverine and a very few fishes which are also very commonly found in marine and estuarine waters. These fishes belong to 10 orders, 27 families, 68 genera comprising 158 species. 8 species has been recorded here as new state records. All the orders, families, subfamilies, genera have been described in brief along with keys to the above systematic categories. All the 158 species have been described giving their diagnostic features, fin formulae, colour in alcohol, distribution, size, fishery values and remarks along with species keys. 143 text figures and two maps have been provided in this work.

The fishes which have been incorporated with the fishes of Andhra Pradesh as new state record are as follows : *Salmostoma horai* (Silas), *Salmostoma untrahi* (Day), *Rasbora caverii* (Jerdon), *Puntius curmuca* (Hamilton Buchanan), *Puntius vittatus* Day, *Labeo ariza* (Hamilton Buchanan), *Garra mcClellandi* (Jerdon) and *Mystus montanus* (Jerdon). The included exotic fishes which have been introduced at different times and acclimatized in Andhra Pradesh are as follows : *Hypophthalmichthys molitrix* (Valenciennes), *Cyprinus carpio* Linnaeus, *Ctenopharyngodon idella* (Valenciennes), *Gambusia affinis patruelis* (Baird and Girard), *Lebistes reticulatus* (Peters), *Oreochromis mossambica* (Peters) and *Osphronemus goramy* Lacepède. The fishes of Andhra Pradesh include some of the threatened species of India, such as follows : *Labeo fimbriatus* (Bloch), *Labeo potail* (Sykes), *Tor khudree* (Sykes), *Puntius jerdoni* (Day), *Puntius curmuca* (Hamilton Buchanan), *Cirrhinus cirrhosa* (Bloch),

Silonia childreni Sykes, *Pangasius pangasius* (Hamilton Buchanan) and *Bagarius bagarius* (Hamilton Buchanan).

It is expected that this work would provide a very useful hand book to those who are engaged in the development of fish and fisheries of Andhra Pradesh and also to the systematic workers on freshwater fishes of the state.

SYSTEMATIC LIST OF FRESHWATER FISHES OF ANDHRA PRADESH DESCRIBED IN THIS WORK

Class	PISCES
Subclass	TELEOSTOMI
Order I.	ANGUILLIFORMES
Family 1.	ANGUILLIDAE
Genus 1.	<i>Anguilla</i> Shaw
	1. <i>A. bengalensis bengalensis</i> (Gray and Hardwicke)
Order II.	CLUPEIFORMES
Family 2.	CLUPEIDAE
Subfamily	ALOSINE
Genus 2.	<i>Hilsa</i> Regan
	2. <i>H. ilisha</i> (Hamilton Buchanan)
Genus 3.	<i>Gudusia</i> Fowler
	3. <i>G. chapra</i> (Hamilton Buchanan)
Order III.	OSTEOGLOSSIFORMES
Family 3.	NOTOPTERIDAE
Genus 4.	<i>Notopterus</i> Lacepède
	4. <i>N. notopterus</i> (Pallas)
Order IV.	CYPRINIFORMES
Family 4.	CYPRINIDAE
Subfamily	CULTRINAE
Genus 5.	<i>Chela</i> Hamilton Buchanan
	5. <i>C. (Chela) cachius</i> (Hamilton Buchanan)
	6. <i>C. (Chela) laubuca</i> (Hamilton Buchanan)

- Genus 6. Salmostoma Swainson**
7. **S. bacaila** (Hamilton Buchanan)
8. **S. boopis** (Day)
9. **S. clupeoides** (Bloch)
* 10. **S. horai** (Silas).
11. **S. phulo phulo** (Hamilton Buchanan)
* 12. **S. untrahi** (Day)
- Subfamily HYPOPTHALMICHTHYINAE**
- Genus 7. Hypophthalmichthys Bleeker**
13. **H. molitrix** (Valenciennes)
- Subfamily RASBORINAE**
- Genus 8. Esomus Swainson**
14. **E. barbatus** (Jerdon)
15. **E. danricus** (Hamilton Buchanan)
- Genus 9. Danio Hamilton Buchanan**
16. **D. aequipinnatus** (McClelland)
17. **D. devario** (Hamilton Buchanan)
18. **D. rerio** (Hamilton Buchanan)
- Genus 10. Rasbora Bleeker**
* 19. **R. caverii** (Jerdon)
20. **R. daniconius daniconius** (Hamilton Buchanan)
21. **R. rasbora** (Hamilton Buchanan)
- Genus 11. Aspidoparia Heckel**
22. **A. morar** (Hamilton Buchanan)
- Genus 12. Amblypharyngodon Bleeker**
23. **A. microlepis** (Bleeker)
24. **A. mola** (Hamilton Buchanan)
- Genus 13. Barilius Hamilton Buchanan**
25. **B. bakeri** Day
26. **B. barila** (Hamilton Buchanan)
27. **B. barna** (Hamilton Buchanan)
28. **B. bendelisis** (Hamilton Buchanan)
29. **B. evezardi** Day

- Subfamily CYPRININAE
- Genus 14. **Cyprinus** Linnaeus
 30. **C. carpio carpio** Linnaeus
- Genus 15. **Oreichthys** H.M. Smith
 31. **O. cosuatis** (Hamilton Buchanan)
- Genus 16. **Puntius** Hamilton Buchanan
 32. **P. amphibius** (Valenciennes)
 33. **P. chola** (Hamilton Buchanan)
 34. **P. conchoni** (Hamilton Buchanan)
 * 35. **P. curmuca** (Hamilton Buchanan)
 36. **P. dorsalis** (Jerdon)
 37. **P. filamentosus** (Valenciennes)
 38. **P. gelius** (Hamilton Buchanan)
 39. **P. guganio** (Hamilton Buchanan)
 40. **P. jerdoni** (Day)
 41. **P. kolus** (Sykes)
 42. **P. melanampyx melanampyx** (Day)
 43. **P. neilli** (Day)
 44. **P. parrah** Day
 45. **P. sarana sarana** (Hamilton Buchanan)
 46. **P. sophore** (Hamilton Buchanan)
 47. **P. terio** (Hamilton Buchanan)
 48. **P. ticto ticto** (Hamilton Buchanan)
 * 49. **P. vittatus** Day
- Genus 17. **Rohtee** Sykes
 50. **R. ogilbii** Sykes
- Genus 18. **Osteobrama** Heckel
 51. **O. belangeri** (Valenciennes)
 52. **O. cotio cotio** (Hamilton Buchanan)
 53. **O. cotio cunma** Day
 54. **O. neilli** (Day)
 55. **O. vigorsii** (Sykes)
- Genus 19. **Thynnichthys** Bleeker

- 56. **T. sandkhol** (Sykes)
- Genus 20. Schismatorhynchus** Bleeker
- 57. **S. (Nukta) nukta** (Sykes)
- Genus 21. Labeo** Cuvier
- * 58. **L. ariza** (Hamilton Buchanan)
- 59. **L. bata** (Hamilton Buchanan)
- 60. **L. boga** (Hamilton Buchanan)
- 61. **L. boggut** (Sykes)
- 62. **L. calbasu** (Hamilton Buchanan)
- 63. **L. dussumieri** (Valenciennes)
- 64. **L. fimbriatus** (Bloch)
- 65. **L. gonius** (Hamilton Buchanan)
- 66. **L. kawrus** (Sykes)
- 67. **L. pangusia** (Hamilton Buchanan)
- 68. **L. porcellus** (Heckel)
- 69. **L. potail** (Sykes)
- 70. **L. rohita** (Hamilton Buchanan)
- Genus 22. Tor** Gray
- 71. **T. khudree** (Sykes)
- 72. **T. mussullah** (Sykes)
- Genus 23. Cirrhinus** Oken
- 73. **C. cirrhosa** (Bloch)
- 74. **C. fulungee** (Sykes)
- 75. **C. horai** Lakshmanan
- 76. **C. mrigala** (Hamilton Buchanan)
- 77. **C. reba** (Hamilton Buchanan)
- Genus 24. Osteocheilus** Günther
- 78. **O. nashii** (Day)
- 79. **O. thomassi** (Day)
- Genus 25. Catla** Valenciennes
- 80. **C. catla** (Hamilton Buchanan)
- Genus 26. Ctenopharyngodon** Steindachner
- 81. **C. idella** (Valenciennes)

- Subfamily GARRINAE
- Genus 27. **Crossocheilus** Van Hasselt
82. **C. latius latius** (Hamilton Buchanan)
- Genus 28. **Garra** Hamilton Buchanan
83. **G. gotyla gotyla** (Gray)
84. **G. gotyla stenorhynchus** (Jerdon)
85. **G. lamta** (Hamilton Buchanan)
- * 86. **G. mcClellandi** (Jerdon)
87. **G. mullya** (Sykes)
- Family 5. HOMALOPTERIDAE
- Subfamily NOEMACHEILINAE
- Genus 29. **Noemacheilus** Van Hasselt
88. **N. anguilla** (Hamilton Buchanan)
89. **N. botia** (Hamilton Buchanan)
90. **N. denisoni denisoni** Day
91. **N. denisoni dayi** Hora
92. **N. evezardi** (Day)
93. **N. moreh** (Sykes)
94. **N. striatus** (Day)
- Family 6. COBITIDAE
- Subfamily COBITINAE
- Genus 30. **Lepidocephalus** Bleeker
95. **L. (Lepidocephalichthys) guntea** (Hamilton Buchanan)
96. **L. (Lepidocephalichthys) thermalis** (Valenciennes)
- Order V. SILURIFORMES
- Family 7. BAGRIDAE
- Genus 31. **Rita** Bleeker
97. **R. gogra** (Sykes)
98. **R. kuturnee** (Sykes)
- Genus 32. **Mystus** Scopoli
99. **M. armatus** (Day)
100. **M. bleekeri** (Day)
101. **M. cavasius** (Hamilton Buchanan)

- 102. **M. gulio** (Hamilton Buchanan)
- 103. **M. malabaricus** (Jerdon)
- 104. **M. menoda menoda** (Hamilton Buchanan)
- * 105. **M. montanus** (Jerdon)
- 106. **M. punctatus** (Jerdon)
- 107. **M. tengara** (Hamilton Buchanan)
- 108. **M. vittatus** (Bloch)
- Genus 33. **Aorichthys** Wu
 - 109. **A. aor** (Hamilton Buchanan)
 - 110. **A. seenghala** (Sykes)
- Family 8. **SILURIDAE**
- Genus 34. **Ompok** Lacépède
 - 111. **O. bimaculatus** (Bloch)
 - 112. **O. pabda** (Hamilton Buchanan)
 - 113. **O. pabo** (Hamilton Buchanan)
- Genus 35. **Wallago** Bleeker
 - 114. **W. attu** (Schneider)
- Family 9. **SHILBEIDAE**
- Subfamily (i). **AILINAE**
- Genus 36. **Ailia** Gray
 - 115. **A. coila** (Hamilton Buchanan)
- Subfamily (ii). **SCHILBEINAE**
- Genus 37. **Pseudeutropius** Bleeker
 - 116. **P. atherinoides** (Bloch)
- Genus 38. **Proentropiichthys** Hora
 - 117. **P. taakree** (Sykes)
- Genus 39. **Eutropiichthys** Bleeker
 - 118. **E. goongwaree** (Sykes)
- Genus 40. **Silonia** Swainson
 - 119. **S. childreni** (Sykes)
- Family 10. **PANGASIIDAE**
- Genus 41. **Pangasius** Valenciennes
 - 120. **P. pangasius** (Hamilton Buchanan)

- Family 11. SISORIDAE
- Genus 42. **Bagarius** Bleeker
121. **B. bagarius** (Hamilton Buchanan)
- Genus 43. **Nangra** Day
122. **N. itchkeea** (Sykes)
123. **N. viridescens** (Hamilton Buchanan)
- Genus 44. **Glyptothorax** Blyth
124. **G. lonah** (Sykes)
- Family 12. CLARIIDAE
- Genus 45. **Clarias** Scopoli
125. **C. batrachus** (Linnaeus)
- Family 13. HETEROPNEUSTIDAE. (= SACCOBRANCHIDAE)
- Genus 46. **Heteropneustes** Müller
126. **H. fossilis** (Bloch)
- Order VI. ATHERINIFORMES
- Family 14. BELONIDAE
- Genus 47. **Xenentodon** Regan
127. **X. cancila** (Hamilton Buchanan)
- Family 15. CYPRINODONTIDAE
- Genus 48. **Aplocheilus** McClelland
128. **A. lineatus** (Valenciennes)
129. **A. panchax** (Hamilton Buchanan)
130. **A. rubrostigma** (Jerdon)
- Genus 49. **Oryzias** Jordon and Snyder
131. **O. melanostigma** (McClelland)
- Family 16. POECILIDAE
- Genus 50. **Gambusia** Poey
132. **G. affinis patrulis** (Baird and Girard)
- Genus 51. **Lebistes** Filippi
133. **L. reticulatus** (Peters)
- Order VII. CHANNIFORMES (= OPHICEPHALIFORMES)
- Family 17. CHANNIDAE
- Genus 52. **Channa** Scopoli

- 134. *C. marulius* (Hamilton Buchanan)
- 135. *C. orientalis* Schneider
- 136. *C. punctatus* (Bloch)
- 137. *C. striatus* (Bloch)
- Order VIII. SYNBRANCHIFORMES**
- Family 18. SYNBRANCHIDAE**
- Genus 53. Ophisteron McClelland**
- 138. *O. bengalensis* McClelland
- Order IX. PERCIFORMES**
- Family 19. CHANDIDAE**
- Genus 54. Chanda Hamilton Buchanan**
- 139. *C. nama* Hamilton Buchanan
- 140. *C. ranga* Hamilton Buchanan
- Family 20. NANDIDAE**
- Genus 55. Nandus Valenciennes**
- 141. *N. nandus* (Hamilton Buchanan)
- Family 21. CICHLIDAE**
- Genus 56. Etroplus Cuvier**
- 142. *E. maculatus* (Bloch)
- 143. *E. suratensis* (Bloch)
- Genus 57. Oreochromis Günther**
- 144. *O. massambica* (Peters)
- Family 22. MUGILIDAE**
- Genus 58. Mugil Linnaeus**
- 145. *M. cephalus*
- Genus 59. Liza Jordon and Swain**
- 146. *L. parsia* (Hamilton Buchanan)
- Genus 60. Rhinomugil Gill**
- 147. *R. corsula* (Hamilton Buchanan)
- Family 23. GOBIDAE**
- Genus 61. Awaous Valenciennes**
- 148. *A. stamineus* (Valenciennes)
- Genus 62. Glossogobius Gill**

149. **G. biocellatus** (Valenciennes)
 150. **G. giuris** (Hamilton Buchanan)
- Family 24. **ANABANTIDAE**
 Genus 63. **Anabas** Cuvier
 151. **A. oligolepis** Bleeker
 152. **A. testudineus** (Bloch)
- Family 25. **BELONTIDAE**
 Subfamily (i). **MACROPODINAE**
 Genus 64. **Macropodus** Lac'épe`de
 153. **M. cupanus** Valenciennes
- Subfamily (ii). **TRICHOGASTRINAE**
 Genus 65. **Colisa** Cuvier
 154. **C. fasciatus** (Schneider)
- Family 26. **OSPHRONEMIDAE**
 Genus 66. **Osphronemus** Lac'épe`de
 155. **O. goramy** Lac'épe`de
- Order X. **MASTACEMBELIFORMES**
 Family 27. **MASTACEMBELIDAE**
 Genus 67. **Macrognathus** Lac'épe`de
 156. **M. aculeatus** (Bloch)
- Genus 68. **Mastacembelus** Scopoli
 157. **M. armatus armatus** Lac'épe`de
 158. **M. pancalus** (Hamilton Buchanan)

R E F E R E N C E S

- Alexander, R. McN.** 1964. The structure of the Weberian apparatus in the Siluri. *Proc. Zool. Soc. Lond.*, 142 (3) : 419-440.
- Babu Rao, M.** 1976. Clupeoid fishes of Godavari estuary. *Matsya*, 2 : 32-37.
- Banarescu, P.** 1968. Revision of the Indo-Burmese genus *Salmostoma* Swainson (Pisces : Cyprinidae) with description of a new subspecies. *Rev. Rom. Biologie Zoologie*, 13 (1) : 3-14.
- Barman, R. P.** 1985. On the type specimen of *Danio unnandalei* Chaudhuri, 1908 with a redescription of the species. (Pisces : Cyprinidae). *J. Bombay nat. Hist. Soc.*, 82 (1) : 170-174.
- Barman, R. P.** 1988. The fishes of the river Gumti, Tripura, N. E. India, *Rec. zool. Surv. India, Occ. Paper No. 119* : 1-86.
- Barman, R. P.** 1991. A taxonomic revision of the Indo-Burmese species of *Danio* Hamilton Buchanan (Pisces : Cyprinidae) *Rec. zool. Surv. India, Occ. Paper. No. 137* : i-viii + 1-91, text-figs 20.
- Brittan, M. R.** 1954. A revision of the Indo-Malayan freshwater fish genus *Rasbora*. *Monogr. Inst. Sci. & Tech.*, Manila, 3 : 1-224.
- Chacko, P. I.** 1949. The Krishna river and its fishes. *Proc. 36th Ind. Sci. Cong.* 3 : 165-166.
- Chacko, P. I., Abraham, J. G. and Andal, R.** 1952. Survey of the flora, fauna and fisheries of the Collair Lake. *Ind. Com. J.*, 8 : 274-280.
- Chacko, P. I. and Kuriyan, G. K.** 1948. Survey of the fisheries of the Tungabhadra river. *Proc. Ind. Acad. Sci.*, 22 : 165-176.
- Chardon, M.** 1968. Anatomie comparee de l'appareil de Weber et des structures connexes chez less Siluriformes. *Mus. R. Afr. Cent. Ann. (Ser. 8, Zool.)*. 169 : 1-227.
- Chaudhuri, B. L.** 1916. Fauna of the Chilka Lake. *Mem. Indian Mus.*, 5, Fish (Part I) : 405-439.
- Datta, A. K. and Barman, R. P.** 1985. Fauna of Namdapha : Arunachal Pradesh. Pisces. *Rec. zool. Surv. India*, 82 (1-4) : 275-284.
- David, A.** 1963a. Studies on fish and fisheries of the Godavari and the Krishna river systems. Part 1. *Proc. Nat. Acad. Sci., Section B*, 33 (2) : 263-286.

- David, A. 1963b. Studies on fish and fisheries of the Godavari and the Krishna river systems. Part 2. *Proc. Nat. Acad. Sci.*, Section B, 33 (2) : 287-293.
- Day, F. 1875-88. The fishes of India ; being a natural history of the fishes known to inhabit the seas and freshwaters of India, Burma and Ceylon. Text and atlas in 4 parts, including the supplement London, xx, 1-816, pls. 197.
- Day, F. 1889. The Fauna of British India, including Ceylon and Burma. Fishes, 1, 548 pp. 2, 509 pp.-London, Taylor and Francis.
- Dutt, S. and Murthy, V R. 1971. On the fishes of the genus *Cirrhinus* Cuvier, 1817 (Family Cyprinidae) from Lake Kolleru, Andhra Pradesh. *Bull. Dept. Mar. Oceanogr. Univ. Cochin*, 5 : 39-48.
- Dutt, S. and Murthy, V S. 1976a. On the fish and fisheries of lake Kolleru, Andhra Pradesh. *Mem. Soc. Zool. Guntur*, 1 : 17-27.
- Dutt, S. and Murthy, V S. 1976b. Remarks on some diagnostic characters used in taxonomic studies on cyprinid fishes with special reference to those of Lake Kolleru, Andhra Pradesh. *ibid.*, 1 : 70-75.
- Dutt, S. and Reddy, P. B. 1979. On the Snake-head fishes of Andhra Pradesh. *ibid.*, 1 : 103-108.
- Dutt, S. and Sharma, S. V. 1979. Provisional key to common catfishes of central coastal Andhra Pradesh. *ibid.*, 1 : 109-119.
- Dutt, S. and Ramaseshaiah, M. 1980. Chromosome number in *Anabas testudineus* (Bloch, 1795) and *A. oligolepis* Bleeker, 1855 (Osteichthyes : Anabantidae). *Matsya*, 6 : 71-74.
- Dutt, S. and Ramaseshaiah, M. 1983. Taxonomic and Biometric studies on *Anabas testudineus* (Bloch) and *A. oligolepis* Bleeker (Osteichthyes : Anabantidae). *Proc. Indian natn. Sci. Acad.*, B 49 (4) : 317-326.
- Govind, B. V. and Rajagopal, K. V. 1975. Occurrence of a giant *Mystus* species in Krishna river system, *Matsya*, 1 : 79-80.
- Greenwood, P. H., Rosen, D. E., Weitzman, S. H. and Myers, G. S. 1966. Phyletic studies of teleostean fishes with a provisional classification of living forms. *Bull. Amer. Mus. nat. Hist.*, 131 ; 339-456.
- Haig, J. 1950. Studies on the classification of the catfishes of the Oriental and Palaearctic family Siluridae. *Rec. Indian Mus.*, 48 (3 & 4) : 59-116.
- Hamilton, F. 1822. An account of the fishes found in the river Ganges and its branches. Edinburg and London, viii+405, pls. 39.

- Hora, S. L. 1921.** Fish and fisheries of Manipur with some observations on those of the Naga Hills. *Rec. Indian Mus.*, **22** (3) : 165-214, pls. 4.
- Hora, S. L. 1937a.** Notes on fishes in the Indian Museum. XXVIII. On three collections of fish from Mysore and Coorg, South India. *Rec. Indian Mus.*, **39** (1) : 5-28.
- Hora, S. L. 1937b.** Notes on fishes in the Indian Museum. XXX. On the systematic position of *Cyprinus cosuatis* Hamilton Buchanan. *Rec. Indian Mus.*, **39** (4) : 321-323.
- Hora, S. L. 1942a.** The game fishes of India. XV. The Mahaseers or the large scaled Barbels of India. 8. On the specific identity of Sykes's species of *Barbus* from the Deccan. *J. Bombay nat. Hist. Soc.*, **43** (2) : 163-169, pls. 2.
- Hora, S. L. 1942b.** A list of fishes of the Mysore state and of the neighbouring hills ranges of the Nilgiris, Wynaad and Coorg. *Rec. Indian Mus.*, **44** (2) : 193-200.
- Hora, S. L. 1943a.** The game fishes of India. XVI. The Mahaseers or the large scaled Barbels of India. 9. Further observations on Mahaseers from the Deccan. *J. Bombay nat. Hist. Soc.*, **44** (1) : 1-8, pl. 1.
- Hora, S. L. 1943b.** The game fishes of India, XVII. The Mahaseers or the large scaled Barbels of India. 10. On the species identity of Jerdon's species of Mahaseers from the Southern India. *J. Bombay nat. Hist. Soc.*, **44** (2) : 164-168, pl. 1.
- Hora, S. L. and Misra, K. S. 1940.** Notes on fishes in the Indian Museum. XL. On fishes of the genus Rohtee Sykes, *Rec. Indian Mus.*, **42** (1) : 155-172.
- Hora, S. L. and Misra, K. S. 1942.** Fish of Poona. Part II. *J. Bombay nat. Hist. Soc.*, **43** (2) : 218-225.
- Hora, S. L. and Mukerji, D. D. 1928.** Notes on fishes in the Indian Museum. XVI. On fishes of the genus *Esomus* Swainson. *Rec. Indian Mus.*, **30** (1) : 41-56.
- Hora, S. L. and Mukerji, D. D. 1938.** Table for the identification of Indian freshwater fishes, with descriptions of certain families and observation on the relative utility of the probable larvivorous fishes of India. *Health Bull.* No. 12, *Malaria Bureau* No. 4. 2nd Ed.
- Howes, G. J. 1980.** The anatomy, phylogeny and classification of bariliine cyprinid fishes. *Bull. Br. Mus. Nat. Hist. (Zool.)* **37** (3) : 129-198.
- Jayaram, K. C. 1977.** Zoogeography of Indian freshwater fishes. *Proc. Indian Acad. Sci.*, **86 B** (4) : 265-274.
- Jayaram, K. C. 1981.** The Freshwater fishes of India, Pakistan, Bangladesh, Burma and Sri Lanka. A handbook. Govt. of India, i-xii, + 475.

- Jayaram, K. C., Venkateswarlu, T. and Ragunathan, M. B. 1982. A survey of the Cauvery river system with a major account of its fish fauna. *Rec. zool. Surv. India, Occ. Paper No. 36* : 1-115.
- Jerdon, T. C. 1849. On the freshwater fishes of the southern India. *Madras J. Lit. Sci.*, **15** : 302-346.
- Jhingran, V. G. 1983. Fish and fisheries of India. Hindustan Publishing Corporation, New Delhi, 666 pp.
- Lakshmanan, M. A. V. 1966. *Citrhinus horai*, a new cyprinid fish from the Godavari river system with notes on its bionomics. *J. zool. Soc. India*, **16** (1 & 2) : 59-64.
- Liem, K. F. 1963. The comparative osteology and phylogeny of the Anabantoidei (Teleostei, Pisces). *Illinois Biol. Monogr.* No. 30, 149 pp.
- Liem, K. F. 1965. The status of the anabantoid fish general *Ctenops* and *Trichopsis*. *Copeia*, **1965** (2) : 206-213.
- Mahmood, S. and Rahimullah, M. 1947a. Fishing contrivances used in H. E. H. the Nizam's Dominions. *J. Bombay nat. Hist. Soc.*, **46** : 649-654.
- Mahmood, S. and Rahimullah, M. 1947b. Fish survey of Hyderabad state. Part IV. Fishes of the Nizamabad district. *J. Bombay nat. Hist. Soc.*, **47** : 102-111.
- Menon, A. G. K. 1964. Monograph of the cyprinid fishes of the genus *Garra* Hamilton Buchanan. *Mem. Indian Mus.*, **14** (4) : 173-260, pls. 13.
- Menon, A. G. K. 1966. On a collection of fish from the Coromandal coast of India including Pondicherry and Karaikkal areas. *Rec. Indian Mus.*, **59** (4) : 369-404.
- Menon, A. G. K. 1987. The fauna of India and the adjacent countries. *Pisces*, **4** (1) : i-x, + 259, pls. 16.
- Misra, K. S. 1938. On a collection of fish from the Eastern Ghats. *Rec. Indian Mus.*, **40** (3) : 255-264.
- Misra, K. S. 1962. An aid to the identification of the common commercial fishes of India and Pakistan. *Rec. Indian Mus.*, **57** (1-4) : 1-320.
- Misra, K. S. 1976a. The Fauna of India and the adjacent countries. *Pisces*, **2** : i-xxii + 438, pls. 21.
- Misra, K. S. 1976b. The Fauna of India and the adjacent countries. *Pisces*, **3** : i-xxi, + 367, pls. 15.
- Murty, V. S. 1977. Taxonomic studies on the fishes of the family Cyprinidae from Lake Kolleru, Andhra Pradesh. *Proc. Indian Acad. Sci.*, **85 B** (3) : 107-146.

- Nalbant, T. 1963.** A study of the genera of Botiinae and Cobitinae (Pisces, Ostariophysi, Cobitidae). *Trav. Mus. Hist. Nat., "Grigore Antipa"* Bucharest, 4 : 343-379.
- Nelson, J. S. 1983.** Fishes of the World. John Wiley and sons, New York. 523 pp. 45 maps.
- Rahimullah, M. 1943a.** Fish survey of Hyderabad state. Part 1. A preliminary report on fishes found in the Godavari, Purna, Kista, Tungabhadra and Siddha rivers. *J. Bombay nat. Hist. Soc.*, 43 (3 & 4) : 648-653.
- Rahimullah, M. 1943b.** Fish survey of Hyderabad state. Part II. Fishes of Hyderabad city and its suburbs. *J. Bombay nat. Hist. Soc.*, 44 (1 & 2) : 88-91.
- Rahimullah, M. 1944.** Fish survey of Hyderabad state III. *J. Bombay nat. Hist. Soc.*, 45 : 73-77.
- Rao, Seshagiri, B. V. 1968.** Systematic studies on *Anabas testudineus* (Bloch, 1872) and *A. oligolepis* Bleeker, 1855. *Proc. Indian Acad. Sci.*, 57 (5) : 207-214.
- Robins, C. R. et. al. 1980.** Common and scientific names of fishes from the United States and Canada. *Am. Fish. Soc. Spec. Publ.* 12, 4th ed. 174 pp.
- Rosen, D. E. and Patterson, C. 1969.** The structure and relationships of the paracanthopterygian fishes. *Bull. Amer. Mus. nat. Hist.*, 141 : 357-474.
- Shaw, G. E. and Shebbeare, E. O. 1937.** The fishes of northern Bengal. *Jl. R. Asiat. Soc. Beng. Sci.*, 3 : 1-137, pls. 6.
- Silas, E. G. 1951.** On a new species of cyprinid fish from Coorg, South India. *J. zool, Soc. India*, 3 : 7-10.
- Silas, E. G. 1958a.** Studies on cyprinid fishes of the Oriental genus *Chela* Hamilton. *J. Bombay nat. Hist. Soc.*, 55 (1) : 54-99.
- Silas, E. G. 1958b.** Remarks on Indian cyprinid fishes described by Jerdon (1849) under *Gonorhynchus* McClelland. *J. Bombay nat Hist. Soc.*, 55 (3) : 523-531.
- Smith, H. M. 1933.** Contributions to the Ichthyology of India. III. A new genus and a new species of cyprinid fishes. *J. Stam. Soc. Nat. Hist. Suppl.*, 9 : 63.
- Sufi, S. M. K. 1956.** Revision of the Oriental fishes of the family Mastacembelidae. *Bull. Raffles Mus.*, 27 : 94-146.
- Sykes, W. H. 1838.** On fishes of the Deccan. *Proc. zool. Soc. London*, 6 : 157-165.
- Sykes, W. H. 1840.** On the fishes of the Deccan. *Ann. Mag. Nat. Hist.*, 4 : 54-62.
- Sykes, W. H. 1841.** On the fishes of the Dukhun. *Trans. zool. Soc. London*, 2 : 349-378.

- Tilak, R. 1964. The osteocranium and the Weberian apparatus of the fishes of the family Schilbeidae (Pisces : Siluroidea) *Proc. zool. Lond.*, **143** (1) : 1-36.
- Tilak, R. 1967. The fishes of river Tawi and its tributaries (Jammu State) with some notes on ecology. *Rec. zool. Surv. India*, **65** : 183-232.
- Trewavas, E. 1983. Tilapiinae fishes of the genera. *Sarotherodon*, *Oreochromis* and *Danakilia*. *Br. Bus. nat. Hist.* No. **878** : 1-583.

INDEX TO SCIENTIFIC NAMES

- aculeata*, *Rhynchobdella* 301
- aculeatum*, *Ophidium* 301
- aculeatus*, *Macrogathus* 301, 302
- aequipinnatus*, *Danio* 120, 121
 Perilampus 120
- affinis patruellis*, *Gambusia* 263, 264
- Ageniosus childreni* 243
- Ailia* 236
 bengalensis 236
 coila 237
- Aillichthys* 236
 punctata 236
- Ailinae* 236
- Alosinae* 101
- Ambassis nama* 274
- Ambassis ranga* 275
- amphibia*, *Capoeta* 141
- amphibius*, *Barbus* 141
 Puntius 141, 142
- Amblypharyngodon* 117, 129
 microlepis 129
 mola 130
- ANABANTIDAE 272, 292
- Anabas* 292
 oligolepis 292, 293
 scandens 294
- testudineus* 292, 293, 294
- Anguilla* 99
 bengalensis 99
 bengalensis bengalensis 99
 vulgaris 99
- anguilla*, *Noemacheilus* 204
- ANGUILLIDAE 98, 99
- Anguilliformes 98
- Anthias testudineus* 294
- aor*, *Aorichthys* 228, 229
 Macrones 228
 Pimelodus 228
- Aoria* 228
- Aorichthys* 214, 228
 aor 228, 229
 seenghala 229, 230
- Aplocheilus* 258
 chrysostigmus 258
 lineatus 258, 259
 melastigmus 262
 panchax 258, 259, 260
 rubrostigma 258
- ariza*, *Cyprinus* 170
 Labeo 170, 305
- armatus armatus*, *Mastacembelus* 302, 303

armatus, *Hypselobagrus* 217
Macrognathus 302
Macrones 217
Mastacembelus 302
Mystus 217, 218

Aspidoparia 117, 127
morar 128
sardina 127

Atheriniformes 98, 255

atherinoides, *Pseudeutropius* 239
Silurus 239

atpar, *Cyprinus* 108
Perilampus 108

attu, *Silurus* 235
Wallago 235

aureus botia, *Noemacheilus* 208

Awaous 287
stamineus 288

bacalla, *Chela* 111
Cyprinus 110, 111
Salmostoma 111

Bagarius 246, 247
bagarius 247
yarrelli 247

bagarius, *Bagarius* 247
Pimelodus 247

BAGRIDAE 213

Bagrus halepensis 216
lonah 251
malabaricus 222
montanus 224
punctatus 225

bakeri, *Barilius* 132

barbatus, *Esomus* 118
Leuciscus 118

Barbus amphibius 141
(Barbodes) jerdoni 149
chola 142
conchoni 143
cosuatis 140
curmuca 144
dobsonii 150
dorsalis 146
filamentosus 147
gelius 148
guganio 148
jerdoni 149
khudree 183
kolus 150
mahecola 147
melanampyx 151
mussullah 184
nashii 191
neilli 152
parrah 153
sarana 154
sophore 154
terio 156
ticto 157
vittatus 158
barila, *Barilius* 133
Cyprinus 132
Barilius 117, 131
bakeri 131, 132
barila 131, 133
barna 131, 133, 134
bendelisis 131, 134, 135
evezardi 131, 136
barna, *Barilius* 133, 134
Cyprinus 133
bata, *Cyprinus* 171
Labeo 171
batrachus, *Clarias* 253
Silurus 253

Leuciscus 161
belangeri, *Osteobrama* 161
Rohtee 161
Belone cancila 256, 257
BELONIDAE 256
BELONTIDAE 272, 295
bendelisis, *Barilius* 134, 135
Cyprinus 134
bengalensis bengalensis, *Anguilla* 99
bengalensis, *Ailia* 236
Muraena 99
Ophisternon 271
Synbranchus 271
bimaculatus, *Callichrous* 232
Ompok 231, 232
Silurus 231
biocellatus, *Glossogobius* 290
Gobius 290
bleekeri, *Macrones* 218
Mystus 218, 219
boga, *Cyprinus* 172
labeo 172
boggut, *Chondrostoma* 173
Labeo 173
boopis, *Chela* 112
Salmostoma 112
botia, *Cobitis* 205
Noemacheilus 205
(Brachydanio) rerio, *Danio* 122
browni, *Danio* 120
buchanani, *Catla* 193
Pangasius 245
Rasbora 126
cachius, *(Chela) Chela* 108
(Chela) Cyprinus 107

calbasu, *Cyprinus* 174
Labeo 174
Callichrous 231
bimaculatus 232
pabda 233
pabo 234
cancila, *Belone* 256
Esox 256
Xenentodon 256, 257
Capoeta amphibia 141
carpio carpio, *Cyprinus* 138
carpio communis, *Cyprinus* 139
carpio speculasis, *Cyprinus* 139
carpio nudus, *Cyprinus* 139
Catla 137, 139
buchanani 193
catla 139, 193
catla, *Catla* 139, 193
Cyprinus 193
cavasius, *Macrones* 219
Mystus 217, 220
Pimelodus 219
caverii, *Leuciscus* 124
Rasbora 124, 305
Chaetodon maculatus 279
suratensis 280
Chanda 273
nalua 273
nama 273, 274, 276
ranga 273, 275, 276
CHANDIDAE 273
Channa 266
marulius 266
orientalis 266, 267, 268
punctatus 266, 268, 269
striatus 266, 269, 270

CHANNIDAE 265

Channiformes 98, 265

chapra, Clupanodon 103

Clupea 103

Gudusia 103

Chela 107

bacaila 111

boopis 112

(*Chela*) *cachius* 108

(*Chela*) *laubuca* 109

horai 113

phulo 114

untrahi 115

childreni, Ageniosus 243

Silonia 243

Silonopangasius 243

chola, Barbus 142

Cyprinus 142

Puntius 142, 143

Chondrostoma, boggut 173

fulungee 186

kawrus 178

mullya 202

Chromis nilotica 281

chrysostigmus, Aplocheilus 258

CICHLIDAE 273, 278

Cirrhhina cirrhosa 185

fulungee 186

latia 196

mrigala 139, 188

reba 189

Cirrhhinus 137, 185

cirrhhosa 185, 186

fulungee 185, 186, 187

horai 185, 187

mrigala 185, 188

reba 185, 188, 189

cirrhhosa, *Cirrhhina* 185

Cirrhhinus 185

Cyprinus 185

cirrhhosus, *Cyprinus* 185

Clarias 252

batrachus 253

magur 253

orontis 252

CLARIIDAE 213, 252

Clupanodon ilisha 101

chapra 103

Clupea chapra 103

keele 101

ilisha 101

CLUPEIDAE 100

Clupeiformes 98, 100

clupeoides, Chela 113

Cyprinus 112

Salmostoma 111, 112, 113

Clupisoma garua 213

COBITIDAE 106, 209

Cobitinae 210

Cobitis botia 205

guntea 210

macrochir 210

moreh 208

thermalis 212

coila, Ailia 237

Malapterurus 237

Coius nandus 277

Colisa fasciata 297, 298

vulgaris 297

colisa, Trichopodus 295

conchonius, Barbus 143

Cyprinus 143

Puntius 143, 144

corsula, *Macrones* 223
 Mugil 223, 286
 Rhinomugil 286
cosuatis, *Barbus* 140
 Cyprinus 139, 140
 Oreichthys 139, 140
cotio cotio, *Osteobrama* 161, 162
cotio, *cunma*, *Osteobrama* 161
cotio, *Cyprinus* 160, 162
 Rohtee 162
Crossocheilus 196
 latius latius 196, 197
 oblongus 196
Ctenopharyngodon 137, 194
 idella 194, 195
 laticeps 194
Cultrinae 107
cunma, *cotio*, *Osteobrama* 163
 Rohtee 163
cupanus, *Macropodus* 296
 Polycanthus 296
curmuca, *Barbus* 144
 Cyprinus 144
 Puntius 144, 145, 305
Cyclocheilichthys 140
CYPRINIDAE 106
Cyprininae 107, 137
CYPRINODONTIDAE 256, 257
Cypriniformes 98, 106
Cyprinus 137
 ariza 170
 atpar 108
 bacaila 110, 111
 barila 132
 barna 133
 bata 171

bendelisis 134
 boga 172
 calbasu 174
carpio 137, 138
 carpio 138
 communis 139
 nudus 139
 specularis 139
catla 193
 (*Chela*) *cachius* 107, 108
 (*Chela*) *laubuca* 107, 108, 109
chola 142
cirrhusa 185
cirrhosus 185
conchoniis 143
cosuatis 139
cotio 160, 162
curmuca 144
dangila 119
daniconius 125
danrica 117
devario 121
fimbriatus 176
gelius 148
gonius 177
gotyla 198
guganio 148
lamta 200
latius 196
mola 130
morar 127
mrigala 188
niloticus 169
nukta 168
pangusia 179
phulo 114
potail 181
rasbora 123, 126
reba 189
terio 156

- rohita* 182
- sarana* 154
- sophore* 155
- ticto* 157
- tor* 183
- dangila*, *Cyprinus* 119
- daniconius daniconius*, *Rasbora* 125
- Danio* 117, 119
 - aequipinnatus* 120, 121
 - browni* 120
 - devario* 120, 121, 122
 - rerio* 120, 122, 123
 - strigillifer* 120
- danrica*, *Cyprinus* 117, 118
 - Nuria* 118
- danricus*, *Esomus* 118, 119
- denisonii denisonii*, *Noemacheilus* 203, 205, 206
- denisonii*, *Nemachilus* 205
- devario*, *Cyprinus* 121
 - Danio* 121, 122
- dinema*, *Wallago* 235
- dobsonii*, *Barbus* 150
- dorsalis*, *Barbus* 146
 - Puntius* 145, 146
 - Systomus* 145
- dussumieri*, *Labeo* 175
 - Rohita* 175
- Esomus* 117
 - barbatus* 118
 - danricus* 118, 119
 - vittatus* 117
- Esox panchax* 259
- Etioplus* 278
 - maculatus* 278, 279
 - meleagris* 278
 - suratensis* 279, 280
- Eutroplichthys* 238, 241
 - goongwaree* 242
- Eutropius macophthalmus* 240
- evezardi*, *Barilius* 136
 - Noemacheilus* 203, 207
- fasciata*, *Colisa* 297, 298
- fasciatus*, *Noemacheilus* 203
 - Trichogaster* 297
- filamentosus*, *Barbus* 147
 - Leuciscus* 147
 - Puntius* 147
- fimbriatus*, *Cyprinus* 176
 - Labeo* 176
- fossilis*, *Heteropneustes* 254
 - Saccobranchus* 254
 - Silurus* 254
- fulungee*, *Chondrostoma* 186
 - Cirrhhina* 186
 - Cirrhhinus* 186, 187
- gachua*, *Ophiocephalus* 267
- Gagata* 248
 - itchkeea* 249
- Gambusia* 263
 - affinis patruelis* 263, 264
 - punctata* 263
- Garra* 196, 197
 - gotyla gotyla* 198
 - gotyla stenorhynchus* 198, 199
 - lamta* 197, 198, 200
 - mcClellandi* 198, 201, 305
 - mullya* 198, 201, 202
- Garrinae* 107, 197
- garua*, *Clupisoma* 213
- gelius*, *Barbus* 148
 - Cyprinus* 148
 - Puntius* 148

giuris, *Glossogobius* 291
Gobius 291
Glossogobius 287
 biocellatus 290
 giuris 290, 291
Glyptosternum lonah 251
Glyptothorax 246
 lonah 251
 trilineatus 251
GOBIIDAE 272, 287
Gobius biocellatus 290
 giuris 291
 ocellaris 288
 platycephalus 289
 stamineus 288
 striatus 288
godavarii, *pangasius pangasius* 246
gogra, *Phractocephalus* 214
 Rita 214, 215
gonius, *Cyprinus* 177
 Labeo 177
Gonorhynchus mcClellandi, 201
 stenorhynchus 199
goongwaree, *Eutropiichthys* 242
 Hypophthalmus 242
 pseudeutropius 242
goramy, *Osphronemus* 299
gotyla, *Cyprinus* 198
gotyla gotyla, *Garra* 198
gouramy, *osphronemus* 299
Gudusia 101, 102
 chapra 103
guganio, *Barbus* 148
 Cyprinus 148
 Puntius 148
gullo, *Macrones* 221
 Mystus 217, 221
 Pimelodus 221

guntea, (*Lepidocephalichthys*) *Lepidocephalus* 210, 211
guttatus, *Perilampus* 107
Gymnotus, notopterus 104, 105
halepensis, *Bagrus* 216
hamiltoni, *Tor* 183
Haplocheilus lineatus 259
 melanostigma 262
 panchax 260
 rubrostigma 260
hastata, *Rita* 215
Heteropneustes 254
 fossilis 254, 255
Heterandria patruelis 263
HETEROPNEUSTIDAE 213, 254
heterorhynchus, *Schismatorhynchus* 167
Hilsa 91, 96, 101
 ilisha 101
HOMALOPTERIDAE 106, 203
horai, *Chela* 113
 Cirrhinus 185
 Salmostoma 113, 305
hunteri, *Oreochromis* 281
Hypophthalmichthinae 116
Hypophthalmichthys 116
 molitrix 116
Hypophthalmus goongwaree 242
 iaakree 240
Hypselobagrus armatus 217
idella, *Ctenopharyngodon* 194, 195
 Leuciscus 194
ilisha, *Clupanodon* 101
 Clupea 101
 Hilsha 101

itchkeea, *Gagata* 249
 Nagra 249
 Phractocephalus 249

jerdoni, *Barbus* 149
 Puntius 149

Kantaka 190

kaprat, *Notopterus* 105

kawrus, *Chondrostoma* 178
 Labeo 178

keele, *Clupea* 101

khudree, *Barbus* 183
 Tor 183

kolus, *Barbus* 150
 Puntius 150

kuturnee, *Phractocephalus* 215
 Rita 214, 215, 216

Labeo 137, 169
 ariza 169, 170, 305
 bata 169, 171, 188
 boga 169, 172
 boggut 169, 173
 calbasu 170, 174
 dussumieri 169, 175
 fimbriatus 169, 176
 gonius 169, 177
 kawrus 169, 178
 melanampyx 151
 nukta 168
 pangusia 169, 179
 porcellus 170, 180
 potail 169, 170, 181
 rohita 139, 170, 182

lamta, *Cyprinus* 200
 Garra 200

latla, *Cirrhhina* 196

laticeps, *Ctenopharyngodon* 194

latus, *Cyprinus* 196

latus latus, *Crossocheilus* 196, 197

laubuca, *Chela* 109
 (*Chela*) *Chela* 109
 (*Chela*) *Cyprinus* 107, 109
 Perilampus 109

Lebistes 263
 poeciloides 264
 reticulatus 264

Lepidocephalichthys 210

Lepidocephalus 210
 (*Lepidocephalichthys*) *guntea* 210, 211
 (*Lepidocephalichthys*) *thermalis* 210, 212

Leuciscus barbatus 118
 belangeri 161
 caverii 124
 filamentosus 147
 microlepis 129
 sandkhol 166
 stigma 155

leneatum, *Panchax* 259

lineatus, *Aplocheilus* 258, 259
 Haplocheilus 259

Liza 283
 parsia 285

lonah, *Bagrus* 251
 Glyptosternum 251
 Glyptothorax 251

macrochir, *Cobitis* 210

Macrogathus 301
 aculeatus 301
 armatus 302
 pancalus 303

Macrones 228
 aor 228
 armatus 217, 218
 bleekeri 218
 cavasius 219
 corsula 223

- gilio* 221
malabaricus 222
montanus 224
punctatus 225
seenghala 229
tengara 226
vittatus 227
Macropodinae 295
Macropodus 295
 cupanus 296
 viridiauratus 295
maculatus, *Chaetodon* 279
 Eetroplus 278, 279
magur, *Clarias* 253
mahecola, *Barbus* 147
malabaricus, *Bagrus* 222
 Macrones 222
 Mystus 217, 222
 Perilampus 120
Malapterurus coila 237
marmoratus, *Nandus* 276
marulius, *Channa* 266
 Ophiocephalus 266
MASTACEMBELIDAE 300
Mastacembeliformes 98, 300
Mastacembelus 301, 302
 armatus armatus 302, 303
 pancalus 302, 303, 304
mastacembelus, *Ophidium* 302
mcClellandi, *Garra* 201, 305
 Gonorhynchus 201
meleagris, *Eetroplus* 278
melanampyx, *Barbus* 151
 Labeo 151
melanampyx melanampyx, *Puntius* 151
melanopleura, *Rohita* 190
melanostigma, *Haplocheilus* 262
 Oryzias 262
melastigmus, *Aplocheilus* 262
menoda menoda, *Mystus* 217, 223
menoda, *Pimelodus* 223
microlepis, *Amblypharyngodon* 129
 Leuciscus 129
mola, *Amblypharyngodon* 130
 Cyprinus 130
molitrix, *Hypophthalmichthys* 116
montanus, *Bagrus* 224
 Macrones 224
 Mystus 217, 224, 305
moreh, *Cobitis* 208
 Noemacheilus 203
morar, *Aspidoparia* 128
 Cyprinus 127
Morara 127
mossambica, *Oreochromis* 281, 282
 Tilapia 281, 282
mrigala, *Cirrhina* 188
 Cirrhinus 139, 185, 188
 Cyprinus 188
mussullah, *Barbus* 184
 Tor 184
Mugil 283
 capito 284
 cephalus 283, 284
 corsula 223, 286
 oeur 283
 parsia 285
MUGILIDAE 272, 282
mullya, *Chondrostoma* 202
 Garra 202
Muraena bengalensis 99

***Mystus* 214, 216**

- armatus* 217, 218
- bleekeri* 217, 218, 219
- cavasius* 217, 219, 220
- gullo* 217, 221
- malabaricus* 217, 222
- menoda menoda* 217, 223
- montanus* 217, 224, 305
- pelusius* 216
- punctatus* 217, 225
- tengara* 217, 226
- vittatus* 217

***nalua*, *Chanda* 273**

***nama*, *Ambassis* 274
Chanda 273, 274, 276**

NANDIDAE 273, 276

***Nandus* 276**

- marmoratus* 276, 277
- nandus* 277

***nandus*, *Coius* 277
Nandus 277**

***Nangra* 246, 248
itchkeea 248, 249
punctata 249
viridescens 248, 249, 250**

***nangra*, *Pimelodus* 248**

***nashii*, *Barbus* 191
(*Osteochilichthys*) *Osteocheilus* 191
Scaphiodon 191**

***neilli*, *Barbus* 152
Osteobrama 161, 164
Puntius 152, 153**

***Nemachilus denisoni* 205
dayi 206
evezardi 207
striatus 208**

***nilotica*, *Chromis* 281**

***niloticus*, *Cyprinus* 169**

***Noemacheilinae* 203**

***Noemacheilus* 203
anguilla 204
botia aureus 208
botia 204, 205
denisoni dayi 204, 206
denisonii denisonii 203, 205, 206
evezardi 203, 207
fasciatus 203
moreh 203
sinuatus 208
striatus 204, 208, 209**

NOTOPTERIDAE 104

***Notopterus* 104**

- kpirat* 105
- notopterus* 105
- osmani* 105

***notopterus*, *Gymnotus* 104, 105
Notopterus 105**

***nudus carpio*, *Cyprinus* 139**

***Nukta* 167**

***nukta*, *Labeo* 168**

***nukta*, (*Nukta*) *Schismatorhynchus* 168**

***Nuria danrica* 118**

***oblongus*, *Crossocheilus* 196**

***ocellaris*, *Gobius* 288**

***oeur*, *Mugil* 283**

***ogilbil*, *Rohtee* 159, 160**

***olfax*, *Osphronemus* 299**

***oligolepis*, *Anabas* 293**

***Ompok* 231**

- bimaculatus* 231, 232
- pabda* 231, 233
- pabo* 231, 234
- siluroides* 231

Ophicephalus 266
 punctatus 268
 striatus 269
Ophiocephalus gachua 267
 marulius 266
 punctatus 268
 striatus 269
Ophidium aculeatum 301
 mastacembelus 302
Ophiocephaliformes 98
Ophisternon 271
 bengalensis 271
Opisthopterus 100
Oreichthys 137, 139, 140
 cosuatis 139, 140
 parvus 140
Oreochromis 278, 281, 283
 hunteri 281
 mossambica 281, 282
orientalis, *Channa* 266, 267, 268
 Ophiocephalus 267
orontis, *Clarias* 252
Oryzias 258, 261
 melanostigma 262
Osmani, *Notopterus* 105,
 OSPHRONEMIDAE 272, 298
Osphronemus 299
 goramy 299
 gouramy 299
 olfax 299
Osteobrama 137, 160
 belangeri 161
 cotio cotio 161, 162
 cotio cunma 161
 neilli 161, 164
 vigorsii 161, 165
Osteocheilus 137, 190

Osteochilichthys 190
Osteocheilus (Osteochilichthys) nashii 190, 191
 (Osteochilichthys) thomassi 190, 192
Osteoglossiformes 98, 104
pabda, *Ompok* 233
pabo, *Ompok* 234
pancalus, *Macrognathus* 303
 Mastacembelus 304
Osteoglossiformes 98, 104
Panchax linealum 259
panchax, *Aplocheilus* 258, 259, 260
 Esox 259
 Haplocheilus 260
 PANGASIIDAE 213, 244
Pangasius 244
 buchanani 245
 pangasius 245, 246
 pangasius godavarii 246
pangasius, *Pangasius* 245
 Pimelodus 244, 245
pangasius godavarii, *Pangasius* 246
pangusia, *Cyprinus* 179
 Labeo 179
Paralosa durbanensis 101
parrah, *Barbus* 153
 Puntius 153
parsia, *Liza* 285
 Mugil 285
parvus, *Oreichthys* 140
patruelis, *Heterandria* 263
patruelis affinis, *Gambusia* 263
pavimentata, *Rita* 214
pelusius, *Mystus* 216
Perca scandens 292

- Perciformes** 98, 272
- Perilampus aequipinnatus** 120
 atpar 108
 guttatus 107
 laubuca 109
 malabaricus 120
- Phractocephalus gogra** 214
 itchkeea 249
 kuturnee 215
- phulo, chela** 114
 Cyprinus 114
 phulo phulo, Salmostoma 114
- Pimeledus aor** 228
 bagarius 247
 cavasius 219
 gulio 221
 menoda 223
 nangra 248
 pangasius 244
 rita 214
 silondia 243
 tengara 226
 vacha 241
 viridescens 249
- Pisces** 97
- platycephalus, Gobius** 289
- Platystoma seenghala** 229
- Poecilia laticeps** 261
- POECILIDAE** 256, 262
- poeciloides, Lebistes** 264
- Polycanthus** 295
 cupanus 296
- porcellus, Labeo** 180
 Tylognathus 180
- potall, Cyprinus** 181
 Labeo 181
- Proeutropilichthys** 238, 240
 taakree 240, 241
- Pseudeutropius** 238
 atherinoides 239
 brachyopterus 238
 goongwaree 242
- pulchellus, Puntius** 150
- punctata, Ailiichthys** 236
 Gambusia 263
 Nangra 249
- Punctatus, Bagrus** 225
 Channa 266, 268, 269
 Macrones 225
 Mystus 217, 225
 Ophicephalus 268
 Ophiocephalus 268
- Puntius** 137, 140
 amphibius 141
 chola 140, 142, 143
 conchoniis 141, 143, 144
 curmuca 141, 144, 145, 305
 dorsalis 141, 145, 146
 filamentosus 141, 147
 gelius 141, 148
 guganio 141, 148
 jerdoni 141, 149, 150
 kolus 141, 150
 melanampyx melanampyx 141, 151
 neilli 141, 152, 153
 parrah 140, 153, 154
 pulchellus 150
 sarana sarana 141, 155
 sophore 141, 155, 156
 terio 141, 157
 ticto 157
 ticto ticto 141, 157, 158
 vittatus 141, 158, 305
- ranga, Ambassis** 275
 Chanda 273, 275, 276

Rasbora 117, 123, 124, 127
 buchanani 126
 caverii 124, 305
 daniconius 125
 daniconius daniconius 124, 125
 rasbora 124, 126
rasbora, *Cyprinus* 123, 126
 rasbora 127
 Rasborinae 107
reba, *Cirrhinus* 189
 Cirrhinus 185, 189
 Cyprinus 189
rerio (*Brachydanio*), *Danio* 122
 Cyprinus 122
 Danio 120, 122, 123
reticulatus, *Lebistes* 264
Rhinomugil 283
 corsula 286
Rhynchobdella aculeata 301
Rita 214
 gogra 214, 215
 hastata 215
 kuturnee 214, 215, 216
 pavimentata 214
rita, *Pimelodus* 214
Rohita melanopleura 190
rohita, *Cyprinus* 182
 Labeo 139, 182
Rohtee 137, 159
 belangeri 161
 cotio 162
 cunma 163
 neilli 164
 ogilbii 159, 160
 vigorsii 165
rubrostigma, *Aplocheilus* 258
 Haplocheilus 260

Rhynchobdella aculeata 301
 SACCOBRANCHIDAE 254
Saccobranchus 254
 fossilis 254
Salmostoma 107, 110
 bacaila 111
 boopis 112
 clupeoides 111, 112, 113
 horai 113, 305
 phulo phulo 114
 untrahi 115, 305
sandkhol, *Leuciscus* 166
 Thynnichthys 166, 167
sarana, *Barbus* 154
 Cyprinus 154
sarana sarana, *Puntius* 154, 155
sardina, *Aspidoparia* 127
scandens, *Anabas* 294
 Perca 292, 294
Scaphiodan nashii 191
 thomassi 192
 SCHILBEIDAE 213
 Schilbeinae 236, 238
Schismatorhynchus 137, 167
 heterorhynchus 167
 (*Nukta*) *nukta* 168
seenghala, *Aorichthys* 228, 229, 230
 Macrones 229
 Platystoma 229
silondia, *Pimelodus* 243
Silonia 238, 243
 childreni 243, 244
 silondia 244
silondia, *Silonia* 244

Silonopangasius 243
 childreni 243

Silundia 243
 sykesii 243

SILURIDAE 213, 230

Siluriformes 98, 212

siluroides, *Ompok* 231

Silurus atherinoides 239
 attu 235
 batrachus 253
 bimaculatus 231
 fossilis 254
 pabda 233
 pabo 233
 singio 254
 vittatus 227

sinuatus, *Noemacheilus* 208

Sisor 246

SISORIDAE 213, 246

sophore, *Barbus* 155
 Cyprinus 155
 Puntius 155, 156

specularis carpio, *Cyprinus* 139

stamineus, *Awaous* 288
 Gobius 288

stenorhynchus, *Gonorhynchus* 199
 gotyla, *Garra* 199

stigma, *Leuciscus* 155

striatus, *Channa* 266, 269, 270
 Gobius 288
 Noemacheilus 208, 209
 Ophicephalus 269
 Ophiocephalus 269

strigiller, *Danio* 120

suratensis, *Chaetodon* 280
 Etroplus 280

sykesii, *Silundia* 243

SYNBRANCHIDAE 270

Synbranchiiformes 98, 270

Systomus dorsalis 145

taakree, *Hypophthalmus* 240
 Proeutropilichthys 240, 241
 pseudeutropius 240

Teleostomi 97

tengara, *Macrones* 226
 Mystus 217, 226
 Pimelodus 226

terio, *Barbus* 156
 Cyprinus 156
 Puntius 156, 157

testudineus, *Anabas* 294
 Anthias 295

thermalis, (*Lepidocephalichthys*) *Lepidocephalus* 210, 212

thomassi, (*Osteochilichthys*) *Osteocheilus* 192
 Scaphiodon 192

Thynnichthys 137, 166
 sandkhol 166, 167

ticto, *Barbus* 157
 Cyprinus 157

ticto ticto, *Puntius* 158

Tilapia 278
 mossambica 281, 282

Tor 137, 183
 hamiltoni 183
 khudree 183
 mussullah 183, 184

Trichogaster fasciatus 297

Trichogasterinae 295, 297

Trichopodus colisa 295

trilineatus, *Glyptothorax* 251

Tylognathus porcellus 180
untrahi, *Chela* 115
 Salmostoma 115, 305
vacha, *Pimelodus* 241
vigorsii, *Osteobrama* 161, 165
 Rohtee 165
viridescens, *Nangra* 249, 250
 Pimelodus 249
viridiauratus, *Macropodus* 295
vittatus, *Barbus* 158
 Esomus 117
 Macrones 227

Puntius 141, 158, 305
Mystus 227
Puntius 158
Silurus 227
vulgaria, *Auguilla* 99
 Colisa 297
Wallago 231, 235
 attu 235
 dinema 235
Xenentodon 256
 cancila 257
yarrellii, *Bagarius* 247

