

MISCELLANEOUS PUBLICATION  
OCCASIONAL PAPER NO. 70

# Records of the Zoological Survey of India

**FISHES OF KHASI HILLS**

by

**G. M. YAZDANI**

Issued by the Director  
Zoological Survey of India, Calcutta

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OF THE  
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**G. M. YAZDANI**

*Gangetic Plains Regional Station  
Zoological Survey of India  
Patna-20*



*Edited by the Director, Zoological Survey of India*  
**1985**

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## AUTHOR'S PREFACE

While working out of the fish material of Khasi Hills (Meghalaya) at the Eastern Regional Station, Zoological Survey of India, Shillong during the years 1969 to 1972 I experienced great difficulty in determining the species accurately. This was partly because the material showed certain amount of unusual variation and partly because the available literature on Assam region contained very little information on the Khasi Hills. Though Day's *Fishes of India* (1878) and the *Fauna of British India*, Fish series (1889) proved to be the most useful work for identification, I greatly felt the need for an aid to the identification, of regional fish fauna. With this view in mind I have attempted to write this handbook and trust that it would cater to the need of students as well as fishery workers of the area.

I have given taxonomic account of each species, including the remarkable eel-like fish (Family Pillaiidae) and other new species discovered recently. I have purposely given an outline drawing of each species as I believe the illustrations of most species are available in the literature.

I feel pleased to offer my grateful thanks to Dr B. K. Tikader, Director, Zoological Survey of India, Calcutta for kindly giving me an opportunity to undertake this work and to Dr. P. D. Gupta, Deputy Director, Zoological Survey of India, Gangetic Plains Regional Station Patna, for kindly extending facilities. I would also like to record my grateful thanks to Professor, George Michael, Head of Zoology Department, North-East Hill University, Shillong for useful discussion in the course of this work.

G M. YAZDANI

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# FISHES OF KHASI HILLS

*By*

G. M. YAZDANI

Zoological Survey of India,  
Gangetic Plains Regional Station, Patna

## INTRODUCTION

Khasi Hill is one of the three districts *viz.*, Khasi, Jaintia and Garo Hill of the state of Meghalaya of the Indian Union. The capital of the state—Shillong is situated in the Khasi Hills at an altitude of about 5,000 ft. (1524 metres). The greater part of this hill district is like a plateau which consists of blocks of flat or gently undulating land separated by narrow ravines and deep valleys. This plateau is remarkably abrupt on its southern face but on its northern edge it gradually slopes towards the Brahmaputra valley. Its height varies from around 3,000 ft. (914.15 metres) to 6,000 ft. (1,830 metres). The vegetation of the hill is luxuriant due to heavy rainfall and bamboo and pine forests cover a large tract. The upper and more level parts of the hill are, however, thickly carpeted with grass. The beds of streams and rivers are generally rocky and full of gravels. The water current is swift and after a heavy rainfall most of the streams become torrential.

The drainage of the Khasi Hills forms a part of the Brahmaputra drainage system of the Himalayas wherefrom 161 species of fishes have been reported so far (Menon, 1962). A perusal of literature on the fishes of Khasi Hills, however, reveals that until recently only 15 species were on record (see McClelland, 1842; Day, 1889; Sehgal, 1959, Yazdani and Chanda, 1971 and Yazdani, 1972), Yazdani (1977) published an account of the fishes of Khasi Hills with observations on their distributional pattern and recorded therein 29 species belonging to 16 genera, 10 families and 4 orders. He also found out that nearly 1/3 of the fish fauna of Khasi Hill comprises of Cyprinidae and 1/5th of Cobitidae and the total number of species suddenly falls to nearly 1/3rd at elevations over 4,000 ft.

Though Day's *Fishes of India* (1878) and the *Fauna of British India*, Fish series (1889) remain even today the most useful work on the Indian fishes, many changes have occurred in the classification and nomenclature of fishes and the average worker may often be confused as to the exact identity of the species. Since Day's classical publications a great deal of work has been done on Indian freshwater fishes, for example, Chaudhuri, 1912 ; Hora, 1921, 1922, 1923, 1938 ; Hora and Mukherji, 1928, 1931, 1935 ; Shaw and Shebbeare, 1938 ; Menon, A.G.K., 1949 a, b, 1950, 1954, 1962, 1964, 1974 ; Menon, M.A.S., 1952, 1954 ; Sinha and Shiromani, 1953 ; Choudhary and Khandelwal, 1960 ; Misra, 1962, Shrivastava, 1968 and Jayaram, 1981. Unfortunately, these accounts of fishes are so widely scattered in the literature that it is not easily available to students and fishery workers in different states of India, especially in the recently formed state like Meghalaya where a suitable guide to the identification of fishes is a real necessity.

The present handbook has been designed to suit students of Ichthyology as well as field workers engaged in the development of fisheries in the Khasi Hills where the main population, comprising of Khasis, Bengalese, Assamese and Nepalese, is predominantly fish-eating and as such there exists a growing demand for this item of food. An attempt has been made in this book to give an upto-date classification, nomenclature and distributional records besides synoptic keys, important synonyms and outline drawings of all the 29 species which have been reported by Yazdani (1977) from the hilly parts of the Khasi Hills. Only one exotic species, *Cyprinus carpio* L., has been included as this species is occurring in some streams and lake of this hill. The synoptic keys are based on external and easily recognisable characters. They are, therefore, artificial and are strictly limited in scope to the families, genera and species of fishes of the Khasi hills. In the specific synonymies, only original reference of the species with its type-locality and Day's (1889) reference, as in the *Fauna of British India* series, are given. Under each species the formulae of fins and scales, general features, including an account of colouration, and distributional range have been given. Wherever possible, local names of species, habits and notes on features of taxonomic importance have also been added.

LIST OF FISHES

A classified list of 29 species belonging to two major superorders viz., Ostariophysi and Acanthopterygii, 4 orders, 10 families and 16 genera is given below. The classification of Greenwood, Rosen, Weitzman and Myers (1966) has been followed. This is preferred to Berg's (1940) classification in view of the fact it is based on evolutionary relationship of fishes.

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Superorder OSTARIOPHYSI

Order CYPRINIFORMES

Suborder CYPRINOIDEI

Family CYPRINIDAE

Subfamily CYPRININAE

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#### EXPLANATION OF ABBREVIATIONS AND TERMS

*Abbreviations* : The following abbreviations are used in the description of bony fishes.

D = Dorsal fin ; P = pectoral fin ; V = ventral fin or Pelvic fin ; A = Anal fin ; C = caudal fin ; L. l. = lateral line of scales ; L. tr = lateral transverse row of scales ; O = adipose dorsal.

The positions and proportions of the different parts of a fish are shown in the accompanying figures. (Figs. 1 & 2)

*Terms* : The following terms are used in the description of bony fishes.

*Total length* (Fig. 1, AG) is measured from the tip of the snout to the end of the caudal fin.

*Standard length* (Fig. 1, AF) is measured from the tip of the snout to the base of caudal fin.

*Height or Depth of body* (Fig. 1, HJ) is measured along the vertical line at its deepest part.

*Caudal peduncle* (Fig. 1, EF) is the narrow portion of the body between the origin of last ray of anal fin and the origin of caudal fin.

*Least height of caudal peduncle* (Fig 1, LM) is measured vertically at its narrowest part.

*Length of head* (Fig. 1 AD) is measured from tip of snout to the posterior most bony extremity of the opercle ; in percoid fishes it includes the opercular spine.

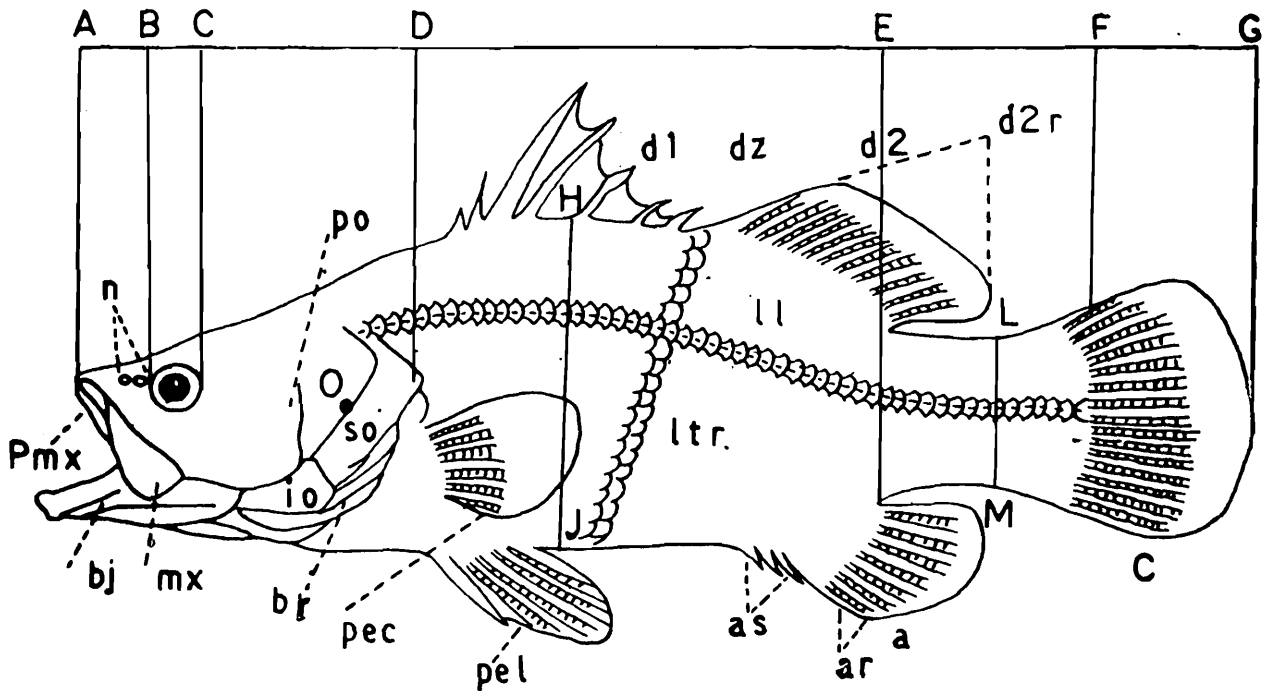


Fig. 1.—A percoid fish, labelled to show the principal parts (semidiagrammatic) AB = Length of snout ; AD = Length of head ; AF = Length of Body (Standard length) ; AG = Total length ; BC = Diameter of eye ; EF = Length of caudal peduncle ; HJ = Height or Dept of body ; LM = Least height of caudal peduncle. a. Anal fin ; a.r. Rays of anal fin ; as. Spines of anal fin ; br. Branchiostegal rays ; c. Caudal fin ; d1. First dorsal fin ; d2. Second dorsal fin ; d2r. Rays of second dorsal fin ; d2s. Spine of second dorsal fin ; i.o. Interoperculum ; 1 1. Lateral line and longitudinal series of scales along the latter line ; 1.tr. Transverse series of scales from middle of dorsal surface to middle of ventral surface ; lj. lower jaw ; mx. Maxilla ; n. Nostrils ; o. Operculum ; pec. Pectoral fin ; pel. Pelvic or ventral fin ; pmx. Premaxilla ; p.o. Preoperculum ; s.o. Suboperculum.

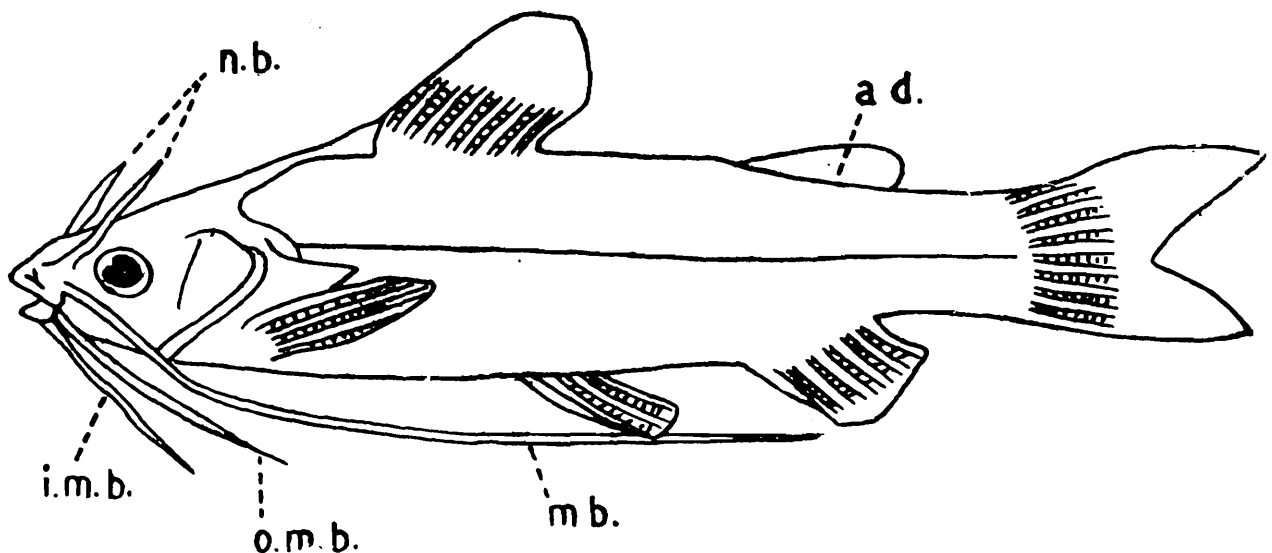


Fig. 2.—A catfish, labelled to show certain structures not present in the percoid fish (semidiagrammatic). a.d. Adipose dorsal ; i.m.b. Inner mandibular barbel ; m.b. Maxillary barbel ; n.b. Nasal barbels ; o.m.b. Outer mandibular barbel.

*Width of head* is taken at its widest part.

*Interorbital width* is a measurement taken along the dorsal surface between the eyes.

*Diameter of eye* (Fig. 1, BC) called "eye" in descriptions is measured lengthwise between margins of the bony orbit.

*Snout* (Fig. 1, AB) is measured from the tip of snout to the anterior margin of orbit.

*Length of head excluding snout* (Fig. 1, BD) is measured from the anterior margin of orbit to the posterior most bony extremity of opercle

*Predorsal length* is measured from the tip of snout to the origin of dorsal fin.

*Height/Length and insertions of fins* : The height of dorsal and anal fins is measured along its longest ray or spine and the length is measured along its base. But in the case of pectoral, ventral and caudal, the length is measured along its longest ray. The origin and insertion of a fin is taken from its ray, or spine.

*Fin formulae* : The numerical figures followed by the abbreviations denote their number, and when separated by a (—), the range of variations. An oblique stroke (/) differentiates spiny or undivided rays from branched ones. A vertical stroke (|) separates fins such as rayed dorsal from the adipose dorsal or the spiny fin from the non-spiny one.

*The lateral line* :—It is a row of perforated scales between the angle of gill-opening and the base of the caudal fin. It may be complete, incomplete or interrupted.

*Scales* :—The scales are counted along the lateral line. In case the lateral line is not present the scales are counted along the row where lateral line would have existed. The transverse row of scales are counted from the anterior base of dorsal to the ventral line. In case a lateral line is present, the scales above and below the lateral line are separated by an oblique (/) stroke

Predorsal scales are counted from the anterior extremity to the origin of the dorsal fin.

*Barbels* : Barbels may be present in some or absent ; those from the region of nostril are called nasal, from the snout region-rostral,

from the maxillae (upperjaw), maxillary and from the lower jaw-mandibular.

*Form* :—As a rule, the body of a fish is subcylindrical with the ventral surface more flattened than the dorsal. However, in some forms the body is laterally compressed so that the ventral surface becomes edged, and in some others the body is depressed so that the flattened ventral surface becomes almost horizontal.

*Profile* :—is the curve from tip of snout to the base of the caudal fin both along the dorsal and the ventral surfaces.

### KEY TO THE FAMILIES OF FISHES

1. Body eel-like ; pelvic fin absent	...	...	18
2. Body not eel-like, pelvic fin present	...	...	3
3. Body subcylindrical ; head broad, flat with large scales ; dorsal and anal fins long	...	...	Channidae
4. Body and head markedly depressed ; chest flat ; pectoral fins horizontally inserted ; mouth inferior	...	...	6
5. Body and head more or less compressed, chest rounded ; pectoral fins not horizontally inserted ; mouth terminal and inferior	—	...	8
6. Dorsal fin with a spine ; 4 pairs of barbels	...	...	Sisoridae
7. Dorsal fin without a spine ; no barbels	...	...	Psilorhynchidae
8. Dorsal and anal fins with spines (spinous portion of dorsal much longer than the soft portion)	...	...	Nandidae
9. Dorsal and anal fins generally without spines but strong undivided spinous ray may be present	...	...	10
10. Scales absent or indistinct	...	...	12
11. Scales present and distinct	...	...	Cyprinidae
12. Anal fin short	...	...	Cobitidae
13. Anal fin long	...	...	14
14. Dorsal fin very long	...	...	Clariidae
15. Dorsal fin very short	...	...	16
16. Barbels two pairs	...	..	Siluridae
17. Barbels four pairs	...	...	Heteropneustidae
18. Spines and scales absent	...	...	Pillaiidae

FAMILY CYPRINIDAE

The family Cyprinidae contains the largest group of Indian fresh-water fishes, popularly known as the "Carps". In this family the scales on the body are either large or moderate but always distinct. Barbels are present or absent ; if present 1-2 pairs only. Lateral line is generally complete ; in some forms incomplete. Gill-openings are fairly wide.

*KEY TO THE GENERA OF FISHES*

1. A symphysial knob on the lower jaw fitting into a notch in the upper jaw ; dorsal origin behind pelvic origin 8
2. No symphysial knob in the lower jaw ; dorsal origin before, above or behind pelvic origin ... .. 3
3. Lips thin ; lower lip conspicuously separated from the jaw which has horny covering ; dorsal spine osseous smooth ; 4 barbels ... .. *Acrossocheilus*
4. Lower lip not separated, or separated only by a superficial furrow from the jaw which is devoid of horney covering ; dorsal spinous ray osseous or weak and smooth or serrated ; 4, 2 or no barbels ... .. *Puntius*
5. Upper and lower lips continuous ; lower lip with suctorial disc ... .. *Garra*
6. Upper and lower lips thick and continuous ; lower lip with a posterior fold ; 4 barbels ; D. 3/9 ... .. *Tor*
7. Mouth directed forwards, lips fleshy ; 4 barbels on the upper lip. D. 3-4/17-22 ... .. *Cyprinus*
8. Suborbital ring of bones distinctly broad and prominent ; A. 12-18 ... .. *Danio*

**Genus *Acrossocheilus* Oshima**

1919. *Acrossocheilus* Oshima, *Ann Carnegie Mus.*, 12, p. 206  
(Type : *Gymnostomus formosanus* Regan)

**1. *Acrossocheilus hexagonolepis* (McClelland)**

1839. *Barbus hexagonolepis* McClelland, *Asiat. Res.*, 19, pp. 270, 336, pl. 41, fig. 3 (Type-locality : Upper Assam).

Bengali : *Bhorkol* or *Buluk* ; Nepalese : *Katli* ; Assamese : *Boka* ; English : *Chocolate Mahaseer*.

*General features:* A large carp similar to *Mahaseers* (*Tor* spp.) with thin lips, having labial fold widely interrupted in the middle. Horny tubercles present on the sides of snout and suborbital region. Dorsal fin with a strong spinous ray, about as long as head excluding the snout; its origin almost opposite or slightly in front of ventral origin. Barbels 2 pairs longer than eye.

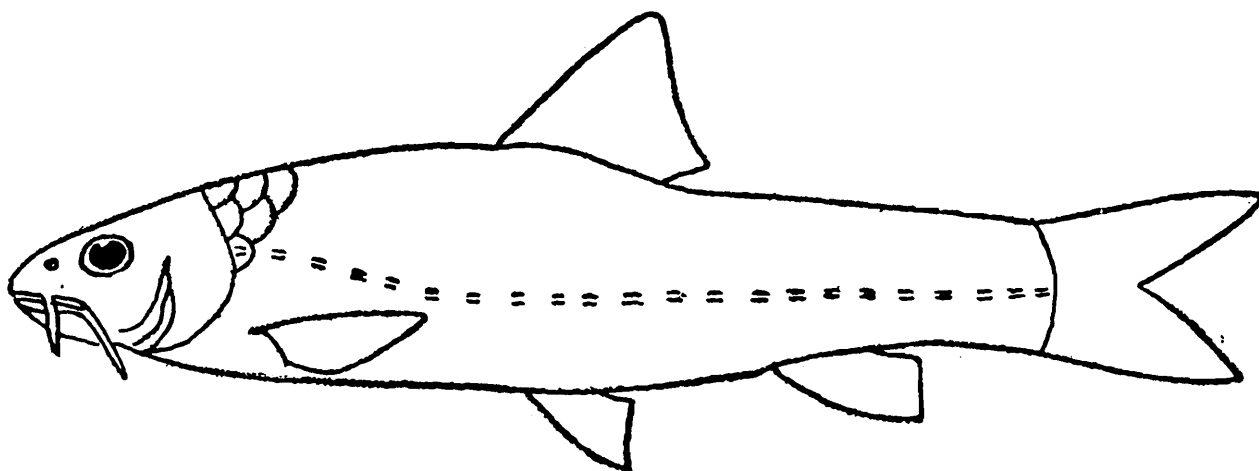


Fig. 3—*Acrossocheilus hexagonolepis* (McClelland)

General olive above, silvery white below, with a golden yellow lateral band above lateral line; fins mainly slate-grey and pale towards the margin.

Being a voracious feeder, it takes aquatic vegetation such as filamentous and planktonic algae, vegetable debris; and gastropods.

It breeds during the rainy season.

*Distribution:* India: Assam, Meghalaya, Arunachal-Pradesh; Burma, Nepal, Thailand, Malaya and Sumatra.

*Remarks:* The species described under the names *Fairbus dukai* by Day (1889), *Barbus (Lissocheilus) dukai* by Shaw and Shebbeare (1938) and *Barbus hexastidus* by Chaudhuri (1913) are considered synonyms of *A. hexagonolepis* (See Menon, 1974).

In the Khasi Hills, *A. hexagonolepis* commonly occurs in the Barapani Lake and in some deeper streams connected with the lake. It is caught by angling and takes baits like bananas, earthworms, oil-cake paste, grass hoppers, flowers cucumber and aromatic leaves like those of the Tulsi plant (*Ocimum sanctum*).

**Genus *Cyprinus* Linnaeus**

1758. *Cyprinus* Linnaeus, *Syst. Nat.*, ed. 1a, p. 320.

**2. *Cyprinus carpio* Linnaeus**

1758. *Cyprinus carpio* Linnaeus, *Syst. Nat.*, ed. 10, vol. 1.

D. 3-4/17-22 ; P. 1/15-16 ; V. 2/8-9 ; A. 3/5 ; L. 1. 35-39 ;

English : *The common carp.*

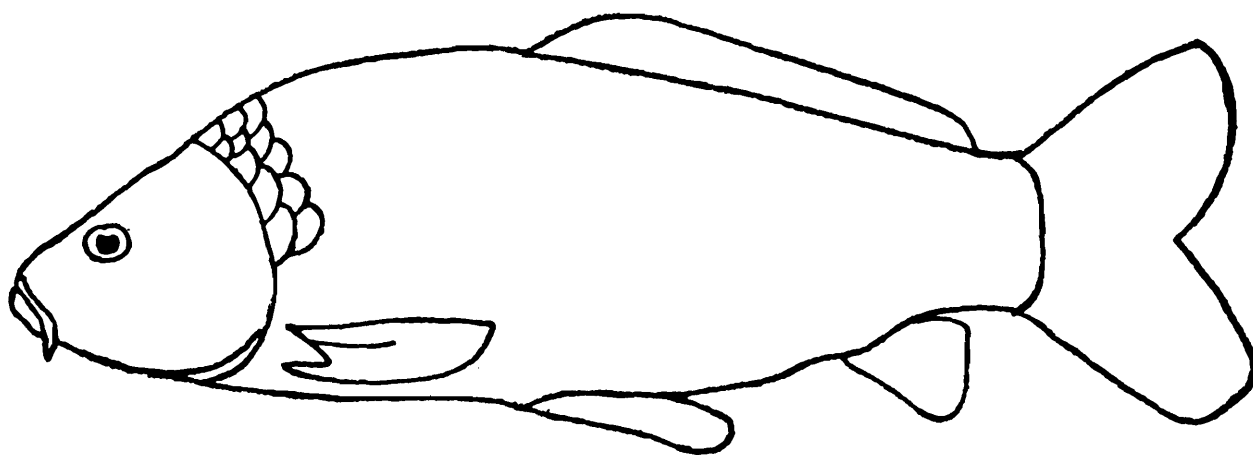


Fig 4—*Cyprinus carpio* Lin.

*General features* : Major carp having a moderately deep and slightly compressed body. Mouth, surrounded by fleshy lips, is directed forwards and protrusible. Lateral line is complete. Three varieties are available in India : the Mirror carp (*C. carpio* var. *specularies*), with large, shiny yellowish scales over the body, the Scale carp (*C. carpio* var. *communis*), with rather small scales completely covering the body, and Leather carp (*C. carpio* var. *nudus*), with scales almost completely absent on the body which has leathery appearance.

*C. carpio* is an omnivorous feeder and browses on the shallow bottom and margins, takes in vegetable debris, insects, worms crustaceans and also planktonic algae. It breeds almost throughout the year but unlike the major carps such as *Labeo rohita*, *Catla catla* and *Cirrhina mrigala* it also breeds in ponds.

*Distribution* : It is an exotic fish, introduced into India from Sri Lanka in 1939. Its original home is China and Japan.

*Remarks* : It is essentially a cold-water fish, but easily adapts itself to warm water conditions of the tropics. It is being cultured in artificial ponds in Shillong by the State Fisheries Department, Govt. of Meghalaya.

Genus *Garra* Hamilton

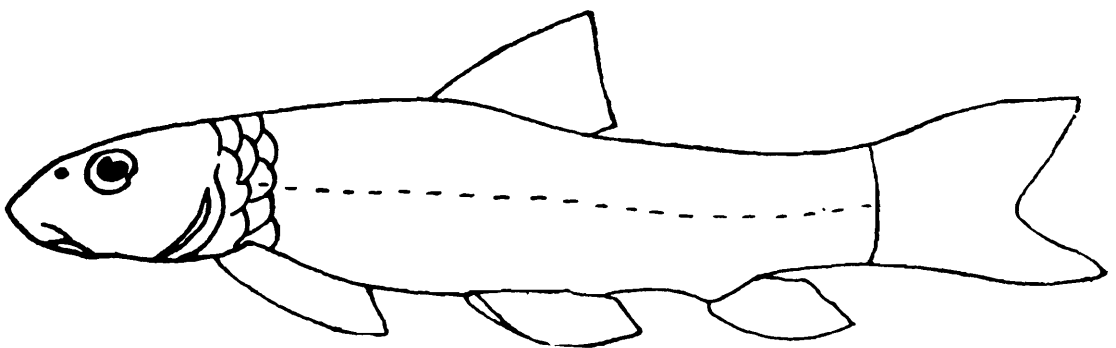
1822. *Garra* Hamilton, *Fish Ganges*, pp. 343, 393.  
(Type: *Cyprinus lamta* Hamilton)

KEY TO THE SPECIES OF *GARRA*

- |  |     |     |                         |
|--|-----|-----|-------------------------|
| 1. Scales in the lateral line 35 or fewer  | ... | ... | 3                       |
| 2. Scales in the lateral line 38 to 49   | ... | ... | 5                       |
| 3. Tip of snout marked off by a deep transverse groove ; chest and belly scaleless ; distance of vent from base of anal fin more than 4 times in that between anterior origins of anal and pelvic fins | ... | ... | <i>G. lamta</i>         |
| 4. Tip of snout not marked off by a deep transverse groove ; chest and belly scaleless ; back and pelvic regions scaled.   | ... | ... | <i>G. lissorhynchus</i> |
| 5. Chest, abdomen and back scaled ; distance of vent from base of anal fin a little over 2 times in that between the origins of pelvic and anal fins   | ... | ... | <i>G. naganensis</i>    |

3. *Garra lamta* (Hamilton)

1822. *Cyprinus (Garra) lamta* Hamilton (in part). *Fish Ganges*, Edinburgh, pp. 344, 393 (Type-locality : Tinau River at Butwal, Nepal).  
1889. *Discognathus lamta*, Day (in part), *Faun. Brit Ind. Fish*, 1, p. 246. D. 3/7-8 ; A 2/5 ; L. 1. 31-34 ; Barbels 2 pairs.

Fig. 5—*Garra lamta* (Ham.)

*General features* : Body rather elongated, subcylindrical. Mouth semicircular, inferior, a suctorial disc on the chin. Snout rounded,

smooth, the tip marked off by a transverse groove ; the transverse lobe at the tip and the sides of snout in front of nostrils covered by horny tubercles arranged in bilaterally symmetrical patches. Chest and belly naked.

Generally dark grey above, paler beneath ; a broad lateral band from gill-openings to caudal base bordered above and below by incomplete dark narrow lateral stripes. A black spot on the upper angle of the gill-openings and a black blotch at the caudal base.

A typical hill-stream fish found adhering to the rocky bottom of streams and rivers.

*Distribution* : India : Darjeeling and Kumaon Himalayas, Assam, Sikkim ; Nepal, Pakistan.

*Remarks* : A detailed taxonomic account of this species is given by Menon (1964).

#### 4. *Garra lissorhynchus* (McClelland)

1842. *Platycara lissorhynchus* McClelland, *Calcutta Journ. Nat. Hist.*, Calcutta, 2, pp. 537, pl. 68 (Type-locality : Khasi Hills (Meghalaya)).

1889. *Discognathus modestus* Day, *Faun. Brit. Ind. Fish.*, 1, p. 247 D. 2/6-7 ; A. 1/5 ; L. 1. 32-35 ; Barbels 2 pairs.

Khasi : *Kha Kulai*.

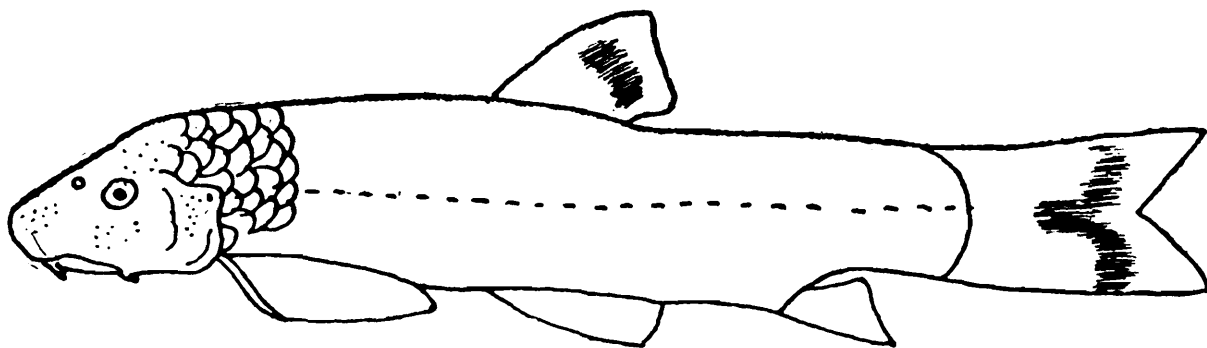


Fig. 6—*Garra lissorhynchus* (McClelland)

*General features* : Body elongated, subcylindrical, mouth inferior, a suctorial disc on the chin. Snout somewhat broadly rounded, smooth. Barbels smaller than the diameter of eye. Chest and belly naked ; post pelvic region scaled.

Generally dark-grey, paler beneath, a dark streak near the free margin of the dorsal, a broad black w-shaped band on the anterior half of caudal fin ; an indistinct black blotch near the base of caudal. A black spot behind the upper angle of the gill-openings.

*Distribution* : India : Brahmaputra river system, Assam Himalayas.

*Remarks* : A detailed taxonomic account of this species is given by Menon (1964).

### 5. *Garra naganensis* Hora

1921. *Garra naganensis* Hora, *Rec. Indian Mus.*, Calcutta, **22**, p. 667, pl. 25, figs. 2, 2a (Type-locality : Naga Hills (Nag: land)).

1964. *Gara naganensis*, Menon, *Mem. Indian Mus.* **14**, p. 226.  
D. 2/7-8 ; A. 1-2/5 ; L. 1. 38-40 ! Barbels 2 pairs.

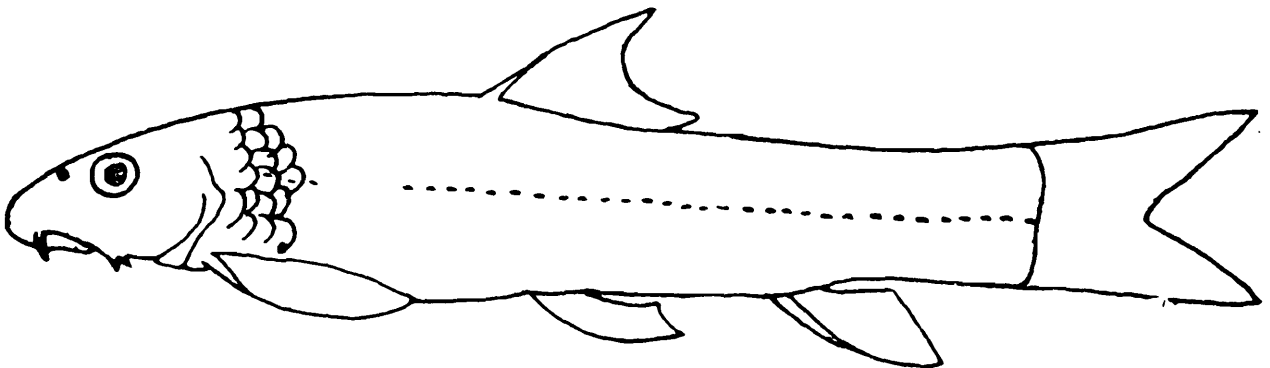


Fig. 7—*Garra naganensis* Hora

*General features* : Body elongated, subcylindrical, mouth inferior, a suctorial disc on the chin. Snout semicircular, scarcely tuberculated. Barbels shorter than diameter of eye. Chest and abdomen scaled, but scales on chest are much reduced.

Generally dark-grey above, pale white beneath, an indistinct narrow, lateral band from behind gill-opening to the base of caudal fin. A minute black spot behind the upper angle of the gill-openings.

*Distribution* : India : Naga Hills (Nagaland) and Khasi Hills (Meghalaya).

*Remarks* : A detailed taxonomic account of this species is given by Menon (1964).

**Genus Puntius Hamilton**

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

*KEY TO THE SPECIES OF PUNTIUS*

1. No barbels ; last unbranched dorsal ray serrated	...	3
2. Two barbels ; last unbranched dorsal ray entire	...	4
3. L. 1. 20-23 ; L. tr. 6-7	... ..	<i>P. shalynius</i>
4. L. 1. 26-28 ; L. tr. 5½-6½/5½	... ..	<i>P. chola</i>

**6. Puntius chola (Hamilton)**

1882. *Cyprinus chola* Hamilton, *Fish Ganges*, pp. 312, 389. (Type-locality : north-eastern parts of Bengal)

1889. *Barbus chola*, Day, *Faun. Brit. Ind. Fish.*, 1, p. 317.  
 D. 3/8 ; P. 14-15 ; V. 9 ; A. 3/5 ; C. 19 ; L. 1. 26-28 ; Ltr. 5½ to 6½/5½ ;  
 Barbels 1 pair ; 10-12 predorsal scales.

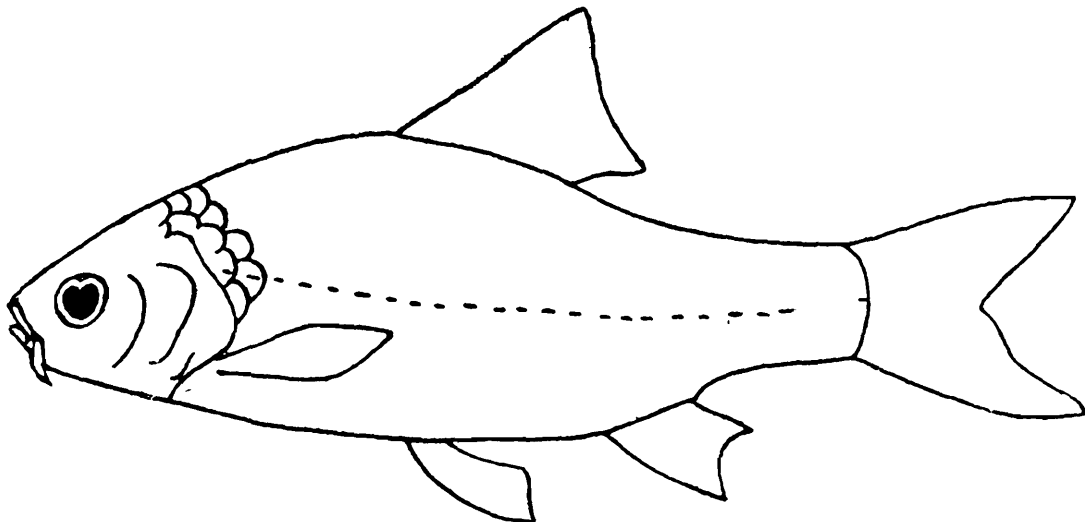


Fig. 8—*Puntius chola* (Ham.)

*General features* : Body fairly deep, moderately compressed. Dorsal fin commences opposite the ventral fin. Its last undivided ray is osseous and smooth ; the spinous portion being moderately strong and as long as the head excluding the snout. Caudal forked. Lateral line complete.

Silvery ; opercle shot with gold and purple. A black blotch present on the 23rd and 24th scales, along the lateral line. Another blotch is also present at the base of the dorsal fin, while a faint band is located along its middle portion.

*Distribution* : Throughout India ; Sri Lanka ; Pakistan ; Bangladesh ; Burma and Nepal.

*Remarks* : This species is rather uncommon in the Khasi Hills. It is known to grow to 5 inches (128.0 mm) in longest specimen found in this hill is only 64 mm (Yazdani, 1977).

### 7. *Puntius shalynius* Yazdani and Talukdar

1975. *Puntius shalynius* Yazdani and Talukdar. *J. Bombay nat. Hist. Soc.*, 72(1), p. 218-221.

D. 3-7 ; P. 13-14 ; V. 1/7 ; A. 2/5 ; C 18-20 ; L. 1. 20-23 ; L tr. 6-7.

Khasi : *Shalyni*.

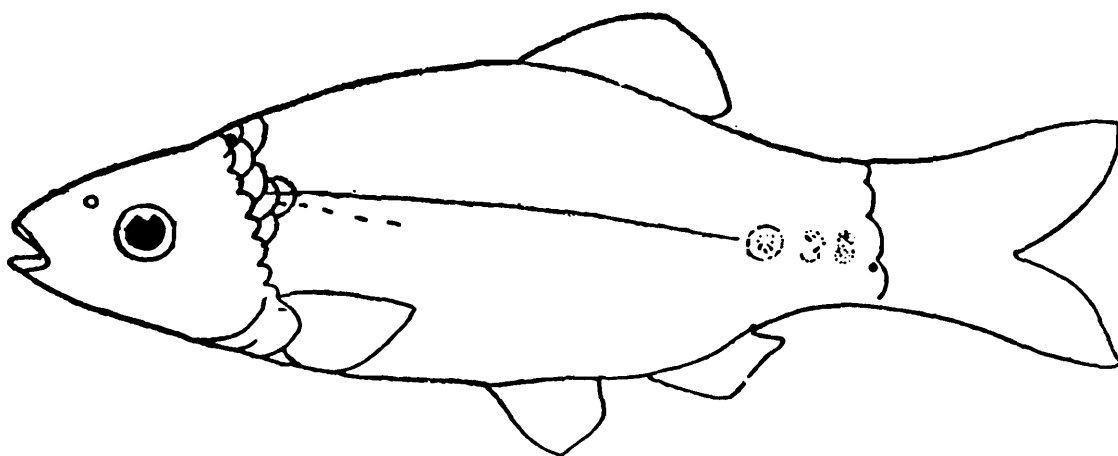


Fig. 9—*Puntius shalynius* Yazdani and Talukdar.

*General features* : Carp minnow without barbels, having the last undivided dorsal ray serrated. Lateral line incomplete, ending on or before 11th scales.

Females yellow to black on sides and back, silvery below ; scales black-edged ; fins mostly orange with light blackish tinge. Males more blackish in appearance ; fins except caudal jet black ; two black spots on tail and a horizontal blue line on the body.

*Distribution* : India : Khasi and Jaintia Hills (Meghalaya)

*Remarks* : *P. Shalynius* is one of the most common species in the Khasi hill-streams.

**Genus Tor Gray**

1834. *Tor* Gray III. *Ind. Zool.*, 2, pl. 96 (Type : *Cyprinus tor* Hamilton=*Tor hamiltoni* Gray).

**KEY TO THE SPECIES OF TOR**

- |  |        |                   |
|--|--------|-------------------|
| 1. Length of head greater than the depth of body | ...    | <i>T putitora</i> |
| 2. Length of head less than depth of body        | ... .. | <i>T Tor</i>      |

**8. *Tor putitora* (Hamilton)**

1822. *Cyprinus putitora* Hamilton, *Fish Ganges*, pp. 303. (Type-locality : eastern parts of Bengal)

1889. *Barbus tor*, Day (in part) *Faun. Brit. Ind. Fish.*, 1, p. 120, fig. 307.  
 D. 4/8 ; P. 17-18 ; V. 9 ; A. 2/5 ; C. 19 ; L. 1. 25-28 ; L. tr. 4½/2½ ;  
 Barbels 2 pairs ; predorsal scales 9.

Khasi : *Kha Mahasu* ; Bengali : *Tor, Mahaser, Mahasol* ;  
 Nepalese : *Sor-machha*.

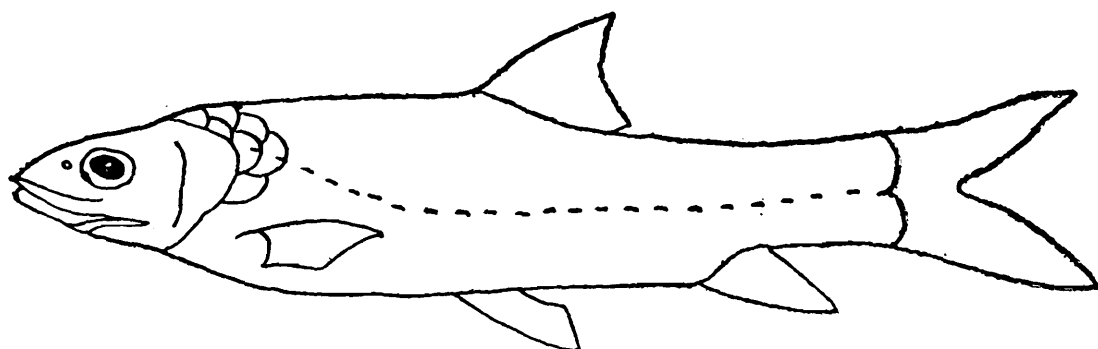


Fig. 10—*Tor putitora* (Ham.)

**General features :** Large-scaled carp with dorsal and ventral profiles slightly arched. Lips thick, very extensible ; no pores on snout. Two pairs of barbels, maxillary longer than rostral and extending to below the last third of the eye. Dorsal spine bony, strong, smooth. Origin of dorsal fin midway between the tip of snout and base of caudal.

Usually greenish dorsally, light pink laterally, silvery white ventrally ; a lateral broad band of greyish blue or purplish colour ; fins generally greyish green.

*Distribution* : India : all along the Himalayas including Kashmir and Khasi Hills (Meghalaya), Nepal, Pakistan, Bangladesh.

### 9. *Tor tor* (Hamilton)

1822. *Cyprinus tor* Hamilton, *Fish Ganges*, pp. 305, 388 (Type-locality : River Mahananda)

1889. *Barbus tor*, Day (in part) *Faun. Brit. Ind. Fish.*, 1, p. 307, 308, fig. 104.

D. 4/8 ; P. 15-18 ; v. 9 ; A. 3/5 ; C 19 ; L. 1. 22-27 ; L. tr.  $\frac{1}{4}$ / $2\frac{1}{2}$

Barbels 2 pairs : predorsal scales 9.

Khasi : *Kha Mahasur* ; Bengali : *Mahasol*.

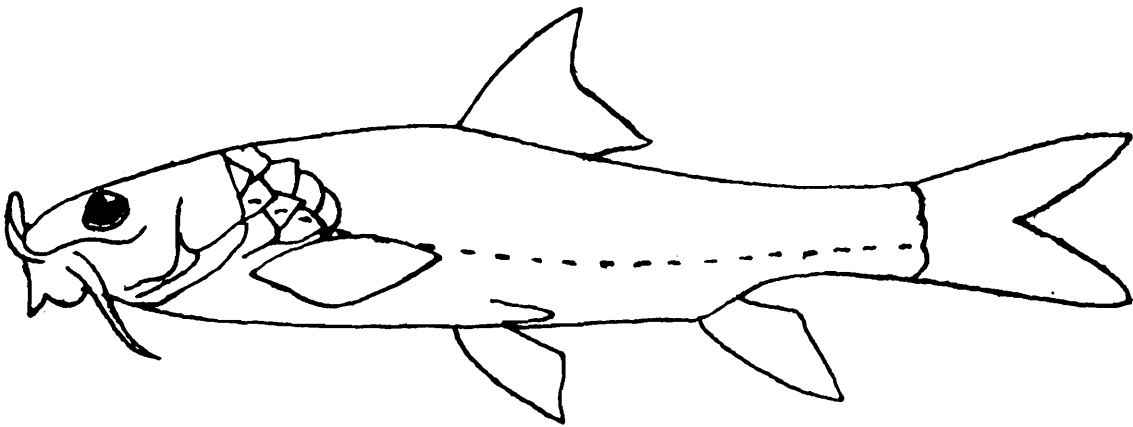


Fig. 11—*Tor tor* (Ham.)

*General features* : Large scaled carp, with dorsal profile more sharply arched than the ventral. Lips thick, produced into a mesial line. Dorsal fin origin almost opposite that of ventral fin ; its spinous ray smooth, bony, shorter than the depth of body.

Generally golden along the sides ; dark grey dorsally ; silvery grey ventrally. Fins redish yellow.

*Distribution* : India : Foot hills of Himalayas, Madhya Pradesh, Bihar, Khasi Hills (Meghalaya), North Bengal, Assam ; Burma ; Bangladesh ; Pakistan.

### Genus *Danio* Hamilton

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

#### KEY TO THE SPECIES OF DANIO

- |                            |     |     |     |   |
|----------------------------|-----|-----|-----|---|
| 1. Barbels long            | ... | ... | ... | 3 |
| 2. Barbels short or minute | ... | ... | ... | 5 |

3.	D. 8-9 ; L. 1. 26-28	...	...	...	<i>D. rerio</i>
4.	D. 10-13 ; L. 1. 38	...	...	—	<i>D. dangila</i>
5.	D. 12-16 ; L. 1. 32-36	...	...	...	<i>D. aequipinnatus</i>

**10. *Danio (Danio) aequipinnatus* (McClelland)**

1939. *Perilampus aequipinnatus* McClelland, *Asiat. Res.*, 19, p. 393, pl. 60, fig. 1  
(Type-locality : Assam).

1889. *Danio aequipinnatus*, Day, *Faun. Brit. Ind. Fish.*, 1, p. 356, fig. 3  
D. 12-16 ; V. 8 ; A. 14-18 ; C. 19-20 ; L. 1. 32-36 ; L. tr. 6-7/3½ ;  
Barbels 2 pairs ; predorsal scales 13.

Bengali : *Chebli* ; Nepalese : *Bhiti*.

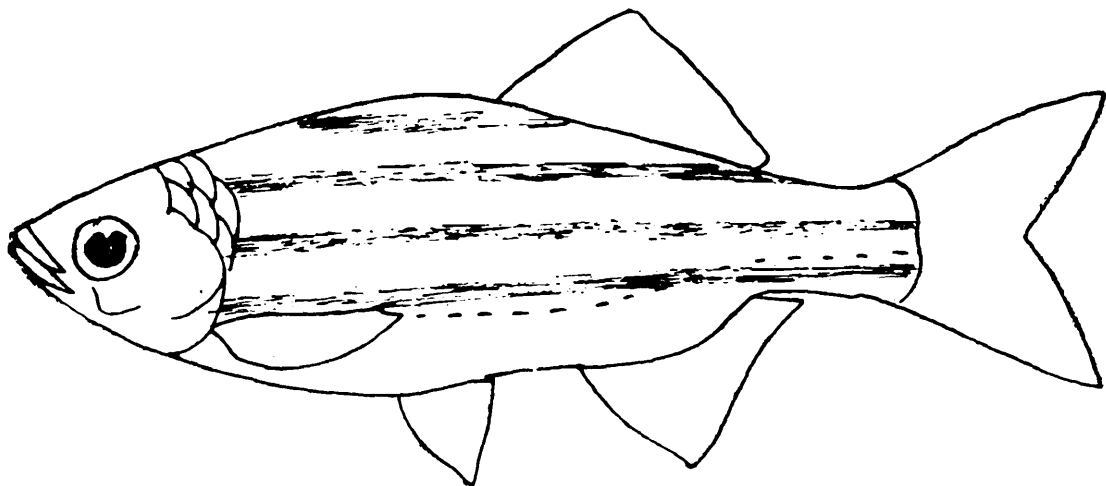


Fig. 12—*Danio aequipinnatus* (McClelland)

*General features* : Body compressed, abdomen rounded. Cleft of mouth oblique, extending to below anterior margin of eye. Sub-orbitals broad. Dorsal fin moderately elongated, its origin midway between centre of eyes and the base of caudal. Scales moderate in size. Barbels two pairs, rostral half as long as eyes, maxillary pair minute. Lateral line concave, passes over lower half of the tail.

A beautiful, silvery fish with blue and orange iridescence on horizontal bands—a wide bluish band between eye and the centre of caudal base, another narrow band above and two other lighter ones below them. Fins yellowish, dorsal and anal with a broad, bluish band.

*D. aequipinnatus* occurs in streams having clear water and co-exists with *D. dangila*. It is rather uncommon in the Khasi Hills, where it is not found at altitudes over 3,500 ft.

*Distribution* : India : Eastern Himalaya, Meghalaya and the Deccan ; Sri Lanka ; Bangladesh ; Nepal ; Burma and Thailand.

*Remarks* : The specimens of *D. aequipinnatus* in the Khasi Hills exhibit certain significant variations in their range of meristic characters and proportions the dorsal rays vary from 12-13, anal rays from 13-15 and the body depth (in the total length) from  $4\frac{1}{2}$  to 5. The longest specimens recorded in this hill is 77 mm (Yazdani, 1977) against 152 mm the highest length known for this species (see Misra, 1962).

### 11. *Danio (Danio) dangila* (Ham.)

1822. *Cyprinus dangila* Hamilton, *Fish Ganges*, pp. 321, 330 (Type-locality : mountain streams of Monghyr).

1889. *Danio dangila*, Day, *Faun. Brit. Ind. Fish.*, 1, p. 356.

D. 11-13 ; P. 13 ; A. 16-18 ; C. 20 ; L. 1. 38 ; L. tr.  $7\frac{1}{2}$  ; Barbels 2 pairs ; predorsal scales 18.

Bengali : *Nipati*.

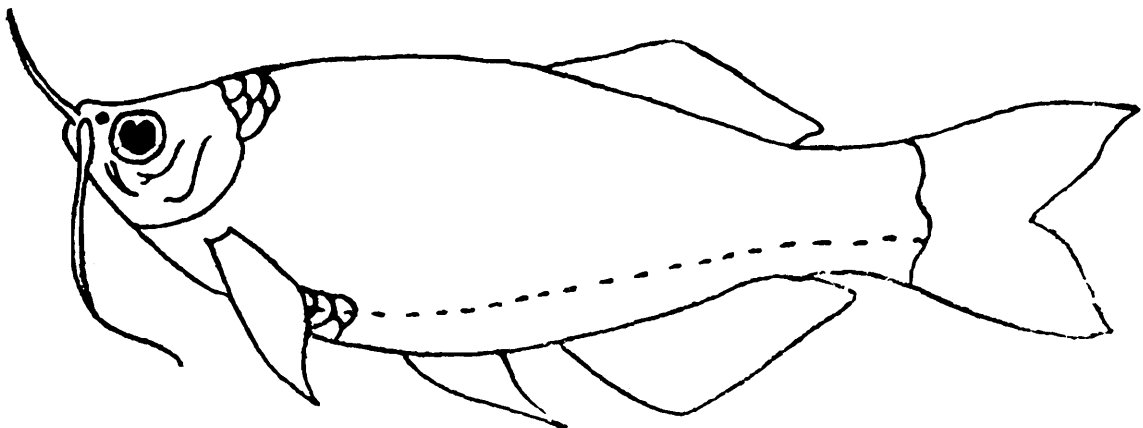


Fig. 13 *Danio dangila* (Ham.)

*General features* : Body compressed, abdomen rounded. Cleft of mouth oblique, lower jaw longer. Rostral barbels a little shorter than the head ; the maxillary pair slightly longer.

Silvery with three parallel longitudinal blue or dark lines running from mid-body to half way along the tail, and generally form a beautiful network on the anterior part of the body. A black spot behind the gills.

*D. dangila* is the most common species in the streams and lake of Khasi Hills and unlike *D. aequipinnatus* it occurs upto 5,000 ft. altitude. It is more commonly found with *D. rerio* than with *D. aequipinnatus* and prefers to live near the edges of streams.

**Distribution :** India : Uttar-Pradesh, Bihar, West-Bengal, Assam, Meghalaya, Manipur, Nagaland ; Bangladesh ; Burma ; Nepal.

**Remarks :** The specimens of this species also show variation in their range of meristic characters and proportions : the dorsal rays vary from 10-12, the anal rays from 12-14 and the body depth (in total length)  $4\frac{1}{2}$  to 5. The longest specimen recorded in this hill is 82.0 mm (Yazdani, 1977), while specimens upto 152.0 mm in length are known from other areas (Day, 1889).

## 12. *Danio* (*Brachydanio*) *rerio* (Hamilton)

1822. *Cyprinus rerio* Hamilton, *Fish Ganges*, p. 323 (Type-locality : R. Kosi)

1889. *Danio rerio*, Day, *Faun. Brit. Ind. Fish.*, 1, p. 358.

D. 2/7 ; A. 15-16 ; C. 18-19 ; L. 1. 26-28 ; L. tr. 6 ; Barbels 2 pairs.

Bengali : *Anju*.

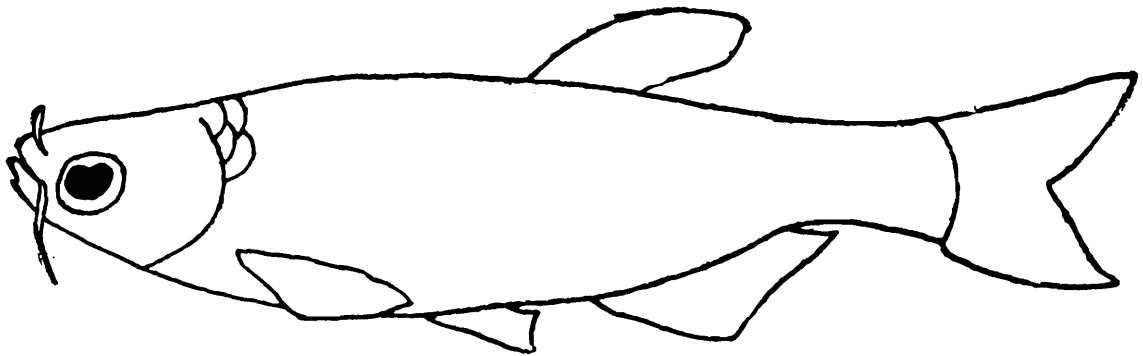


Fig. 14—*Danio rerio* (Ham.)

**General features :** Body compressed, narrower than in *D. dangila*, abdomen rounded. Rostral barbels short, maxillary pair reaching the end of opercle.

A beautiful little fish with four metallic blue longitudinal bands separated by three narrower silver ones ; the three lower blue bands extending to the caudal fin. Anal with three blue bands.

*D. rerio* is common in the Khasi Hills but it occurs upto an altitude of 5,000 ft.

**Distribution :** India : Eastern India from Bengal upto Krishna river system ; Pakistan ; Bangladesh ; Burma and Nepal.

**Remarks :** The specimens of this species show certain variations in their range of meristic characters ; the dorsal rays vary from 8 to 9 and the anal rays 12 to 15.

## Family PSILORHYNCHIDAE

The family Psilorhynchidae contains a group of hill-stream fishes belonging to a single genus *Psilorhynchus*. These fishes are characterized by the following: back somewhat elevated, head and body markedly depressed; snout more or less spatulate, mouth small, transverse, inferior, lips entire, barbels absent, chest flat, pectoral and pelvic fins horizontally inserted and provided with 2 or more outer and inner simple ray; air bladder reduced.

In India, this family is restricted in distribution to the Himalayas but one of its members also occurs in Burma.

Genus *Psilorhynchus* McClelland

1839. *Psilorhynchus* McClelland, *Asiat. Res.*, 19, p. 299, 429, pl. 50, fig. 1  
(Type: *Cyprinus secatio* Hamilton)

## KEY TO THE SPECIES OF PSILORHYNCHUS

- |  |     |     |                       |
|--|-----|-----|-----------------------|
| 1. Body moderately elevated; unbranched rays<br>in the pectoral fin 4-6; L. 1. 32-33   | ... | ... | <i>P. balitora</i>    |
| 2. Body depressed and flattened; unbranched rays<br>in the pectoral fin 8; L. 1. 42-44 | ... | ... | <i>P. homaloptera</i> |

13. *Psilorhynchus balitora* (Hamilton)

1822. *Cyprinus balitora* Hamilton. *Fish Ganges*, pp. 348, 394 (Type locality: Rivers of north-east of Bengal)

1889. *Psilorhynchus balitora*, Day, *Faun. Brit. Ind. Fish*, 1, pp. 244, 245  
D. 2/7-8; P. 17; V. 9; A. 2/5; C. 18; L. 1. 35; L. tr. 4½/4½

Hindi: *Titari*.

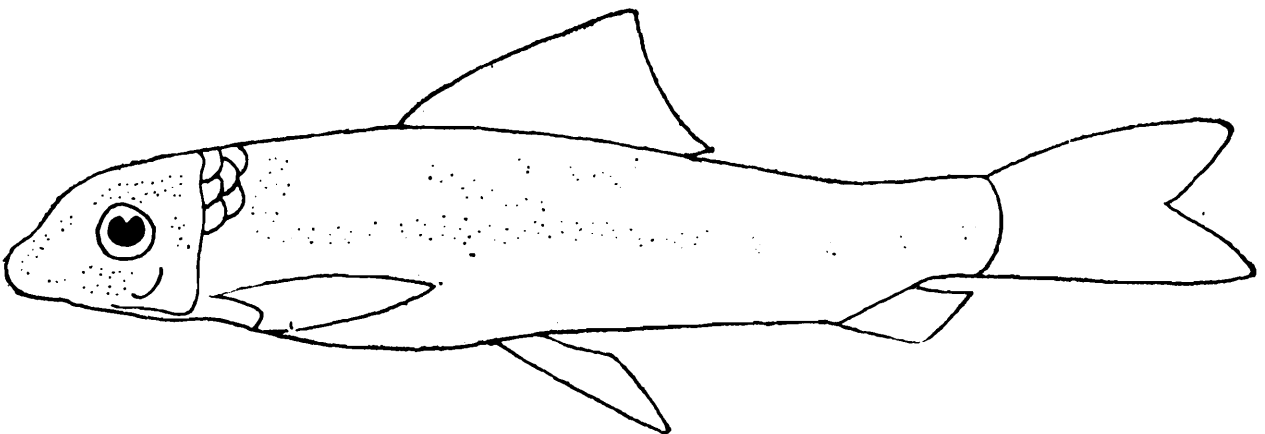


Fig. 15—*Psilorhynchus balitora* (Ham.)

*General features* : Back elevated, ventral surface flattened, head somewhat depressed. Mouth small, inferior. Edges of lips covered with round hard pores, some fine pores also on the cheeks and snout. Dorsal fin in advance of pelvics. Pectorals and pelvics nearly horizontal ; the outer seven rays of the former and 2 of the latter, unbranched.

Generally yellowish grey to brown with diffuse darker blotches.

*Distribution* : India : River Jamuna in Delhi, River Gomti at Lucknow (U.P.), West Bengal, Assam, Meghalaya ; Burma ; Bangladesh

#### 14. *Psilorhynchus homaloptera* Hora and Mukerji

1935. *Psilorhynchus homaloptera* Hora and Mukerji. *Rec. Indian Mus.*, 37, p 391, pl. 7, figs. 1-6 (Type-locality : Emilomi, Naga Hill's (Nagaland) D. 2/7 ; P. 7-8/9 ; V. 2/7 ; A. 2/5 ; C. 18 ; L. 1. 42-44 ; L. tr. 6-7 ; Predorsal scales 14-15.

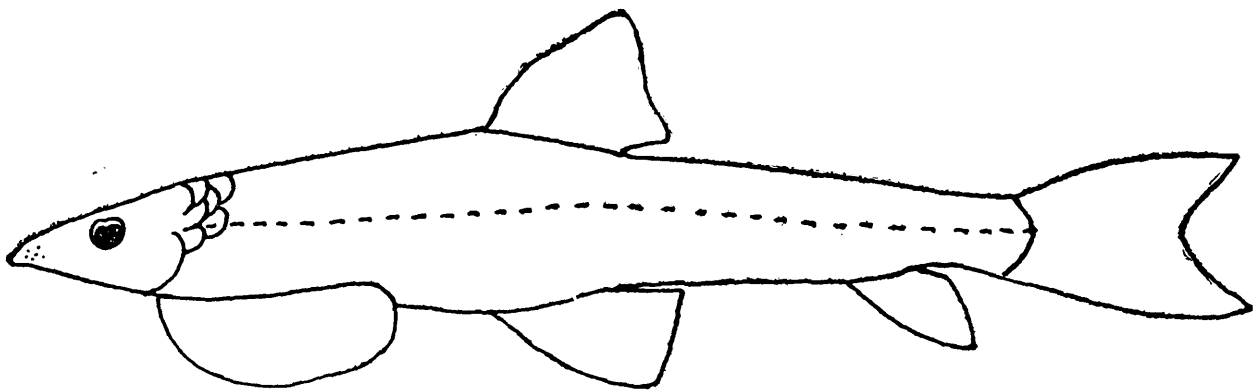


Fig. 16—*Psilorhynchus homaloptera* Hora and Mukerji

*General features* : Body depressed and flattened. The dorsal profile is evenly arched while the ventral profile is almost straight. The mouth is ventral. The snout is spatulate ; it is considerably longer than the post orbital part of the head. The caudal peduncle is short and fairly compressed. The gill-openings are narrow. The dorsal fin is in advance of the ventral. The pectoral fins are broad, fan-shaped with a rounded free margin and are horizontally placed. The ventral fins are similar to the pectoral. The caudal fin is lunate with unequal and angular lobes.

Generally, pale olivaceous green ; head with fine black dots. The fins are dusky.

*Distribution* : India : Naga Hills (Nagaland), Khasi Hills (Meghalaya) ; Nepal.

### Family COBITIDAE

The fishes of the family Cobitidae (loaches) have elongate, oblong, compressed for cylindrical body. Mouth is small, inferior and provided with 6-12 barbels which are short but conspicuous and never longer than the head. Pectoral and pelvic fins are not horizontally inserted and are provided with only one simple outer ray. Vertical fins are spineless. Gill-openings small or moderate. Air-bladder entirely or partially enclosed in a bony capsule. Lateral line incomplete or absent.

#### KEY TO THE GENERA OF COBITIDAE

1. Barbels 8 or more, 4 rostral, 2 maxillary and rest mandibular : a sharp bony prickle beneath the eye *Lepidocephalus*
2. Barbels 6, 4 rostral, 2 maxillary : no bony prickle beneath the eye      ...      ...      ...      ... *Noemacheilus*

#### Genus *Lepidocephalus* Bleeker

1858. *Lepidocephalus* Bleeker, *Nat. Tijdschr. Nederl. Indie*, 16. p. 303  
(Type—*Cobitis macrochir* Bleeker)

#### KEY TO THE SPECIES OF LEPIDOCEPHALUS

1. 25 to 30 rows of scales between the base of anal fin and back : a dark band composed of spots along the lateral line... *L. guntea*
2. About 40 rows of scales between the base of anal fin and back : a dark band along the lateral line      ... *L. berdmorei*

#### 15. *Lepidocephalus berdmorei* (Blyth)

1860. *Acanthopsis berdmorei* Blyth, *Proc. Asiat. Soc. Beng.*, p. 168  
(Type-locality : Tenasserim, Burma)
1889. *Lepidocephalichthys berdmorei*, Day, *Faun. Brit. Ind. Fish.*, 1, p. 221.  
D. 2/6 : P. 10 : V. 8 : A. 2/5-6 : C. 17 : Barbels 3 pairs.

**General features :** A small loach having dorsal and ventral profiles of the body nearly parallel but deepest in front of dorsal fin. A large erectile, bifid spine counter sunk below the eye. Two pairs of rostral and a maxillary pair of barbels extending to below the hind edge of the orbit. The caudal fin is slightly emarginate.

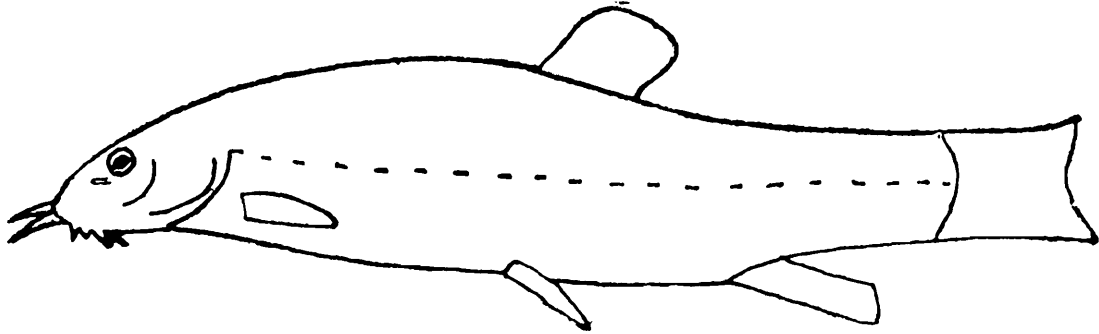


Fig. 17—*Lepidocephalus berdmorei* (Blyth)

Generally yellowish brown with a dark band along the body. A black spot at the base of the caudal fin. Fine spots and markings also present on fins.

**Distribution :** India : Manipur, Khasi Hills (Meghalaya) ; Burma.

**Remarks :** The species is extremely rare in the Khasi Hills.

### 16. *Lepidocephalus guntea* (Hamilton)

1822. *Cobitis guntea* Hamilton, *Fish Ganges*, pp. 353-394 (**Type-locality :** Ponds and freshwaters of Bengal).

1889 *Lepidocephalus guntea*, Day, *Faun. Brit. Ind. Fish.*, I, p. 220, fig. 80.  
D. 2/6 ; P. 8 ; V. 7-8 ; A. 2/5 ; C. 16 : Barbels 3 pairs.

**Bengali :** *Gunte'*.

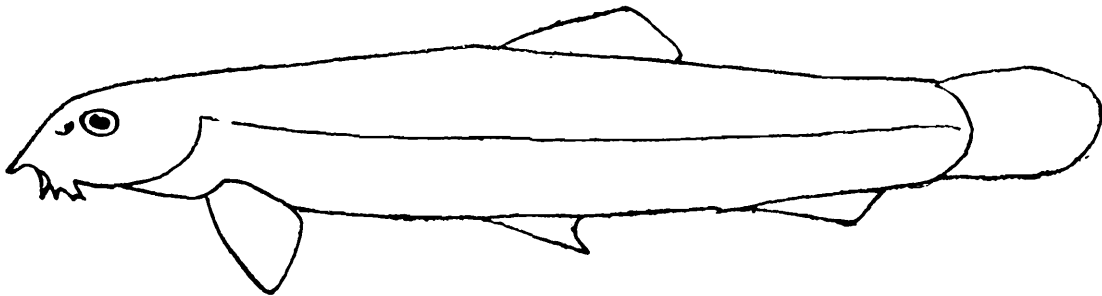


Fig. 18—*Lepidocephalus guntea* (Ham.)

*General features* : In this loach, the dorsal and ventral profiles of the body are almost parallel but deepest in front of the dorsal fin. A large erectile, bifid spine countersunk below the eye. Upper profile of snout almost a quadrant but its lower profile is horizontal. Barbels are short. Dorsal fin is located opposite the ventrals and the caudal fin is entire. Head is partly scaled ; scales are minute.

This species exhibits a great range of variation in colouration. In the Khasi Hills, however the colour of the body is brown dorsally, and dirty yellowish brown laterally. A black band composed of a number of dark spots run from the snout to the tail region. Some spots and dark markings are also present on the fins.

*Distribution* : India : Throughout northern, central and part of western India ; Nepal ; Bangladesh and Pakistan ; Burma.

### Genus *Noemacheilus* Van Hasselt

1823. *Noemacheilus* Van Hasselt, *Alg. Konst. Letterbode*, 2(35), p. 133  
(Type : *Noemacheilus fasciatus* Van Hasselt)

#### KEY TO THE SPECIES OF NOEMACHEILUS

- |   |     |     |                            |
|---|-----|-----|----------------------------|
| 1. Well marked nasal barbels  | ... | ... | 3                          |
| 2. No well marked nasal barbels   | ... | ... | 4                          |
| 3. Caudal fin square or faintly lobed ; ground colour yellowish, with 14-16 brown transverse belts wider than the interspace between them                   | ... | ... | <i>N. rupicola inglisi</i> |
| 4. Vertical brown bands as wide as the ground colour, numerous bands between head and dorsal and 5 behind the dorsal  | ... | ... | <i>N. multifasciatus</i>   |
| 5. About 12 vertical dark-brown bands on sides, narrower than the ground colour, 4 bands before the dorsal, 3 under the dorsal base and 5 behind the dorsal | ... | ... | <i>N. sikmaiensis</i>      |
| 6. About 14 vertical, wide, brown bands separated by narrow yellowish bands   | ... | ... | <i>N. dayi</i>             |

### 17. *Noemacheilus dayi* Hora

1878. *Nemachilus savona* Day (in part), *Fish India*, p. 619, pl. 155, fig. 8  
 1935. *Nemachilus dayi* Hora, *Rec Indian Mus*, **37**, p. 57 (Type-locality :  
 N. W. Province)  
 D. 2-3/8 ; P. 10 ; V. 7 ; A. 2/5 ; C. 18 ; Barbels 3 pairs.

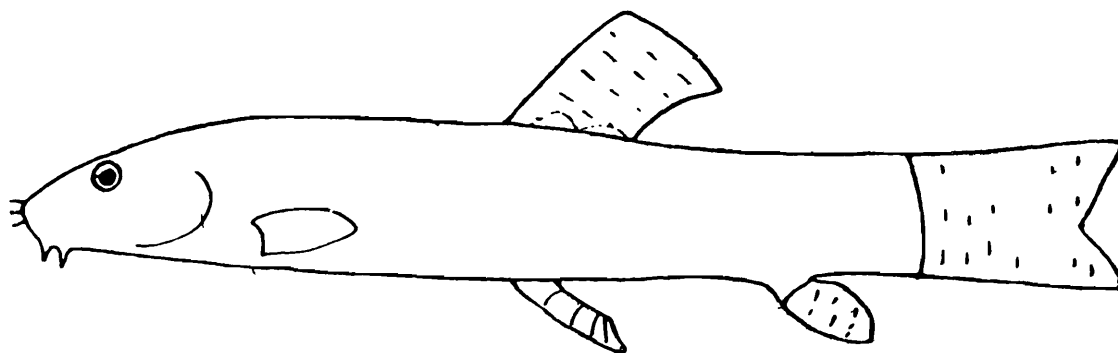


Fig. 19—*Noemacheilus dayi* Hora

**General features :** A well-built loach. The dorsal fin arises before the origin of the ventrals ; the caudal is slightly emarginate. Lateral line incomplete.

The ground colour is purplish dorsally ; the dorsal fin is marked with 4-5 rows of spots and its base marked with blotches ; the caudal fin has several irregular bands. Body banded ; about 14 vertical, wide brown bands separated by narrow yellowish bands. Ventral and anal fins are also banded.

**Distribution :** India Meghalaya, Bengal, N. W Province, Bihar, Madhya Pradesh and Western Ghats ; Bangladesh.

### 18. *Noemacheilus multifasciatus* Day

1878. *Nemachilus multifasciatus* Day, *Fish. India*, pp. 617, pl. 153, fig. 7  
 (Type-locality : Darjeeling and Assam)  
 1889. *Nemachilus multifasciatus*, Day, *Faun. Brit. Ind. Fish.*, **I**, p. 231.  
 D. 2/8 ; P. 11 ; V. 9 ; A. 2/5 ; Barbels 3 pairs.

**General features :** In this loach, the profiles are very slightly arched and eyes are situated partly before the middle of head length. The maxillary pair of barbels is longer than the eye but the rostral pair is slightly shorter. Caudal fin is lobed in its last fourth. Pectoral fins reach half way to the ventral. Lateral line complete or incomplete.

Body vertically banded ; the bands almost as wide as the ground colour, pass from the back to the lower surface of the abdomen ;

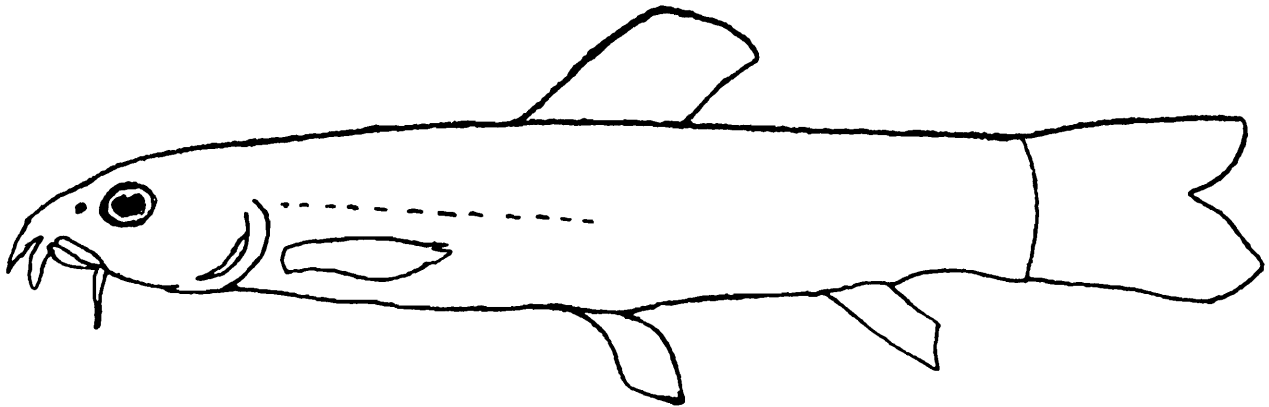


Fig. 20—*Noemacheilus multifasciatus* Day

those anterior to dorsal fin are numerous, while there are 5 bands posterior to the dorsal fin. Fins are yellowish ; the dorsal and caudal fins are provided with many rows of spots.

*Distribution* : India : Assam, Meghalaya & W Bengal.

### 19. *Noemacheilus rupicola inglisi* Hora

1935. *Nemachilus rupicola* var. *inglisi* Hora, *Rec. Indian Mus.*, 37, pp. 58, pl. 3, fig. 9-10 (Type-locality ; rivers below Darjeeling and Sikkim).

1938. *Nemachilus rupicola* var. *inglisi*, Shaw and Shebbeare, *J. Asiat Soc. Beng.*, 3, p. 74, text-fig. 71.

D 2/7 ; P. 12 ; V. 8 ; A. 1/5 ; C. 16 ; Barbels 3 pairs.

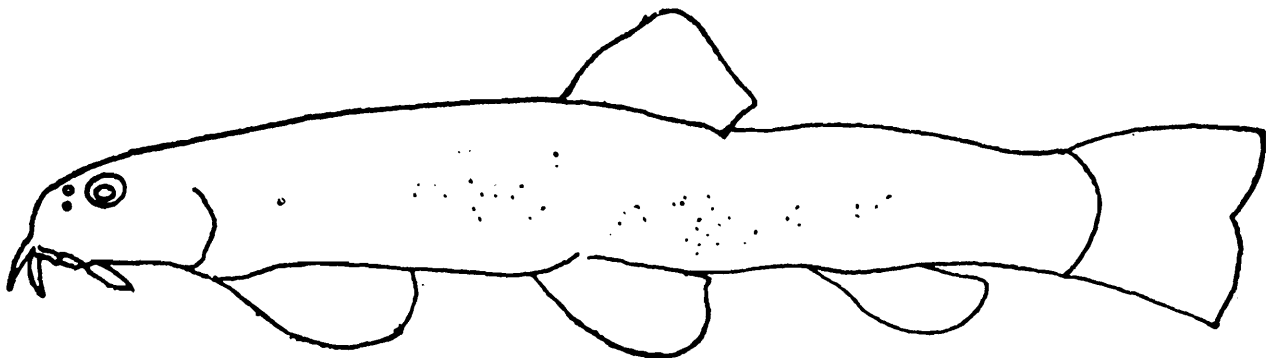


Fig. 21—*Noemacheilus rupicola inglisi* Hora

*General features* : A stoutly built loach, roughly cylindrical anteriorly (except for the flattened belly), tapering towards the caudal which is slightly compressed laterally. The dorsal profile is slightly

arched and the ventral (profile) straight. Nasal barbels are strongly developed, The paired fins are horizontally placed. The caudal fin is square or faintly lobed.

Body colour is yellowish, with 14 to 16 brown vertical bands which are wider than the interspaces between them ; those behind the dorsal fin are almost across the back but those in front of it break up into isolated blotches.

*Distribution* : India : Assam, Meghalaya, West-Bengal, Bihar, U.P. and Sikkim ; Bangladesh.

*Remarks* : *N. rupicola inglisi* Hora is one of the commonest loach of the genus *Noemacheilus* in the Khasi Hills.

## 20. *Noemacheilus sikmaiensis* Hora

1921. *Nemachilus sikmaiensis* Hora, *Rec. Indian Mus.*, 22, p. 201, pl. 9, fig. 4, pl. 10, fig. 1, 1a (Type-locality : Sikmai stream, near Palel, Manipur.

D. 2/8 ; A. 2/5 ; P. 2/12 ; V. 8 ; Barbels 3 pairs.

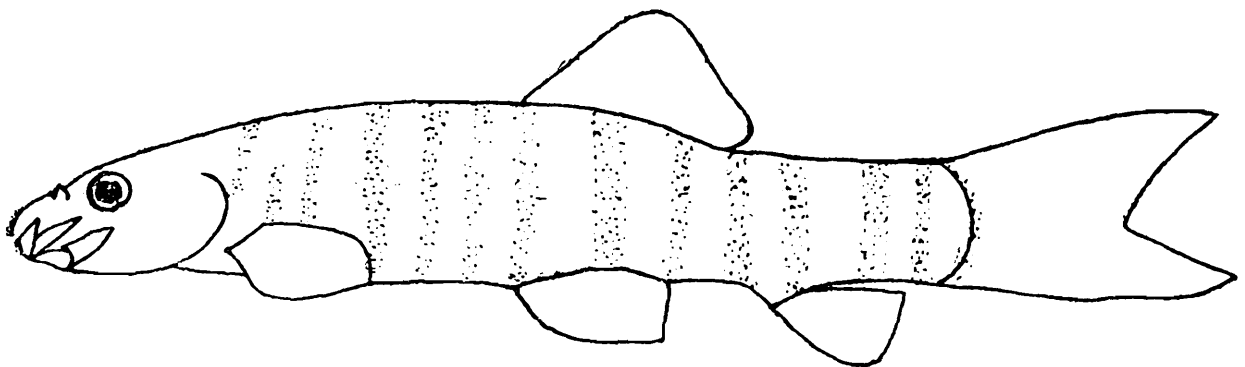


Fig. 22 *Noemacheilus sikmaiensis* Hora

*General features* : The dorsal profile rises gradually upto the dorsal fin and then slopes to the base of the caudal fin. The head is slightly depressed and the ventral (Profile) almost horizontal. Mouth is inferior, semicircular and is surrounded by thick lips. The lower lip, slightly notched in the middle, is without any swelling papillae. The two rostral pairs of barbels are the longest and reach the posterior margin of the nostrils. The origin of the dorsal is slightly in advance of the ventrals. The pectoral fins are rounded and shorter than the head. The pelvic fins reach the vent. The caudal fin is deeply forked. Lateral line does not extend beyond the middle of anal fin.

Body provided with 12 to 13 black rings around it, separated by an equal number of slightly narrow white ones. A black band across the base of the caudal fin is present.

*Distribution* : India : Khasi Hills (Meghalaya), Manipur ; Burma.

### Family SILURIDAE

Catfishes with strongly compressed body and depressed head ; without scales ; a single short dorsal fin without spines, neither second dorsal nor adipose fin present. Anal fin is long. Two pairs of barbels present ; nasal barbels absent.

### Genus *Ompok* Lacépede

1803. *Ompok* Lacépede, *Hist. Nat. Poiss.*, 5, p. 49 (Type : *Ompok siluroides* Lacépede)

### 21. *Ompok bimaculatus* (Bloch)

1797. *Silurus bimaculatus* Bloch, *Ichthyol. Hist. Nat. d. Poiss.* ; pt. 11, p. 17, pl. 364 (Type locality : Malabar)

1889. *Callichrous bimaculatus, pabda, sindensis, macrophthalmus, malabaricus*, Day, *Faun. Brit. Ind. Fish.*, 1, p. 130, 132, 133, 134, fig. 57.

D. 2-5 ; P. 1/11-15 ; V. 8-10 ; A. 2-3/47-72 ; C. 13-19 ; Barbels two pairs.

*Khasi* : Kha Babia ; *Bengali* : Pabda ; *Assamese* : Pubha.



Fig. 23—*Ompok bimaculatus* (Bloch)

*General features* : Body elongate and laterally compressed. The lower jaw is prominent and is slightly longer than the upper. The maxillary pair of barbels reaching the origin of the anal and a little beyond it. The mandibular pair of barbels reaching the hinder edge

of the orbit. Pectoral spine is strong, serrated internally. Anal fin is not continuous with the caudal fin, which is forked and its upper lobe is slightly longer.

Generally silvery ; a black spot behind the gill-opening and another at the tail is present.

*Distribution* : Throught India, Pakistan, Nepal, Bangladesh, Sri Lanka, Burma, Malay Archipelago, Thailand and Indochina.

*Remarks* : This species is extremely rare in the Khasi Hill.

### Family SISORIDAE

Catfishes with head and anterior portion of the body broad and depressed, lower surface of head and abdomen flat. Mouth small, transverse, the upper jaw the longer. Nostril close together, separated by a barbel, 4 pairs of barbels. Dorsal fin with a spine ; paired fins are horizontal.

### Genus *Glyptothorax* Blyth

1860. *Glyptothorax* Blyth, *J. Asiat. Soc. Beng.*, 29, p. 154 (Type : *Glyptothorax trilineatus* Blyth)

#### 22. *Glyptothorax striatus* (McClelland)

- 1842 *Glyptosternon striatum* McClelland, *Calcutta J. nat. Hist.*, 2, p. 587, pl. 6, fig. 1, 2 (Type-locality : Kosyah mountains)
1889. *Glyptosternum striatum*, Day, *Faun. Brit. Ind. Fish.*, 1, p. 200.  
D. 1/6 ; P. 1/11 ; V. 6 ; A. 2/9 ; C. 15 ; Barbels 4 pairs ;

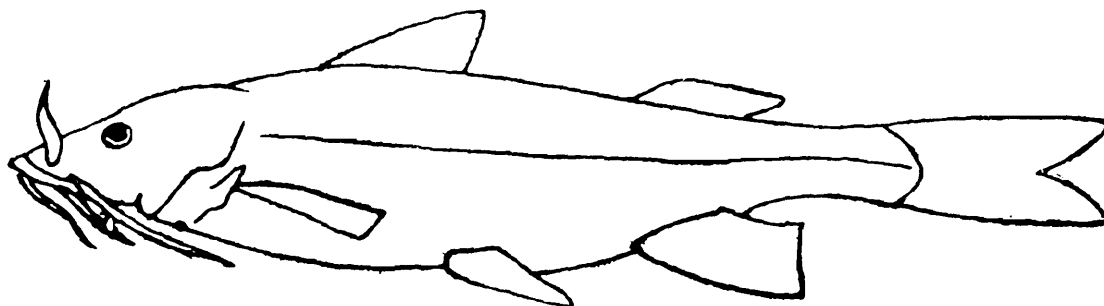


Fig 24—*Glyptothorax striatus* (McClelland)

*General features* : Head rather depressed, nearly as broad as long. The upper jaw is longer than the lower ; the width of the gap of mouth

equals half the length of the head. The maxillary pairs of barbels reaching beyond the origin of the pectoral fin.

Generally uniform brown in colouration.

*Distribution* : India : Sikkim, Meghalaya, Assam Himalayas.

### Family CLARIIDAE

Catfishes with a very long anal fin containing more than 45 rays and a long dorsal fin which is spineless. Barbels are 4 pairs. Nasal barbels are present. Branchial cavity with dendritic accessory respiratory organ.

### Genus *Clarias* Scopoli

1777. *Clarias* Scopoli, *Introd. Hist. Nat.*, p. 445  
(Type : *Clarias orontis* Gunther)

### 23. *Clarias batrachus* (Linnaeus)

1758. *Silurus batrachus* Linnaeus, *Syst. Nat.*, 1, ed. 10, p. 305  
(Type-locality : Asia and Africa)

1889. *Clarias magur*, Day, *Faun. Brit. Ind. Fish.*, 1, p. 115, figs. 48 & 49.  
D. 62-76 ; P. 1/8-11 ; V. 6 ; A. 45-58 C. 15-17 ; Barbels 4 pairs.

*Khasi* : Kha Magoor ; *Bengalee & Assamese* : Magur.

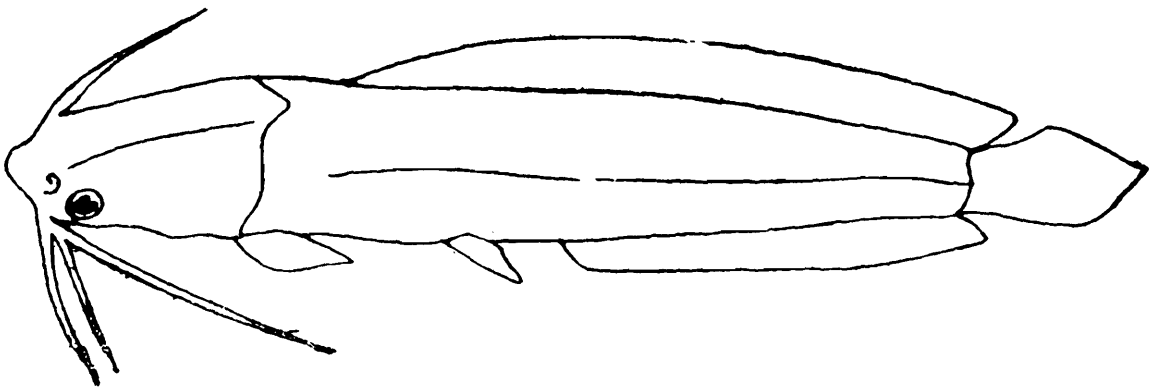


Fig. 25—*Clarias batrachus* (Lin.)

*General features* : Head is depressed and the tail compressed. Upper jaw is longer than the lower. The nasal barbels reach the base of the occipital process ; the maxillary pair run only upto the middle of pectoral and the mandibular up to the base of the pectoral. Pectoral fin reaches below the origin of the dorsal, its spine serrated externally

as well as internally. The dorsal fin is very long, free from the caudal fin which is rounded.

Usually brownish black in colouration.

*Distribution* : Fresh and brackish waters of India, Sri Lanka, Pakistan, Bangladesh, Burma, Malay Archipelago, Thailand, Indo-China, Philippines, Hong Kong and S. China.

*Remarks* : This species possesses accessory respiratory organ and it is able to breath air. It can, therefore, survive for a long time out of water.

#### Family HETEROPNEUSTIDÆ

Catfishes with a short spineless dorsal fin and a long anal fin with more than 45 rays. No adipose fin. Barbels 4 pairs; nasal barbels present. A long air-sac acting as an accessory respiratory organ extend back from the branchial cavity.

#### Genus *Heteropneustes* Müller

1840. *Heteropneustes* Muller, *Arch Anat. Physiol.* p. 115  
(Type : *Silurus fossilis* Bloch)

#### 24. *Heteropneustes fossilis* (Bloch)

1797. *Silurus fossilis* Bloch, *Ichth. His. nat. d. Poiss.*, 11, p. 36, pl. 370, fig. 2.

1889. *Saccobranhus fossilis*, Day, *Faun. Brit. Ind. Fish.*, 1, p. 125, fig. 53.  
D. 6-7; P. 1/7; V 6; A. 60-79; C. 19; Barbels 4 pairs.

Khasi : *Kha Singhi* ; Bengali : *Singhi* ; Assamese : *Singi*.

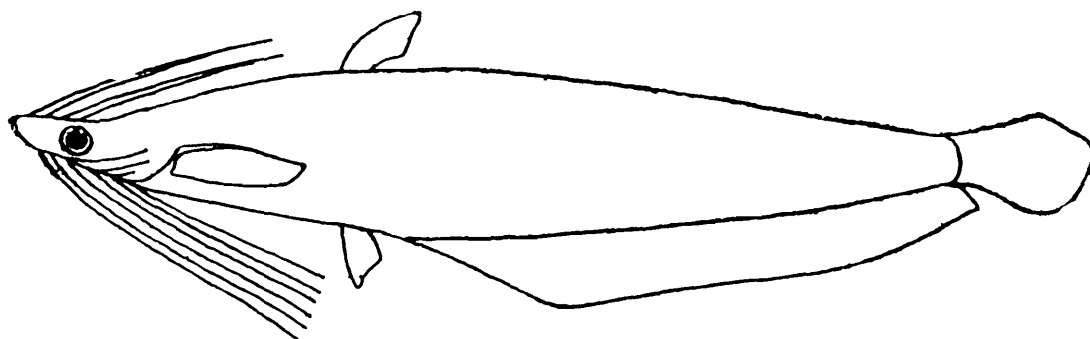


Fig. 26—*Heteropneustes fossilis* (Bloch)

*General features* : Body tapers gradually from the gills to the caudal fin in the horizontal plane. Head is somewhat flat and wide. The snout is almost chisel-like. The maxillary barbels reach the pectoral or beyond it. Dorsal fin is short, commences in the anterior 1/3 of the body. Pectoral spine is serrated internally but some serrations at its anterior part externally are also present. Caudal is rounded.

*Distribution* : Freshwaters of India, Sri Lanka, Pakistan, Bangladesh, Nepal, Burma, Thailand and Indo-China.

*Remarks* : This species is also able to breathe air and can survive out of water for sometime. In the Khasi Hill it grows to 160.0 mm in length (see Yazdani, 1977) whereas in the plains it has been found to attain a length of one foot (304.0 mm) (see Misra, 1962).

#### Family CHANNIDAE

Body is elongate and subcylindrical. Head is broad and depressed with plate-like scales. Mouth is large. Eyes are laterally placed. Gill-openings are wide, the membranes being connected together beneath the isthmus. Supra-branchial cavities are present. Dorsal fin is single long and spineless. Anal fin is shorter than the dorsal and is spineless.

#### Genus *Channa* Scopoli

1777. *Channa Scopoli. Introd. Hist. Nat. p. 459* (Type : *Channa orientalis* Bl. & Schn.)

#### KEY TO THE SPECIES OF CHANNA

1. Ventral 3/4th length of pectoral ; pectorals without transverse bands and with uniform colouration ; several bands or patches from back pass down the abdomen ... *C. punctata*
2. Ventral 1/3rd to 2/3rd length of pectoral.  
Pectoral spotted in zones ... .. 3
3. Ventral 1/3 to 1/2 the length of pectorals ... .. *C. stewartii*
4. Ventral 2/3 the length of pectorals ... .. *C. orientalis*

25. *Channa orientalis* Schneider

1801. *Channa orientalis* Schneider, *Syst. Ichth. Bloch* , p. 496, pl. 90, fig. 2  
(Type-locality : India)

1889. *Channa orientalis*, Day, *Faun. Brit. Ind. Fish.*, 2, p. 365

1879. *Ophiocephalus gachua*, Day, *Faun. Brit. Ind. Fish* , 2 p. 364.

D. 32-37 ; P. 15 ; V. 6 ; A. 21-23 ; C. 12 : Ll. 40-45 ; L. tr. 3-4/6-7 ;  
predorsal scales 12.

Khasi : *Dohlti* ; Bengali : *Cheng* ; Assamese : *Cheng*.

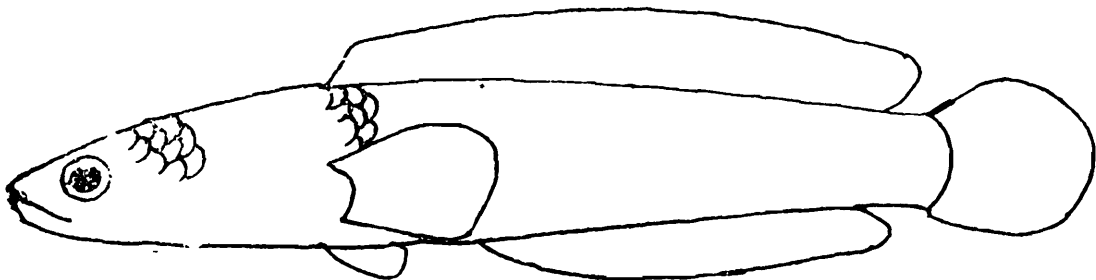


Fig 27—*Channa orientalis* Schneider

*General features* : Body sub-cylindrical, tapering from the flattened, snake-like head to the rounded caudal. Scales on head broad and irregular. A row of 4 to 5 scales between the orbit and the angle of the opercle.

Colour varies with the environment ; generally brown becoming lighter beneath ; pectoral with a black base, transversely barred ; darker and lighter patches above and below the lateral line ; chin marbled

*Distribution* : India, Sri Lanka, Nepal, Pakistan, Bangladesh, Burma, Thailand, Indo-china, Yunan, Malaya, Malay Archipelago, Hainan and Taiwan.

*Remarks* : *Channa orientalis* is one of the commonest species in the Khasi hill-streams. It co-exists with *C. stewartii* (Playfair) and lives along the edges of streams having overhanging vegetation. It is known to grow to 203 mm (8 inches) in length (Misra, 1962) but the longest specimen found in the Khasi Hill is only 115 mm (Yazdani, 1977).

26. *Channa punctata* (Bloch)

1793. *Ophiocephalus punctatus* Bloch, *Naturges ausland Fische*, 7, p. 139, pl. 358 (Type-locality : Coromandel coast).
1889. *Ophiocephalus punctatus*, Day, *Faun Brit. Ind. Fish.*, 2, p. 364.  
 D 29-34 ; P. 17 ; V. 6 ; A. 21-23 ; C. 12 ; L. 1. 37-40 ; L. tr. 4-5/9 ; predorsal scales 12.

Bengali : *Lata* ; Assamese : *Goroi*.

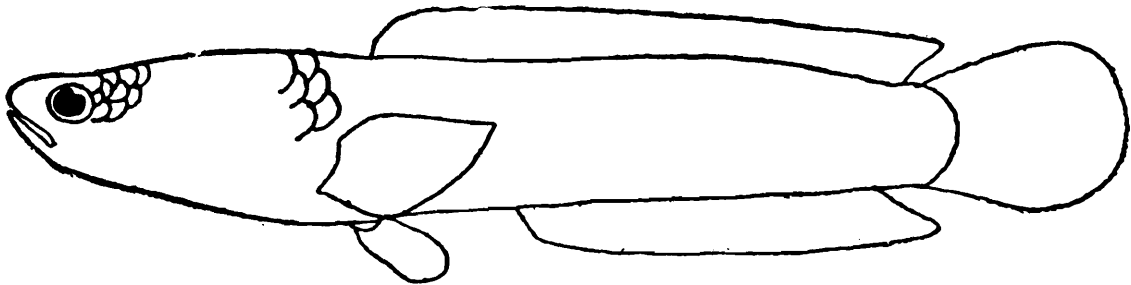


Fig. 28—*Channa punctata* (Bloch)

**General features :** Shape similar to that of *C. orientalis*. Ventral fin three-fourth as long as pectoral. Five rows of scales between eye and angle of preopercle.

**Colour varies with the environment.** Brown on the dorsal side fading to lighter laterally ; a dark stripe along side of head and several short cross bands from back to middle of body.

**Distribution :** India, Sri Lanka, Pakistan, Nepal, Bangladesh and Burma ; Malay, China, Tahiti, Polynesia.

**Remarks :** Compared to other species of *Channa*, this species is rather rare in the Khasi Hill.

27. *Channa stewartii* (Playfair)

1867. *Ophiocephalus stewartii* Playfair, *Proc. zool. Soc. Lond* ; pp. 14, pl. 3 (Type-locality : Cachar, Assam).
1889. *Ophiocephalus stewartii*, Day, *Faun. Brit. Ind. Fish.*, 2 p. 363.  
 D. 35-40 ; P. 17 ; V. 6 ; A. 23-28 ; C. 14 ; Ll. 45-50, L. tr. 4½-5½/9-7.

Khasi : *Dohthli*.

*General features* : Shape very similar to *C. orientalis*.

Colour varies with the environment. Generally dark brown dorsally fading to lighter on sides ; pectorals spotted on zones ; darker and lighter patches continuous above and below the lateral line. Chin marbled.

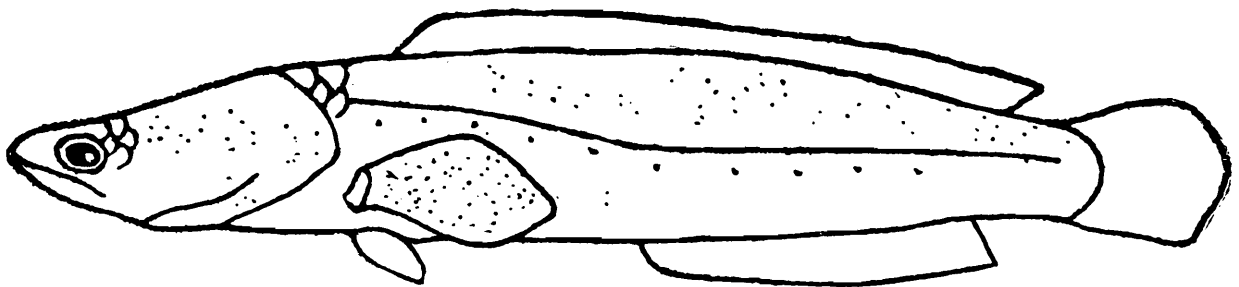


Fig 29—*Channa stewartii* (Playfair)

This is one of the common species of fish in the Khasi-hill-streams. It very much resembles *C. orientalis* in its way of life.

*Distribution* : India : Bihar, W Bengal, Assam, Meghalaya and Arunachal Pradesh ; Nepal.

*Remarks* : In the Khasi Hills, *C. stewartii* shows a great range of variations in its meristic and morphometric character which are likely to offer some difficulty in distinguishing it from its closest ally, *C. orientalis*. Yazdani and Chanda (1971) have redefined the key characters of *C. stewartii* as follows : dorsal fin rays 35-40 (vs 39-40), anal fin rays 23-28 (vs 26-27) and ventral fin  $\frac{1}{2}$  to  $\frac{1}{3}$  (vs  $\frac{2}{5}$ ) of the pectoral fin.

*C. stewartii* is known to grow up to 10 inches (Day, 1889) and 18 inches (Shaw & Shebbeare, 1938) in length but the longest specimen found in the Khasi Hills is only 111.0 mm ( $4\frac{1}{2}$  inches) (Yazdani, 1977).

#### Family NANDIDAE

Body is oblong and compressed. Mouth is large and greatly protractile. Gill-membranes free from each other. Spinous portion of the dorsal fin is much longer than the soft portion ; anal fin is with three spines ; the caudal fin is rounded ; ventral fin is thoracic. Scales on the body are ctenoid.

Genus *Badis* Bleeker

1853. *Badis* Bleeker, *Verh. Bat. Gen.*, 25, p. 106 (Type : *Labrus badis* Ham. = *Badis buchanani* Bleeker)

28. *Badis badis* (Hamilton)

1822. *Labrus badis* Hamilton, *Fish Ganges*, pp. 70, 368, pl. 25, fig. 23  
(Type-locality : Gangetic provinces)
1889. *Badis buchanani*, Day, *Faun. Brit. Ind. Fish.*, 2, p. 80, fig. 38.  
D. 16-17/7-10 ; P. 12 ; V. 1/5 ; A. 3/6-8 ; C. 16 ; L.l. 26-33 ; L. tr  $2\frac{1}{2}/8\frac{1}{2}$ .

Bengali : *Bot Koi* or *Bhedo* or *Bheda*.

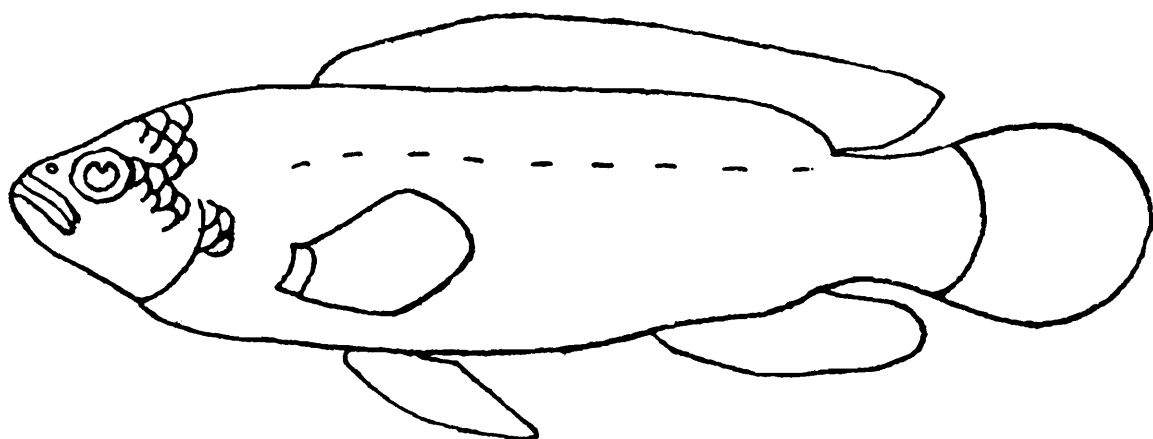


Fig. 30—*Badis badis* (Ham.)

*General features* : Body is elongated, oval, laterally compressed. Head is scaled ; opercle possesses one sharp spine. Dorsal spine is somewhat slender its soft portion elongated and pointed. Anal spines are short. Lateral line is placed high on the body but it is interrupted at 22nd scale and below the posterior extremity of the dorsal fin.

Colour is variable ; ground colour dirty red to dark brown with usually a series of darker transverse bands ; irregular black spots are also present on the body.

*Distribution* : Throughout India, Nepal, Pakistan, Bangladesh and Burma.

*Remarks* : This species is rather uncommon in the Khasi Hills and it lives near the edges of streams, hiding under vegetation.

## Family PILLAIIDAE

Small eel-like fish with subcylindrical, elongated body. Head depressed anteriorly. Head and body without scales. Mouth fairly

wide ; upper jaw with a single large strong hockey-stick shaped bone bearing teeth. Branchiostegal rays six. Dorsal and anal fins long without any spine. Small pectorals. Pelvic girdle and pelvic fins absent. Lateral line present.

### Genus *Pillaia* Yazdani

1972. *Pillaia* Yazdani, *J. Bombay nat. Hist. Soc.* **69**(1) : p. 134 (Type : *Pillaia indica* Yazdani)

#### 29. *Pillaia indica* Yazdani

1972. *Pillaia indica* Yazdani, *J. Bombay nat Hist. Soc.* **69**(1) : p. 134-135, fig. 1 (Type-locality : Summer stream near Shillong, Khasi and Jaintia hills. Meghalaya)

D. 34-36 ; P. 7-9 ; A. 34-36 ; C. 8-10.

Khasi : *Dha Bsein.*



Fig. 31—*Pillaia indica* Yazdani

*General features* : Small eel-like fish with long anteriorly depressed head ; without spines before dorsal or anal fins, with both dorsal and anal united with the caudal of 8-10 unbranched rays, without scales, a rather indistinct fleshy rostral appendage bearing anterior tubular nostrils ; eyes fairly prominent, placed dorsally, gill-openings wide ; mouth is wide and horizontal ; pectorals are small ; ventrals are absent.

Upper part of the body light to dark purplish brown, the lower part very light brown ; fins dirty white.

This little fish is very inactive and mostly spends its time lying at the bottom buried in mud or clinging to some submerged vegetation. Its swimming and crawling movements resemble that of the anguilliform fishes.

*Distribution* : India : Khasi Hills (Meghalaya).

*Remarks* : The little eel-like fish, *P. indica* is a characteristic of the fish-fauna of Khasi and Jaintia hills. The genus *Pillaia* is so peculiar that a new family Pillaiidae had to be erected for it (See Yazdani, 1976), under the suborder Mastacembeloidei of the order Perciformes (see Greenwood *et al*, 1966). The family Pillaiidae shows affinities with the Burmese eel-like fish (Chaudhuriidae) (Annandale, 1918 ; Annandale & Hora, 1:23) and spiny eels (Mastacembelidae) (Sufi, 1956).

#### SUMMARY

1. An introduction to the Khasi hill and its fish-fauna has been given.
2. A classified list of 29 species belonging to two major super-orders *viz* , Ostariophysii & Acanthopterygii, 4 orders, 10 families and 16 genera has been given.
3. Explanations to the abbreviations and terms, normally used in the description of fishes, has been given with illustrations.
4. A key to the identification of the families of fishes in the Khasi Hills has been given.
5. A systematic description of the 29 species has been given along with keys to the identification of species and genera under each family.
6. Under the systematic description of each species is given important synonyms, fin formulae, local names, outline drawing of the fish, general features, general distribution and, wherever necessary, remarks on taxonomic characters.

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