

OCCASIONAL PAPER NO. 215

**RECORDS OF THE
ZOOLOGICAL SURVEY OF INDIA**

Ichthyofauna of northern part of Western Ghats

B.E. YADAV

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Edited by the Director, Zoological Survey of India, Kolkata



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PREFACE

It gives me immense pleasure to publish the ichthyofaunal work carried out by me under the supervision of Dr. G.M. Yazdani, Ex-Scientist 'SF' Pune.

After a monumental work of eminent ichthologists like Dr. S.L. Hora, Ex-Director, Z.S.I., Calcutta, Dr. A.G.K. Menon, Emeritus Scientist, S.R.S., Z.S.I.; Dr. K.C. Jayaram, Ex-Joint Director, Z.S.I., S.R.S., Chennai and other veteran scientists, I am delighted indeed to be a small fry in ocean but getting a splendid opportunity to explore marvelous fishes of northern part of Western Ghats.

The Western Ghats, one of the twenty five hotspots in the world sustains unique piscine fauna, which need protection. The present work submits an account on 135 species of fishes comprising 57 genera and 22 families under 8 orders of freshwater fishes viz. foodfishes, gamefishes, ornamental fishes and many more.

I hope this work will serve the purpose of inquisitive research workers and can provide insight into ichthyology.

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CONTENTS

INTRODUCTION	1
MATERIAL AND METHODS	2
RESULTS AND DISCUSSION	3
TABLE I : Geographical distribution of the fishes in major river systems of the Western Ghats	6
SUMMARY	26
ACKNOWLEDGEMENTS	26
BIBLIOGRAPHY	26
TABLE II : Fishes of Western Ghats	30
TABLE III : Percentage composition of major orders of fishes occurring in two global Hotspots	31
TABLE IV : Composition of threatened and endemic fishes in Western Ghats	31

INTRODUCTION

The Western Ghats constitute an important biogeographic zone of India. It is one of the global hotspots, in megadiversity country. The ecosystem and biota herein is of immense importance from conservation point of view. The chain of hills, almost continuous from Dangs District of Gujarat (8°-23°N. latitude and 73°-78°E longitude) to Kanyakumari, Dist., Tamil Nadu, measuring about 1400 km in length, parallel to the West coast with a unique gap at Palghat (Kerala State). The hills stand at the altitudinal range between 200 to 2700 MSL with senile topography of crystalline rocks, flat tops etc. in northern part and with rounded heads in the southern portion. It covers Dangs District in Gujarat, 12 in Maharashtra, 5 in Karnataka, 1 in Tamil Nadu, entire Goa state and Kerala.

Sixty million old tropical ecosystem of the Western Ghats is recognised by high degree of precipitation, moderate climate and variety of forests (from dry deciduous to mixed deciduous, evergreen, shola grass land and Savana forest (at 4500-1700 M). The Western Ghats give rise to 3 major east flowing rivers viz. Godavari, Krishna and Cauvery as well as a west flowing river, Tapi which originates from Satpura hill ranges, M.P. and its lower reaches traverse through western Ghats. Many short west flowing rivers along with their tributaries, also tranverse through the ranges. The unique topography and structural function of Western Ghats is to obstruct the south west monsoon and forming a major watershed for Peninsular India. The present ichthyofaunal study of northern part includes the fish collection from Gujarat State to South Kanara, Dist., Karnataka.

The study area constitutes significant piscine fauna comprising 135 species of 57 genera under 22 families. The waterbodies like ponds, puddles, foot hills, hillstreams rivulets, rivers and many reservoirs support excellent fish life. However, 51 species of fishes (i.e. 38%) are under severe threat of becoming rare or extinct in near future. Moreover 41 species amongst these are endemic to this region.

The Western Ghats offer substantial fish material for taxonomic study and many workers have contributed to the science, a knowledge on the ichthyofaunal diversity of this region. (Annandale, 1919, Hora, 1937, 1949, 1953, 1935, Hora and Misra, 1937, 1939, 1942, Fraser, 1942a, b; Kalwar and Kelkar, 1956, Silas, 1953, 1958, David 1963, Menon, 1964, 1973, 1992, Jayaram, 1974, 1995, 1997, Jayaram *et. al.* 1982; Hora and Mukerji, 1953, 1935; Rao *et. al.* 1975, Rao and Yazdani, 1977; Singh and Kamble, 1987, Singh and Yazdani, 1988; 1991 Sykes, 1841; Tilak and Tiwari, 1976; Tonapi and Mulherkar, 1963, Valsangkar, 1993, Yazdani, 1991, Yazdani and Mahabal, 1976, Silas,

1952, Menon, 1977, 1988; Yazdani and Singh, 1990, 1994; Yazdani and Yadav, 1995; Yadav, 1996, Sarkar and Yadav 1995, Ghate and Wagh 1991, 1994; Ghate and Pawar, 1992, Ghate *et al.*, 1992, Suryawanshi, 1996). Although the above work provides a good insight into the ichthyofauna, taxonomic status of fishes and bibliographic information, it is restricted to a particular region of the Western Ghats. The present study reveals the ichthyofauna spread over from waterbodies of Gujarat to south Kanara, Karnataka with an updated account of fishes with comments on the status of threatened and endemic species on the basis of work carried out by Yadav (1997).

MATERIAL AND METHODS

The fish material was collected by applying different methods, by using cast net having 6 meter diameter in rivers as well as with the aid of smaller net in shallow water and also by using bag net.

Various parties of Zoological Survey of India, Western Regional Station, collected the huge fish material during the surveys conducted in the past 35 years (1960-1995), covering the entire northern part of Western Ghats.

The fish specimens collected were instantly fixed in 4-5% Formaldehyde solution and subsequently after 3-4 hour's fixation and washing with water, transferred to rectified spirit. The large sized specimen was injected with 10% Formaldehyde and given incision on its belly.

While identifying the fish specimens, stress was mainly given on stable characters, both meristic and morphometric. The shape of the snout, presence or absence of barbels, number of dorsal finrays, number of scales in lateral line, scales in transverse lines, predorsal scales etc. (meristic characters which do not vary with age were considered important in identifying fishes).

The fishes were studied, identified and their valid scientific names have incorporated in the present paper. The latest authentic books on fish systematics and Fauna volumes such as Day (1878, 1889), Jayaram (1981, 1991), Menon (1964, 1987) and Talwar and Jhingran (1991) were referred to for fish identification.

A data in Table I indicates distribution of fishes in major river systems of Western Ghats, common name, distribution, status, key character etc. Table II denotes approximate number of broad category of fish spp. Table III indicates % fish composition of various orders occurring in Western Ghats and in Himalaya. Table IV represents % of threatened and endemic species in two major orders. Histogram I reflects on decline in number of fishes in 3 decades (1960-69, 1970-79, 1980-89) and II indicates comparative occurrence of fish spp. in Krishna river system.

RESULTS AND DISCUSSION

The present study reveals that moderate cooler climate, high degree of precipitation and senile topography of tropical ecosystem in Western Ghats sustain significant piscine fauna. The northern part of Western Ghats harbour 135 species of fishes, comprising 57 genera, 22 families and 8 orders.

It is evident from Table II that along the eastern and western drainage systems, a good number of species of foodfishes, aquarium fishes, gamefishes, larvivorous fishes, rarely occurring species restricted to easterly drainage, common to both drainage systems and few are restricted to west flowing rivers, while few fish species are exotic and are harmful to indigeneous population.

Among 13 species of fishes occurring in waterbodies of Western Ghats 51 species (i.e. 38%) are endemic to this region, out of these, 41 species (30.6%) are under serious threat of becoming rare or extinct (Table III). The population status of a species has been determined by the fish collection present in Western Regional Station, Zoological Survey of India (Yadav, 1997), Menon (1988) and Yazdani (1991). Although a high degree of endemism in fishes is observed in Western Ghats due to human invasion, water pollution etc fish population is declining in number. During the period of present study and based upon date of previous collection; it has been found that in a decades (1960-1969, 1970-1979, 1980-1989) a steady decline in number has been observed (39%, 35%, 26%) (Fig. III).

Table III shows that Cypriniformes (carps, barbs, minnows forms a predominant group comprising 86 species (65%), followed by Siluriformes, (Catfishes), 28 species (20%), Perciformes (Perches) 10 species (7.5%) and other minor groups (Osteoglossi formes, Beloniformes, Cyprinodontiformes) 10 species (7.5%).

Among cyprinids, subfamily Cyprininae shows large assemblage of fish species which is 59%. Other subfamilies Cultrinae, Rasborinae, Garrinae, Parapsilorhynchinae exhibit common distribution but lesser speciation. In Cyprininae, the genera *Labeo* and *Puntius* show maximum speciation in Western Ghats (11) and (20) respectively. *Labeo* spp. are medium to large sized fishes having typical shape of snout, while *Puntius* spp. constitute small to medium sized boat shaped fishes (barbs). The genus *Puntius* forms 51% species in the northern part of Western Ghats, out of the total occurring in Indian waters. It is 44% of all the genera of subfamily Cyprininae in the region, while 75% of *Puntius* spp. in Western Ghats. The cyprinids are clear water inhabitants and mostly surface feeders. Members of the genera *Chela*, *Salmostoma* (Cultrinae), *Rasbora*, *Danio* (Rasborinae), *Puntius* (Cyprininae), *Nemacheilus* (Homalopteridae Nemacheilinae), can be considered as indicators of water pollution. The genera *Garra*, *Crossocheilus*, *Tor*, *Schismatorhynchus*, *Parapsilorhynchus* (Cyprinidae), *Nemacheilus*, *Lepidocephalus* and *Botia* (Homalopteridae) constitute members of hillstream fishes. In the order 40% cyprinids are threatened and 23.5% are endemic to northern part of Western Ghats, (Table IV).

In the order Siluriformes (catfishes), family Bagridae constitutes (14 spp.), Siluridae (4 spp.), Schilbeidae (3 spp.), Sisoridae (4 spp.) Clariidae (2 spp.) and Heteropneustidae (1 sp.). In the family Bagridae, genus *Mystus* exhibits 11 species of fish and is a predominant genus under this family from this region. The fishes of other genera like *Aorichthys* and *Rita* occur frequently but among the former, *Aorichthys sheenghala* (Sykes) is a common species. The sisorids represent hill stream fishes. Among carnivorous, nocturnal catfishes, many are food fishes and game fishes.

In the order Perciformes (Perches), there are 8 genera and 10 species, while in other minor orders there are 10 species which are mostly larvivorous, burrowing (Mugiliformes, Beloniformes, Cyprinodontiformes and Synbranchiformes).

The fishes of northern portion of Western Ghats also include the air breathing catfish, magur : *Clarias batrachus* (Linn.) air sac catfish, Bichhu ka kata, *Heteropneustes fossilis* (Bloch) (Siluriformes); jumping perch, *Ananbas testudineus* Bloch, snake headed fish *Channa* spp.; swampeel *Monopterus indicus* (Silas & Dawson) (Synbranchiformes). These fishes possess either labyrinthiform organ helping them in aerial respiration while others have air sacs in operculum or in alimentary canal for the same purpose. These fishes can withstand oxygen debt and are able to survive in slightly polluted and inadequate quantity of water.

The fishes occurring in the southern part of Western Ghats like *Bhavanaia australis* (Jerdon) *Homaloptera montana* Herre, *Travencoria jonesii* Hora are not found in the northern region while blind snake eel (Ophiichthyidae), cold water trout *Schizothorax richardsonii* (Gray), Indian trout *Raiamas bola* (Ham-Buch) and *Psilorhynchus* spp. which occur in the Gangetic river system are absent from northern part of Western Ghats.

The present observation coincides to that of Jayaram (1995) on Krishna river system. Cypriniformes forms 65% (68.8), Siluriformes 20% (16.8), Perciformes, 7.5% (8.6) and other 7.5% (5.8) of the total ichthyofuna. Further, ichthyofauna of Godavari river system resembles to that of Tapi river system.

On comparing the ichthyofauna of northern part of Western Ghats with that of the Himalayan drainage, demonstrates that the former contains more number of cyprinoid species and lesser number of siluroid and lesser number of percoid species. The ichthyofauna of Western Ghats vs Himalayan drainage is expressed as : Cypriniformes : 65% vs 53%, Siluriformes : 20% vs 29% and Perciformes 7.5 vs 15% (Yazdani 1994 unpublished report). Further, Menon's work (1962) on Ganga, Brahmaputra and Indus river systems clearly shows the presence of fish families as follows : Cypriniformes : 57-59%, Siluriformes : 20-29% and Perciformes : 13-20%. Among catfishes, the number of sisorid species is found higher in snowfed Himalayan rivers than those of Peninsular rivers. This striking difference in the ichthyofauna can possibly be correlated with the differences in climate and river systems between these two important biogeographic zones of India.

Earlier studies by ichthyologists, Hora (1937, 1949 & 1953), Menon (1964, 1987) have clearly revealed the fact that Cypriniformes, a major order of toothless carps, having single dorsal fin and cycloid scales seems to have evolved from ancestors of Indo-Malayan and Indo-Chinese origin. Evidently it appears that this is successful group of lower teleosts having wide distribution in south east Asia. *Puntius* seems to be very old genus of primary freshwater fishes.

The early migration of hillstream fishes has been well illustrated by Hora's Satpura Hypothesis. It suggests that during the Pliocene period, due to eustatic drop in the sea level, fishes have migrated through Garro-Rajmahal gap to Vindhya-Satpura hill ranges and further reached Western Ghats. Silas (1952) supported this view. Menon (1964, 1987) has explained the route of migration of the Himalayan hillstream fishes of the genera *Garra* (Cyprinidae) *Nemacheilus* and *Lepidoocephalus* (Homalopteridae) *Bagarius* (Sisoridae) from south China to India, and further in Western Ghats. According to Menon (1964) cobitids have evolved after cyprinids. However, the clariids and bagrids are undoubtedly of African origin (Jayaram, 1974).

Finally about 10 genera of fishes are truly autocanthus Gondwan element in the Peninsular India (Mani, 1974). Further, he elaborately illustrated that cascades, water falls and streams of Western Ghats exactly resemble to that of Himalayan drainage, due to earlier complex, turning, twisting, folding and Geological as well as Geographical changes in Peninsular India and Himalaya, during the continental drift in Jurassic and Cretaceous period.

Thus northern portion of Western Ghats constitutes 135 species of fish, of which 38% species are endemic to this region and 30.6% are threatened Cypriniformes is a predominant family in this region, while siluriformes and perciformes are found less in number. In these 3 orders. Comparatively reverse fauna has been observed in Himalaya by revealing the literature (Yazdani 1994) The ichthyofauna of Western Ghats is mostly of Indo-Chinese and Indo-Malayan origin while few are African and palartic origin.

A serious cause of threat to fishes is human interference, exploitation and mass killing. Besides water pollution, developmental projects, irrigation activities, use of insecticides, pesticides, fertilizers and loss of natural habitats of fish.

Our valuable ichthyofauna can be protected by regulating killing of fishes, giving protection to eggs, fry, fingerlings and broods by observing close period. Formation of fish ladder, fish sanctuary and putting ban on killing, sale and poaching of threatened and endemic fish species; initiating and encouraging the conservation movement among masses are some of the urgent steps to be taken by N.G.O's. and Government Departments.

Table I : Geographical distribution of the fishes in major river systems of the Western Ghats

Sl. No.	Species	Common name	East Flowing rivers Krishna Godavari Cauvery	West flowing rivers	Dist. in W.G.	Dist else where	Population status	Key character
(1)	(2)	(3)	(4) (5) (6)	(7)	(8)	(9)	(10)	(11)
1.	O : Osteoglossi formes Fam : Notopteridae							Laterally compressed leaf like body,
1.	<i>Notopterus notopterus</i> (Pallas).	Feather back	+ + +	+		India, Pakistan, Nepal, Bangladesh, Myanmar, Thailand Indonesia.	Common	dorsal fin short, anal very long.
	Fam : Cyprinidae S. F. : Cultrinae							
2	<i>Chela cashius</i> (Ham-Buch.)	Sonkuli	+ + +	+		India, Pakistan Bangladesh, Myanmar	UnCommon	Laterally compressed, small sized fish mouth oblique, triangular pointed snout.
3.	<i>Salmostoma acinaces</i> (val.)	Silver razor belly minnow.	+ +	+		W. Bengal & S. India	-do-	Elongated compressed body, auxillary scale hidden bet. pect. fin & lateral side of body.
4.	<i>Salmestoma bacaila</i> (Ham-Buch.)	Dental	+ +	+	Kanya kumari T. N.	India. Pakistan Nepal, Bangladesh,	Common	Ventrally keeled body with yellowish band on some specimens

(1)	(2)	(3)	(4) (5) (6)	(7)	(8)	(9)	(10)	(11)
5.	<i>Salmostoma boopis</i> (Day)		+ +	+	South Kanara		-do-	Lower lip extended, large eyes; silvery lateral band on body l.l scales 40
6.	<i>Salmostoma clupeioides</i> (Bloch).	Vadashi	+ + +	+	Kanyakumari	India, Jabalpur M. P. Myanmar,	Common	Ventral part of caudal fin longer.
7.	<i>Salmostoma novacula</i> (val.)	Alkut	+ +	+	Beale dam	Madras	Uncommon	Lateral line scales above 70, body with Vertical stripes. Anal fin with 14-17 br. rays.
8.	<i>Salmostoma phulo phulo</i> (Ham-Buch.)		+ +	+		Ganga, Brhamputra, Bangladesh.	-do-	Lateral line scales 99-112. Anal fin with 13-16 br. rays.
9.	<i>Amblypharyngodon mola</i> (Ham-Buch.)	Mola Carplet	+ +	+		India except Kerala, Nepal, Bangladesh. Pakistan,	-do-	Upper lip absent. Lower jaw curved. Symphyisal knob present.
10.	<i>Aspidopayia morar</i> (Ham-Buch)	Amlee	+ +	+		Northern India Nepal, Pakistan Bangladesh.	-do-	Lower lip absent, blunt round snout.
11.	<i>Aspidoparia jaya</i> (Ham-Buch.)			+		Assam; Nepal; Bangladesh.	-do-	Elongated body, blunt snout, l.l. 52-60.
12.	<i>Barilius barna</i> (Ham-Buch)		+	+		Northern India; Nepal, Bangladesh	Common	Barbels absent, body with 7-9 vertical bars; Dorsal fin far behind. These are foot hill inhabitants.
13.	<i>Barilius evezardi</i> Day	Jhorya	+ +	+			Threatened endemic.	Barbels absent, upper jaw longer, body silvery, without bars.

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
14.	<i>Barilius bendelisis</i> (Ham-Buch.)	Jhorya	+	+	+	+	Common		India except Kerala, Nepal Pakistan, Srilanka.	Two pairs of minute barbels, 1.1, scales 40-44, with black dots, No vertical bars on body.
15.	<i>Barilius gatensis</i> (Val.)	Jhorya	+		+	+	Uncommon, endemic.			Body with the 13-15 vertical bars.
16.	<i>Brachydanio rerio</i> (Ham-Buch)	Zebra danio	+	+	+	+	do	Kerala, T.N.	W. Bengal, Nepal, Bangladesh	Flat small specimens with 3-4 brownish black horizontal lines. It is a good aquarium fish.
17.	<i>Danio aequipinnatus</i> (mcclelland)	Balooki	+	+	+	+	Common		E. Himalya, Meghalya, Deccan, Nepal, Bangladesh, Srilanka.	Snout conical pointed, small oblique mouth, 3-4 lateral bands on body.
18.	<i>Danio fraseri</i> Hora & Mukerji	Gayroonji	+	+		+	Endemic, threatened			Lower lip hypertrophied, 2-3 black horizontal bands on body, surface feeder. It is a larvivorous fish.
19.	<i>Danio malabaricus</i> (Jerdon)	Malbar danio	+		+	+	Declyning in population		Srilanka	Elongated body, silver belt below lateral line.
20.	<i>Esomus danricus</i> (Ham-Buch.)	Dannika, flying barb	+		+	+	uncommon in W.G.		N. India, Nepal, Pakistan, Bangladesh	Long barbels present, thick, black median line present on body.
21.	<i>Rasbora daniconius</i> (Ham-Buch.)	Danda	+	+	+	+	Very common		Throughout India	Broad flattened snout, lacking barbels, lower jaw has symphysial knob, thick median line present on body. Move in shoals.

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
22.	<i>Rasbora rasbora</i> (Ham-Buch.)		.	+		+	Uncommon		Gangetic Province, Coromandel coast, Bangladesh, Myanmar, Thailand	Small sized fish, dorsal hypural dist. when carried forward. falls at anterior border of eye. black line present from the snout to caudal fin, caudal fin tips dark. It is a good aquarium fish.
23.	<i>Catla catla</i> (Ham-Buch.)	Catla, major carp	+	+	+	+	Common		Indian subcontinents, Thailand	It is a surface feeder upperlip absent, head broad blunt snout, deep bodied fish I. I. scales 40-43, dorsal fin at median position.
24.	<i>Cirrhinus cirrhosa</i> (Bloch)		+		+	+	Threatened endemic			Rostral barbel (2 pairs) present, inferior crescentic mouth.
25.	<i>Cirrhinus fulungee</i> (Sykes)	Mulichagana	+			+	Common in northern part of W. G.			One pair of rostral barbel present, barbel inferior, I. I. scales 48.
26.	<i>Cirrhinus mrigala</i> (Ham-Buch.)	Mrigal	+	+	+	+	Declining in number		Northern India, Pakistan, Nepal, Bangladesh, Myanmar.	Two pairs of barbels, dorsal fin with 15-16 rays. I. I. scales 40-45, bottom feeder.
27.	<i>Cirrhinus reba</i> (Ham-Buch.)	Reba	+	+	+	+	do		India pakistan, Nepal, Bangladesh	Lateral groove on snout, I pair of rostral barbels, dorsal fin with 8 br. rays, I. I. scales 35-38.
28.	<i>Cyprinus carpio</i> Linn.	Common carp	+				Uncommon exotic		Central Asia	2 pairs of barbels, long dorsal fin with iii20, I. I. scales 32. It is a bottom dweller fish.

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
29.	<i>Labeo boggi</i> (Sykes)	Bogga labeo	+	+	+	+	do		Pakistan, Bangladesh, India, up to Cauvery.	Lips thick, fimbriated. 1 pair of barbels, dorsal fin not more than 13 rays, 1.1 scales 60-65.
30.	<i>Labeo calbasu</i> (Ham-Buch.)	Kanas	+	+	+	+	Threatened		Pakistan, India, Nepal, Myanmar, Yunnan riv. (S. China)	Snout tapering, mouth Ventral with many villi, 2 pairs of barbels present. It is a gamefish.
31.	<i>Labeo dussumieri</i> (Val.)	Malbar labeo	+	+	+	+	Threatened		Srilanka	Fringed lips with folds, iii 12 1.1 scales 53-60.
32.	<i>Labeo gonius</i> (Ham-Buch.)					+	Uncommon		Pakistan, N. India, Myanmar, Bangladesh	Projecting snout studded with pores, 2 pairs of small barbels, scales small in 1.1 71-84.
33.	<i>Labeo kavrus</i> (Sykes)	Deccan labeo	+			+	Threatened		Central India	One pair of minute barbels present, 1.1 scales 38.
34.	<i>Labeo fimbriatus</i> (Bloch)		+				Threatened		W. Bengal, S. India, Nepal, Myanmar, Pakistan.	Dorsal fin rays 19-22, scales bet 1.1 & pelvic base 6-7, 2 pairs of barbels present.
35.	<i>Labeo microphthalmus</i> Day		+			+	Threatened		Pakistan, India, W. Himalaya	Lower lip joined to isthmus, 1 pair of barbels present, eyes dorsolateral in position, 1.1 scales 45.
36.	<i>Labeo pangusia</i> (Ham-Buch.)		+	+			do		N. Indian rivs. Pakistan, Bangladesh.	Snout with lateral lobes with pores, lower lip with inner folds, 1 short pair of barbels.

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
37.	<i>Labeo porail</i> (Sykes)	Dotondi	+	+	+		Endemic & threatened			Snout studded with pores, mouth inferior with labial fold, groove on chin. 1 pair of barbel. I. I scales 40.
38.	<i>Labeo rohita</i> (Ham-Buch.)	Rohu	+	+	+	+	Common		Pakistan, N. & central India, Nepal, Bangladesh Myanmar,	Lips thick, fringed. Diii 12, I. I, scales 40. It is a column feeder, food fish & game fish.
39.	<i>Labes sindensis</i> (Day)	Sind labeo	+				Uncommon		Pakistan, Sind, India Punjab, U. P. M. S.	Small sized fish. 1 pair of barbel, dorsal profile curved with silvery reddish tinge.
40.	<i>Osteobrama bhimensis</i> Singh & Yazdani		+				Endemic & threatened			Barbels absent, large eyes. upper jaw longer than lower D III-IV 9, I. I. scales 76-83, body of uniform silvery colour, Anal fin long, Ventral edge keeled.
41.	<i>Osteobrama cotio peninsularis</i> Silas	Bhongi	+	+	+	+	Uncommon		Peninsular India	Barbels absent, trapeoid shape body, PDS 21-24 A of with 21-24br rays I. I. scales 55-60.
42.	<i>Ostebrama neilli</i> (Day)	Nilgiri osteobrama	+	+	+		do		Karnataka. T.N.	2 pairs of barbels present dorsal spine strong & serrated.
43.	<i>Osteobrama vigorsii</i> (Sykes)	Phenkut	+		+		do		Orissa	2 pairs of rudimentary barbels. dorsal spine dentified.
44.	<i>Puntius amphibius</i> (Val.)	Khavli. barb	+	+	+	+	Common		India, Orissa. M. P. Rajasthan, Srilanka	1 pair of barbels, spindle shaped body, I. I. scales 27-25, black blotch before base of caudal fin, These are surface feeders.

Sl. No.	Species	Common Name	East flowing rivers			West flowing river	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
45.	<i>Puntius crescentus</i> Yazdani & Singh					+	Endemic & threatened			1 pair of barbels, D with vertical crescentic band, dark spot at the base of C. median line present on body. small boat shaped fishes.
46.	<i>Puntius chola</i> (Ham-Buch)		+	+	+	+	Dedlining in number		Indian subcontinent	1 pair of barbel, PDS : 10-12, Diii 8, last unbranched ray osseous, smooth I. I. scales 26-28.
47.	<i>Puntius conchoniis</i> (Ham-Buch)	Rosy barb	+	+	+	+	Common		Afghanistan, Pakistan, India northern rivs, Nepal, Bangladesh	Deep body, barbels absent, Diii 8, last unbr ray osseous serrated, black blotch above A, good aquarium fish.
48.	<i>Puntius deccanensis</i> Yazdani & Rao	Deccan barb	+				Endemic threatened		-	1 pair of barbels, Diii 9, the last unbr. ray ossited, serrated, I. I complete with scales 42-45.
49.	<i>Puntius f. fasciatus</i> (Jerdon)		+		+	+	do		Peninsular India	2 pairs of barbels, 3-5 verticle bands on body, I. I. scales 18-22.
50.	<i>Puntius f. pradhani</i> Tilak					+	Endemic threatened			2 pairs of barbels, 5 reddish black bands on body. It is good aquarium fish.
51.	<i>Puntius filamentosus</i> (Val.)	Tiger barb	+		+	+	Uncommon		Southern India, Srilanka, Myanmar, Thailand	Spindle shaped body, oblong finger like dark blotch above A, I. I scales 20-24.
52.	<i>Gonoprokt-opterus Curmuca</i> (Ham-Buch.)	Kolshi	+	+	+	+	Threatened		Indian : M. P.	Elongated specimen, blunt snout with tubercles in male, head & eyes large. I. I. complete with 38-45 scales.

Sl. No.	Species	Common Name	East flowing rivers			West flowing river	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
53.	<i>Puntius dorsalis</i> (Jerdon)	Long snouted barb	+		+		Uncommon		Srilanka	1 pair of barbels present, pointed snout, last unbr. ray of D. osseous, strong, smooth. It is larvivorous fish.
54.	<i>Puntius narayani</i> (Hora)	Indigo barb			+	+	Threatened		Tamil Nadu	Barbels absent, 3-4 vertical bars present on body I. I scales 22-23.
55.	<i>Puntius parrah</i> (Day)		+		+		do			1 pair of barbels, last unbr. ray of D. osseous, smooth, I. I. scales 21-29, good aquarium fish
56.	<i>Puntius phatunio</i> (Hana-Buch)		+		+	+	do		Pakistan, N. E. India, Bangladesh Myanmar	Barbels absent, I. I. scales 20-24, 1 or 4 vertical bands on body.
57.	<i>Barbodes sarana sarana</i> (Ham-Buch.)		+	+	+	+	Common		Northern, India, Afghasistan, Pakistan, Nepal, Bhutan, Bangladesh	Dorsal fin inserted in anterior half of body, scales have black dots, I. I. scales 30-33.
58.	<i>Barbodes sarana subnasutus</i> (Val.)		+		+	+	do		Peninsular India, Srilanka	Dorsal fin inserted equidistant, I. I. scales 28-31.
59.	<i>Puntius sahyadriensis</i> Silas	Khavli	+			+	Endemic & threatened			Short blunt snout, studded with pores, dorsal profile arched, barbels absent, 7 black verteal bnds on body, I. I. scales 23-24
60.	<i>Puntius semai</i> Chhappur & Sane	Black ruby				+	do			It is an aquarium fish Barbels absent, 3 verti. black colour bands on body, I. I. scales 20.

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
61.	<i>Puntius sophors</i> (Ham-Buch.)		+		+	+	Common		India, Pakistan, Nepal, Bangladesh, Myanmar & Yunnan riv. (China)	Barbels absent. deep body, bl. blotch on D. fin base & before C. base, 1.1. scales 21-26. D fin last ray osseous only.
62.	<i>Puntius ticto</i> (Ham-Buch.)	Khavli	+	+	+	+	Very common		Indian subcontinents, Thailand.	Small to medium sized fish, pointed snout, barbels absent, deep body, bl. blotch above A, 1.1. scales 21-26, Last br. ray of D strong serrated. osseous, Larivorous, fish.
63.	<i>Puntius vittatus</i> Day				+	+	Uncommon		Inda Bihar, Rajasthan, Kutch T. N.; Srilanka, Pakistan.	Barbels absent, last undivided ray of D. non ossified, weak, articulated, 1.1, scales 20-25.
64.	<i>Puntius jerdoni</i> (Day)		+				Endemic & threatened			2 pairs of barbels, dorsal spine weak, 1.1. scale 27-32, deep bodied fish. It is a food fish.
65.	<i>Puntius carnaticus</i> (Jerdon)		+				-Do-			2 Pairs of barbels, dorsal spine strong 1.1. scales 24-31, food fish.
66.	<i>Puntius thomassi</i> (Day)		+				Endemic & threatened			2 pairs of barbels dorsal spine not ossified. articulate 1.1. seales, 31-40.

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
67.	<i>Rohtee ogilbii</i> Sykes	Vatani	+	+	+		Endemic & threatened		Mouth terminal oblique, D. towards caudal half last unbr. ray serrated, procumbent, predorsal spine present vertical bands on body, 1.1. scales 55.	
68.	<i>Schismatorhynchus nukta</i> (Sykes)	Nukta	+		+		Endemic & threatened		Horn like projection on snout, flap like, pair of barbels, D. near to snout, anterior 3 rays longer than body depth, 1.1. scales 37-38.	
69.	<i>Tor khudree</i> (Sykes)	Deccan mahseer, khadshi	+	+	+	+	Threatened	India. M. P. Srilanka	Lips hypertrophied, lower lip with fleshy lobes, post labial groove, streamline body, 1.1. 26, 2 pairs of barbels, HL-BD Hill stream fishes. It is a game fish.	
70.	<i>Tor mussullah</i> (Sykes)	Masundi	+	+	+		do		Deep body HL<BD, 1.1. scales more than 26. It is a gamefish.	
71.	<i>Crossocheilus l. latius</i> (Ham-Buch)		+	+		+	Common	Himalayan river systs Mahanadi.	Elongated body, rostral barbels present, eyes lateral in position, 1.1. scales 39-41 paired fins in horizontal position.	
72.	<i>Garra bicarnera</i> Rao	Tunga gara	+		+		Uncommon	Maharashtra kamataka, Tunga riv. syst.	1 pair of barbels, chest & belly scaled, black spot above operculum, 1.1. scales 31 Hill stream inhabitant.	
73.	<i>Garra gotyla stenorhynchus</i> (Jerdon)		+	+	+	+	Uncommon	India M. P. Bihar	Horny spines on snout distance of vent to A, 3-6 times in dist bet pelvic & anal origin BD 5 or more in SL.	

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
74.	<i>Garra mullya</i> (Sykes)	Mally	+	+	+	+	very common		Throughout India except Assam & Himalaya.	2 pairs of barbels, l.l. scales 34. reduced scales on chest & belly, dist of vent, from A base less than 4 times in dist bet pelvic & and origin.
75.	Subfam : Parapsil-orhynchinae <i>Parapsilo-rhynchus discophorous</i> (Hora)	Minnow	+			+	Threatened & endemic			Elongated body, ventral surface flattened, dorsal surface arched, ventrally snout has disk like organ Hillstream fishes
76.	<i>Parapsil-orhynchus prateri</i> Hora & Misra	do		+			do			Upper lip has rostral folds, tubercels, 1 pair of short stumpy barbels, thickened area of skin behind lower lip l.l. seals 43-47 Hillstreamfishcs.
77.	<i>Parapsil-orhynchus tentaculatus</i> Annandale	Khandala minnow	+	+		+	endemic threatened			Pectoral fin with 3 simple rays, l.l. scales 36-39
	Fam : Homalopteridae sub fam : Nemacheilinae									
78.	<i>Nemacheilus unguilla</i> Annandale	Loaches	+	+			Endemic & threatened			These are good indicator of water pollution Elongated snout, lips thick, D with 8 br. rays mouth inferior. midlateral back band on body.
79.	<i>Nemacheilus botia</i> (Ham-Buch)	do	+	+		+	Common		Pakistan, India, Indus basin, Gange tic riv. syst.	Stout spindle shaped body. nasal barbels absent, elliptical spots on median position in the form of line l.l. complete 12-16. spots on base.

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
80.	<i>Nemacheilus denisoni</i> Day	Loaches	+	+	+	+	Very common		India M. P. Deccan, E. Ghats	10-14 verti bands on body, pelvic touching anal opening, C rounded lobes, with rows spots. I. I. line incomplete, black spot at the base of D.
81.	<i>Nemacheilus evezardi</i> Day	Loaches	+	+	+	+	Endemic & threatened		Satpura hill ranges	Well developed barbels, D situated in posterior half of body, lips fleshy, interrupted in the middle, C. emarginated, with two spots at base.
82.	<i>Nemacheilus Moreh</i> (Sykes)	Loaches	+		+		Endemic & threatened		Satpura hill ranges	Small papillae nr. cleft of lower jew, D with 9-11 br. rays, I. I. incomplete.
83.	<i>Nemacheilus ruppelli</i> (Sykes)	Loaches	+				Endemic & threatened			Large sized fish with prolonged snout, large head & eyes, well developed barbels, D with 10 br. rays, 18-19 brownish verti bands, anal opening situated far forward, C. forked, Hillstream loaches.
84.	Fam : Cobitidae subfam : cobitinae <i>Lepidocephalus guntea</i> (Ham-Buch)	Stone Loaches	+	+		+	Common		N. India, Pakistan, Bangladesh, Nepal, Myanmar	3 pairs of barbels, scales present on head elongated body, with blotches, suborbital spine present, C. cutsquare, Larvivorous fish
85.	<i>Lepidocphalus the rmalis</i> (val.)	Malbar loach	+	+	+	+	Common		Srilanka	Elongated, anteriorly arched body. 8-12 black blotches on body. dorsal keel above analfin present Larvivorous fish

Sl. No.	Species	Common Name	East flowing rivers			West flowing river	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
86.	<i>Bonia striata</i> Rao	Tiger loach	+		+		endemic threatened	Tunga riv. syst.		4 pairs of barbels. eyes in posterior position. pointed snout. oblique alternate light yellow bands on body, spine. present nr. eye. Good aquarium fish
87.	Order : siluriformes Fam : Bagridae <i>Aorichthys uor</i> (Ham-Buch)	Singala	+	+	+		uncommon		Pakistan, N. India, Nepal, Bangladesh, Myanmar.	Snout rounded, four pairs of barbels. maxillary reaching up to C, with 17 rays carnivorous fishes. It is a food fish.
88.	<i>Aorichthys seenghala</i> (Sykes)	Shingata	+	+	+		uncommon		Afghanistan, Pakistan, India, Nepal, Bangladesh	Snout spatulate, maxillary barbels reaching up to pelvic fins C. with 19-21 rays. It is a food fish & gamefish.
89.	<i>Mystus bleekeri</i> (Day)	Singala	+	+	+		common		Pakistan, India, (N) sumatra, Nepal, Bangladesh, Myanmar.	Greenish eyes, maxillary barbels reaching up to Anal fin, dorsal a dipose long, light bands on lateralside. It is a foodfish.
90.	<i>Mystus cirxasius</i> (Ham-Bach)		+	+	+		do		Indian sub-continent, Thailand	Maxillary barbels reach up to C. dark spot at the base of D., common food fish.
91.	<i>Mystus Keletius</i> (val.)				+	+	uncommon		India, Tamilnadu Srilanka	Light silvery bands present on lateral side, D. & C. fins dusky black tipped, A dusky.
92.	<i>Mystus malabaricus</i> (Jerdon)	Shingeti	+	+	+		endemic & threatened		f.w. estuaries	Maxillary fins reach up to pelvic fins, linear band on I. I., dark blotch on C. base, dark blotch shoulder.

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
93.	<i>Mystus menoxla</i> (Ham-Buch)		+			+	-Do-		-Do-	Maxillary barbels reach up to A.. dorsal spine serrated, C. forked, upperlobe longer. cluster of dots present along median line.
94.	<i>Mystus montanus</i> (Jerdon)	Shingat	+		+		Uncommon		India : M.P. Assam	Spot on shoulder, pectoral fins with 6 soft rays, median line with blotches, 12 light bands present
95.	<i>Mystus oculatus</i> (val)		+				Very uncommon	Kanyakumari	India : Tamil Nadu	Median longitudinal groove on head short, adipose dorsal fin base longer than A. base.
96.	<i>Mystus vittatus</i> (Bloch)		+	+	+	+	do		Indian subcontinents, Thailand	Pect. fin with 9 rays 3-4 longitu, dinal, bluish brown or black bands on body, dark shoulder spot present
97.	<i>Mystus gulio</i> (Ham-Bach)					+	Unommon		Indian subcontinents	Body plain without colour bard
98.	<i>Rita kutumee</i> (Sykes)	Katarnee	+	+	+		Uncommon		Rivs. of M.S., Kamataka, A.P.	Head depressed, mouth trans verse. 3 pairs of barbels, maxillary reaching pect. fin last D ray pointed.
99.	<i>Rita pavementatus</i> (val.)	Ghoghrya	+	+			do		Rivs. of Deccan	Short broad, rounded head. D. i7. Pill, thrives well in dry conditions.
100.	<i>Rita rita</i> (Ham-Buch)		+	+			Uncommon		Afghanistan. Pakistan, India (N), Bangladesh, Myanmar	Teeth on palate into two elliptical patches, wide apart.

Sl. No.	Species	Common Name	East flowing rivers			West flowing river	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
101.	<i>Ompok bimaculatus</i> (Bloch)	Moone. Indian butter catfish	+	+	+	+	Common		Afghanistan, Indian subcontinents, Thailand, China.	It is a foodfish Elongated compressed body, cleft oblique not reaching from border of eyes, D. short, A. very long (57-58)
102.	<i>Ompok pabo</i> (Ham-Buch)		+	+			Uncommon		Pakistan, N.E. India, Bangladesh, Myanmar	Maxillary barbels short, reaching up to head length, pelvic with 9-10 rays, A. with 66-71 rays.
103.	<i>Silurus goae</i> Haig		+			+	Endemic & threatened			Anal fin with 80 rays, covered with intugement, adipose D. fin absent, C. rounded
104.	<i>Wallago attu</i> (schneider)	pattan	+	+	+	+	Common		Indian subcontinents, Thailand, Vietnam, Kampuchea Malaya peninsula.	Gape of mouth wider. reaching beyond eyes. D. short with 5 rays, A with (74-93 rays.) It is food fish.
105.	Fam : schilbeidae Subfam: Schilbeinae <i>Pseudotropis atherinoides</i> (Bloch)	sura	+	+	+		do		India Himalaya, Deccan, E Ghats, Nepal, Bangladesh, Myanmar	Upper jaw projecting beyond lower jawmaxillary barbels extend to anal fin. It is a gamefish.
106.	<i>Eutropiichthys vacha</i> (Hum-Buch)		+				do		Pakistan, N. India, Bangladesh, Myanmar	Elongated laterally compressed body, D. short with 17 rays. It is a food fish.
107.	<i>Proutropiichthys t. taakree</i> (Sykes)	Moonia, minvi	+	+			Threatened		India, Deccan, E. Ghats.	Four pairs of barbels, maxillary extend up to pelvic fin. D. serrated anteriorly & denticulated posteriorly, pectoral serrated on its inner edge.

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
108.	Fam: Sisoridae <i>Bagrius bagarius</i> (Ham-Buch)	Goonch	+	+			-Do-		India; Ganga drainage Laos & probably Malaya peninsula	It is a gamefish, four pairs of barbels nasal short, maxillary flat, head rounded, mouth inferior, rough texture of skin, C. pear shaped. It is a living fossil.
109.	<i>Gagata gagata</i> (Ham-Buch)		+				Threatened			Rounded blunt snout, isthmus broad, distal part of fins except C. dusky.
110.	<i>Glyptothorax conirostre poonensis</i> Hora		+				Endemic & threatened			Elongated, depressed body, mouth inferior, trasverse, ventrally possesses adhesive apparatus, paired fins non plaited.
111.	<i>Glyptothorax lonah</i> (Sykes)		+	+	+		Threatened		Deccan plateau	Adhesive apparatus well developed, paired fins plaited below, skin minutely granulate body of brownish yellow colour, D., A. & C. with dark bands.
112.	Fam: Clariidae <i>Clarias batrachus</i> (Linn)	Magur, air breathing catfish	+	+	+		Common		India Ganga darinage, Indian subconts Singapore, Phillippines.	Body elongated, torpedo like, naked, D & A. very long, no adipase fin, pect with strong serrated pungent spine. Labrynthiform accessory resp organ present.
113.	<i>Clarias dussumieri</i> Val		+			+	Uncommon		Deccan plateau E. Ghats	Broad snout, nasal barbels longer, D. closer to head, pect. spine posteriorly serrate, D. 66-69

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
114.	<i>Heteropneustus fossilis</i> (Bloch)	Bitchukamachi, air sac catfish	+	+	+	+	common		Indian sub-continents, Thailand, Laos.	Four pairs of barbels present. D. short without spine. A very long adipose dorsal fin absent pect, with strong poisonous spine. It is a food fish.
115.	Series : Mugilomorpha order : Mugiliformes Fam : Mugilidae <i>Rhinomugil corsula</i> (Ham-Buch) Series : Atherinomorpha order : Beloniformes Fam : Belontiidae	Vardoli	+	+	+	+	common		India, Nepal Bangladesh, Myanmar	Elongated body dorsally placed eyes, scales in 1.1 48-52 move in schools. Fishes.
116.	<i>Xenentodon cancila</i> (Ham-Buch)	Tikali	+	+	+	+	Common		Indian subcontinents	Slender, elongated specimen, beak like long snout, D. opposed to A. median black line on body, C. truncate, 1.1. on posterior part. It is a good aquarium fish.
	Order : Cyprinodonti-formes Fam : Aplocheilidae									
117.	<i>Aplocheilus lineatus</i> (val)		+	+	+	+	common		India western & S.E. region.	Small sized fish, semicircular head, flat snout, 9-10 verti, black bars on body, black spot at the base of D. C. rounded with dark bands. Larvivorous fish.
118.	<i>Apocheilus panchax</i> (Ham-Buch)		+		+	+	uncommon		Pakistan N. India, Myanmar Indo-Malaysian archipelago	Anal fin square shaped, greenish blue colour, fins yellow Larvivorous fish

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
119.	Fam : Poeciliidae <i>Gambusia affinis</i> (Baird & Girad)		+	+	+	+	Exotic common		South central USA., introduced in India	Small sized fish, caudal peduncle, longer than head. D. & C. have black spots. Larvi vorous but destructive to native stock
120.	<i>Poecilia reticulata</i> Peters	Guppy	+	+	+	+	do		Netherlands. Antilles, Veneze ulan isls, Trinidad, British Guiana.	Deep body. flat snout, teeth on jaws, D. inserted above A. larri vorous, but harmful to eggs of other fish.
	Series : Percomorpha Order : Synbranchi-formes Fam : Synbranchidae									
121.	<i>Monopterus indicus</i> (Silas & Dawson)	Swamp eel	+			+	Endemic threatened			It shows burrowing habit suprabranehial airsac present no swim bladder. Eel like brownish yellow coloured body, snout blunt, head produced, triangular gill opening ventral, fins vestigial.
122.	<i>Mastacem-belus armatus</i> (Lacepede)	Sspin yeel	+	+	+	+	Common		Indian sub continents, Thailand, Malaya, S. chira Inhabits few & brarkish water.	Fleshy snout, triangular forehead pelvic absent, pect reduced. D. & A. preceded with numerous spines D.A. & C. united Noctemual fish, It is a food fish.
123.	<i>Macrognathus guentheri</i> (Day)		+		+	+	Uncommon			Large rostrum, concave ventrally, rim of tubular nostril has C. ginger like papillae, D. spin rays 32 or less
	Order : Perciformes Fam : Ambassidae									

Sl. No.	Species	Common Name	East flowing rivers			West flowing rivero	Population status	Distribution in W. G.	Distribution elsewhere	Key character
			Krishna	Godavari	Cauvery					
124.	<i>Chanda nama</i> (Ham-Buch)	Chembardi, Glass perch	+	+	+	+	Common		Indian subcontinents	Small, translucent fish, mouth large, lower jaw extended, D. has distal portion blackish, 1.1 curved in middle with 100-107 scales. Larvivorous fish.
125.	<i>Psudambassis baculis</i> (Ham-Buch)		+	+			Uncommon		Himalaya & Indo-Gangetic plains.	Supra orbital ridge dentate 1.1 scales 90.
126.	<i>Pseudambassis ranga</i> (Ham-Buch)	Kacheri, Chedardi	+	+	+		Common		Indian sub continents, Thailand & Malaysia	Stout, compressed body, mouth oblique, jaws equal, 1.1, scales 47-63, Dusky spot on shoulder D & C. with backish edge. It exhibits parental care.
127.	Fam: Nandidae <i>Pristolepis marginata</i> Jerdon		+			+	Endemic, uncommon			Mouth small, teeth on jaws, D. with 12-16 spines & 11-16 rays, A. 4 spines & 9 soft rays 1.1, interrupted, 25-27 scales
128.	Fam: Cichlidae <i>Oreochromes mossambica</i> (peters)	Tilapia	+		+	+	Exotic common		East Africa, introduced in India, Pakistan & Srilanka.	Deep, compressed body, large mouth fleshy lips, large eyes, 1.1 scales 30-32 D. 15-16 spines & 10-12 rays.
129.	Fam: Gobiidae <i>Glossogobius giuris</i> (Ham-Buch)	Goby, Kharpya	+	+	+	+	Common		Indo-west pacific, Inhabits primarily fw. estuaries & seas.	Elongated body, eyes dorsal, placed closer, look bulging, 5-6 diffused black blotches on body. pelvic form disc like structure. The only fw. goby.
130.	<i>Anabas testudineus</i> Bloch	Climbing perch	+	+	+	+	Uncommon		Indian subcontinents, Malaya archipelago, Singapore, Philippines.	Oblong, deep compressed body, 1.1 scales 2-29 black spot on C. base, & pect. base, dark vertical patches on body. It has labyrinthiform organ for respiration in air. It is a good aquarium fish

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			Krishna	Godavari	Cauvery					
	Order : Belontiidae Fam : Macropodidae Subfam : Macropodinae									
131.	<i>Macropodus cupanus</i> (Val.)	Jumping perch	+	+	+	+	uncommon		Eastern India, Srilanka, Malaya penin sula & Sumatra	Oblong compressed body, outer soft ray of pelvic is produced into filament 1.1 vestigial, green-brown stripes from eye to operculum, brown spots on head, a good aquarium fish
132.	Order : Perciformes Fam : Channidae <i>Channa marulius</i> (Ham-Buch)	murrel, giant snakehead	+	+	+		uncommon		Indian subcontinents, Thailand, China	Elongated body, snake like rounded head, pect half of the length of head, black & white spots on the body, air breathing organ present, inhabit muddy water, carnivorous, food fish.
133.	<i>Channa orientalis</i> Bloch & schneider	snakehead	+	+	+	+	common		Afghanisthan, Iran, Indian subcontinents East Indias.	Medium sized fish brown. green yellowish striations on body. pelvic less than half of pectoral fin
134.	<i>Channa punctatus</i> (Bloch)	do	+	+	+	+	do		Afghanisthan, Indian subcontinents & Yunnan (China)	Large sized greyish coloured spearmen, D 28-32 1.1, scales 37-40, pelvic fin more than 50% of pectoral It can breed in stagnant, muddy water.
135.	<i>Channa striatus</i> (Bloch)	do	+	+	+	+	do		Indian subcontinents, Philippines, Malaya, Thailand	A good food fish occurs in water bodies of plains, prolific breeder.

SUMMARY

The systematic account of the fishes of Western Ghats, indicate that this senile, tropical ecosystem harbours 135 species of freshwater fishes comprising 57 genera, 22 families and 8 orders. Fifty one fish species (38%) are under severe threat and are of high conservation value. Forty one species of fishes are endemic to this region. The ichthyofauna of Western Ghats contains 87 species common to east and west flowing rivers, 47 species occurring in the easterly drainage while only 3 spp. are restricted to the west flowing rivers.

Ichthyofauna of northern part of Western Ghats represents 23 spp. of hillstream fishes, 60 spp. of foodfishes, 25 spp. of aquarium fishes, 15 spp. of gamefishes and 25 spp. of larvivorous fishes.

Waterbodies of the Western Gahts exhibit dominant cyprionoid fauna (65%) followed by siluroids (20%) percoid fishes (7.5%) and others (7.5%). From the literature, it is evident that the Himalayan drainage indicates comparatively more siluroid & percoid fishes and less cyprinids.

As a result of anthropological activities, developmental projects and water pollution the precious ichthyofauna of Western Ghats is under severe threat. For conserving the fishes and aquatic environs formation of new fishery law, putting ban on killing, sale and poaching of endangered fish species, habitat restoration, establishing fish sanctuaries and construction of fish ladders on dams, formulation of speceis recovery plan with the control of exotic ones and updating the ichthyofaunal inventory have been suggested.

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BIBLIOGRAPHY

- Annandale, N. (19919) : The fauna of certain small streams in the Bombay presidency. V. Notes on freshwater fishes mostly from Satara and Pune Dists. *Rec. Indian Mus.* **16** : 125-138.
- Day, F. (1989) : *The fauna of British India including ceylon and Burma*, Fishes, **1** : 548 pp., **2** : 509 pp. London Taylor & Francis.

- David, A. (1963) : Studies on the fish and fisheries of the Godavari and Krishna river systems Pt-1. *Proc. natur Acad. Sic., India*, Allahabad, B (2) : 263-286.
- Fraser, A.G.L. (1942a) : Fishes of Poona. Pt I. *J. Bombay nat. Hist. Soc.*, **43** : 79-91.
- Fraser, A.G.L. (1942b) : Fishes of Poona. Pt. III Ibid, **43** : 452-454.
- Ghate, H.V. & Wagh, G.K. (1991) : First record of the belontid fish, *Macropodus cupanus* (Val.) from Pune, Maharashtra. *J. Bombay nat. Hist. Soc.*, **88** : 124-125.
- Ghate, H.V. & Pawar, V.M. (1992) : Fish fauna of the river Nira near veer dam, Pune. *Proc. First. Natl. Symp. Hydraulics*, Pune. 118-121.
- Ghate, H.V. Wagh, G.K. & Lokhende, S.L. (1992) : Fish Fauna of the rivers Mula-Mutha, Pune *Ibid*, 105-117.
- Ghate, H.V. & Wagh, G.K. (1995) : Additional information on the grey mullet, *Rhinomugil corsula* (Ham-Buch.) (Pisces, Mugilidae) from Western Maharashtra. *J. Bombay nat. Hist. Soc.*, **92** : 273-274.
- Hora, S.L. (1937) : The geographical distribution of Indian freshwater fishes & its bearing on the probable land connection between India & adjacent countries. *Curr. Sci.*, **15** : 351-356.
- Hora, S.L. (1949) Satpura Hypothesis of the distribution of the Malayan flora & fauna to peninsular India, *Proc. Natl. Sci., India* **15** 309-314.
- Hora, S.L. (1953) : The satpura Hypothesis. *Sci. Progress.* **41** (162) 245-255.
- Hora, S.L. & Mukerji D.D. (1935) : On two new species of cyprinid fishes of Deolali. *Rec. Indian Mus.* **37** (II) 375-380.
- Hora, S. L. & Mishra, K. S. 1937 : Fishes of Deolali. Pt. I. *J. Bombay nat. Hist. Soc.* **39**(3) : 1-18.
- Hora, S.L. & Misra, K.S. (1939) : Fishes of Deolali. Pt. III *J. Bombay nat. Hist. Soc.*, **43** : 218-225.
- Jayaram, K.C. (1974) Ecology and distribution of freshwater fishes, Amphibia and Reptiles In Ecology and Biogeography in India. (ed. M.S. Mani). **17** 517-584.
- Jayaram, K.C. (1981) : *The freshwater Fishes of India, Pakistan, Bangladesh, Burma and Srilanka*, Handbook of Z.S.I. No 2 xii + 475 pp.
- Jayaram, A.G.K. (1988) : Conservation of the ichthyofauna of India, In *cons. Management intl. capture Fisheries*, India (Ed. A.G. Jhingran & V.V. Sargan) Intl. Fisheries Soc. Inida, Barkpore, India, 25-33.
- Jayaram, K.C. Vankateswarul, T. & Raghunathan, M.B. (1982) A survey of Cauvery river system with a major account on its fish fauna. *Rec. zool. Surv. India. Occ. Paper.*, **36** : 1-115.
- Jayaram, K.C. (1991) : Revision of the genus *Puntius* Hamilton from the Indian region. (Pisces, Cypriniformes, Cyprinidae, Cyprininae). *Rec. zool. Surv. India. occ. paper* **135** : 1-178.

- Jayaram, K.C. (1995) : The Krishna river system Bioresources study, *Rec. zool. Surv. India. Occ. paper* (160) : 1-167.
- Jayaram, K.C. (1997) : Nomenclature and systematic status of *Barbus mussullah* sykes, 1839, *J. Bombay nat. Hist. Soc.* **94**(1) : 48-55.
- Kalwar, A.G. & Kelkar, C.N. (1956) : Fishes of Kolhapur, *J. Bombay nat. Hist. Soc.*, **53** (4) : 669-679.
- Kulkarni, C.V. & Ogale, S.N. (1995) : *Conservation of the mighty mahseer of India*. Tata Ele. Co. Mumbai, 38 pp.
- Mani, M.S. (1974) : Physical features of the peninsula II. In Ecology and Biogeography of India. (Ed. M.S. Mani) 11-58, Dr. W. Junk, B.V. Publ. The Hague, Netherlands.
- Menon, A.G.K. (1964) : Monograph of the cyprinid fishes of the genus *Garra* Hamilton. *Memoirs India Mus.*, **14** : 173-260.
- Menon, A.G.K. (1973) : Origin of freshwater fish fauna of India. *Curr. Sci.*, **42** : 553-556.
- Menon, A.G.K. (1987) : *The fauna of India and adjacent countries, Pisces Vol. 4. Teleostomi, cobitoidea, pt I Homalopteridae*. *Zool. Surv. India*. 259 pp.
- Menon, A.G.K. (1992) : Taxonomy of mahseer fishes of the genus *Tor* Gray with description of a new species from the Deccan. *J. Bombay nat. Hist. Soc.*, **89**(2) : 210-228.
- Pradhan, M.S. & Singh, D.F. (1984) First record of the freshwater grey mullet *Rhinomugil corsula* (Ham-Buch.) from Maharashtra. *J. Bombay nat. Hist. Soc.*, **81**(1) : 202-204.
- Rao, M.B., Yazdani, G.M. & Nambiar, K.P. (1975) : On the distribution of Guppies *Lebistes reticulatus* (peters) (Atheriniformes, poeciliidae) in India.
- Rao, M.B., Yazdani, G.M. (1977) : Occurrence of cobitid genus *Botia* Gray in Western Ghats of India *J. Bombay nat. Hist. Soc.*, **74**(2) : 367-368.
- Sarkar, L. & Yadav, B.E. (1996) Larvivorous fishes of Western Ghats, Maharashtra : Biocontrol of malaria. *Geobios new Reports.*, **15**(2) : 137-138.
- Silas, E.G. (1952) : Further studies regarding Hora's stapura Hypothesis : 2 Taxonomic assesment and levels of evolutionary divergence of fishes with those that so called Malayan affinities in peninsular India, *Proc. Nat. Sci. India*, **2** : 130-145.
- Silas, E.G. (1953) . Notes on the fishes from Mahabaleshwar and Wai (Satara Dist. Bombay state). *J. Bombay nat. Hist. Soc.*, **51** : 579-589.
- Silas, E.G. (1958) : Studies on cyprinid fishes of the oriental genus *chela* Hamilton. *J. Bombay nat. Hist. Soc.*, **55**(1) : 54-99.
- Sing D.F. & Kamble R.H. 1987 : A note on the ichthyofauna of Jalgaon Dist. M.S. *Bull zool. surv. India*, **8**(1-3) : 291-293.
- Singh, D.F. & Yazdani, G.M. (1991) : A note on the ichthyofauna of Sanjay Gandhi National park, Borivali, Mumbai. *J. Bombay nat Hist. Soc.*, **85**(3) : 631-632.
- Singh, D.F. (1990) : Ichthyofauna of Maharashtra, Dhulia Dist. *Rec. zool. surv. India*, **86** (1) 83-90.

- Singh, D.F. Yazdani, G.M. (1988) : *Osteobrama bhimensis* a new cyprinid fish from Bhima river, Pune Dist. Maharashtra. India *J. Bombay nat. Hist. Soc.*, **89** : 96-99.
- Suryawanishi, S.N. (1996) : A study on the biology of a freshwater fish *Puntius kolus* (Sykes). Ph. D. Thesis, Dr. B.R. Ambedkar Marathwada University, Aurangabad, M.S.
- Sykes, W.H. (1841) : On the fishes of Dukhen, *Trans. zool. Soc. Lond.*, Vol. II pp. 349-376 + Figures.
- Talwar, P.K. & Jhingran, A.G. (1991) : *Inland Fishes of India and Adjacent countries*. Vol I & II oxford & IBH publ. Co. pvt. Ltd., New Delhi, 1158 pp.
- Tilak, R. (1973) : A study of the freshwater and eustarine fishes of Goa. 2. Notes on the fishes found within territory of Goa. *Rec. zool. surv. India*. **67** (1-4) : 87-120.
- Tilak R & Tiwari D.N. (1976) : On the fish fauna of Pune Dist. M.S. *Newsletter. zool. surv. India*. **2** (5) 193-199.
- Tonapi G.T. & Mulherkar, L. (1963) : Notes on the freshwater fauna of Poona pt. I. Fishes *Proc. Indian Acad. Sci.* **58B** : 187-197.
- Valsangkar, S.V. (1993) : Mahseer fisheries of koyana river *Fishing chimes* (Jan.) 15-19.
- Yazdani, G.M. (1991) : Status survey of some threatened fishes of western Ghats of India. *sixth. Engg. Congr. VI/1/1* : 215-225.
- Yazdani, G.M. & Mahabal. A.S. (1976) Fishes of Indryani river *Biovigyanam*, **2** : 119-121.
- Manon, A.G.K. (1962) : A distributional list of fishes of the Himalayas *J. zool. Soc. India*. **14** (1) : 23-32.
- Yadav, B.E. (1996) : New record of a period fish *Pristolepis marginata* Jerdon from Krishna drainage. Western Ghats. India. *Geobios new Reports*. **15** (1) : 55-56.
- Yadav, B.E. (1997) Studies on systematics and zoolgeography of the fishes of Western Ghats with observation on the status of endemic species. Ph. D. Thesis, Pune University. pp. 460.
- Yazdani, G.M. & Singh D.F. (1990) : On the fish resources of Ujani wetland, Pune, (Mah.) *J. Bombay nat. Hist. Soc.*, **87** : 157-160.
- Yazdani, G.M. & Singh, D.F. (1994) : *Puntius crescentus*, a new cyprinid fish from south India, with observation on the taxonomic status of some related species. *J. Bombay nat. Hist. Soc.*, **91** : 107-109.
- Yazdani, G.M. (1944a) Biodiversity of fishes of river Ganga Report, *zool. Surv. India*. 72 pp.
- Yazdani, G.M. & Yadav, B.E. (1995) : Extension of range of distribution of Gangetic grey mullet in India, *Geobios new Reports*. **14** (2) : 167-168.

Table II. Fishes of Western Ghats

(N : 135)

Sl. No.	Broad category	Number of spp.
1	Fishes common to E. & W. flowing river systems.	87
2.	Restricted to easterly drainage	46
3.	Restricted to west flowing rivers.	03
4.	Endemic fishes.	41
5.	Threatened fishes.	51
6.	Fishes showing rare occurrence.	40
7	Hillstream fishes.	23
8.	Clear water inhabitants.	50
9.	Inhabitants of slightly polluted water.	32
10.	Food fishes.	60
11	Aquarium fishes.	25
12.	Game fishes.	15
13.	Larvivorous fishes.	25
14.	Exotic species.	04

Table III. Percentage composition of major orders of fishes occurring in two global Hotspots. (N : 135)

Sl. No.	Order	Occurrence in Western Ghats (N-135)	Occurrence in Himalayan drainage
1	Cypriniformes (barbs, carps)	65%	53%, 57.59%
2.	Siluriformes (catfishes)	20%	29%, 20.29%
3.	Perciformes (perches)	7.5%	15%, 13.20%
4.	Others (synbranchiformes, Mugiliformes, Cyprinodonyigotmrd, Beloniformes and osteoglossiformes)	7.5%	3%

Yazdani (1991)

Menon (1962)

Table IV. % Composition of threatened and endemic fishes in western ghats

Sl. No.	Order	Endemic	Threatened
1	Cypriniformes (n = 85)	23.5%	40%
2.	Siluriformes (n = 28)	17.8%	32%

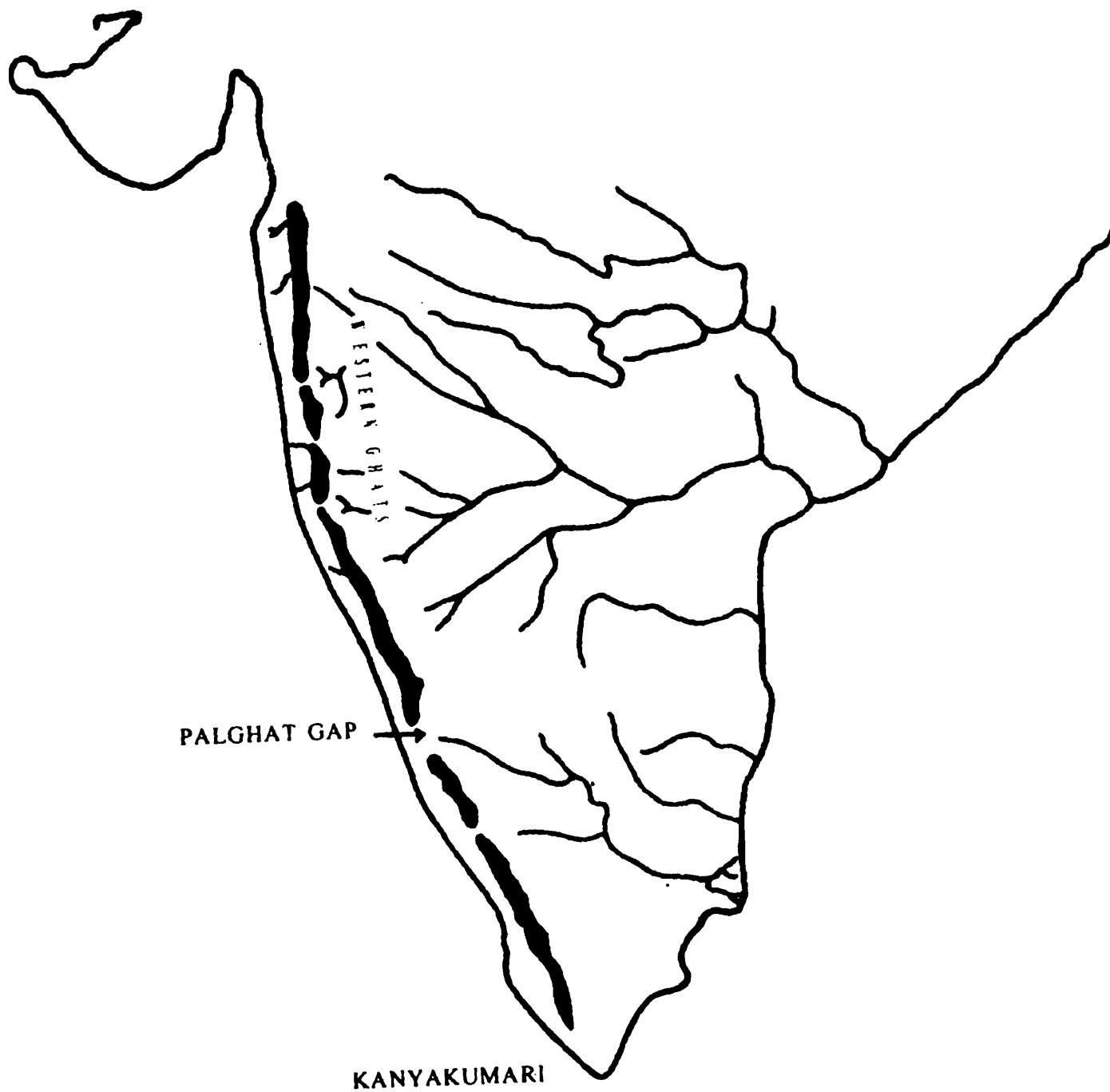


FIG. I

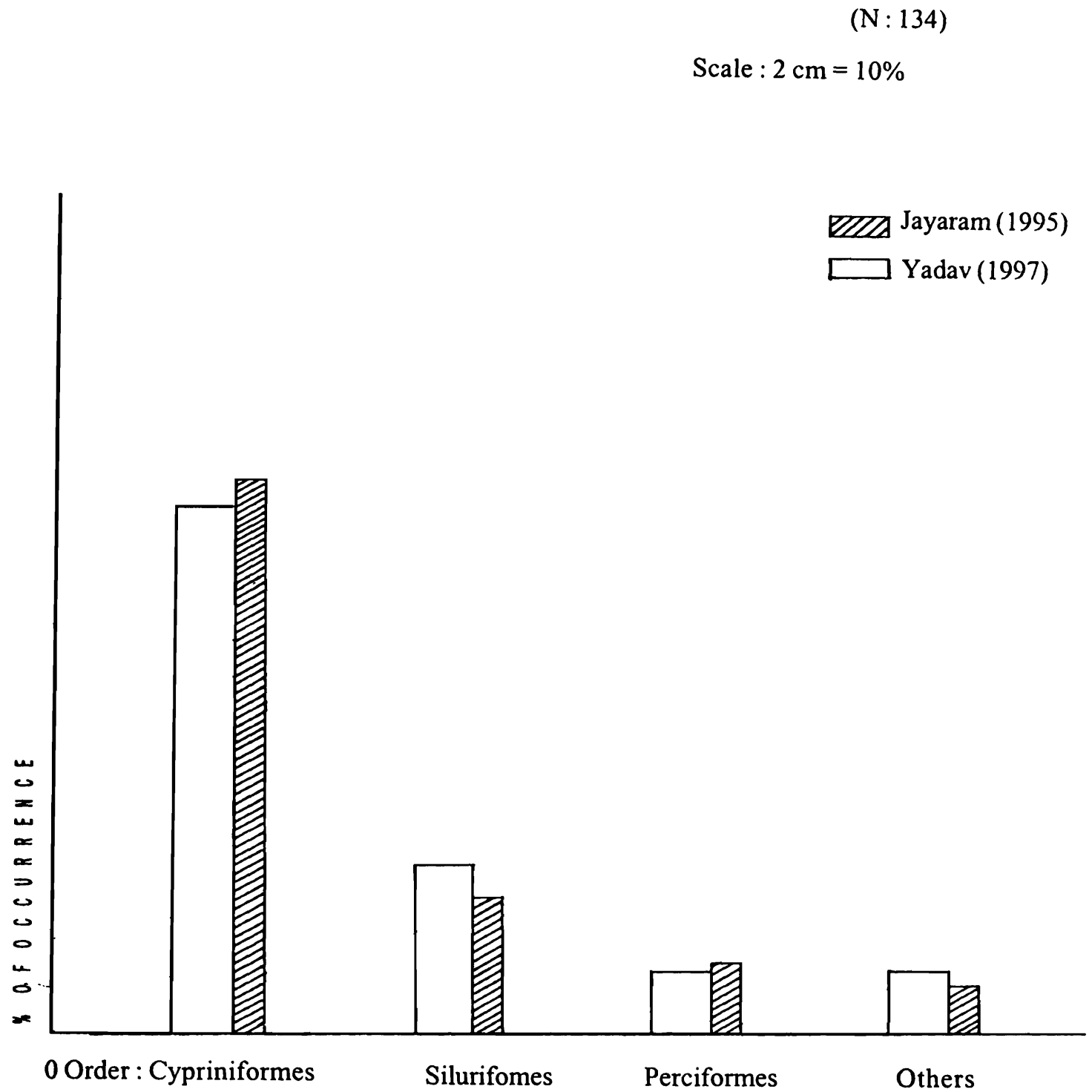


Fig. 2. Occurrence of major fish orders (%) in Krishna river system.

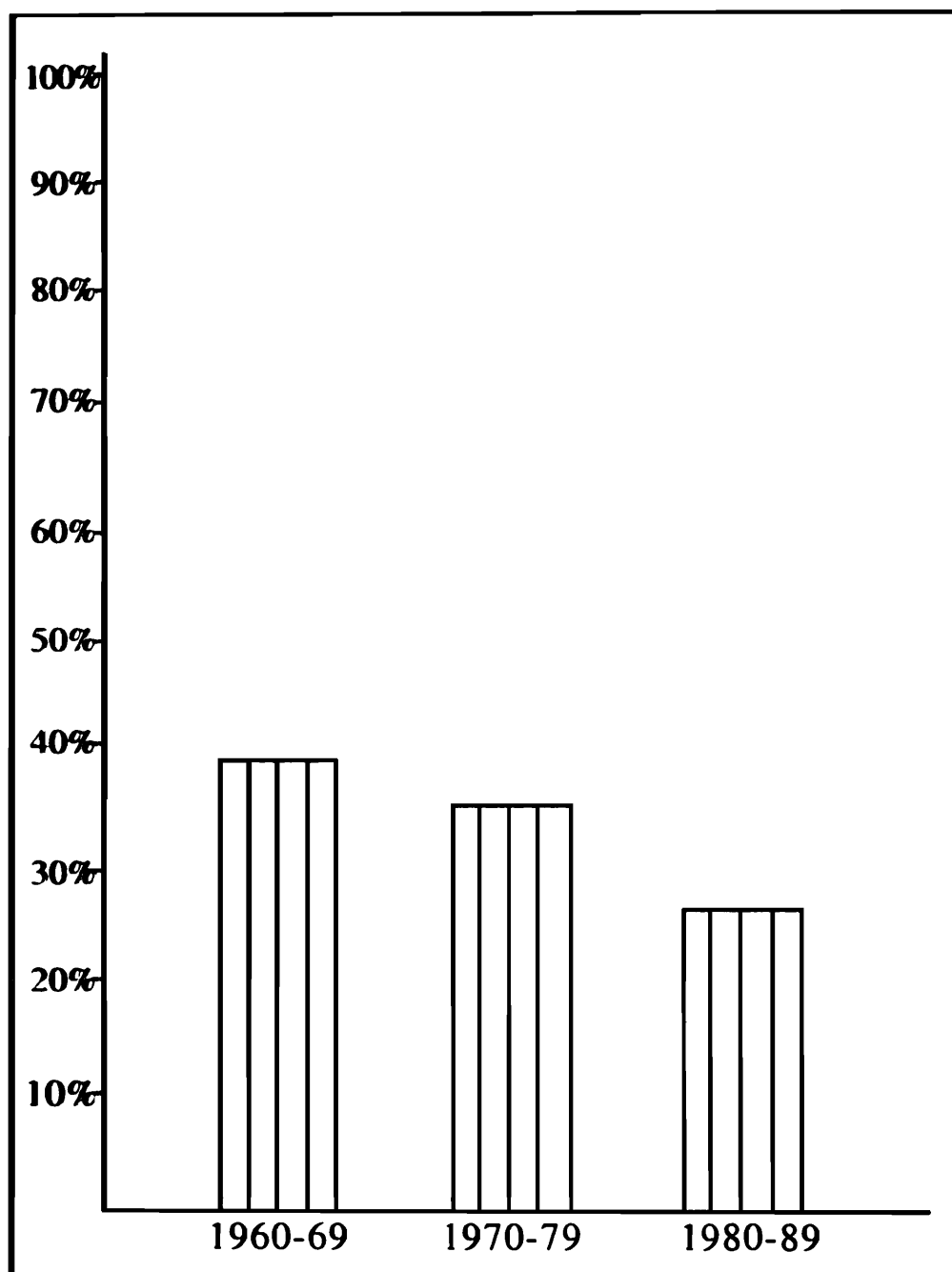
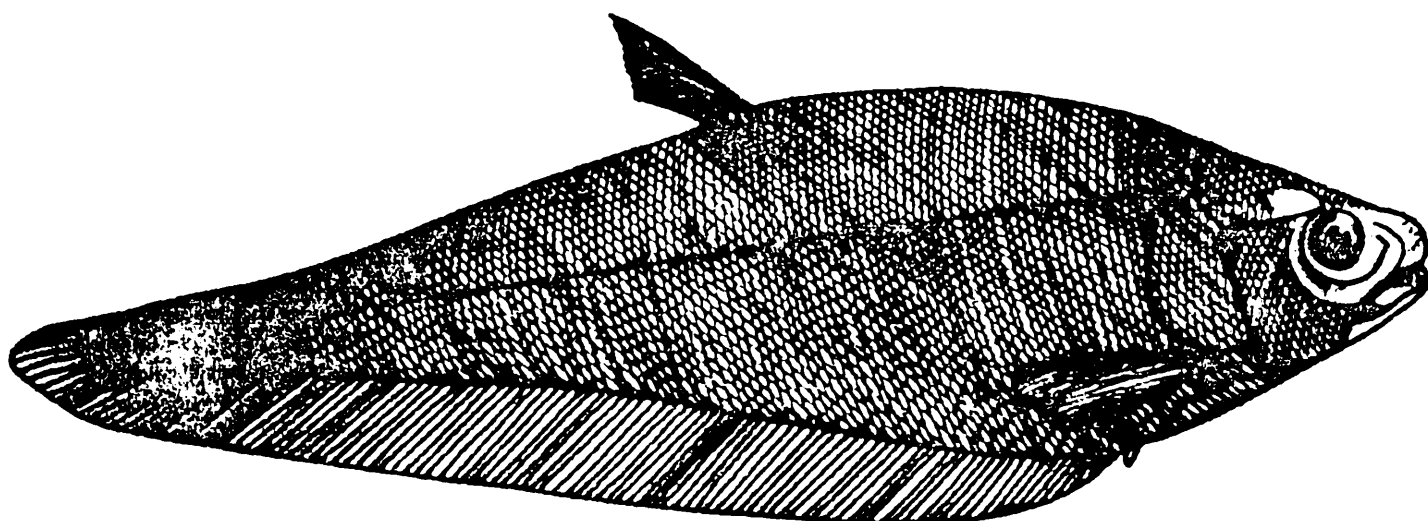
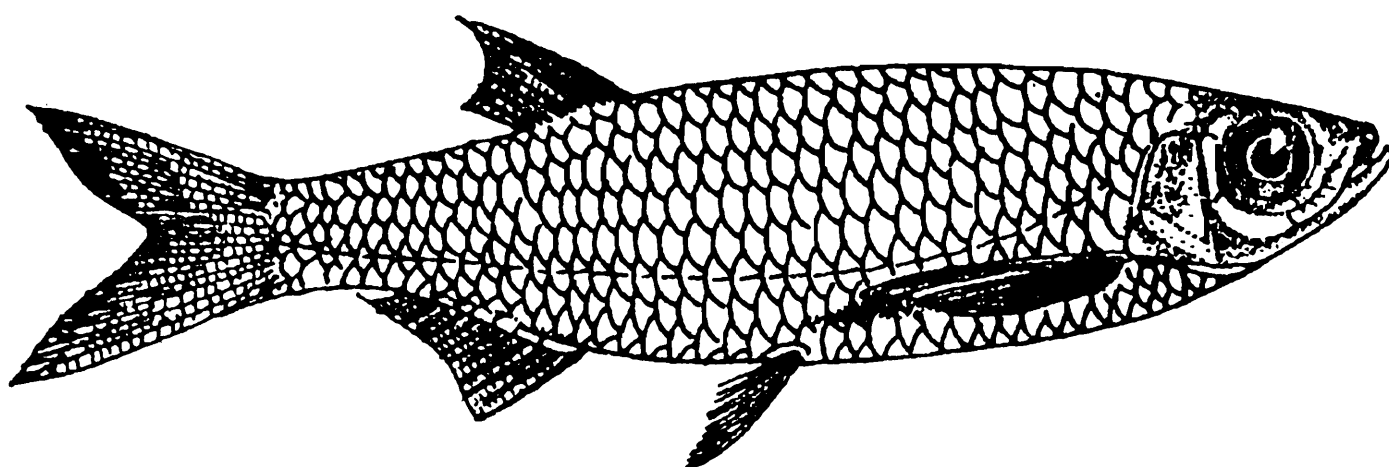


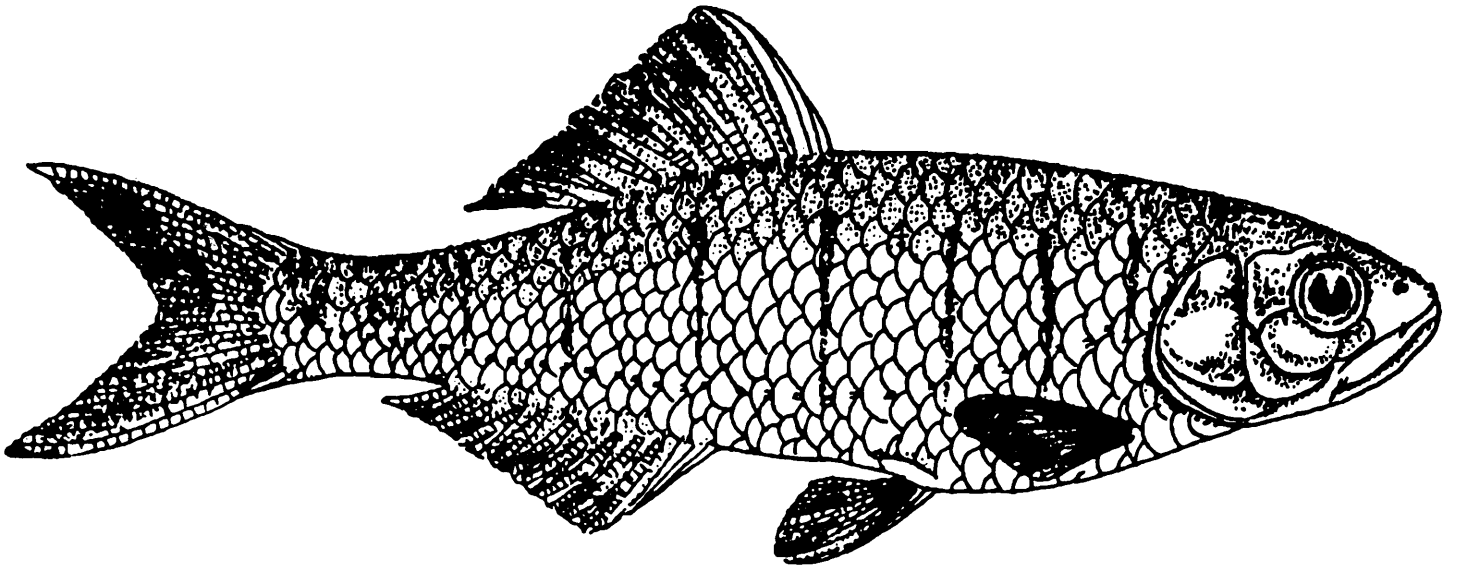
Fig. 3. Percentage of total fish catch in three decades in the Western Ghats



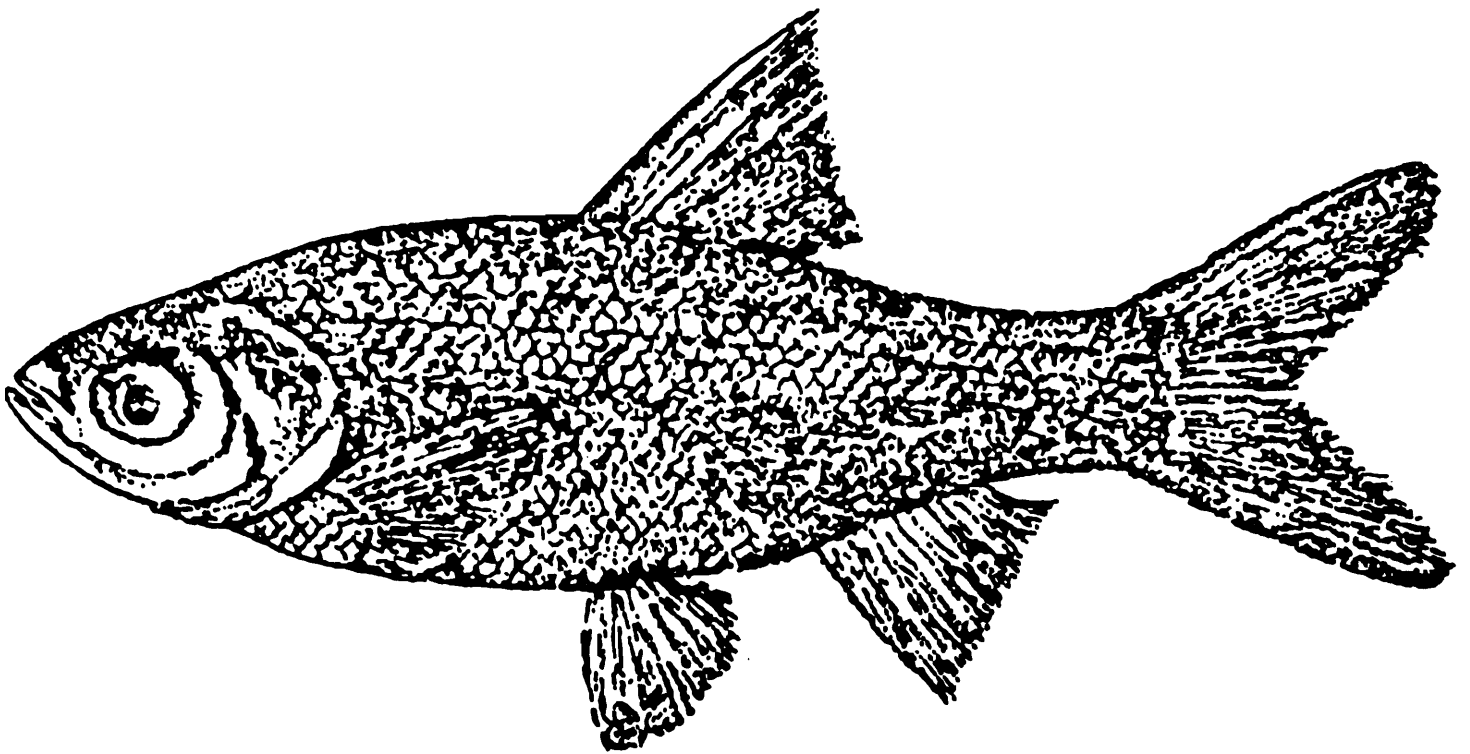
1. *Notopterus notopterus* (Pallas)



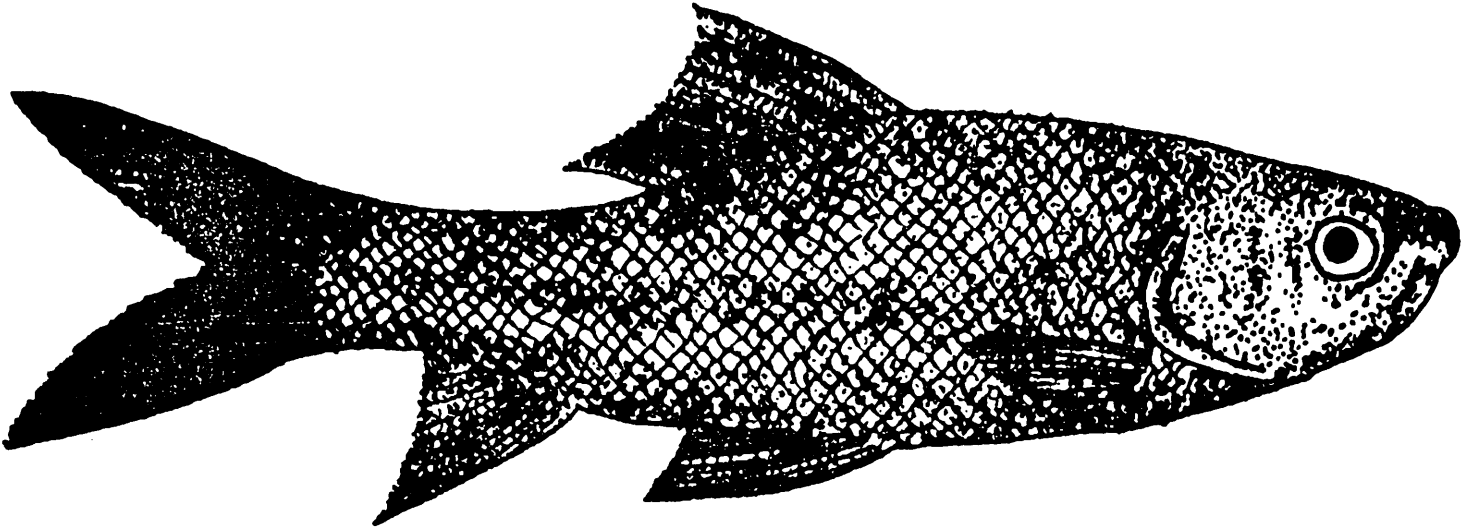
2. *Salmostoma clupeoides* (Bloch)



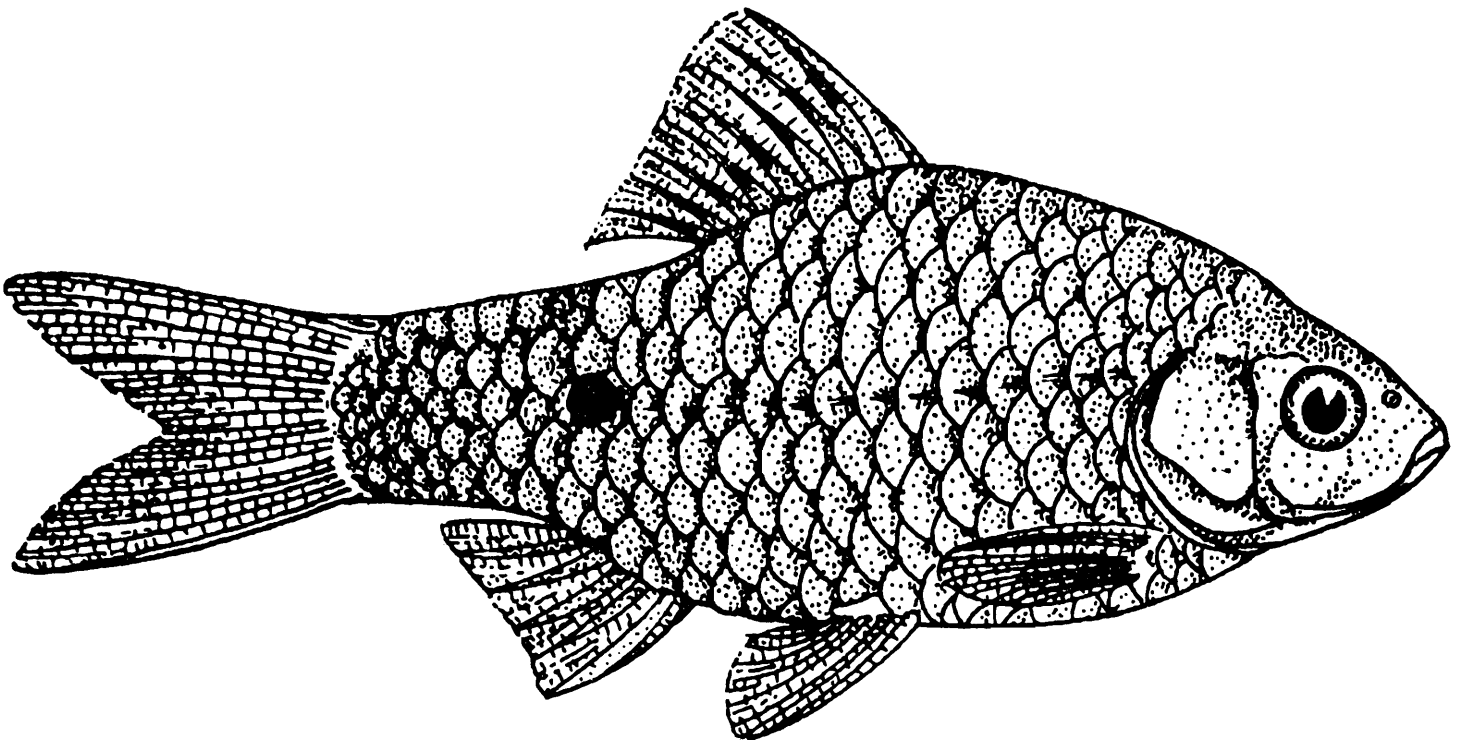
3. *Barilius barna* (Ham-Buch.)



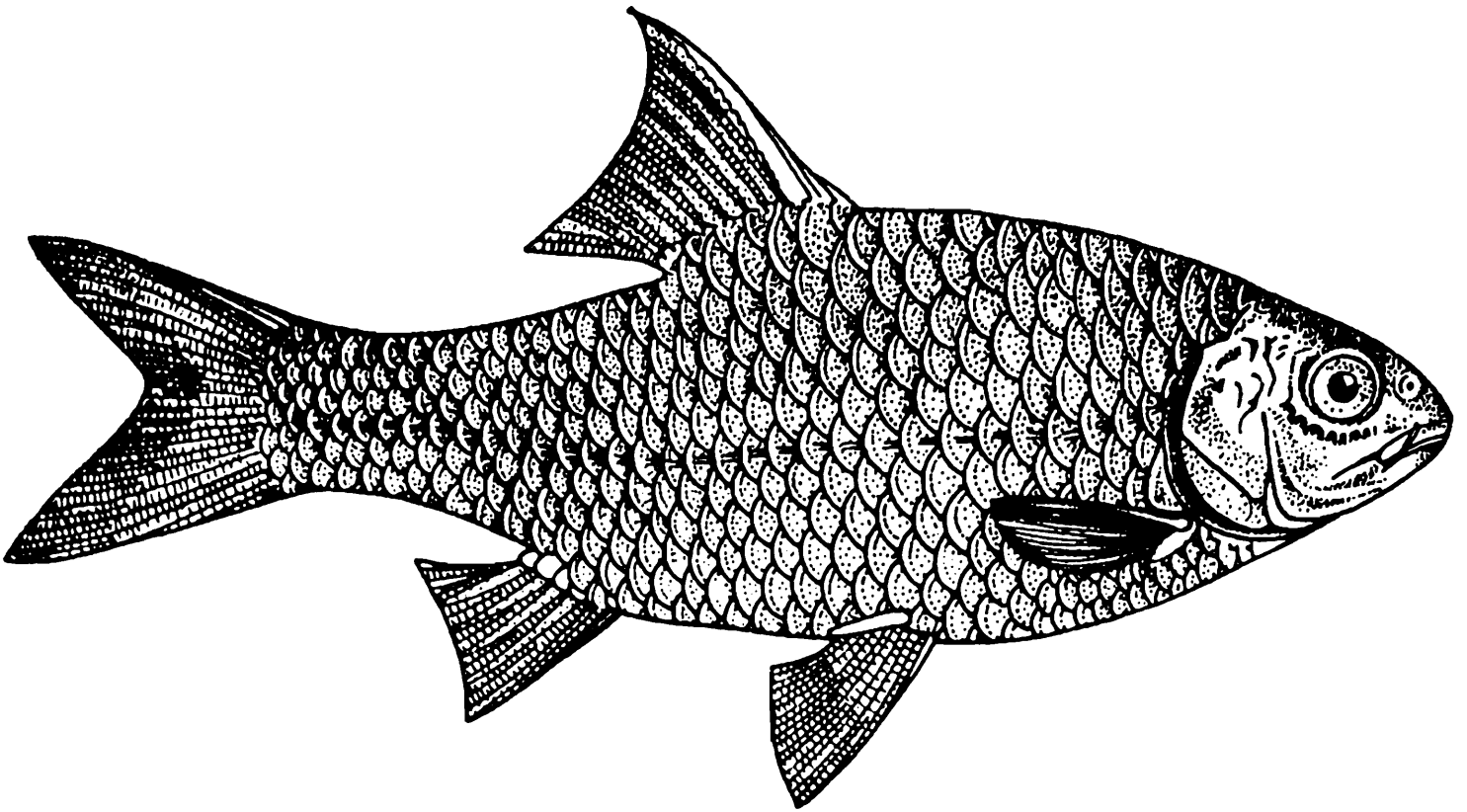
4. *Amblyphryngodon mola* (Ham-Buch.)



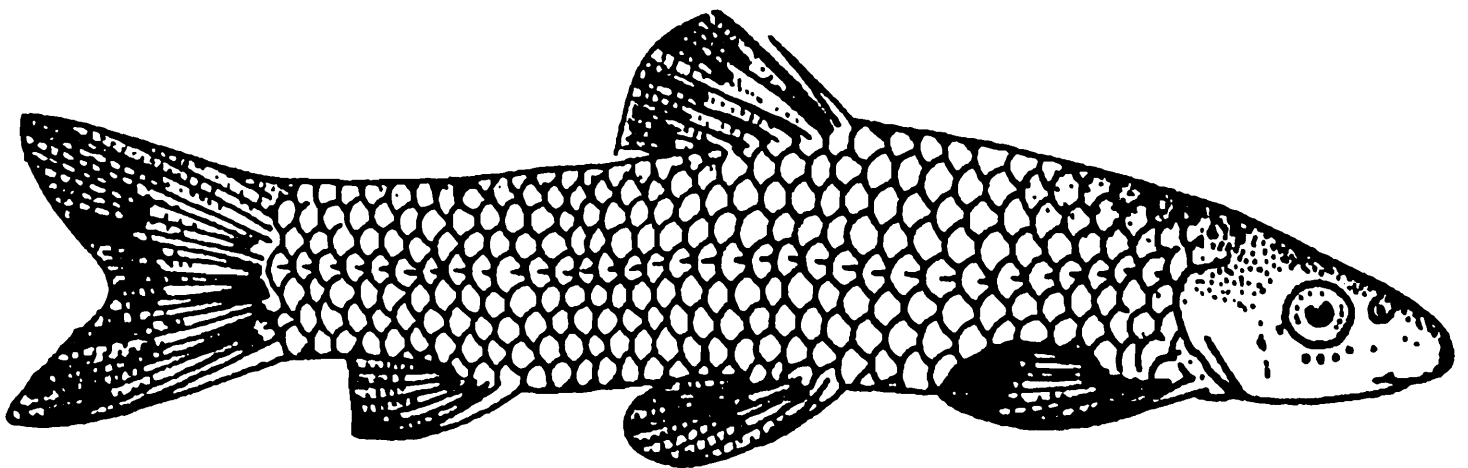
5. *Labeo rohita* (Ham-Buch.)



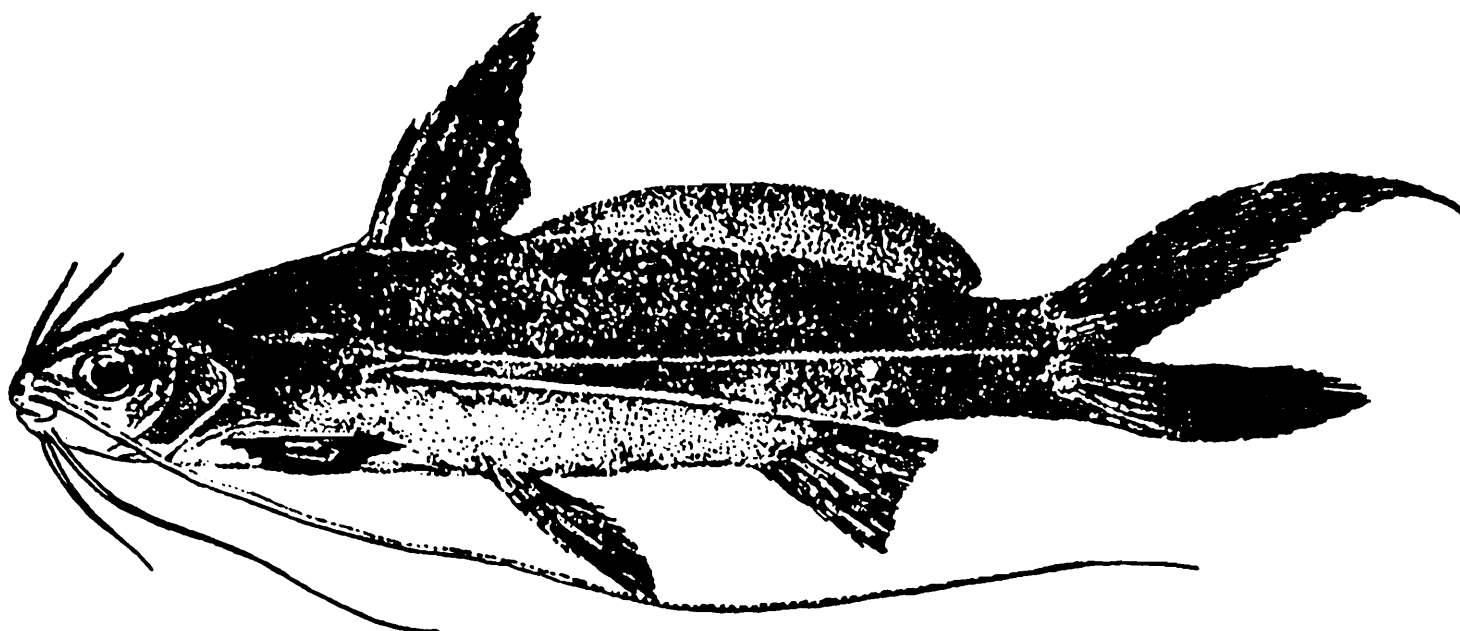
6. *Puntius ticto* (Ham-Buch.)



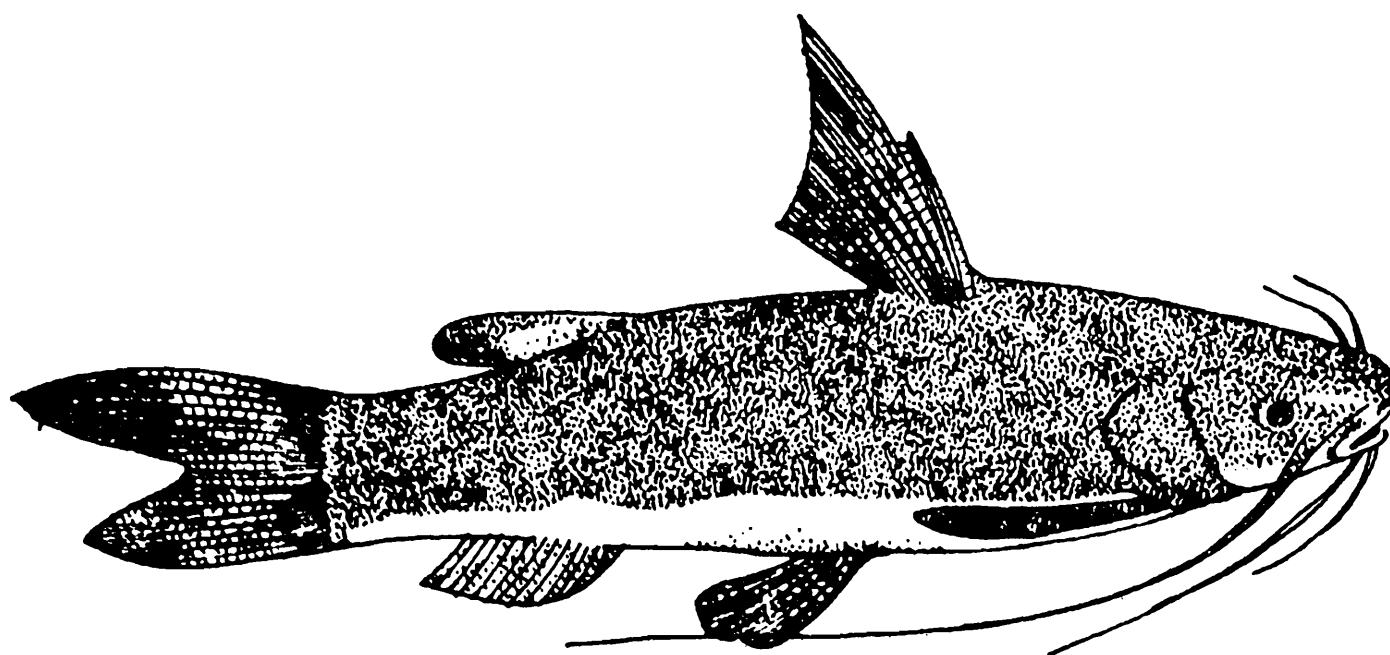
7. *Barbodes sarana* (Ham-Buch.)



8. *P. disscophorus* (Hora)



9. *Mystus cavasius* (Ham-Buch.)



10. *Mystus gulio* (Ham-Buch.)

