

Threatened fishes of India and their conservation



A.G.K. Menon

ZOOLOGICAL SURVEY OF INDIA

THREATENED FISHES OF INDIA AND THEIR CONSERVATION

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PREFACE

Activities of modern man are changing the environment. Though we have a hundred year old history of taxonomic exercises on the ichthyofauna of India, and three decades of excellent fishery research in our fishery research institutes, there has not been any serious attempt to study fish life in relation to the degradation of their habitats. In several parts of India especially in the Himalayas, the Deccan and the Western Ghats the forests are facing extreme pressure from human populations. Alteration of forest habitat causes a series of stream changes, such as increase in the deposition of fine sediments, increase in suspended material, increase in short-term floods, elimination of allochthonous synergy input provided by fallen leaves, elimination of insect population which process the leaf debris, increase in solar energy input, and an explosive growth of aquatic vegetation. These changes are independent of and prior to the efforts of human changes due to a variety of human activities : agriculture, irrigation, construction of dams and canals which cause changes in the river ecosystem. These changes have already affected the catch of our world famous Carps, Mahseers and Catfishes in our river systems. They are on the decline and several species have become threatened and more and more species are added to the endangered category every year.

The Indian marine and brackish water fishing scenario also has led to several environmental maladies and biotic degradation leading to extermination of several marine and brackish water species. Although the fish production from the marine coastal habitat has increased considerably, the increasing fishing pressure has affected the sustenance of production of some species of fishes from these habitats. Their exploitation is invariably concentrated in the coastal waters upto a depth of 50 metres due to economic and operational limitations. As a result of the intensive exploitation of this narrow stretch of coastal habitat and brackish water areas, several marine and brackish water species have already become threatened. Pollution due to urbanisation and industrialisation of the coastal belt has also affected the coastal habitats and their fish populations. The intensification of inshore fishing for increased marine fish production through the introduction of mechanised trawling, innovative mass harvesting gear (Purse seine) and synthetic gear materials have added to the tempo of over exploitation.

In the present work an attempt has been made to review the overall threatened status of Indian freshwater and marine fish faunas and the general problems affecting their environment are discussed. Several conservation measures suggested to solve these problems include (i) creation of fish sanctuaries, (ii) legislation to encourage 10 metre green banks along the rivers with natural herbage and trees to reduce erosion and siltation, (iii) better enforcement of pollution laws, (iv) ban on expansion of plantations, (v) ban on introduction of exotic species, (vi) increased awareness of the public and the fishery managers of location of rare and endangered populations of fishes, (vii) identification of temple tanks and temple sanctuaries on river stretches and declaring them as sanctuaries for fish conservation, (viii) delimitation of areas and seasons for purse-seining and (ix) restriction and control of mechanised trawling on coastal waters.

74 species of the Indian freshwater and marine fishes are either extinct or endangered, or vulnerable, or rare needing immediate protection.

A.G.K. Menon

CONTENTS

PREFACE	iii
INTRODUCTION	1
SYSTEMATIC ACCOUNT	3
Family I. RHINIODONTIDAE	3
1. <i>Rhiniodon typus</i> (Smith)	3
Family II. MURAENESOCIDAE	4
2. <i>Muraenesox cinereus</i> (Forsskal)	4
Family III. CONGRIDAE	5
3. <i>Congresox talabanoides</i> (Bleeker)	5
Family IV. CLUPEIDAE	6
4. <i>Tenuالosa ilisha</i> (Hamilton)	6
Family V. NOTOPTERIDAE	8
5. <i>Notopterus chitala</i> (Hamilton)	8
Family VI. CYPRINIDAE	10
6. <i>Barilius canarensis</i> (Jerdon)	10
7. <i>Barilius radiolatus</i> (Gunther)	12
8. <i>Raiamas bola</i> (Hamilton)	15
9. <i>Rasbora caverii</i> (Jerdon)	17
10. <i>Thynnichthys sandkhol</i> (Sykes)	19
11. <i>Naziritor cheilynoides</i> (McClelland)	22
12. <i>Neolissochilus hexagonolepis</i> (McClelland)	24
13. <i>Neolissochilus wynaadensis</i> (Day)	26
14. <i>Tor khudree</i> (Sykes)	29
15. <i>Tor kulkarnii</i> (Menon)	31
16. <i>Tor progeneius</i> (McClelland)	34
17. <i>Tor putitora</i> (Hamilton)	36
18. <i>Tor tor</i> (Hamilton)	38
19. <i>Osteobrama bakeri</i> (Day)	41
20. <i>Osteobrama belangeri</i> (Valenciennes)	43
21. <i>Osteobrama neilli</i> (Day)	45
22. <i>Rohtee ogilbii</i> (Sykes)	48
23. <i>Barbodes bovanicus</i> (Day)	50
24. <i>Barbodes carnaticus</i> (Jerdon)	52
25. <i>Chagunius chagunio</i> (Hamilton)	55
26. <i>Eechathalakenda ophicephala</i> (Raj)	57
27. <i>Hypselobarbus dobsoni</i> (Day)	59

28.	<i>Hypselobarbus dubius</i> (Day)	62
29.	<i>Hypselobarbus jerdoni</i> (Day)	64
30.	<i>Hypselobarbus lithopidos</i> (Day)	66
31.	<i>Hypselobarbus micropogon</i> (Valenciennes)	69
32.	<i>Hypselobarbus musullah</i> (Sykes)	71
33.	<i>Hypselobarbus periyarensis</i> (Raj)	74
34.	<i>Hypselobarbus pulchellus</i> (Day)	76
35.	<i>Hypselobarbus thomasi</i> (Day)	79
36.	<i>Poropuntius clavatus</i> (McClelland)	81
37.	<i>Lepidopygopsis typus</i> (Raj)	83
38.	<i>Schizothorax curvifrons</i> (Heckel)	86
39.	<i>Schizothorax hugelii</i> (Heckel)	88
40.	<i>Schizothorax nasus</i> (Heckel)	90
41.	<i>Schizothorax niger</i> (Heckel)	92
42.	<i>Cyprinion semiplotus</i> (McClelland)	95
43.	<i>Cirrhinus cirrhosus</i> (Bloch)	97
44.	<i>Labeo dero</i> (Hamilton)	99
45.	<i>Labeo dussumieri</i> (Valenciennes)	102
46.	<i>Labeo kontius</i> (Jerdon)	104
47.	<i>Labeo procellus</i> (Heckel)	106
48.	<i>Labeo potail</i> (Sykes)	108
49.	<i>Labeo pangusia</i> (Hamilton)	111
50.	<i>Schismatorhynchus nukta</i> (Sykes)	113
Family VII.	COBITIDAE	115
51.	<i>Enobarbichthys maculatus</i> (Day)	115
Family VIII.	BAGRIDAE	118
52.	<i>Batasio travancoria</i> (Hora and Law)	118
53.	<i>Pseudobagrus chryseus</i> (Day)	121
Family IX.	SILURIDAE	123
54.	<i>Silurus wynaadensis</i> (Day)	123
Family X.	SCHILBEIDAE	126
55.	<i>Neotropius khavalchor</i> (Kulkarni)	126
Family XI.	PANGASIIDAE	128
56.	<i>Pangasius pangasius</i> (Hamilton)	128
Family XII.	AMBLYCIPITIDAE	130
57.	<i>Amblyceps laticeps</i> (McClelland)	130
Family XIII.	SISORIDAE	132
58.	<i>Bagarius bagarius</i> (Hamilton)	132
59.	<i>Gagata itchkeea</i> (Sykes)	135
Family XIV.	CLARIIDAE	137
60.	<i>Horaglanis krishnai</i> (Menon)	137

Family XV.	ARIIDAE	140
61.	<i>Arius dussumieri</i> (Valenciennes)	140
62.	<i>Arius sona</i> (Hamilton)	141
63.	<i>Arius thalasinus</i> (Ruppell)	142
64.	<i>Arius tenuispinis</i> (Day)	143
Family XVI.	SYNBRANCHIDAE	144
65.	<i>Monopterus fossorius</i> (Nair)	144
Family XVII.	PLATYCEPHALIDAE	146
66.	<i>Grammoplites suppositus</i> (Troschel)	146
Family XVIII.	LACTARIIDAE	147
67.	<i>Lactarius lactarius</i> (Schneider)	147
Family XIX.	HAEMULIDAE	148
68.	<i>Pomadasys argenteus</i> (Forsskal)	148
Family XX.	SCIAENIDAE	149
69.	<i>Otolithoides biauritus</i> (Cantor)	149
70.	<i>Protonibea diacanthus</i> (Lacepede)	150
Family XXI.	POLYNEMIDAE	151
71.	<i>Polydactylus indicus</i> (Shaw)	151
72.	<i>Polydactylus heptadactylus</i> (Cuvier)	152
Family XXII.	NANDIDAE	153
73.	<i>Pristolepis fasciatus</i> (Bleeker)	153
Family XXIII.	CICHLIDAE	155
74.	<i>Eetroplus canarensis</i> (Day)	155
LITERATURE CITED		159
INDEX		166

INTRODUCTION

In India effective concern for the protection of rare and endangered Wildlife has been almost wholly confined to the warm blooded vertebrates. The Wildlife Act of 1972 provided for the formation of several national parks and sanctuaries in India. However these parks and sanctuaries are primarily for the protection of the large game and the birds and the problem of fishlife in India has not so far received the attention it urgently needs. Conservation of fishlife is urgently needed in India both for economic and ecological reasons.

Conservation biology differs from all other biological sciences in one important way; it is a crisis discipline. Often conservation biologists are asked for advice by Government agencies and private organizations on the ecological effects of developmental activities and for practical and other reasons, decisions are often taken in haste. Similarly hasty decisions seem to be necessary in the protection of endangered species. It is all the more necessary in the case of aquatic animals such as fishes; awaiting convincing proof of depletion being dangerous, as it may then be, too late to retrieve. Any list of endangered fishes should therefore be tentative and it should be continuously revised and expanded as and when fresh data on distribution and trend in population fluctuation are discovered.

IUCN list of threatened fish species : The IUCN (International Union for Conservation of Nature and Natural Resources) has published lists of fishes, amphibians, reptiles, birds and mammals considered by IUCN to be globally endangered, threatened or rare in the Red Data Book. The number of threatened animal taxa identified by IUCN is 4494 comprising of :

Mammals	...	550
Birds	...	1073
Reptiles	...	186
Amphibians	...	54
Fishes	...	506
Invertebrates	...	2125

The vast majority of the fishes listed in the IUCN 1988 Red list are freshwater forms, and their geographical distribution are as follows :

	F. W. fish species	Threatened species (all categories)
USA and Canada	c 700	157

South America	c 2700	12
Africa	2000 +	46 + c 250
Oriental Region	c 1200	15
Sri Lanka	64	10

From the table it can be seen that there is a big difference between the proportion of threatened fish species in North America when compared with South America, the Oriental Region and Africa. This may be related to the greater pressures on fish populations in North America though it more likely reflects on lack of knowledge of the status of the fish fauna of tropical regions. The data on fishes of India is totally lacking.

IUCN (1988) Criteria for determining the threatened status of fishes :

Extinct (Ex) : Species not definitely located in the wild during the past 50 years.

Endangered* (E) : Taxa in danger of extinction and whose survival is unlikely if causal factors continue operating. (Including in this are those whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction. Also included are taxa that may be extinct but definitely been seen in the past 50 years).

Vulnerable (V) : Taxa believed likely to move into endangered category in the near future if causal factors continue operating. (Including in this taxa are those of which most of all the populations are decreasing because of overfishing, extensive destruction of habitat or other environmental disturbances, taxa with populations that are still abundant but are under threat from severe adverse factors throughout their range).

Rare (R) : Taxa with small world populations that are not at present endangered or vulnerable but are at risk. (These taxa are usually located within a restricted geographical area or habitat or are thinly scattered over a more extensive range).

The criteria for determining the Extinct status of a taxon by IUCN is applicable more to warm blooded terrestrial animals than to fishes. It is obviously referable to extinction through alteration of environment by man or man-induced extinction. In the case of mammals in the Wild, it is possible to count the numbers and trace the process of extinction.

*It may be stated that a simple census of the population of a particular species at a point of time is not adequate enough to determine whether or not the species is endangered. "Endangered" is not a synonym for population size or population density. The term *embodies* concepts such as rate of recruitment and population dynamics. It is an estimate of the population size *over some considerable future span of time*. An endangered population is, therefore, one that is unlikely to be able to replace itself given present conditions, and at some future point mortality will overtake recruitment and it will disappear (Fruzier, 1985). Viability analysis (MVP) is essential to determine the endangered species (Soule, 1987).

The categorization of a species as extinct applying the IUCN principle in the case of fish is risky. Rare species of fish never turns up in small collections. Finding rare species requires thorough efforts aimed at completely sampling each microhabitat. So the 50 year principle is not followed in the categorizations of threatened status in the present work.

In the Species Account for each threatened species, the status of the species, a general summary of the species distribution, salient features of the species, biological information wherever possible and some recommendations as to the protection of the species are rendered.

SYSTEMATIC ACCOUNT

Suborder LAMNOIDEI

Family I. RHINIODONTIDAE

1. *Rhiniodon typus* (Smith)

Vernacular names : Marathi : *Karani, Behiri, Deomushi*; Malayalam : *Makara-sravu*.

Tamil : *Usman sura, Panai Meen, Uravi, Pullion surrow*. Common English name : *Whale shark*.

Status : Endangered.

Though widely distributed in tropical seas of all oceans it is rarely caught in fishing nets from various parts of India. Along Veraval coast this fish is regularly caught using hooks during March-April. Any directed effort at exploitation of the species as has been taking place at Veraval at present may lead to its extinction (Silas, 1986).

Taxonomic status : The family comprises of one genus *Rhiniodon* Smith, with one species. Regan (1908) treated it as a member of the family Orectolobidae.

Salient features : Robust enormous body. Mouth wide terminal with small numerous teeth. A ridge along the back and two additional ridges above the main ridge.

Fins : Caudal lunate with a caudal pit.

Colour : Greenish black above, with white spots and transverse stripes.

Habitat : Oceanic and epipelagic, often basking in the surface of warm seas.

Maximum size : World's largest fish with 18 m (from Gulf of Siam); 12, 18 m (Indian Coastal waters).

Biology : An omnivorous feeder and not a purely zooplankton feeder or a herbivore; the dietary habits of the fish may change with age. Whale sharks' mode of reproduction is uncertain. The evidences so far collected suggest ovoviviparity. No information about migration, growth, size at first maturity and longevity (Silas, 1989).

Protective measures taken : Nil.

Recommendations

1. Dead specimens whenever come inshore or any found stranded should be reported immediately to nearest Museum or Zoological Survey of India or Marine Living Resources Data Centre, CMFRI, Cochin.
2. Fishing using hooks should be totally prohibited along the coast of India.
3. Identification pamphlets should be distributed to steamer owners to prevent them from killing the fish basking in the surface of the seas.
4. Educate the coastal and island fishermen to release the whale shark when caught.

Family II. MURAENESOCIDAE

2. *Muraenesox cinereus* (Forsskal)

Vernacular names : Tamil : *Kada-Vilangu*; Marathi : *Wam*.

Common English names : *Silver conger*, *Dagger-tooth pike-conger*.

Status. Vulnerable.

Widespread in Central tropical Indo-Pacific, this fish formed an important commercial eel of Bombay coast. Larval forms and elvers of the eel used to be obtained in fair numbers from Sasson Dock and Versova during April and May, found mixed up with shrimp catches landed by the bag nets from 20 to 25 m. The catch statistics of the fifties, sixties and seventies has revealed that this eel has dwindled very much in production along the Maharashtra coast.

Salient features : B. XX-XXII., D. 230-270; P. 14-16; A. 190-220; C. 10. Eel shaped, robust fish with large mouth extending beyond eye, teeth large and formidable. Vent midway in body.

Fins : Dorsal and anal fins continuous with caudal fin around tip of body. Pectoral fins well developed.

Colour : Silvery with grey or yellow sheen.

Habitat : Inhabits soft bottoms down to about 100 m, entering estuaries.

Maximum size : .8 m (80 cm) TL.

Biology : Feed on small bottom fishes and crustaceans. The complete metamorphosis of the leptocephali takes place in six stages within 10 days. The sixth stage is juvenile eel (Nair and Mohamed, 1960).

Protective measures taken : Nil.

Recommendations

The use of bagnets during April and May from 20 to 25 m off the coast of Maharashtra should be regulated.

Family III. CONGRIDAE

3. *Congresox talabanoides* (Bleeker)

Vernacular names : Gujarati : *l'am*; Marathi : *Wam*; Malayalam : *Pambumeen*. Tamil : *l'ilangu*

Common English name : *Indian pike-conger*.

Status : Vulnerable.

This eel distributed from Red Sea through coasts of India to South East Asia and China supported an important and flourishing fishery along the north-western parts of India particularly in Bombay and Gujarat waters. The catch statistical data of the fifties, sixties and seventies reveal a steadily declining trend in the fishery of this species.

Taxonomic status : Bleeker (1853) described this species under genus *Conger* while Day (1878) placed it in the genus *Muraenesox*. Castle (1984) assigns this species to the genus *Congresox* Gill.

Salient features : B. XVIII-XIX., D. 245; P. 15; A. 200-205; C. 10. Body elongate, cylindrical anteriorly and compressed along tail, head sharply conical, snout and lower jaw elongated, mouth large, extending to well beyond eye, teeth large, conspicuous, sharp, conical, 2 or 3 rows on jaws and vomer; outer teeth row on lower jaw leaning outward, teeth on middle row of vomer prominent, needlelike, but with minute basal cusps; tip of lower jaw with its large canines fits into a notch in under side of snout when mouth in closed.

Fins : Dorsal and anal fins continuous with caudal fins around tip of body; pectoral fins relatively small.

Colour : Head and body olive to golden yellow, vertical fins with narrow dusky edges.

Habitat : Inhabits soft bottoms down to about 100 m depth entering estuaries.

Maximum size 2.5m (250cm) TL.

Biology : Feed mainly on bottom fishes and crustaceans. Spawns twice a year, primary spawning in April-May and secondary one in Sept.-Oct. (Kagwade, 1969).

Protective measures taken : Nil.

Recommendations

The use of bag-nets ('dol') and long line should be regulated especially during the monsoon months in Bombay and Gujarat coasts.

Family IV. CLUPEIDAE

4. *Tenualosa ilisha* (Hamilton)

Vernacular names : Hindi : *Hilsa*; Bengali : *Hilsa*; Assamese : *Ilish*; Oriya : *Ilish*, *Illisha*; Tamil : *Oalum*; Telugu : *Palash*; Malayalam : *Pulura*; Marathi : *Pala*; Gujarati : *Palla*, *Chaksi*.

Common English name : *Hilsa shad*.

Status : Vulnerable.

The Hooghly-Matlah (Ganga) estuary *ilisha* is a distinct stock from that of the Padma estuary (Brahmaputra) stock on the east and Subarnarekha estuary stock on the south-west.

In recent years the catch of *Hilsa* shad in the Hooghly-Matlah estuary has been declining. This decline of *Hilsa* catches in the Ganga estuarine system is partly due to the reduction of total spawning and rearing areas (Puntulu, 1966) and partly due to the harmful pollutional effects of industrial wastes discharged indiscriminately in the waters of the Hooghly. These wastes are known to cause large scale mortality of fish eggs and larvae (Gopalakrishnan, 1969).

Taxonomic status : Hamilton (1822) described this species under the genus *Clupeodon* but Day (1878) assigned it to *Clupea*, *C. ilisha*, while Whitehead (1973) placed it under *Hilsa* (*Tenualosa*) *ilisha*. Wongratana (1983) restricted the genus *Hilsa* to *H. kelee* which has numerous longitudinal striae on the top of head, those without fronto-parietal striae are placed under *Tenualosa*.

Salient features : D. IV-V / 14-16; A. II-III/16-20; P. 14; V. 7; belly scutes 30-33, gill-rakers 100-250.

Body oblong, compressed with profiles equally convex. Upper jaw with a distinct median notch. No fronto-parietal striae.

Fins : Dorsal fin midway of body, anal well behind dorsal base, pectoral and pelvic fins with axillary scales. Caudal as long as head.

Colour : Blue-green above, flanks silvery with a dark blotch behind gill opening, followed by a series of small spots or blotches along flanks.

Habitat : Pelagic, schooling in coastal waters, euryhaline and anadromous.

Maximum size : 60 cm SL., commonly 35-40 cm.

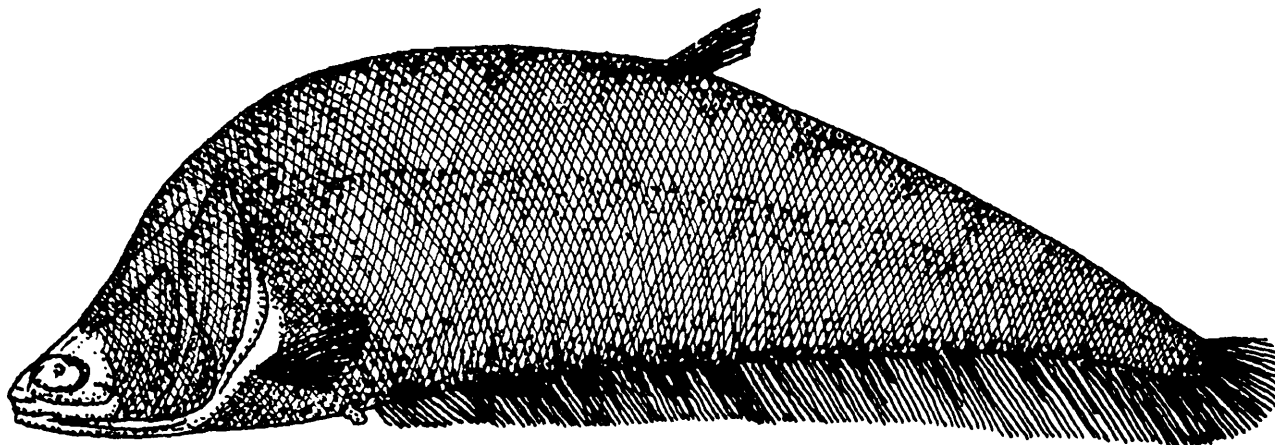
Biology : *Hilsa* used to ascend rivers to breed for over 50 to 100 km (even up to 1200 km in the Ganges). Subsequent to the construction of D. V. C. dams (about 1955) the spawning migration was greatly affected and the harvest of *Hilsa* fishery also had fallen. The Farakka barrage has further affected the up-river migration. The fish feed on plankton and also filter feed on mud bottom taking diatoms, protozoans, crustaceans, mulluscs and tunicates as food items. Breeding takes place during south-west monsoon with a shorter season from January-February or March (Pillay and Rosa 1963).

Protective measures taken : Before partition of Bengal on religious grounds the eating of *Hilsa* by Hindus was prohibited from Dashmi (last day of Durga Puja in October) to Sree Panchami or Saraswati Puja day (end of January to beginning of February). This period corresponds to the period when the spent-up *Hilsa* ought to be descending to the sea. This religious practice was intended to observe a "Close season" towards an effective measure of conservation.

Recommendations

1. Racial studies based on morphological characters of different isolated populations should be taken up.
2. The spawning grounds of *Hilsa* shad of the Hooghly-Matlah estuary should be identified and measures taken to protect the spawning areas.
3. The operation of fine-meshed seine nets operated chiefly between Nabadwip and Kulna should be regulated to avoid destruction of eggs and young ones.
4. Abatement of deterioration of water quality by effluents from industries and siltation.

Family V. NOTOPTERIDAE

5. *Notopterus chitala* (Hamilton)
(Fig.1)

Vernacular names : Oriya : Chitual, Pulli; Assamese : Seetul; Bengali : Chitala, Chital.

Common English name : Featherback.

Status : Vulnerable.

Distributed over a wide area in northern India, Bangladesh and Burma. The habit of the fish coming up the surface, making a flash, rolling over and exposing its broad silvery side has rendered the fish vulnerable to wholesale slaughter by fishermen.

Taxonomic status : Hamilton-Buchanan described it from larger freshwater rivers of Bengal and Bihar under the generic name *Mystus*. It is easily distinguished from *N. notopterus* by its strongly humped dorsal profile which declines gradually from the front to the tail and the small scales on opercle, not larger than those of body (in *N. notopterus* scales larger).

Salient features : D. 9-10; A. 110-135; C. 12-14; L. I. 180. Upper profile of head concave, maxilla extends beyond postorbital margin. Dorsal profile very convex, abdominal straight.

Fins : Dorsal when present small, its origin far behind pelvic origin. Pelvic small. Anal and caudal united.

Scales : 180 scales in lateral line, scales on opercle not larger than those of body.

Habitat : Freshwater rivers, lakes, beels and nullahs in the plains.

Maximum size : 122 cm TL; market specimens 26 cm.

Biology : Breeds in stagnant or running water in rainy season. Fecundity low, 200-

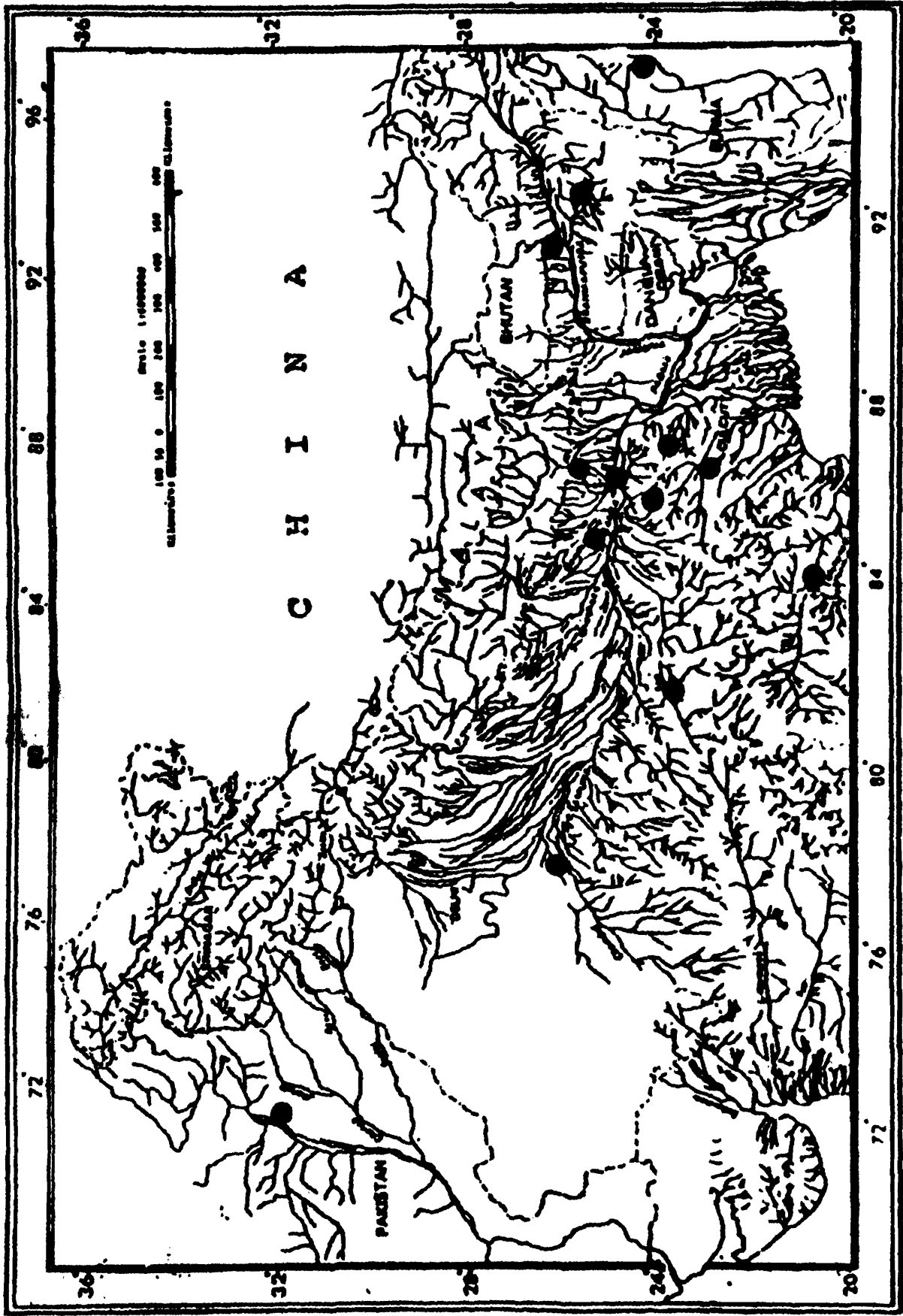


Fig. 1 : Distribution of *Notopterus chitala*. Indiscriminate killing is a threat to this species. Classified as vulnerable.

1000 eggs; eggs large, about 2 mm and yellowish; eggs laid in small clumps on submerged vegetation. Males guard the eggs.

Protective measures taken : None.

Recommendations

Mesh regulation should be enforced wherever the species constitutes a fishery in Bengal, Assam and Orissa.

Family VI. CYPRINIDAE

b. *Barilius canarensis* (Jerdon) (fig. 2)



Vernacular name : Nil.

Status : Endangered.

Found only in Dakshin Kannada hills. Originally its range extended to the coast of Kerala as well (Day, 1878). At present its range is confined to Uppanangudi River in Sulliya Taluk of Dakshin Kannada. Habitat modification by man could well reduce this species to extinction.

Taxonomic status : Jerdon (1849) considered the Malabar population as a distinct species, *Barilus malabaricus*. Hora (1941) has not listed *B. malabaricus* in his "Freshwater fishes of Travancore" Obviously a species similar to this present species does not occur there today.

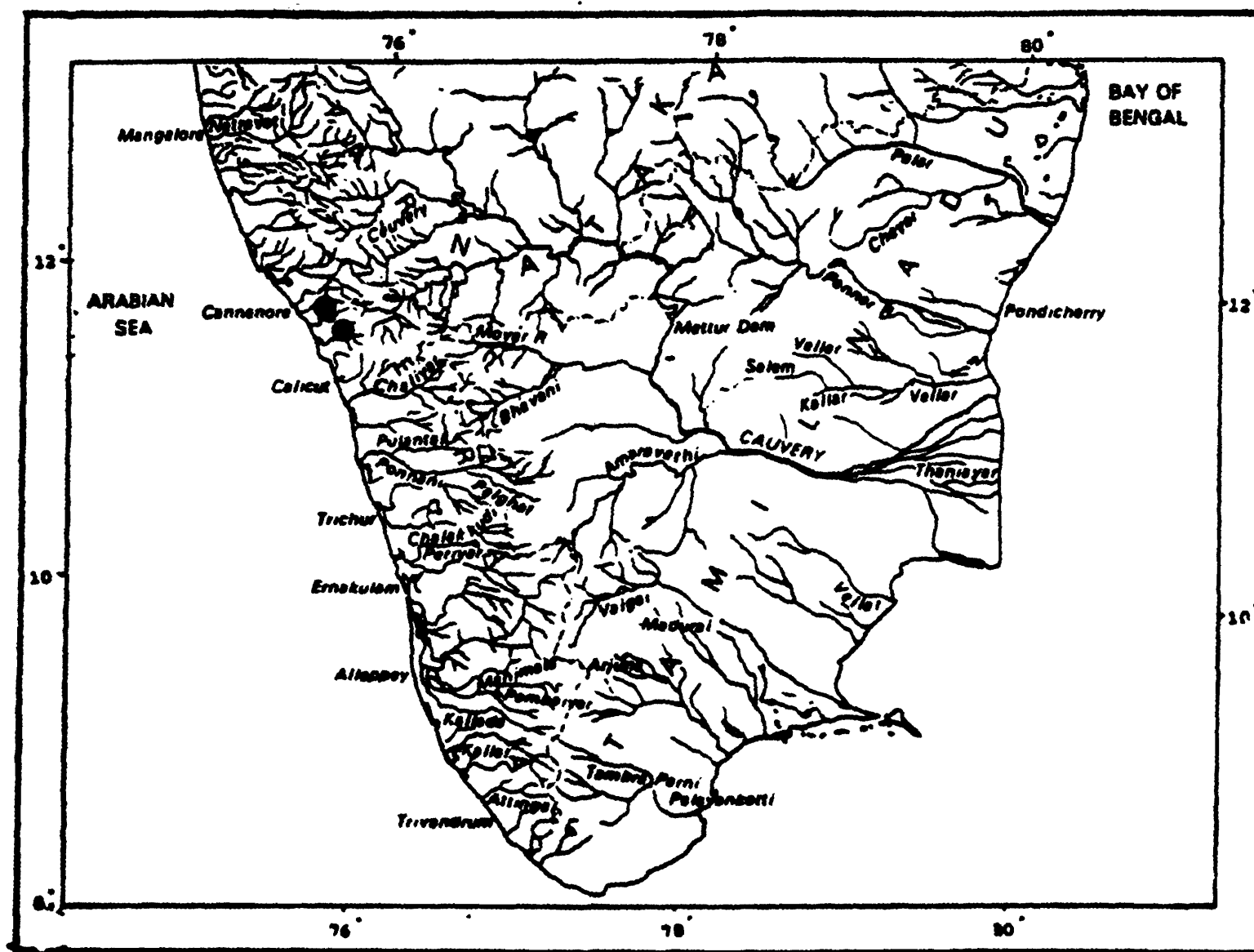


Fig. 2 : Distribution of *Barilius canarensis*. Confined to Uppanangudi river. Habitat modification could reduce the species to extinction.

Salient features : D. II/10-11; V. 9; A. II/12-14; C. 21; L. I. 38; L. tr. 9/4. Body deep about 3 times in SL. Mouth moderate, jaws short, maxilla extends to anterior 3rd of the orbit.

Barbels : Absent.

Fins : Dorsal fin inserted in advance of the anal fin, nearer to the base of the caudal fin.

Scales : L. I. complete, $2\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin.

Colour : Greenish above, golden on the sides, 3 rows of double spots on the anterior part of body and a single row posteriorly (a row of large bluish spots only along the sides in *B. bakeri*).

Habitat : Small streams with pebbly and stony bed.

Maximum size : 8 cm in length.

Biology : Not known.

Protective measures taken : None.

Recommendations

A suitable stream in Uppanangudi river in Sulliya Taluk should be set apart as a sanctuary for protection of this fish.

7. *Barilius radiolatus* (Gunther) (Fig. 3)



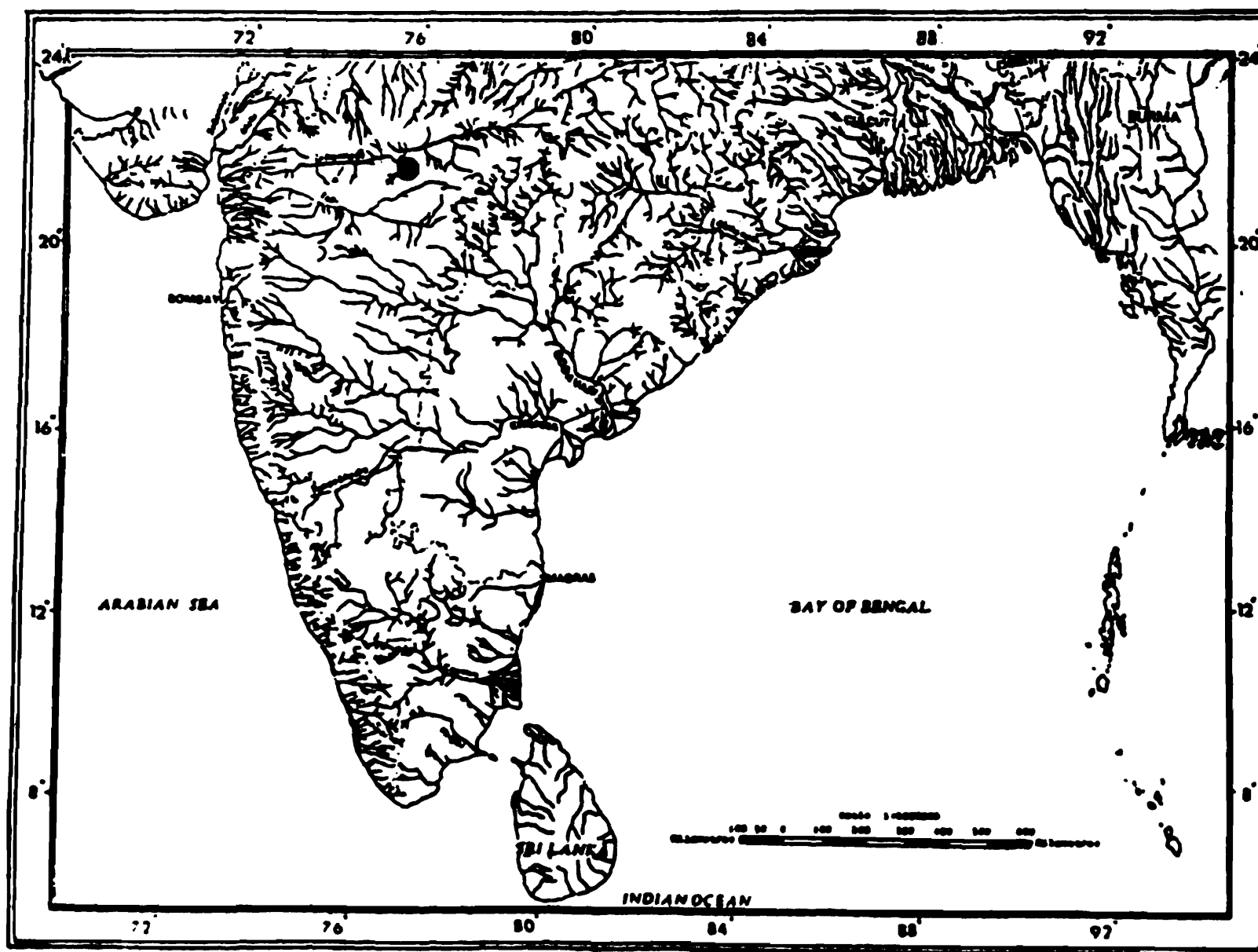


Fig. 3 : Distribution of *Barilius radiolatus*. Known only from the Narmada river, Hoshangabad. The proposed dam across Narmada is a threat to the species.

Vernacular name : Nil.

Status : Vulnerable.

Confined to Malwa, Hoshangabad district in the Narmada river system. Since the time of Gunther (1868) the fish has not been collected and it is known only from the two types in the British Museum (B. M. 3-18-821-2). The proposed construction of hydro-electric dams across the Narmada may bring about the extirpation of the fish.

Taxonomic status : Hora (1937) considered the species to be conspecific with *Barilius bola* Hamilton, a species now relegated to the genus *Raiamas* (Howes, 1980).

Salient features: D. II/8; P. 17; V. 9; A. III/10; L. I. 56-62; L. tr. 9-10/6. Body elongate, its depth 4.50 in SL. Mouth moderate, jaws long, maxilla reaches middle of the orbit. Lower jaw slightly projects when mouth is closed. The third suborbital bone nearly reaches the pre-opercular ridge.

Barbels : A pair of rudimentary barbels (Day gives 2 pairs).

Fins : Dorsal fin commencing midway between posterior orbit and base of the caudal; its last ray not extending so far as to above the anal. Pectoral does not reach the ventral, nor the latter the anal.

Scales : L. I. complete, 2 rows of scales between lateral line and base of pelvic fin.

Colour : Back olive, rest of body pinkish silvery, about 12 incomplete bars go from the back downwards towards the lateral line, a dark bar along upper 3rd of dorsal fin.

Habitat : Rapid clear streams with pebbly and sandy bed.

Maximum size : 5.5 cm in length.

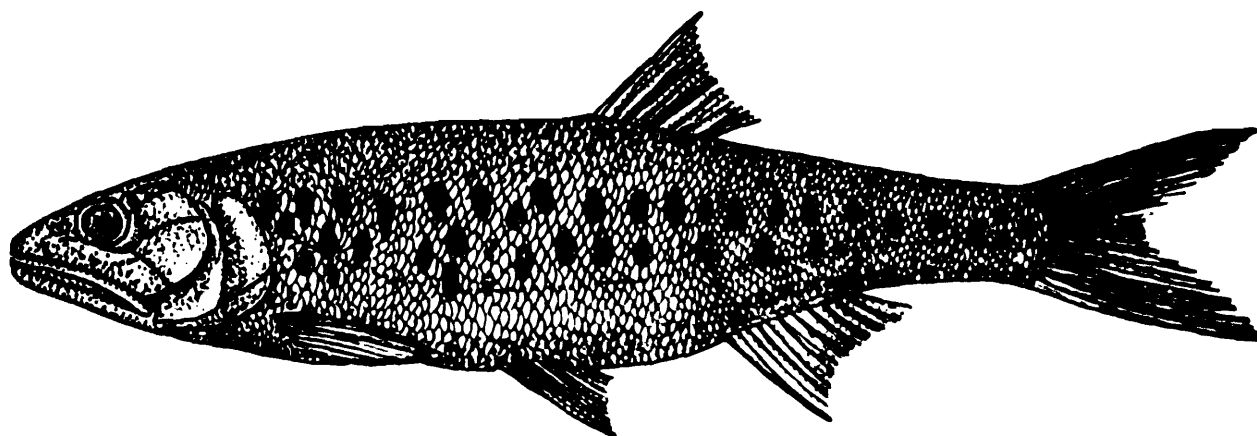
Biology : Not known.

Protective measures taken : None.

Recommendations

1. Environmental impact study of the proposed construction of dams on the river Narmada with special reference to the fish fauna of the river should be conducted.
2. Identification and information pamphlets should be made available to those who are concerned in the protection of the ichthyofauna and other rare animals of the Narmada river.

8. *Raiamas bola* (Hamilton)
(Figure 4)



Vernacular names : Hindi : *Buggaran*; Bengali : *Bola*, Assamese : *Korang*

Common English name : *Indian Trout*.

Status : Endangered.

According to Day, it is found in Orissa, Bengal, North-West Provinces, Assam and Burma, Hora (1937) recorded it from the hilly parts of Haryana, Himachal Pradesh, Uttar Pradesh, Bihar, Orissa, West Bengal, Assam and Burma. Menon (1962) recorded it from the Brahmaputra, the Bagmati, the Gandak, the Rapti, the Karnali and Kali drainages and the headwaters of Ganges and Jumna. The fish has not been recorded from Assam and Himachal Pradesh in recent surveys. It seems to have died out in the Kumaon lakes with the introduction of Mahseer there. Its habitat is reduced today to the Kosi, Bagmati and Gandak drainages of Nepal Terai and headwaters of Ganges system in Uttar Pradesh.

Taxonomic status : Hamilton-Buchanan (1822) described the fish under the generic name *Cyprinus*; Day (1878) assigned it to *Barilius*. Howes (1980) placed the species, *bola* and *guttatus* characterised by deeply cleft mouths and maxilla extending beyond post-orbital margin, under the genus *Raiamas* Jordon.

Salient features : D-III/7-8; P. I/12; V. I/8; A. III/10; C. 19; L. 1. 88-94; L. tr. 12-15/9-11 Body compressed; head sharply pointed. The lower jaw has a tubercle, which fits into a notch in the upper. Mouth obliquely directed upwards.

Barbels : Absent.

Fins : Dorsal origin behind the origin of ventrals; pectoral shorter than head and bears a scaly appendage at axil.

Colour : Body silvery, with two or more rows of vertical blue blotches on sides.

Habitat : Large mountain streams and rivers.

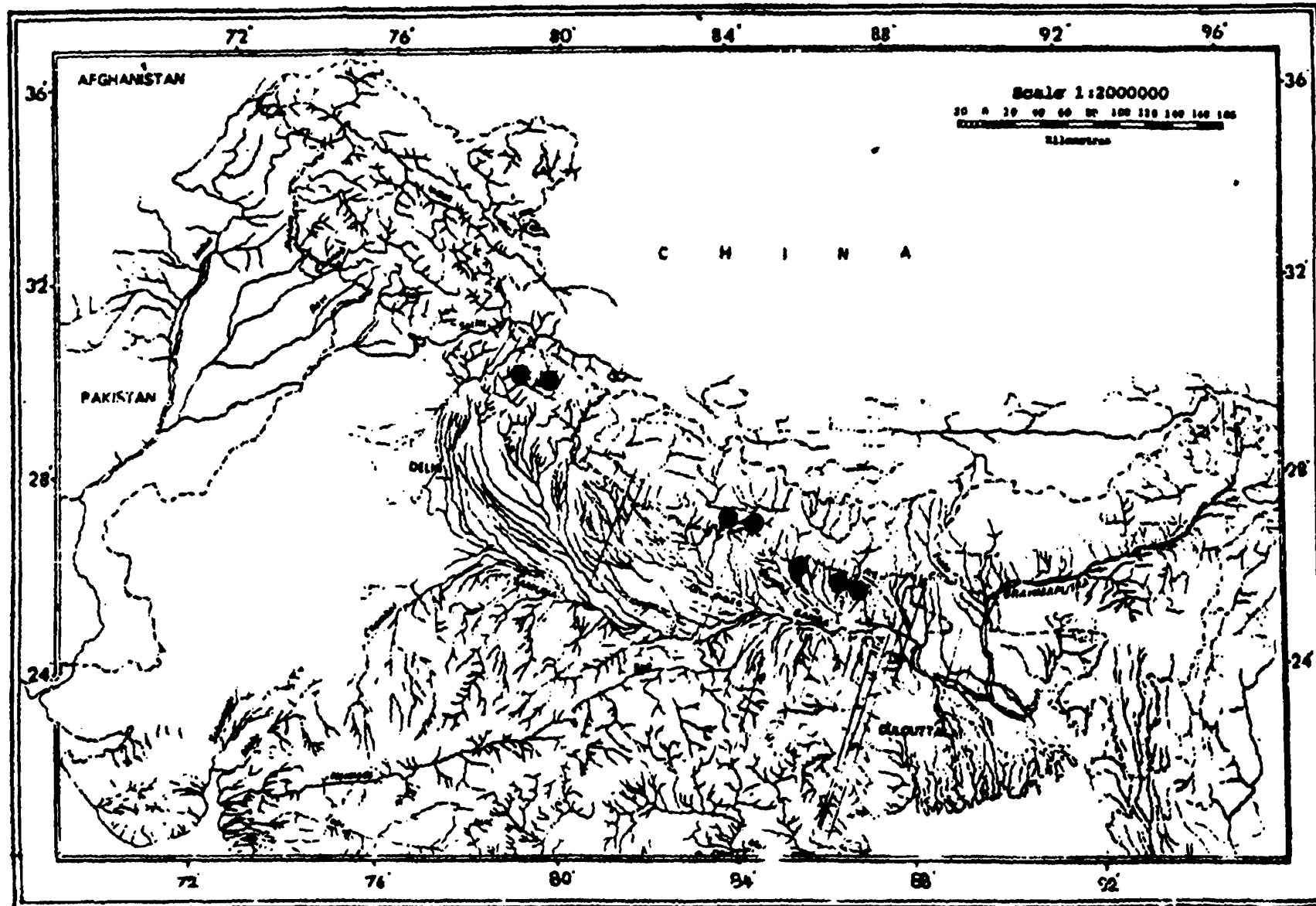


Fig. 4 : Distribution of *Raiamas bola*. Died out in Kumaon lakes with the introduction of Mahseer there. Its present habitat is reduced to the Kosi, Bagmathi and Gandak in Nepal Terai and the headwaters of Ganges system in Garhwal Himalayas, Endangered.

Maximum size : 30.0 cm TL., weighing 2.26 kg.

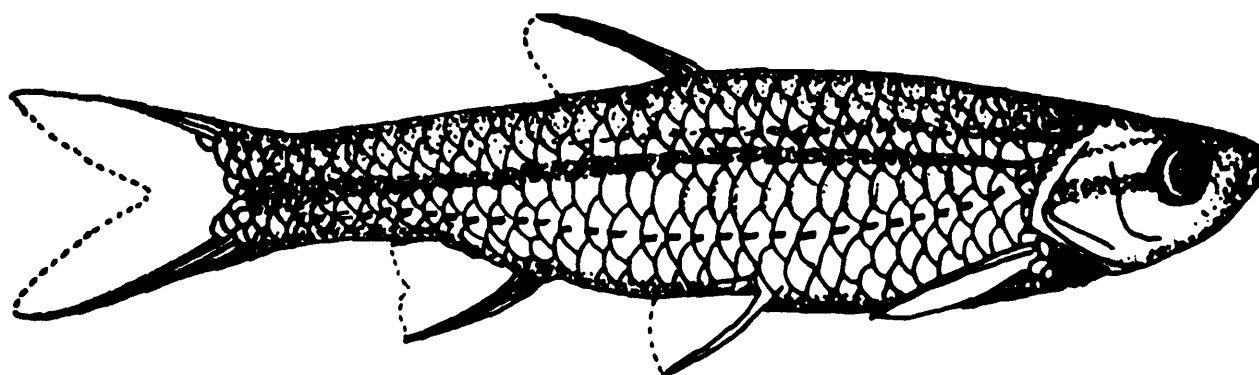
Biology : Breeds during early monsoon, after attaining 3 years of age.

Protective measures taken : None.

Recommendations

A sanctuary should be set up in the Nepal Terai for protection of the species.

9. *Rasbora caverii* (Jerdon) (Fig. 5)



Vernacular name : Kannada : *Ovaree candee*.

Status : Rare.

Known in small numbers; in one locality (one specimen) Cauvery drainage, Mysore; one locality (2 specimens) in Thungabhadra drainage, Chitaldurg, Dist., Karnataka, and two localities (14 specimens) in the North-West Province of Sri Lanka.

Taxonomic status : A species much confused with *R. daniconius* until Hora (1937) redescribed it from Cauvery in Coorg. Since Jerdon's descriptions of fishes in his *Fishes of Southern India* are inadequate for correct determination of his species, Day (1878) erroneously synonymised Jerdon's *caverii* with *Rasbora daniconius* Hamilton.

Salient features : D. 11/7-8; P. 13-14; V. 10; A. 1/5; C. 19; L. 1. 34-36; L. tr. 5 1/2, 3 1/2-4. Body elongate. Mouth small, obliquely upwards. Interorbital space arched; symphyseal knob of lower jaw and corresponding depression in upper lip strongly developed.

Barbels : Absent.

Fins : Origin of dorsal midway between posterior margin of pelvic insertion and vent. Anal, pelvic and pectoral broadly pointed. Pectoral not reaching pelvic. Pelvics not reaching ventral. Caudal deeply incised, the lobes broadly pointed.

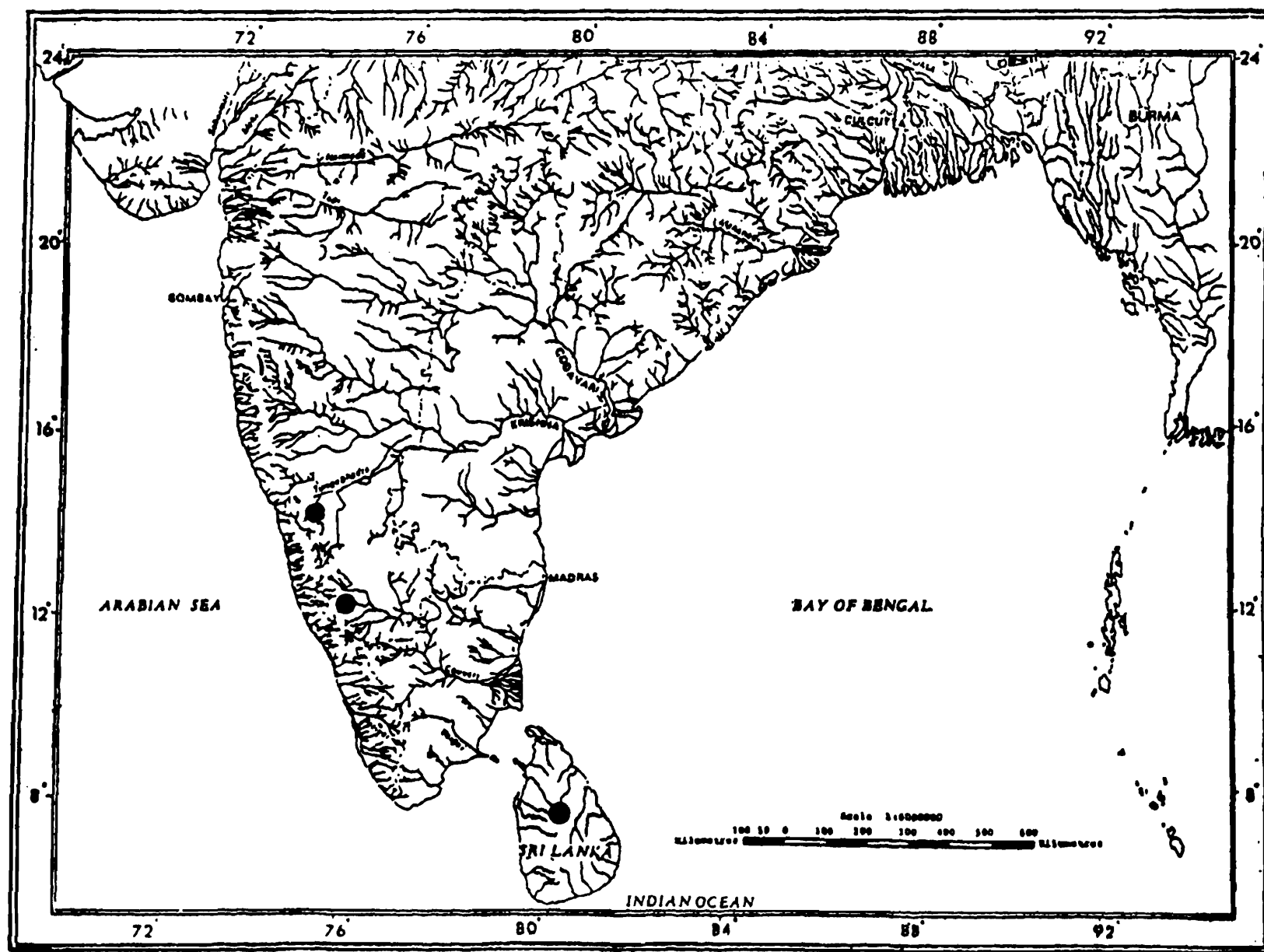


Fig. 5 : Distribution of *Rasbora caverii*. Confused with *R. daniconius*, a rare species of Peninsular India and Sri Lanka.

Scales : L. I complete; 1 scale between lateral line and base of pelvic fin (2 scales in *R. daniconius*).

Colour : Brown above, lighter yellowish brown below; a narrow black stripe of moderate intensity running from opercle to caudal fin base (dark lateral stripe is extremely prominent in most cases of *R. daniconius*). Fins hyaline.

Habitat : Hill streams.

Maximum size : 79.0 mm in length.

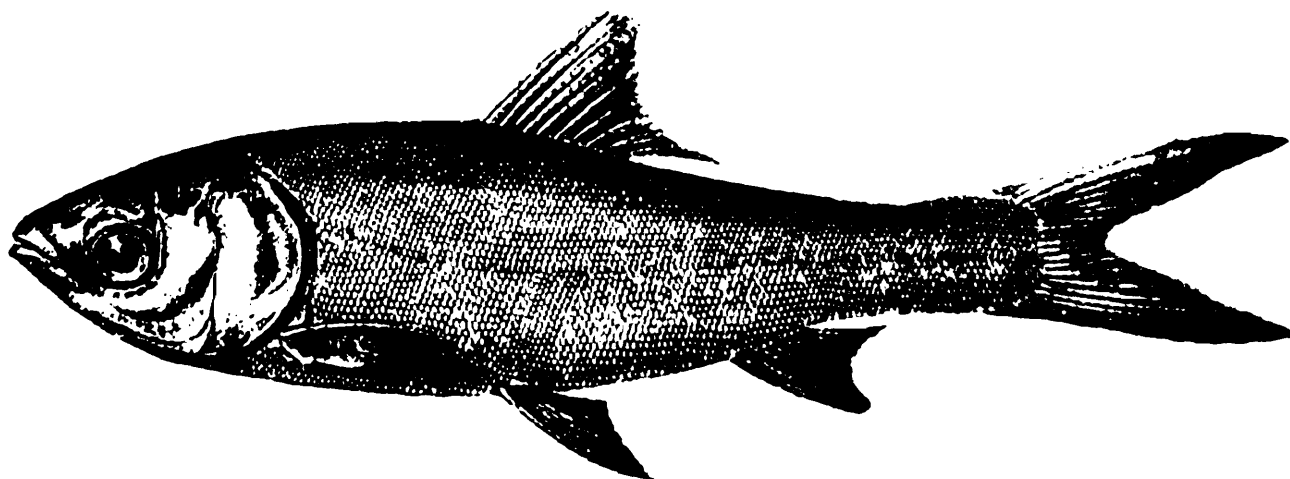
Biology : Not known.

Protective measures taken : None.

Recommendations

1. A reserve should be established for its protection.
2. A study of the population size should be undertaken.
3. Identification card should be prepared and made available to concerned agencies.
4. The identity of the Sri Lanka population should be verified.

10. *Thynnichthys sandkhol* (Sykes) (Fig. 6)



Vernacular names : Oriya : Bareing; Baraing, Telugu : Kalavathandu, Thalasingadu, kala-tale, Aaku-chappah.

Status : Rare.

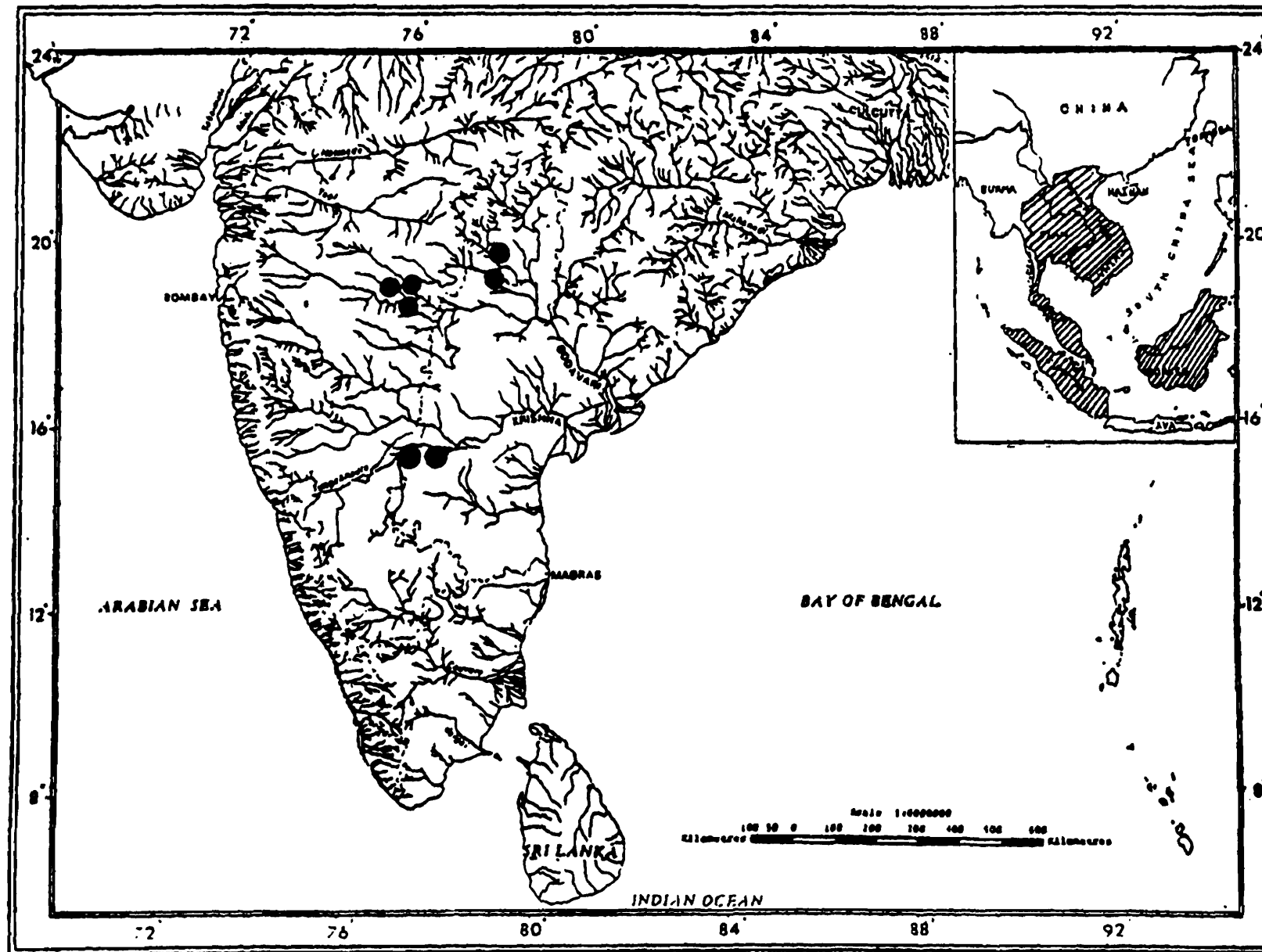


Fig. 6 : Distribution of *Thynnichthys sandkhol*, a rare species, whose closest ally is *T. thynnoides* found in Malaya and further east.

Confined to Godavari and Krishna, the species is highly susceptible to turbidity. The present deterioration of the quality of water caused by the extensive agriculture and deforestation on either banks of the Krishna and Godavari rivers may have caused the depletion of the species. Today the fish is caught in smaller numbers than before especially in the Krishna system.

Taxonomic status : Closely related to *Thynnichthys thynnoides* (Bleeker) found in Malaya and further east. Weber and de Beaufort recorded three species found in the Indo Australian region, namely, *T. vaillanti*, *T. thynnoides* & *T. polylepis*.

Salient features : D. III/9; V. 9; A. III/5; C. 19; L. 1. 120; L. tr. 25-30/25. Body moderately elongate, the tail compressed. Head fairly broad, its width about half its length. Mouth rather wide and terminal; its lower jaw prominent.

Barbels : None.

Fins : Dorsal fin short, three-fourths as high as the body, its upper edge concave; its origin is slightly in advance of the ventral, and about midway between the snout and base of caudal. Caudal deeply forked; its lower lobe longer.

Scales : L. 1. complete; 17-19 rows between lateral line and base of pelvic fin.

Colour : Silvery white, upper surface dark; head purplish. Fins hyaline.

Habitat : Fast flowing rivers and connected tanks.

Maximum size : 60.0 cm in length.

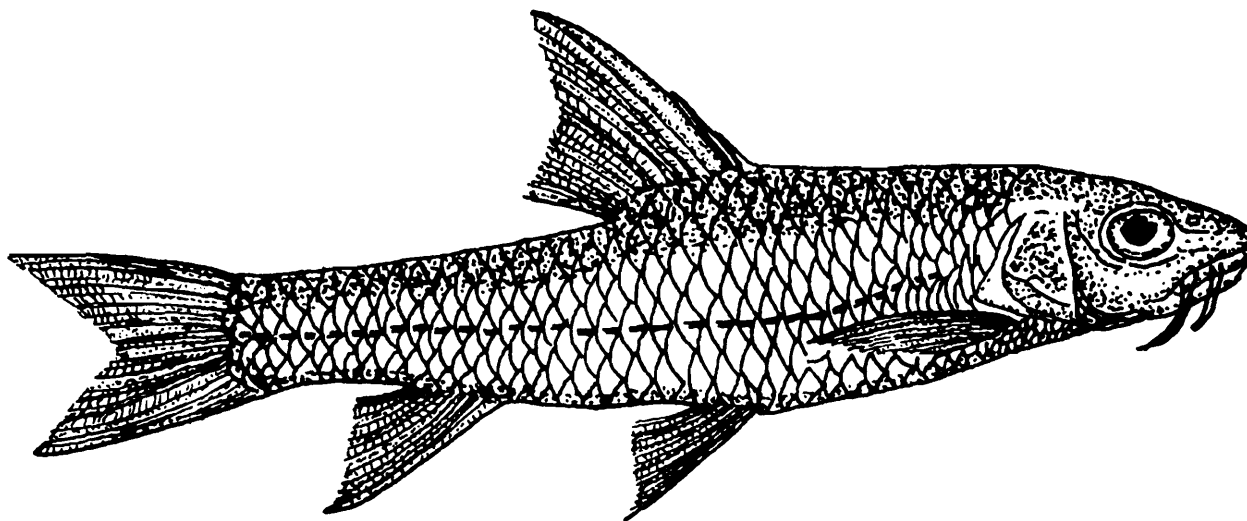
Biology : Subsists mostly on plankton, fast growing , attains 45 to 60 cm and 0.9 to 1.4 kg in one year; matures when 30 cm long in the first year of its life. The spawning period is from June to September during monsoon floods, in the river.

Protective measures taken : None.

Recommendations

1. A study be made to fill in the aspects of the life history such as spawning time, water quality requirements, susceptibility to turbidity and salinity of the water.
2. Existing suitable habitats should be protected from erosion by human activity. Stream bank restoration projects in damaged areas should be carried out.
3. A programme to encourage farmers to leave an area of natural vegetation along the stream banks should be started.

11. *Naziritor cheilynoides* (McClelland)
(Figure 7)



Vernacular name : Punjabi : Chit-rah-too.

Status : Endangered.

According to Day (1878) this fish was known to occur along the "Himalayas as far east as Assam" Walker (1888) found it in Nainital. In 1948 (Menon, 1949) made extensive surveys of the Kumaon Hills but no specimen was found. The fish seems to have died out altogether in the Kumaon lakes with the introduction of Mahseer there. It is not represented in the collection of the ZSI. The species is confined today to the headwaters of the Ganges.

Taxonomic status : Earlier included under *Tor*, Mirza and Javed (1985) erected a subgenus *Naziritor* for the *Tor* species, *T. zhobensis* from the river Zhob in Baluchistan characterised by smaller scales (L. 1 32-37; in *Tor* scales are larger, L. 1 23-28). Mirza (1989) raised *Naziritor* to the generic level.

Salient features : D. III/7-8; P. 7; V. 9; A. 2/5; C. 19; L. 1. 32-35; L. tr. 5½/6.

Barbels : Rostral and maxillary of about same length.

Fins : The last undivided dorsal fin ray osseous, strong, entire. Anal reaches base of caudal.

Colour : Golden above, silvery beneath, the margins of scales with black dots. Fins reddish.

Habitat : Fast-flowing mountain streams.

Maximum size : 66.0 cm TL.

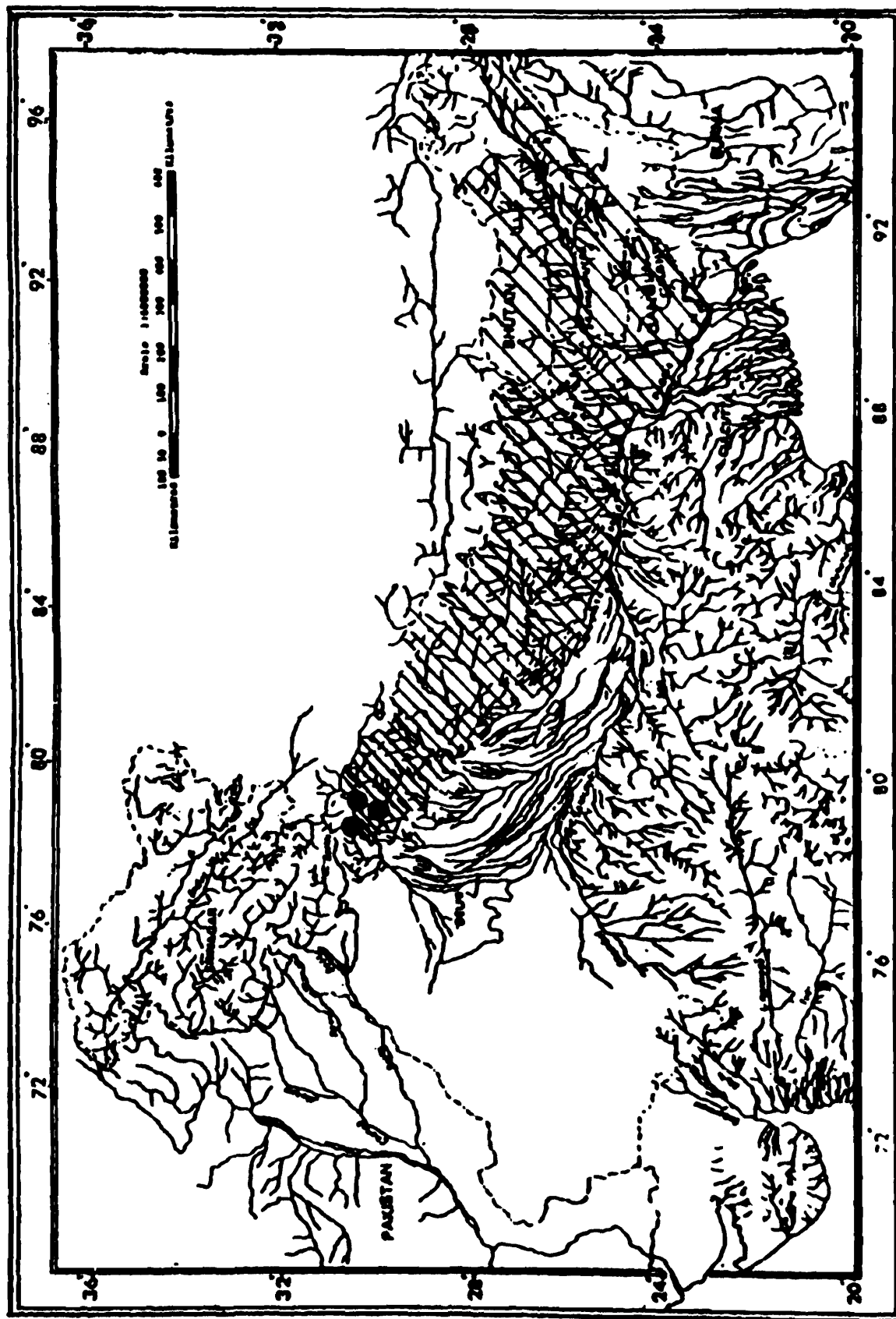


Fig. 7 : Distribution of *Naziritor cheilymoides*. Extinct in Kumaon lakes following introduction of Mahseer in the lakes.

Biology : Feeds on diatoms, algae and insects, breeding period begins from June (Mirza and Javed, 1985).

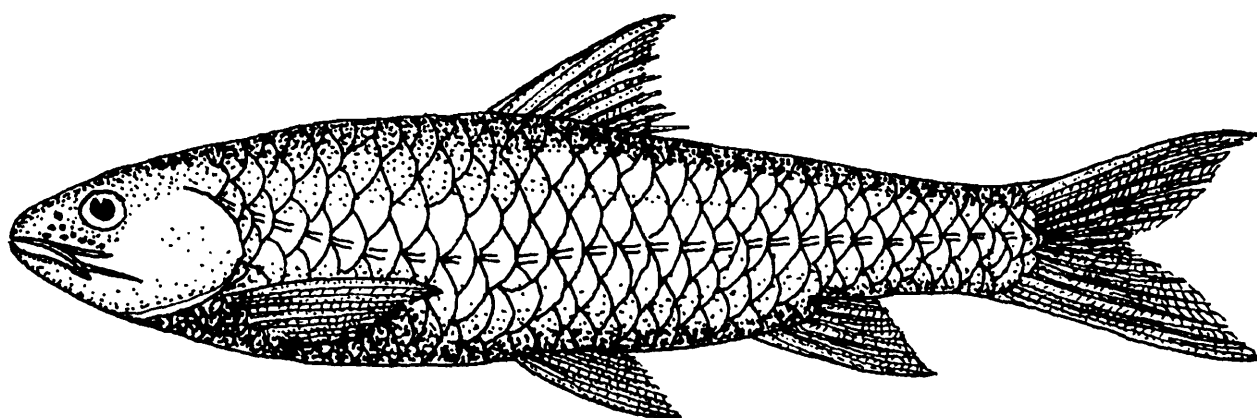
Protective measures taken : None.

Recommendations

A sanctuary should be set up in the headwaters of the Ganges to protect the species.

12. *Neolissochilus hexagonolepis* (McClelland)

(Fig. 8)



Vernacular name : Bengali : *Bhorkol*, *Buluk*, Nepali : *Katli*; Assamese : *Bikha Mhao*, *Boka*, *Bokar*, *Boolloom*.

Status : Endangered.

Distributed in small numbers along eastern Himalayas, Assam, Bangladesh and Burma. Dams and weirs at higher reaches of the Brahmaputra have affected the spawning run of the fish. The populations have depleted in size and numbers.

Taxonomic status : Considered along with Mahseers but differs in the possession of an interrupted post-labial groove. Rainboth (1985) restricted the use of *Acrossocheilus* Oshima to forms occurring in China; *Lissochilus* is inadmissible because it was employed by Zittel for a genus of fossil Molluscs.

Salient features : D. IV/9; P. 1/13-15; V. 1/8; A. III/5; C. 19; L. 1; 28-31; L. tr; 4/2½-3½. Both profiles of body are equally arched. Lips are thin and not produced into flap-like structures. Many rows of horny tubercles on the sides in front of and below eyes. Lower lip with a sharp horny covering.

Barbels : Two pairs.

Fins : Origin of dorsal lies midway or nearer caudal with a weak dorsal spine. Caudal deeply forked.

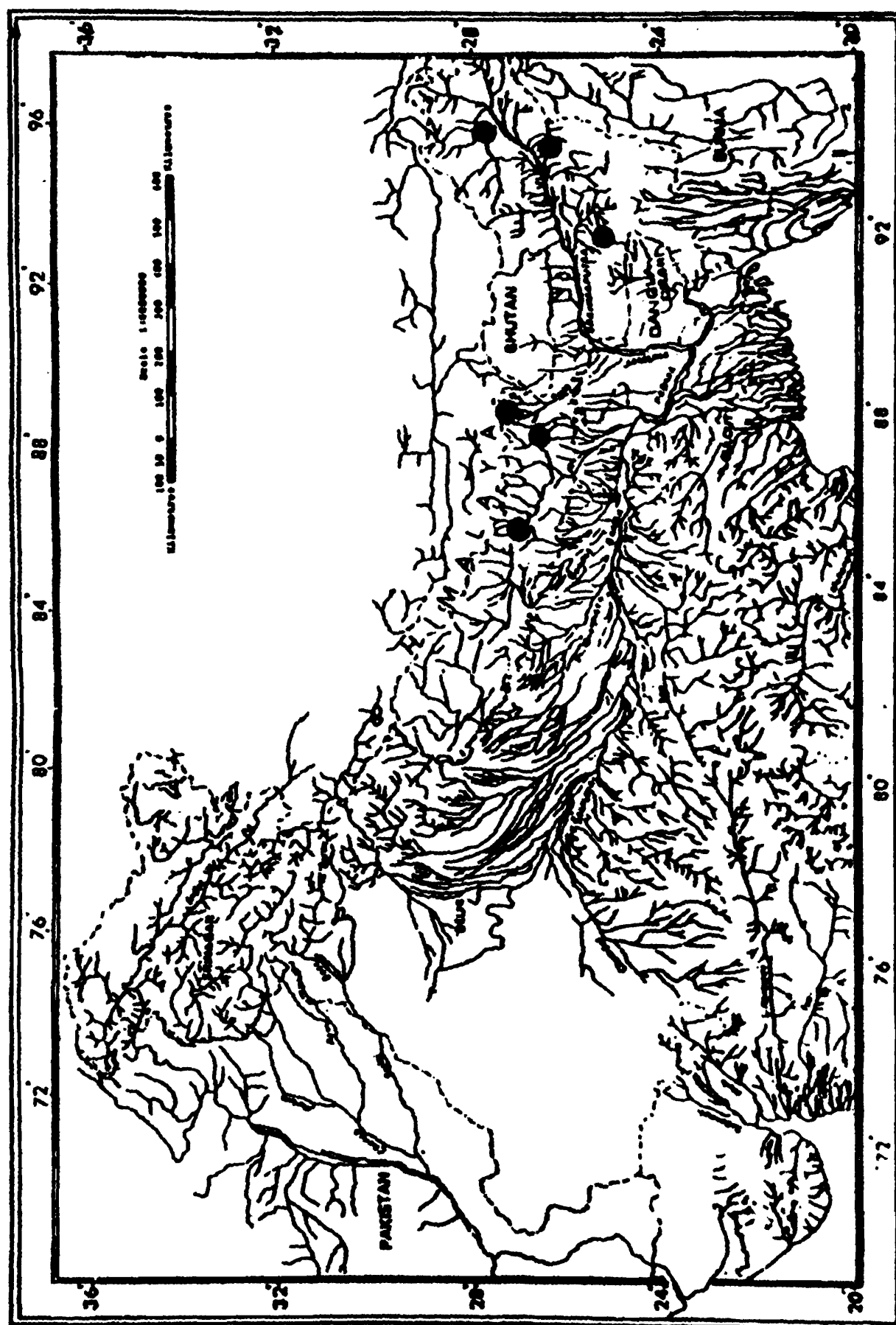


Fig. 8 : Distribution of *Neolissochilus hexagonolepis*. Dams and weirs have affected the spawning run of this fish.

Scales : Relatively smaller, hexagonal.

Colour : Dorsal surface of body and head are green. A lateral yellowish brown band on the sides. The edges of the scales are marked light bluish with neutral tint. Dorsal fin is citron green, while other fins are slate grey.

Habitat : Fast flowing streams and rivers with rocky bottom.

Maximum size : 60.0 cm. TL.

Biology : Feeds on falling fruits, weeds, grasses in rivers and on submerged vegetation in ponds. Breeds from April to October with a peak in August to September.

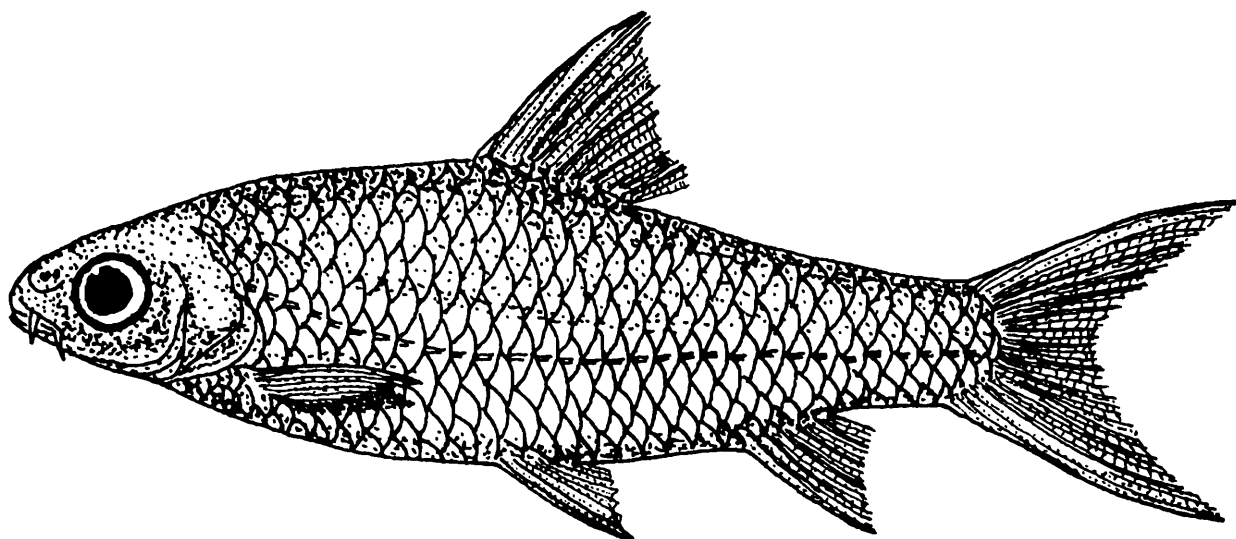
Protective measures taken : None.

Recommendations

A proper sanctuary should be set up in upper Assam for the protection of this species.

13. *Neolissochilus wynaadensis* (Day)

(Figure 9)



Vernacular name : None.

Status : Rare.

Found only in the Cauvery drainage at Vithry in Wynaad. An increase in already high rate of siltation and pollution due to coffee plantation in the area and other agricultural practices could very well reduce the species to extinction.

Taxonomic status : Previously the species has been referred to *Barbus wynaadensis*

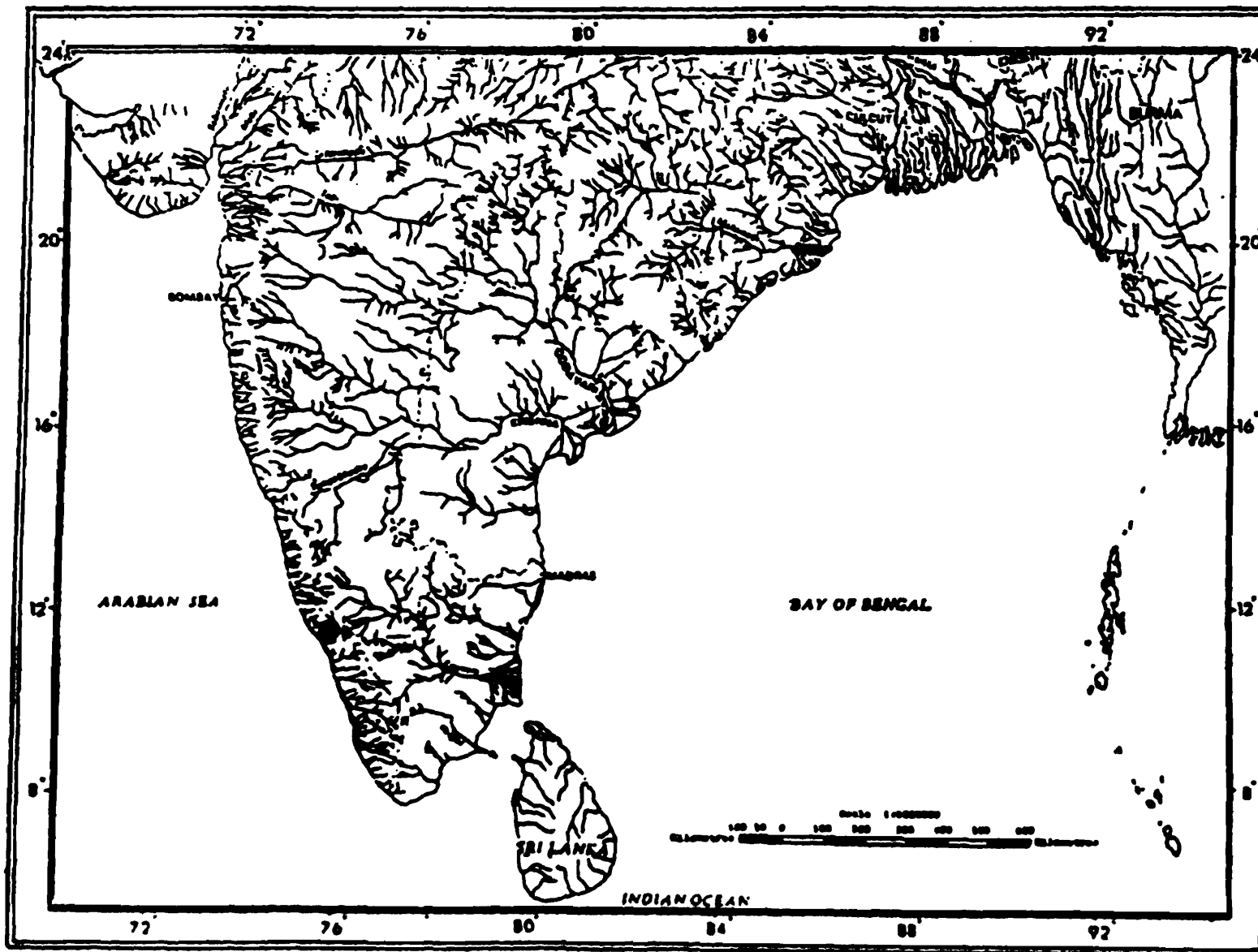


Fig. 9 : Distribution of *Neolissochilus wynaadensis*. This species is confined to Cauvery drainage of Wynaad hills, Western Ghats. It appears that another form exists in Tenmalai, Kerala; whether it is a distinct species is not known at present.

Day (1878) There has been considerable difficulty with taxonomy and systematics of large scaled barbs and Mahseers of Southern and South Eastern Asia (*vide* Rainboth, 1985).

Pillay (1929) recorded *Barbus wyanaadensis* from Tenmalai, Kerala, although the species was recorded only from the eastern drainage by Day in 1878 who was the last to collect it from Vithry in the Cauvery drainage. The small independent population in the western drainage of Tenmalai may prove to be a distinct species if at all the population still survives. The large barbs, *Hypselobarbus* and Mahseers are facing extinction in the Peninsula.

Salient features : D. IV/ 9; P. 17; V. 9; A. III/5, C. 19; L. 1. 26-28; L. tr. 4/6.

Body elongate, no considerable rise to the base of dorsal fin; the ventral profile is somewhat more convex than dorsal. Snout conical, upper jaw longer, overhanging the lower, the lower labial fold is interrupted.

Barbels : Two pairs; the maxillary pair as long as or longer than the orbit, the rostral shorter.

Fins : The dorsal is high as the body, its origin is little anterior to the insertion of ventral; its last undivided ray weak, osseous with an articulated extremity.

Scales : L. 1. complete; $2\frac{1}{2}$ - $3\frac{1}{2}$ rows between lateral line and pelvic fin base.

Colour : Leaden silvery along the back, with a dark band running behind the eye to the middle of the base of the caudal fin where it ends in a round black blotch. Abdomen of a light orange colour. Fins stained with grey at their edges.

Habitat : Its preferred habitat is like that of *Tor* (see under habitat of *Tor tor*). Adults of *Tor* are found in habitat of strong currents and are known to be large range migrants during spawning period. Like *Tor* spp. *Neolissochilus* are also long range migrants to upper reaches of rivers for spawning.

Maximum size : 20 cm TL.

Biology : Unknown.

Protective measures taken : None.

Recommendations

- 1 A suitable sanctuary should be established for its protection in Wynaad and guarded from siltation due to extensive tea plantation in these areas.
2. The population size should be studied.

3. Identification cards with a coloured illustration should be distributed to all concerned in conservation of wildlife.

14. *Tor khudree* (Sykes)
(Fig. 10)



Vernacular name : Marathi : *Khudehee, Bursa.*

Common English name : *Deccan Mahseer.*

Status : Endangered

Found in all the major river systems but the populations are steadily declining in all (Kulkarni and Ogale 1978).

Taxonomic status : See the remarks under the taxonomic status of *Tor tor*.

Salient features : D. IV/9; P. 14-16; V. 9; A. III/5; C. 19; L. 1. 24-26 L. tr. 4/4. Body elongate, streamlined with upper profile convex before dorsal fin, but slightly concave behind it, lower profile slightly arched. Mouth moderate, lips fleshy, smooth edged, continuous in the angle of the mouth with uninterrupted lobe or groove along lower jaw; lower lip with median lobe sometimes hypertrophied in specimens living in highly torrential habitat. Head sharpish, its length equal to depth of body.

Barbels : Two pairs, maxillary longer than the diameter of the eye, rostral shorter.

Fins : Dorsal fin almost in the middle of the body with its upper margin concave; its last undivided ray modified into a strong, smooth spine. Pectoral fin shorter than head; pelvic shorter than pectoral, not extending to the base of anal. Anal longer than pelvics, rounded near the tip in female, not reaching the base of caudal. Caudal forked.

Scales : L. 1. complete; $2\frac{1}{2}$ - $3\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin

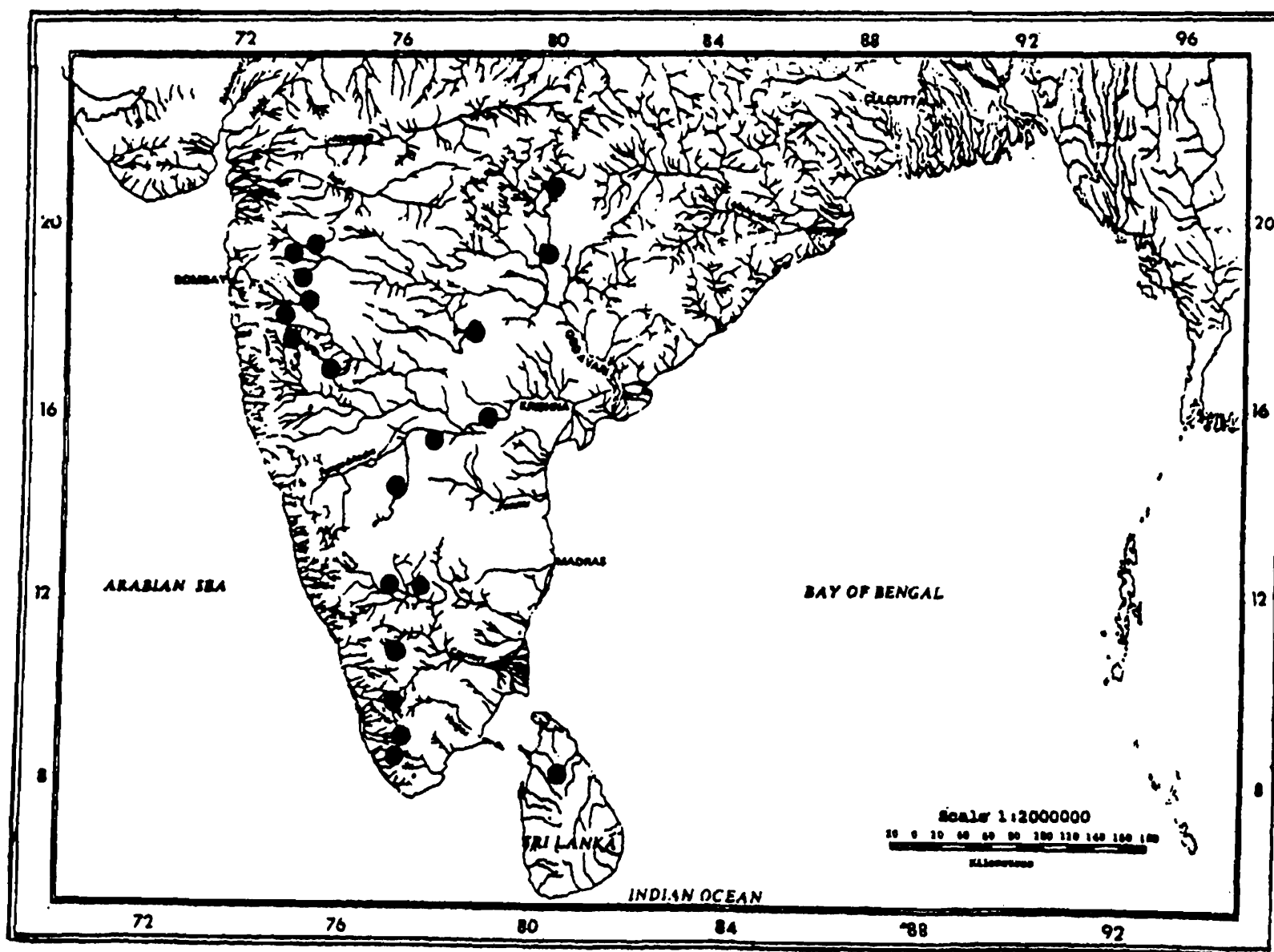


Fig. 10 : Distribution of *Tor khudree*. This species is known from all the major Peninsular rivers and Sri Lanka. Dams impede its spawning migration.

Colour : Colour varies with the habitat in which fish lives. Usually the sides above lateral line and the back dark; the sides below lateral line creamy yellowish-white and silver bluish-grey below on the belly. The bases of scales grey with reddish grey margins. Fins bluish grey. Black Mahseers are known from Mysore.

Habitat : Rapid rivers and streams with rocky substrate.

Maximum size : About a metre in length, weighing 22.6 kg.

Biology : Kulkarni (1971) has published on spawning habits, eggs and early development of the species.

Protective measures taken : Artificial propagation and rehabilitation of *Tor khudree* in the hydel lakes of Tata Electric Company at Lonavala, district Pune, Maharashtra are carried out (*Vide*, Kulkarni and Ogale, 1978).

Recommendations

1. In view of the decline in the Mahseer fishery, biological and ecological investigations of the species should be taken up.
2. The fingerlings raised of the Deccan Mahseer at Lonavala should be utilised for stocking of rivers of the Peninsula only. The Deccan Mahseer should not be introduced into other river systems in the country.
3. Identification and information pamphlets should be distributed to concerned agencies in conservation.

15. *Tor kulkarnii* (Menon) (Fig. 11)



Vernacular name : Nil.

Status : Rare.

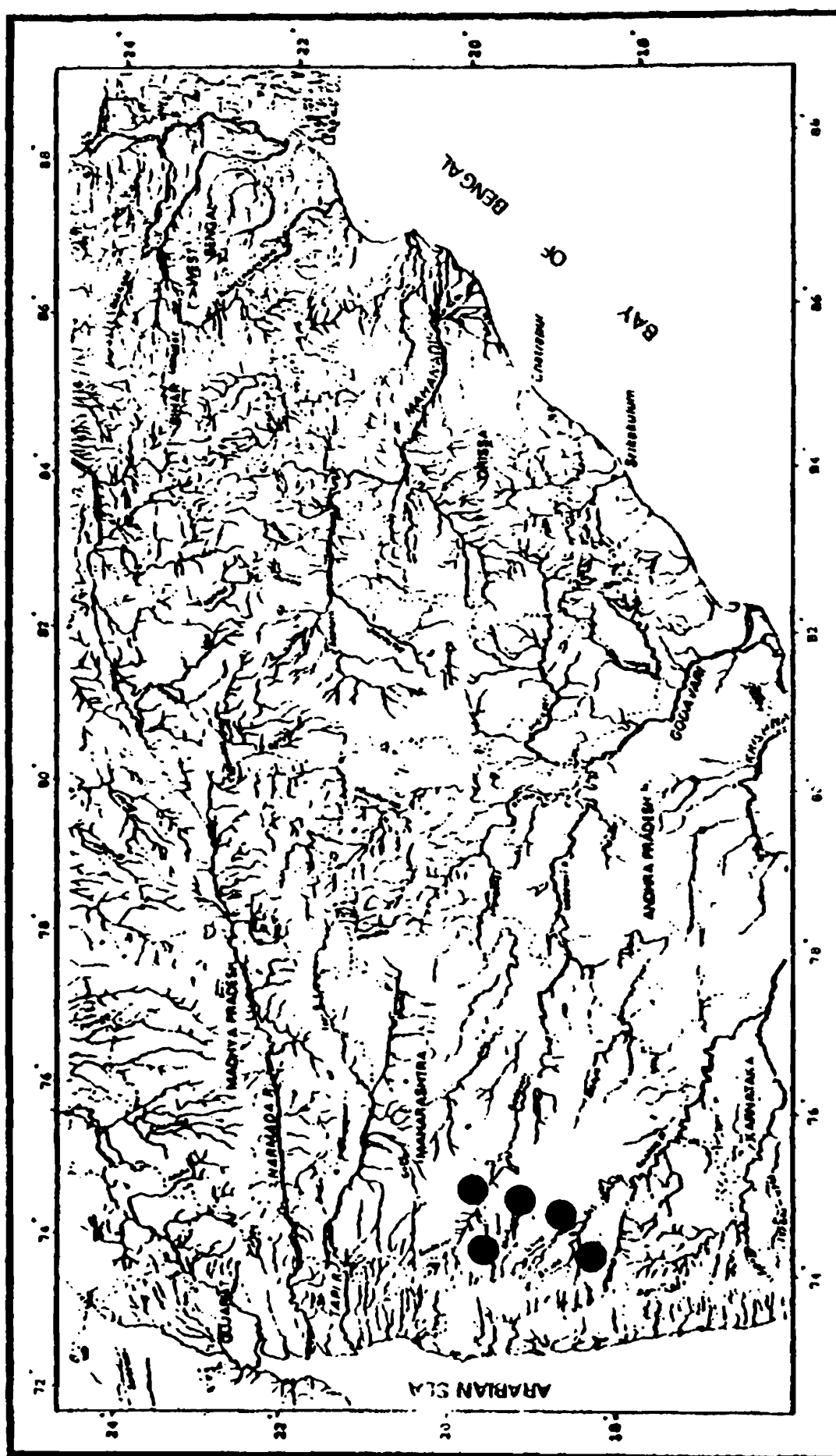


Fig. 11 : Distribution of *Tor kulkarnii*. This species is confined to Darna river, Deolali; a dwarf cognate of *T. khudree*.

Confined to Darna river, Deolali, Maharashtra. Description based on four specimens, and apart from the type specimens no other specimen has so far been collected.

Taxonomic status : See Menon (1992) regarding taxonomy and type specimens. *Tor kulkarnii* is a dwarf cognate of *Tor khudree* (Sykes).

Salient features : D. IV/ 9; P. 14-16; V. 9; A. III/5; C. 19; L. I. 24-26; L. tr. $3\frac{1}{2}$, $-2\frac{1}{2}$.

Body elongate, compressed, more towards tail, upper profile more convex before dorsal fin but slightly concave behind it, ventral profile gently arched. Mouth moderate, terminal, sloping downwards posteriorly. Lips fleshy, smooth edged, continuous at the angles of the mouth with uninterrupted fold or groove along the lower jaw. Head small, shorter than depth of body, more than 4 times in standard length.

Barbels : Two pairs; maxillary barbels longer reaching posterior margin of the eye.

Fins : Dorsal fin almost in the middle of the body with its upper margin concave.

Scales : L.I. complete. $2\frac{1}{2}$ rows of scales between lateral line and pelvic base; $3\frac{1}{2}$ rows between lateral line and base of dorsal fin.

Colour : In preserved specimens, body above lateral line greyish becoming deeper towards dorsal side, lower parts of head and body silvery. Base of the scales bear dark blotches.

Habitat : Clear fast flowing streams with rocky bed.

Maximum size : 20 cm in standard length.

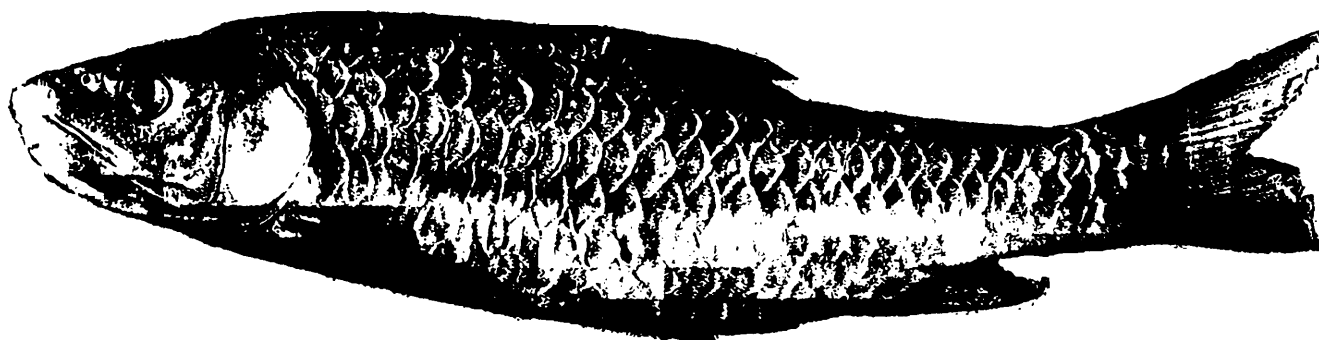
Biology : Unknown.

Protective measures taken : None.

Recommendations

1. A sanctuary should be set up in one of the streams of the Darna river in Deolali to protect this rare fish.
2. Identification cards should be prepared and distributed to the agencies responsible for conservation.
3. If any specimen is found in the fishermen's catch it should be sent to the Zoological Survey of India or Bombay Natural History Society, Bombay, for further taxonomic studies.

16. *Tor progeneius* (McClelland)
(Figure 12)



Vernacular name : Assamese : *Jungha*.

Common English name : *Jungha Mahseer* :

Status : Endangered.

Found in Nagaland and Meghalaya (Brahmaputra system) and known to grow to a size of 64 cm; today specimens more than 30 cm are not met with and the populations are steadily declining.

Taxonomic status : A distinct species of *Tor*, the rounded fan shaped structure behind the upper lip described by Hora (1941) is an abnormal condition. (*vide* Menon, 1992).

Salient features : D. IV/ 9; P. 14-16; A. III/5; C. 19; L. 1 27-31; L. tr. $4\frac{1}{2}/2\frac{1}{2}$.

Barbels : Two pairs, maxillary longer.

Fins : Dorsal fin in the middle of body with upper margin concave and a weak dorsal spine.

Scales : $2\frac{1}{2}$ - $3\frac{1}{2}$ rows between lateral line and base of ventral fin.

Colour : In preserved specimens, body above lateral line is greyish, becoming darker towards dorsal side, lower parts of head and body silvery. Scales bear dark blotches.

Habitat : Large rapid streams with rocky bottom.

Maximum size : Usually 30 cm, maximum known in ZSI collections 69 cm SL.

Biology : Not known.

Protective measures taken : None.

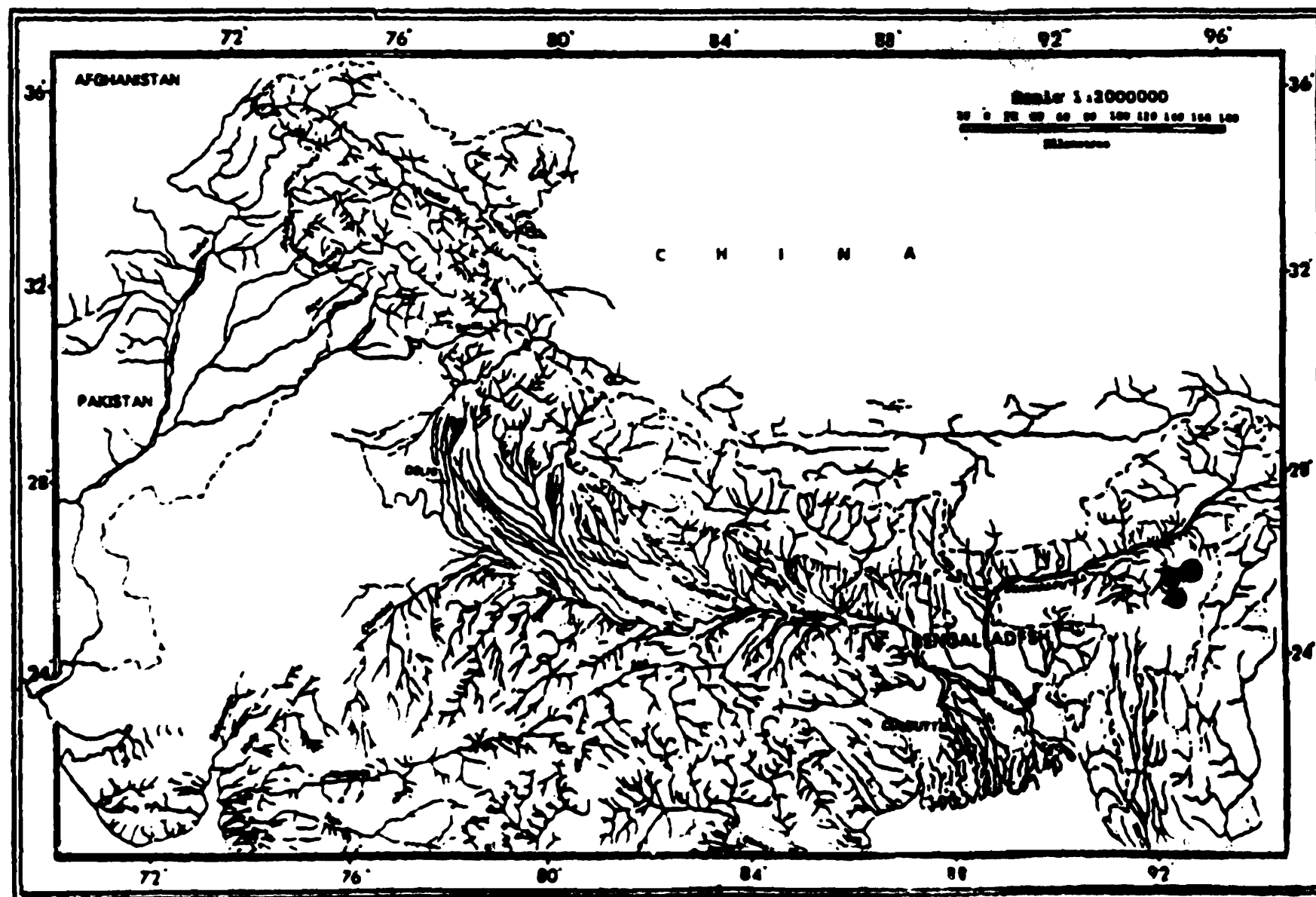
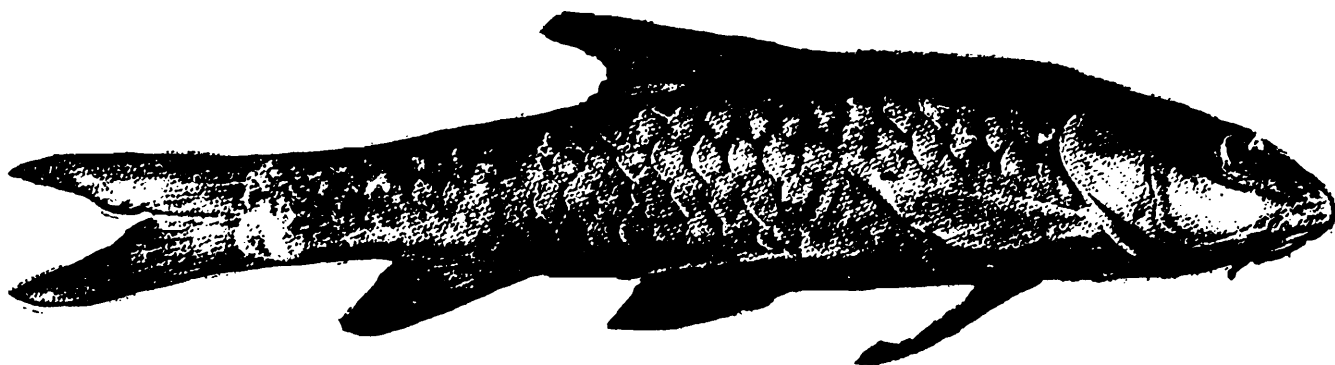


Fig. 12 : Distribution of *Tor progeneius*. A portion of its range should be protected. It is classified as an endangered species.

Recommendations

A sanctuary should be set up in a suitable place in the Barak river in Nagaland.

17. *Tor putitora* (Hamilton) (Fig. 13)



Vernacular names : Assami (Goalpara) : *Putitora*; Bihari (Purnea) : *Sahara, Turyia*; Bengali (Rangpur) : *Tor*; Punjabi and Kashmiri : *Mahsir*.

Common English names : Mahseer; *Golden Mahseer*; *Grey-hound*, *Thick-lipped Mahseer*.

Status : Endangered.

Found along the Himalayas. The number and size of the fish have been steadily declining (*vide*, See remarks under status of *T. tor*).

Salient features : D. IV/9-10; P. 14-17; V. 9; A III/5, C. 19; L. 1. 23-28; L. tr. $4\frac{1}{2}$ / $2\frac{1}{2}$.

Lower lip fleshy with a median lobe; in specimens from fast flowing highly rocky streams it is longer than in slow moving sandy-pebbly habitats.

Barbels : Two pairs, maxillary longer.

Fins : Dorsal fin midway between tip of snout and caudal base, the last undivided ray smooth and shorter than depth of body.

Scales : $2\frac{1}{2}$ rows between L. 1 and base of pelvic fin.

Colour : Back reddish sap-green. Below lateral line, light orange fading to silvery white on belly. Dorsal fin yellowish, pectoral, pelvic and caudal peacock green in larger specimens.

Habitat : Rapid streams with rocky bottom.

Maximum size : Known to grow to 2.7 m, but maximum size recorded by Hora is 60 cm. Today specimens more than 30 cm and 5 kg are rare.

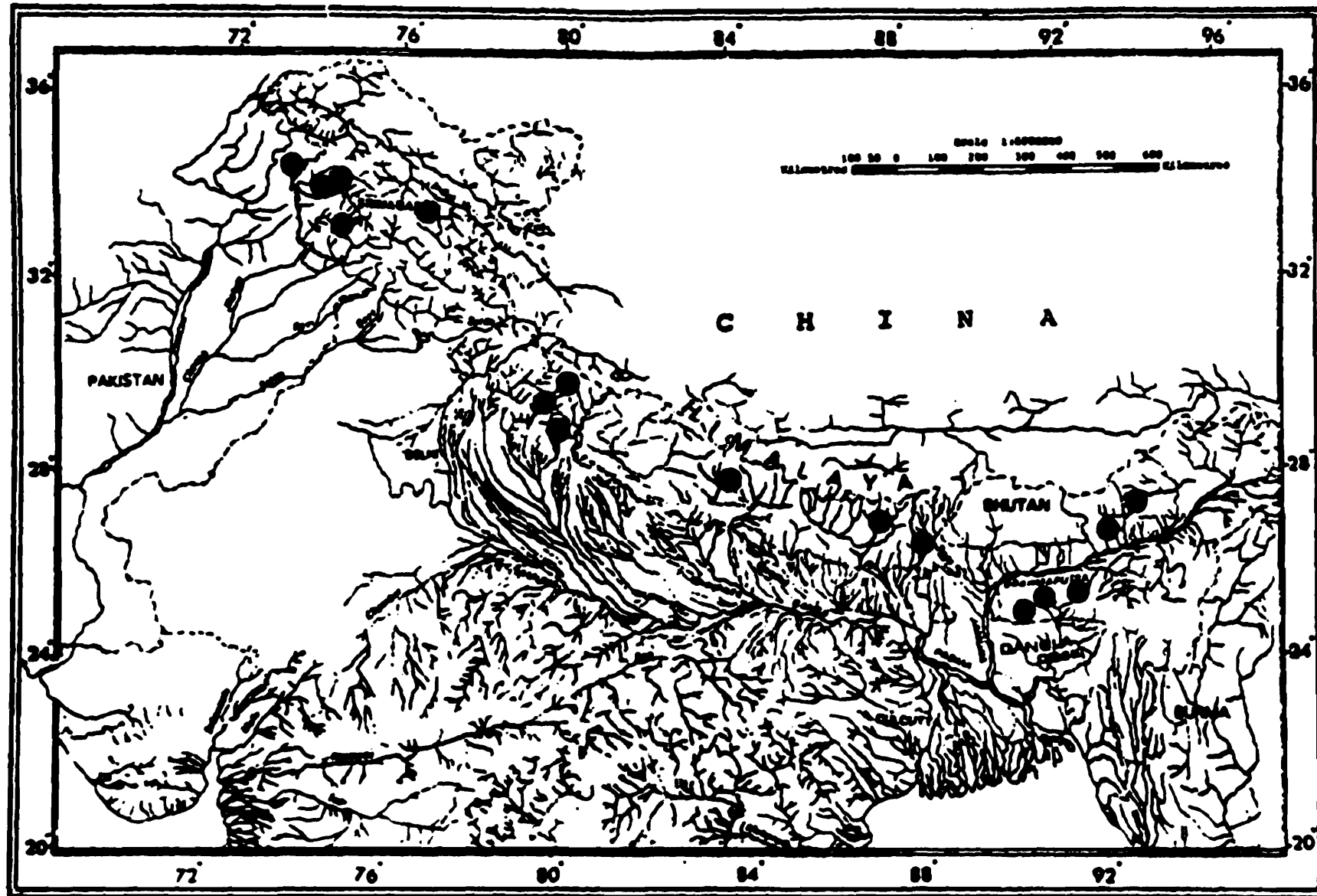


Fig. 13 : The golden Mahseer *Tor putitora* is facing near extinction all along the Himalayas. Dams and weirs have affected the spawning migration of this fish.

Biology : Feeds on green filamentous algae, insect larvae, aquatic plants, slime etc. but the short alimentary canal suggests a carnivorous habit. Breeds during July-August.

Protective measures taken : Some temple tanks and temple sanctuaries (Stretch of river) near temples like that near Haridwar serve as sanctuaries.

Recommendations

- 1 Provision for efficient fish ladders should be made in the design of all proposed dams
2. Fish sanctuaries should be established on a stream order basis in all the Himalayan rivers.

18. *Tor tor* (Hamilton) (Fig. 14)



Vernacular Names : Assamese : *Burapatra, Tunga peetina*; Bengali : *Tor, Mahaseer, Mahasol*; Hindi : *Nagarm, Mahseer*; Nepali : *Sor-machha*; Oriya : *Kajra*.

Status : Endangered.

Found along the base of Eastern and Central Himalayas, higher reaches of Mahanadi and Vindhya-Satpura ranges, Bangladesh and Burma. The number and size of the fish have been declining because of the habitat destruction of the fish by man. Its habitat has been altered as a result of the innumerable dams constructed across the various rivers. During breeding, the respiration of the fish is intensified and the fish starts ascending rivers in which there is plenty of oxygen. The dams impede their migration upstream and prevent the fish from breeding. The brooders are also indiscriminately killed in the path of their migration especially below the dams where they congregate in their futile attempt to cross the obstruction.

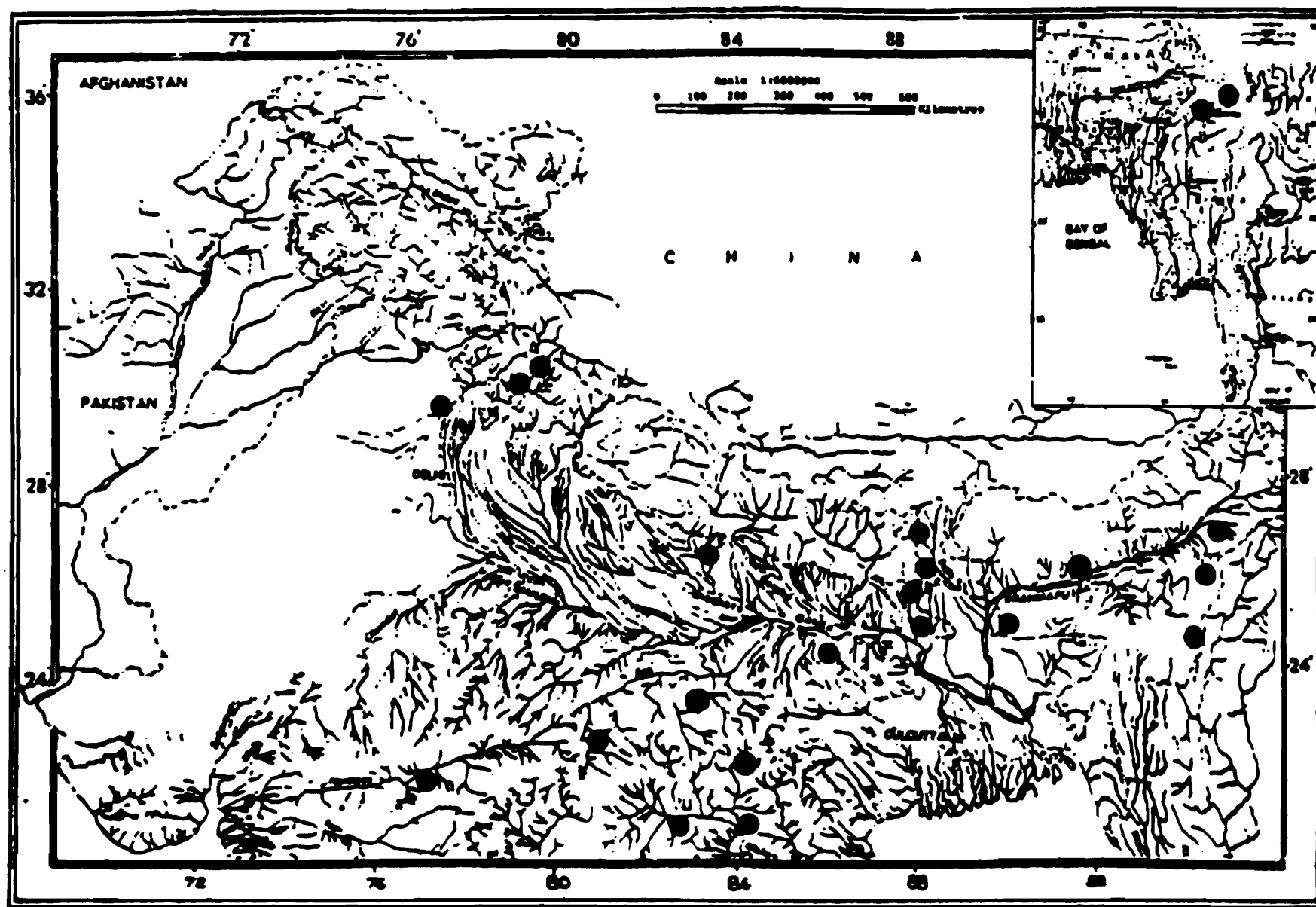


Fig. 14 : Distribution of *Tor tor*. This species is known from Assam and all along the base of Himalayas and southwards as far as Narmada basin. Also in Burma Dams impede its spawning migration.

Taxonomic status : Day (1878) lumped Hamilton's *Cyprinus putitora*, *C. tor* and *C. mosal* together under single species *Barbus tor* and used *B. tor* as a collective name for the various species of Mahseer found in India. Hora (1939) used the generic name *Barbus* and recognised *Tor* Gray as its subdivision. Menon (1992) recognised *Tor* Gray as a distinct genus, though the generic ranking of a number of barbines of southern and southeastern Asia is poorly understood at the moment.

Salient features : D. IV/ 9; P. 14-16; V. 9; A. III/5; L. 1. 22-28; L. tr. 4/4. Body more stoutly built than the putitor Mahseer, muscular and compressed, with ventral profile more prominently arched than dorsal; profile convex before dorsal fin but slightly concave behind it. Mouth small, lips fleshy, continuous with the angle of mouth, with uninterrupted fold or groove along the lower jaw; lower lip invariably with a median lobe of varying length.

Barbels : Two pairs of well developed barbels, maxillary longer than rostral.

Fins : Dorsal fin almost in the middle of body with its upper margin concave; its last undivided ray strong and bony. Pectoral fin slightly shorter than head. Pelvic fins do not extend to anal opening. Anal longer than pelvics, not reaching the base of caudal. Caudal deeply forked.

Scales : L. 1. complete, $2\frac{1}{2}$ - $3\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin.

Colour : Dorsal surface is greyish-green, that of the head neutral green. The sides of the body in the middle pinkish, replaced above by greenish gold and below by olive green. The dorsal fin is reddish buff, the pectorals, pelvics and anal fins deep orange.

Habitat : Rapid rivers and streams with rocky substrate.

Maximum size : Thompson (1897) records a fish of a length of 1.7 meter and weight up to a quintal.

Biology : Kulkarni (1980) has worked out the early development of this species.

Protective measures taken : Use of fish ladders to enable the fish to cross the dams to reach the breeding grounds has been tried but without much success (Hora, 1940). Some temple tanks serve as sanctuaries.

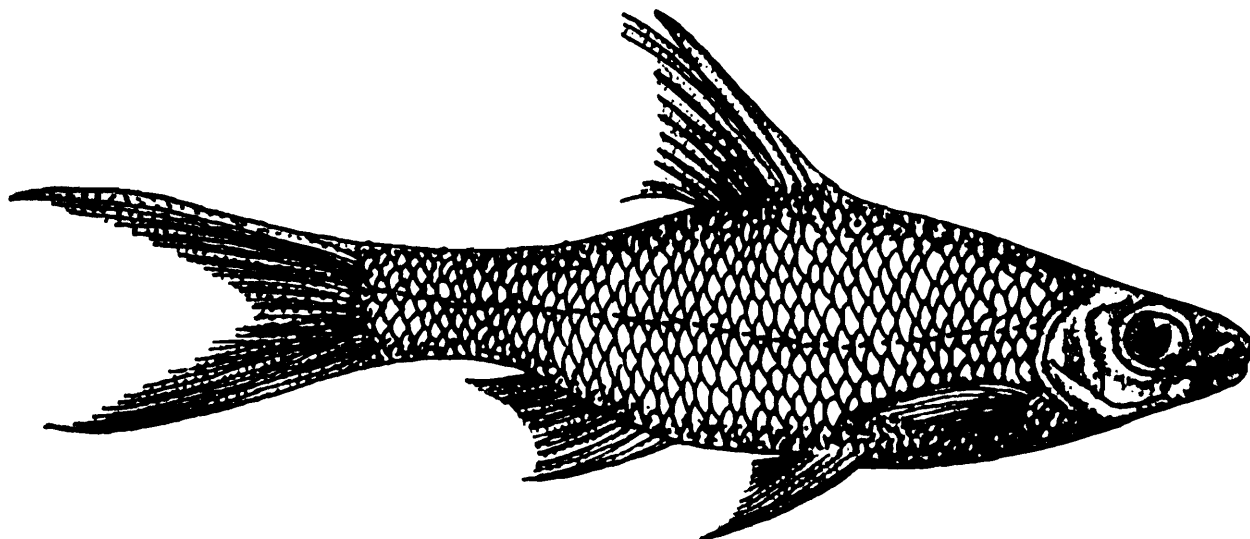
Recommendations

- 1 Fish sanctuaries for the protection of the species should be established on a stream order basis in all our river systems.

2. Provision for efficient fish ladders should be taken up in the design of all the proposed dams.
3. Information and identification pamphlets should be distributed to all the agencies and individuals concerned in Mahseer conservation.

19. *Osteobrama bakeri* (Day)

(Fig. 15)



Vernacular name : Malayalam : *Mullan-paval*.

Status : Rare.

Confined to Manimala river, a tributary of Pamba in Kottayam district, Kerala. Since Day's (1878) time the only authentic record of the fish from Kerala is that of John (1936) who had reported the occurrence of the fish in Manimala river.

Taxonomic status : Formerly referred to the genus *Rohtee*, *Kohtee bakeri* Day.

Salient features : D. III/8; P. 13; V. 10; A. III/11; C. 19; L. 1. 44; L. tr. 8/7. Body elongate, strongly compressed, its depth $3\frac{1}{2}$ times in SL; abdominal edge sharp and trenchant between the pelvic and anal fins, but rounded in front of pelvic fins.

Barbels : 2 pairs; all very short or rudimentary.

Fins : Dorsal rather as high as the body and commences midway between the end of the snout and base of the caudal, its spine weak, somewhat longer than head and serrated posteriorly. Pectoral fin nearly as long as the head. extending to above the pelvic. Pelvic arises rather in advance of the origin of dorsal and reaches the commencement of the anal. Caudal deeply forked.

Scales : L. 1. complete; $5\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin.

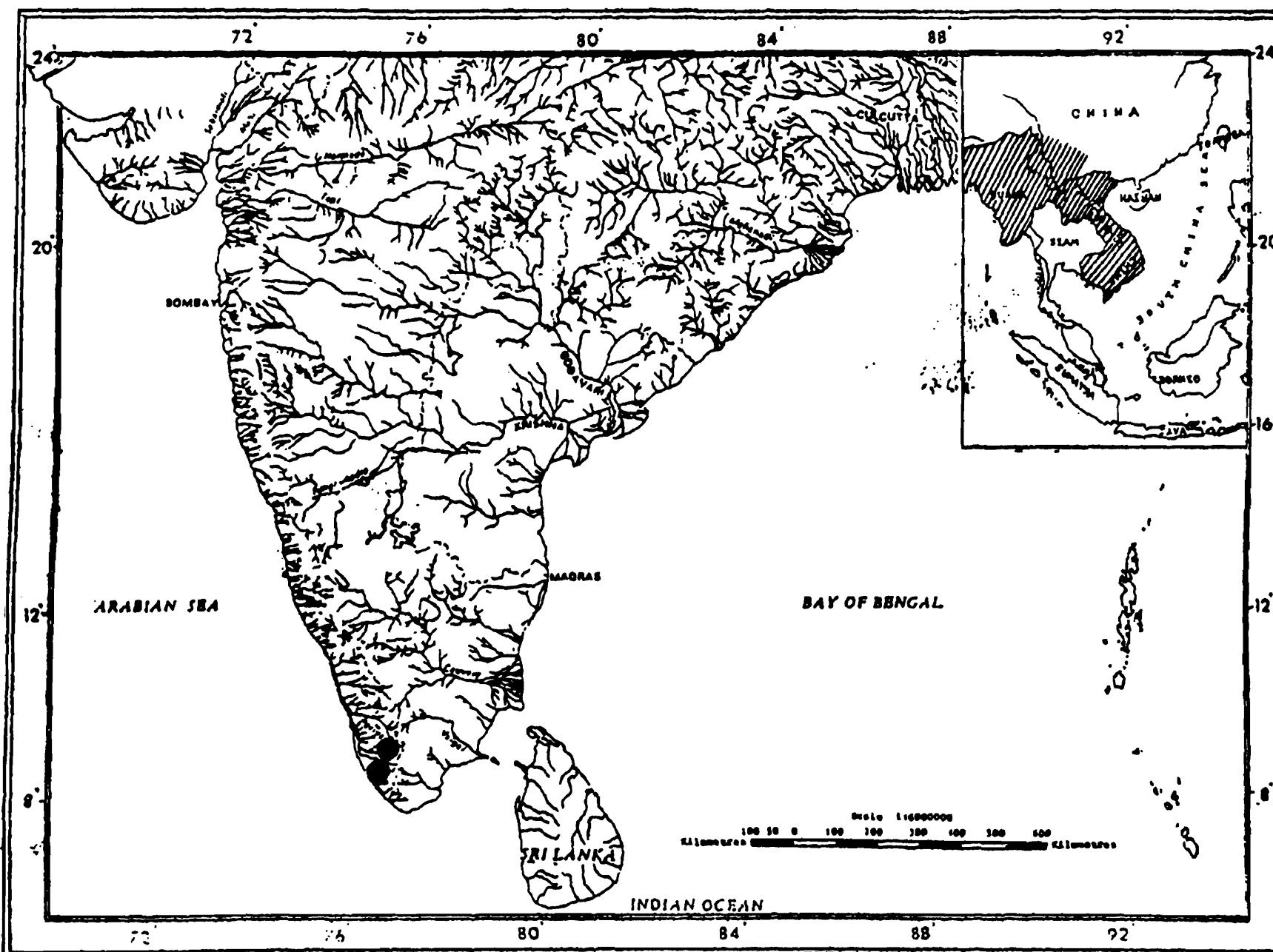


Fig. 15 : Distribution of *Osteobrama bakeri* which lives in streams with considerable current over rocky bottom.

Colour : Silvery, caudal and dorsal edged with black.

Habitat : Fast-flowing hill streams.

Maximum size : 12.0 cm in length.

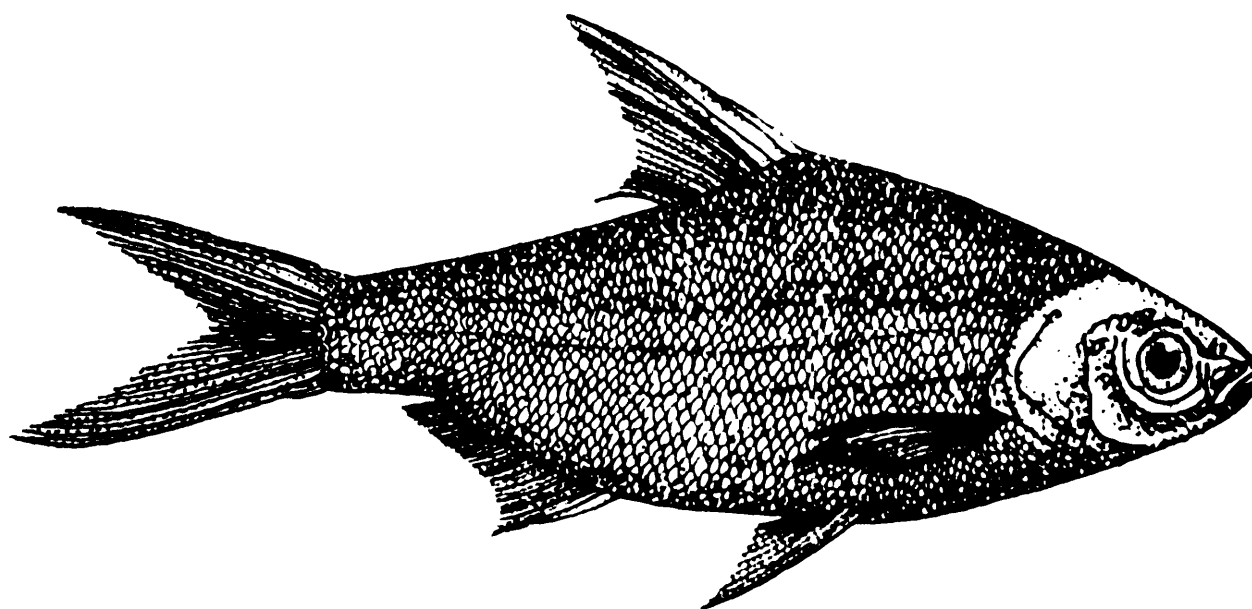
Biology : Unknown.

Protective measures taken : None.

Recommendations

1. A sanctuary in the Manimala river (Kottayam) should be established to protect the fish.
2. Regular monitoring of the water quality of the Manimala river where the fish exists should be carried out.
3. Abatement of deterioration of water quality.

20. *Osteobrama belangeri* (Valenciennes) (Fig. 16)



Vernacular names : Manipuri : *Penga, Tharak*; Burmese : *Nga-hpeh-oung, Nga-net-hya, and Ngaprama*

Status : Endangered.

Found in Manipur and Burma extending to Yunnan. Once it formed a big fishery in Loktak Lake but has become rare or almost exterminated there because of the introduction of Common Carp.

Taxonomic status : Day (1878) included it under *Rohtee* Sykes. *Rohtee* (sensu-

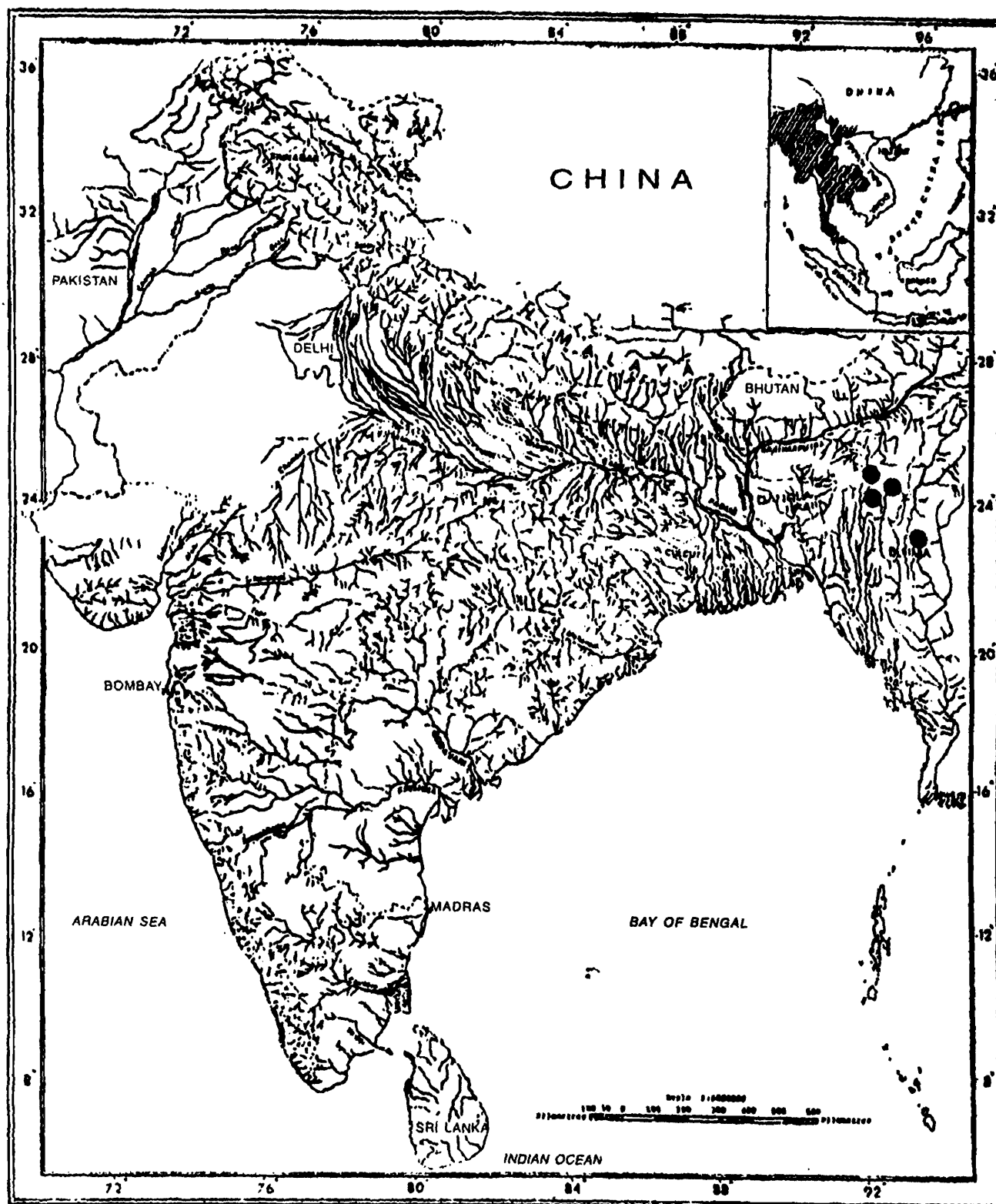


Fig. 16 : *Osteobrama belangeri*. Exotic carp introduced for culture in Lok-tak lake, Manipur, is the direct threat to this species, it is classified as a endangered species.

stricto) characterised with a predorsal procumbent spine, is restricted to Peninsular India. The Burmese, Thailand and Malayan forms of *Rohitee* come under the subgenus *Mystacoleucus*.

Salient features : D. III-IV/8; P. 17; V. 9; A. III/17-18; C. 19; L. I. 68-73; L. tr. 18/22. Abdomen keeled throughout (abdomen edge sharp and trenchant between pelvic and anal fins but rounded in front of ventral fins in *O. neilli*).

Fins : Dorsal osseous ray strong and serrated.

Scales : Small; 14 rows between lateral line and base of pelvic fin.

Colour : Silvery, back greyish, the Loktak Lake form darker in colour.

Habitat : Rivers and lakes.

Maximum size : 38.0 cm SL.

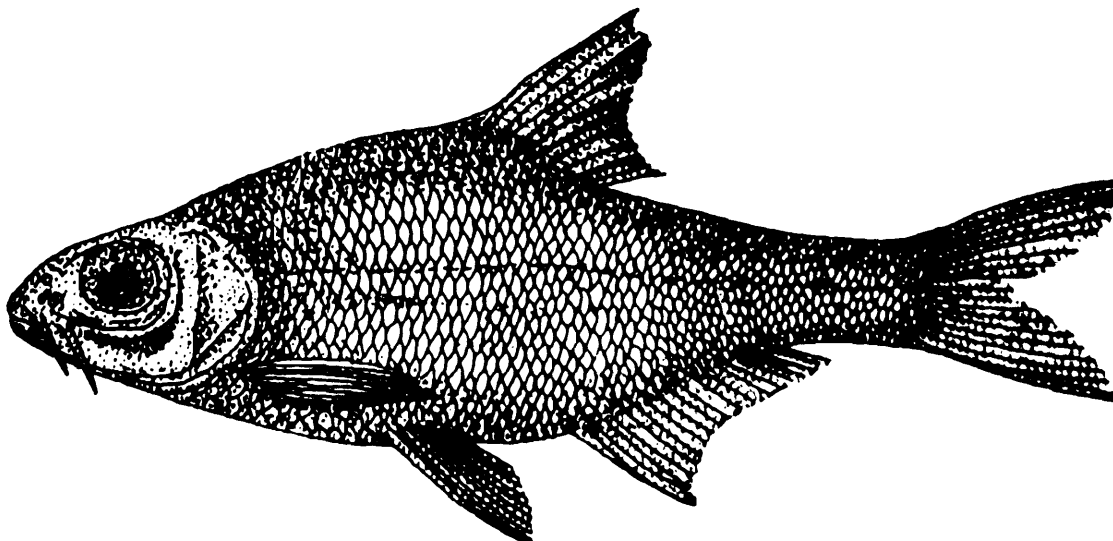
Biology : Not known.

Protective measures taken : None.

Recommendations

1. A sanctuary in one of the streams in its habitat in Manipur should be set for its protection.
2. Distribution and identification information should be made available to concerned agencies in the Manipur Valley.

21. *Osteobrama neilli* (Day)
(Fig. 17)



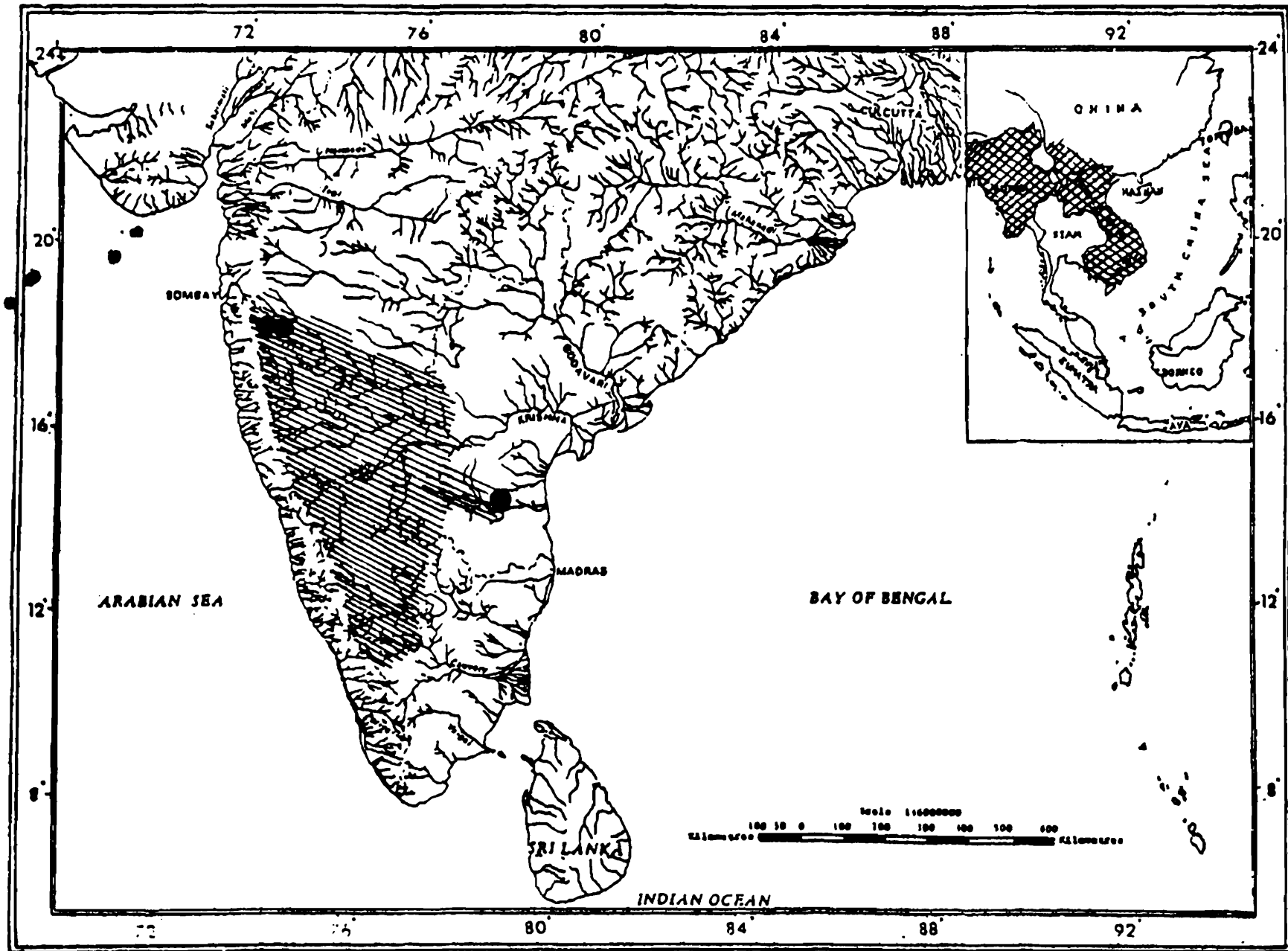


Fig. 17 : Distribution of *Osteobrama neilli* whose range has been reduced and survives today only in the Deccan.

Vernacular name : Nil.

Status : Endangered.

Day (1878) described this species from Bhavani river Nilgiris but since then no specimen has been collected from the Nilgiris. Repeated efforts to collect the fish in the Bhavani river were in vain. The next authentic record is by Hora and Misra (1942) and Fraser (1942) from Poona. Recently one specimen has been collected from Pennar river in Cuddapah district, Andhra Pradesh by the members of the Zoological Survey of India, Southern Regional Station, Madras. The range of distribution has been reduced because of habitat destruction caused by human activities.

Taxonomic status : Previous records of the species have been referred to *Rohtee neilli* Day. Since *Rohtee ogilbii* with a predorsal procumbent spine has been designated as the type of *Rohtee*, species referred to *Rohtee* earlier and having no predorsal procumbent spine have now been placed under the genus *Osteobrama* Heckel.

Salient features : D. 11/8; P. 13; V. 10; A. 11/17; C. 19; L. 1. 55-59; L. tr. 12/18. Body deep and strongly compressed, abdominal edge sharp, trenchant between pelvic and anal fins but rounded in front of ventral fins.

Barbels : Two pairs, all about as long as the eye.

Fins : Dorsal commences midway between tip of the snout and the base of the caudal fin. It is 3/4 as high as the body, its last undivided ray osseous, very strong, serrated and as long as the head excluding the snout. Pectoral 3/4 as long as the head and extends over the pelvic. Ventral rises somewhat in front of dorsal and reaches the commencement of the anal. Caudal deeply forked.

Scales : Lateral line complete; 8-9 rows of scales between lateral line and base of pelvic fins.

Colour : Silvery, opercle golden in live specimen.

Habitat : Hill streams and rivers.

Maximum size : 12.0 cm in length.

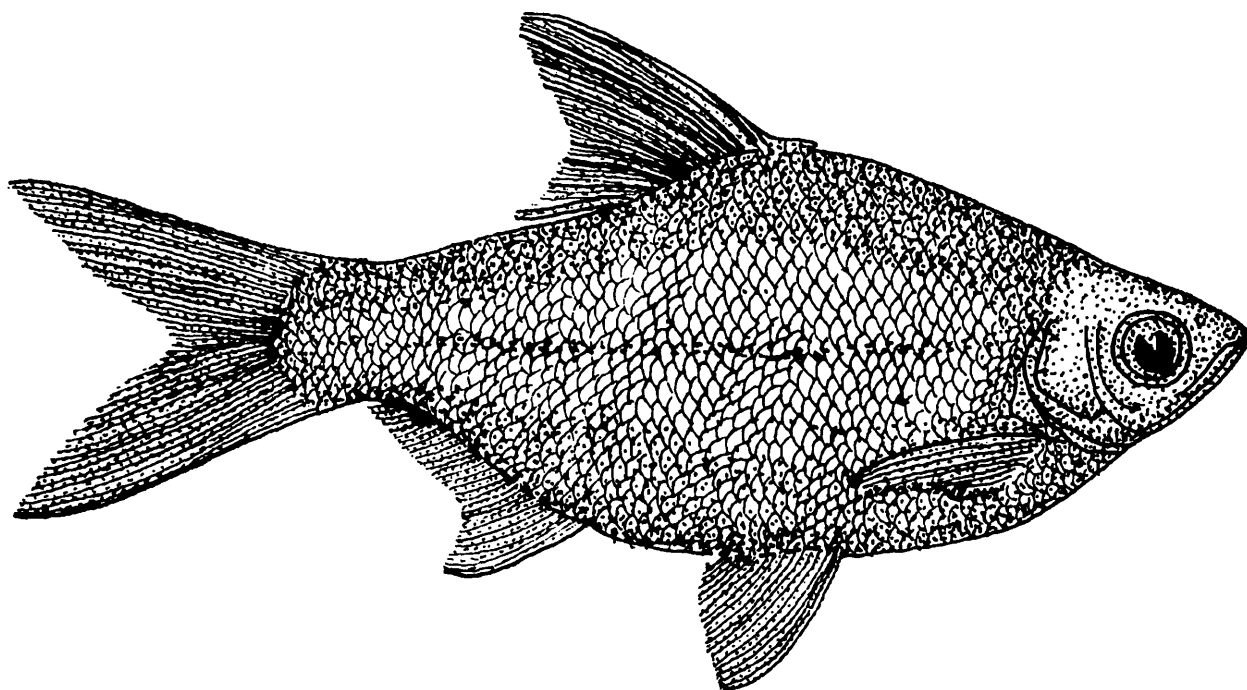
Biology : Unknown.

Protective measures taken : None.

Recommendations

1. A sanctuary in one of the streams of its habitat with minimum human disturbance should be set up for its protection.
2. Distribution and identification information should be made available to concerned agencies and individuals.

22. *Rohtee ogilbii* (Sykes)
(Fig. 18)



Vernacular name : Marathi : *Vatani*.

Status : Vulnerable.

Found only in the Deccan, in the Krishna and Godavari river systems of the Western Ghats. Any small habitat changes in the higher reaches of the river by man or erosion on overgrazed areas could very well affect the species and cause its extinction.

Taxonomic status : *Rohtee ogilbii* Sykes on account of its procumbent predorsal spine was previously referred to as *Mystacoleucus* by Hora (1940). Since Bleeker has already designated *R. ogilbii* as the type of *Rohtee*, it is necessary that all the species with a procumbent spine now assigned to *Mystacoleucus* be placed under *Rohtee*.

Salient features : D. III/8; P. 15; V. 10; A. III/13; C. 20; L. 1. 55; L. tr. 13/11.

Body deep and strongly compressed, the dorsal profile more convex than abdomen. Mouth small, the lower jaw short.

Barbels : None.

Fins : Dorsal commences midway between tip of snout and base of caudal, its osseous ray strong and coarsely serrated. Pectoral reaches to almost above the ventral. Caudal deeply forked.

Scales : L. 1. complete; 9-10 rows of scales between lateral line and base of pelvic fin.

Colour : Purplish-silvery along back, fading to silvery white on belly. In young

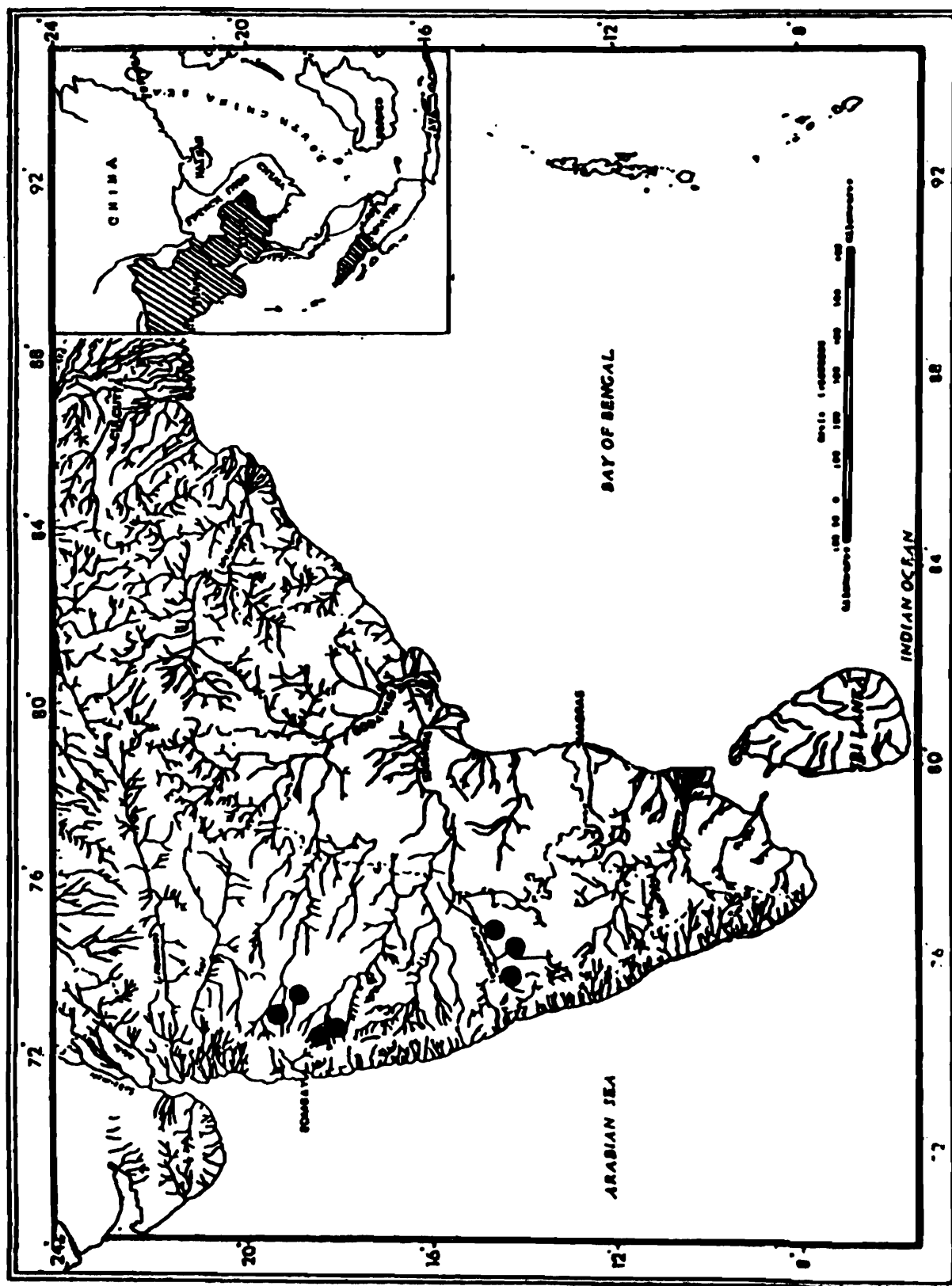


Fig. 18 : Distribution of *Rohtee ogilbi*, a vulnerable species of the Deccan.

specimens there are dark spots on the base of the caudal fin and 4-5 black bands descending from the back to middle of the side.

Habitat : Hill streams and rivers.

Maximum size : 15.0 cm in length.

Biology : Unknown.

Protective measures taken : None.

Recommendations

1. Immediate abatement of deterioration of water quality is necessary if pollution or increase of siltation is detected in the habitat of the fish.

23. *Barbodes bovanicus* (Day) (Fig. 19)



Vernacular name : Nil.

Status : Endangered.

Endemic to Peninsular India. Originally described by Day in 1878 from the Bhavani river at the base of Nilgiri Hills. It has not been collected from this river since Day's time. A specimen collected by late Dr. Sundara Raj from Mettur in 1941 measuring 29 cm and preserved in the Madras Government Museum is the only reliable record of the fish. Its record as "the upper reaches of the Cauvery to the plains of Kumbakonam" (Jayaram, 1982) is probably based on wrong identity. Apparently only the population in the Mettur reservoir survives today. Construction of dams on Bhavani river affected the breeding migration of the fish resulting in the depletion of the species in the Cauvery river.

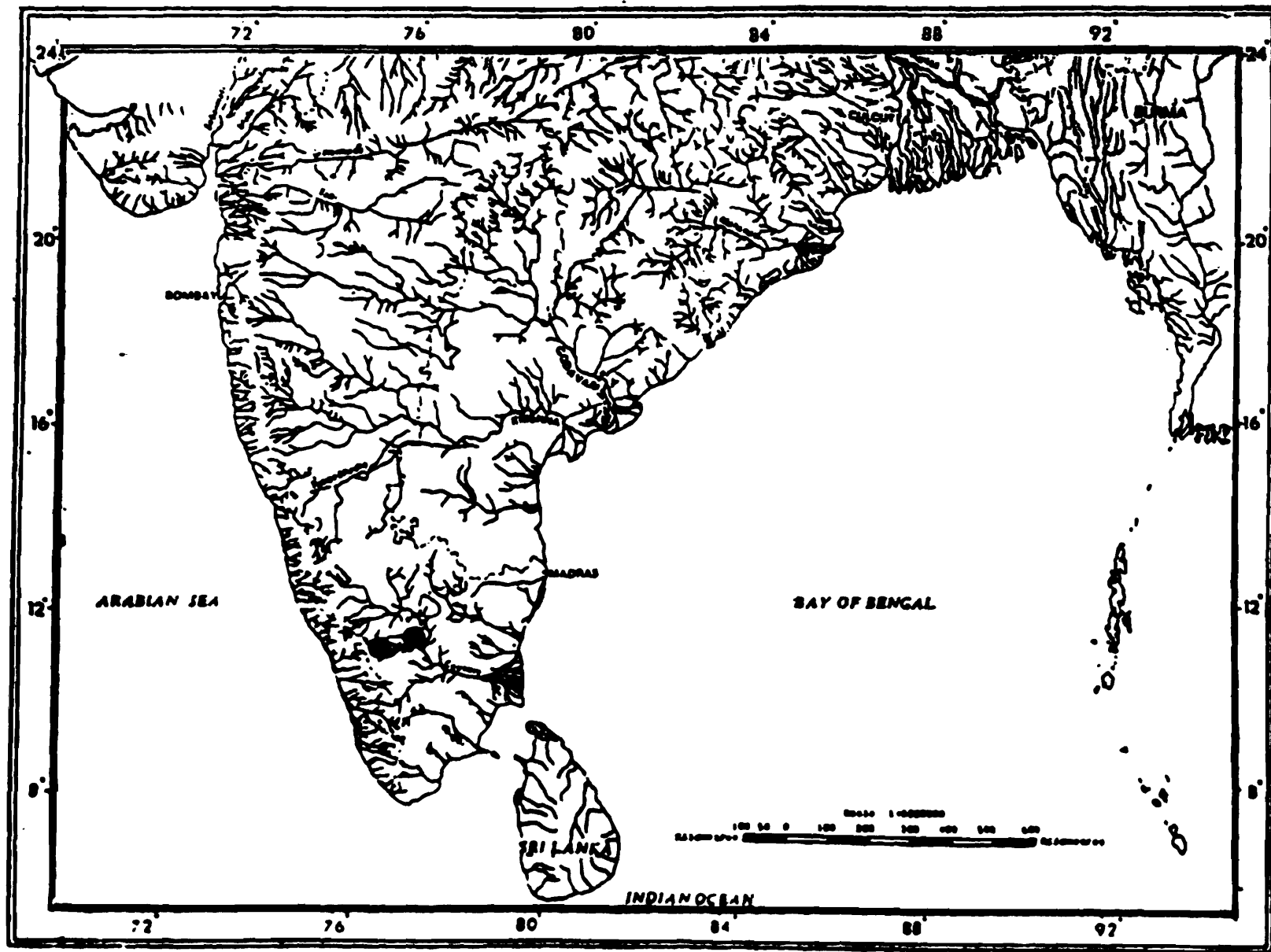


Fig. 19 : Distribution of *Barbodes bovanicus*. Despite several recent search, this species was last found in 1949. Dams may have had adverse effect on it.

Systematic status : The species cannot be considered as a *Puntius* as the name *Puntius* derived from the Bengali epithet *pungti* means small-sized fishes less than four inches in length (Hamilton, 1822). Closely related to *B. carnaticus*.

Salient features : D. III/9; P. 17; V. 9; A. III/5; C. 19; L. 1. 24-26; L. tr. $4\frac{1}{2}$ / $4\frac{1}{2}$.

Dorsal profile more convex than ventral; labial fold interrupted. Lower labial fold interrupted.

Barbels : 2 pairs; rostral pair about as long as eye, maxillary pair slightly longer than eye.

Fins : Dorsal origin midway between tip of snout and caudal base; last undivided dorsal ray osseous, strong; branched rays 9; anal laid flat reaches the caudal base.

Scales : Lateral line complete. $2\frac{1}{2}$ rows between lateral line and base of pelvic.

Colour : Green with a golden tinge, darkest along back.

Habitat : Lives in the reservoir, probably segregated from sympatric *B. carnaticus*.

Maximum size : 36 cm in length.

Biology : Not known.

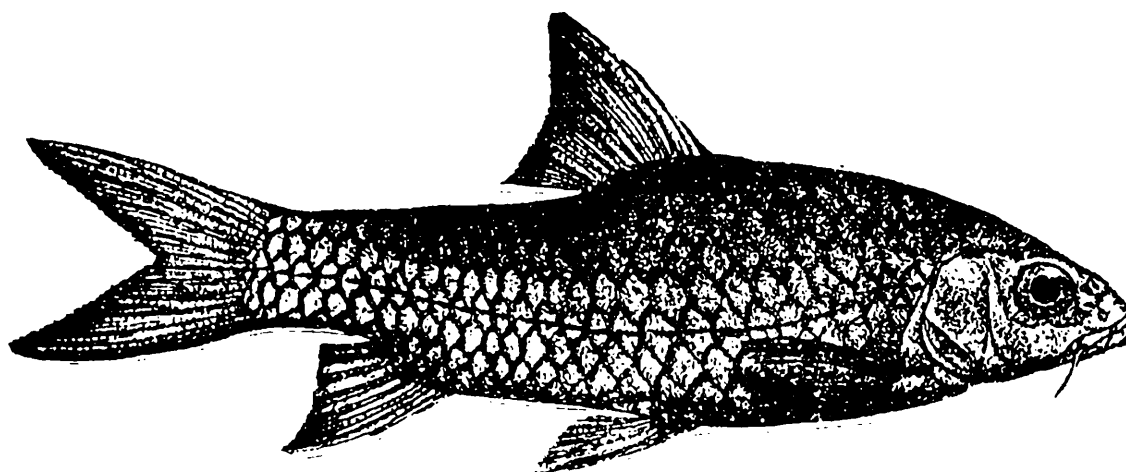
Protective measures taken : None.

Recommendations

- 1 A reserve for the species should be established in one of the streams in the Cauvery above the Mettur Dam.
2. Identity card with illustration of the fish should be prepared and distributed to all agencies concerned in wild-life protection.

24. *Barbodes carnaticus* (Jerdon)

(Fig. 20)



Vernacular name : Kannada : *Gidpakke, Gendai*; Hindi : *Giddi-kooli*; Malayalam : *Kavery kenta*. Tamil : *Poaree candee, Sal candee, Shelle, Pauvri, Kendai, Pura, Pall Kendai, Sall kendai*.

Status : Vulnerable.

Known only from the Cauvery drainage at the base of the Nilgiris, Wynad and also in Karnataka. The catch of the fish in the Mettur reservoir has declined considerably in recent times. The construction of the two dams on the Cauvery, the Krishnarajasagar dam in Mysore and Mettur dam in Tamil Nadu has resulted in the depletion of the species. Natural waterfalls like the Hogainakal is also a barrier for fish migration. Unless the fall becomes flush with the rise of 100 feet of level of water of the Mettur reservoir the fish fail to ascend the river for migration. When there is not sufficient water the breeders congregate below the fall and wanton destruction of breeders takes place.

The introduction of Gangetic carps in the Mettur reservoir has also caused the decline of the indigenous fish.

Taxonomic status : The species has been placed in the genus *Barbodes*. The generic status of the peninsular large carps are still not well understood.

Salient features : D. 4V/8; P. 15; V. 9; A. II/5; C. 19; L. 1. 38; L. tr. 5-6/3 1/2.

Dorsal profile more convex than that of abdomen. Lower labial fold interrupted.

Barbels : 2 pairs, thin, both pairs shorter than the eye.

Fins : Dorsal origin midway between the tip of snout and base of caudal fin. Last undivided ray osseous, broad and spiny; branched rays 8 (in *B. bovanicus* 9). Pectorals as long as the head. Anal laid flat reaches the caudal.

Scales : L. 1. complete; 3 1/2 rows of scales between lateral line and base of the pelvic.

Colour : Greenish brown along the back, becoming dull white glossed with gold on the sides and beneath. Fins greyish.

Habitat : Rapid rivers, introduced into lakes and reservoirs.

Maximum size : 60 cm in length; 12 kg in weight.

Biology : Spawns in July-August and fry available in September to December. It does not breed in ponds and undertakes spawning migration and spawns in flooded rivers in monsoon months.

Protective measures taken : According to Tamil Nadu Fisheries Act fishing is prohibited 200 m on either side of all dams.

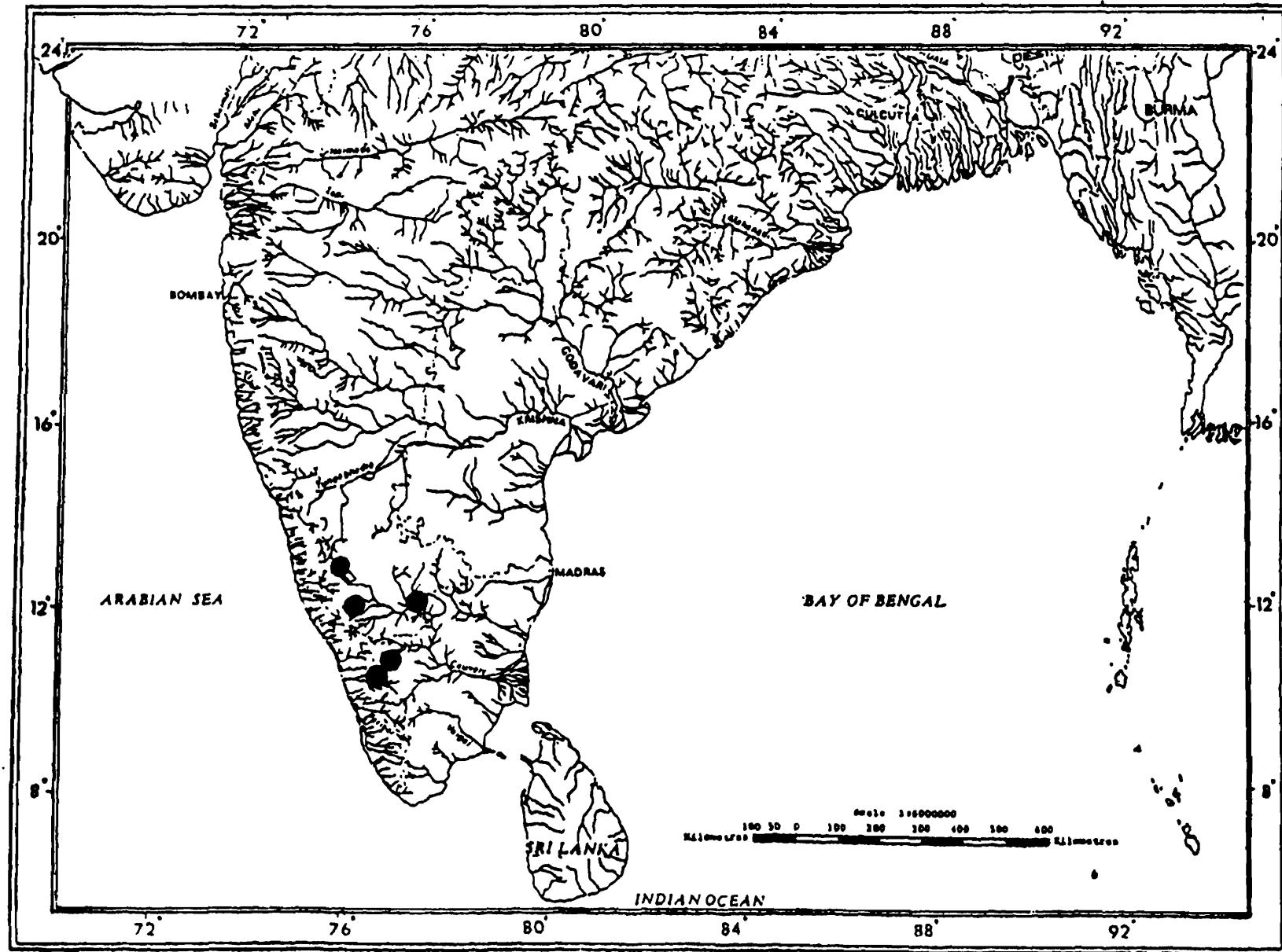
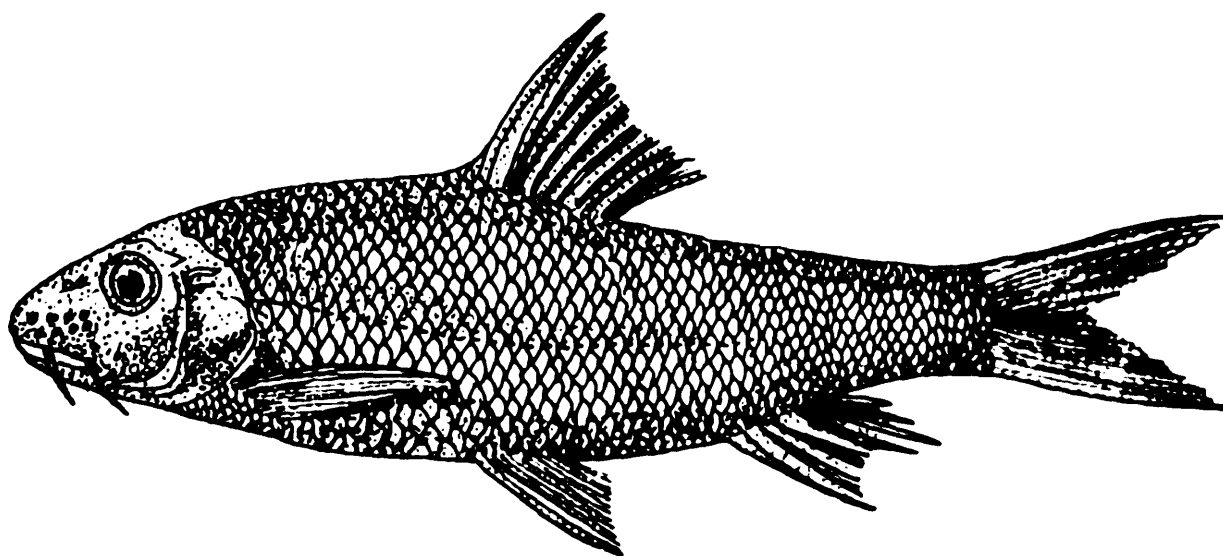


Fig. 20 : Distribution of *Barbodes carnaticus*. Construction of dams and natural waterfall impede its upstream migrating for spawning.

Recommendations

1. A few of the deep pools in the course of the Cauvery should be selected and declared as sanctuaries for the protection of the fish.
2. Laws on catching brooders below the dams should be strictly enforced.

25. *Chagunius chagunio* (Hamilton) (Fig. 21)



Vernacular names : Hindi : *Uta, Galehri, Musaina*; Bengali : *Jerruah*, Bihari : *Chaguni*, Assami : *Pootee-keintah*.

Status : Vulnerable.

Found in small numbers in the Ganges, Brahmaputra and Damodar drainages. Reported to reach a maximum of a half-metre but nowadays specimens more than 12 cm are not met with.

Taxonomic status : Originally called *Cyprinus chagunio* by Hamilton it was elevated to generic level by Smith (1938) because of its peculiar physiognomy, relative to other Southeast Asian barbins. See also remarks under taxonomic status of *Poropuntius clavatus*.

Salient features : D. III/8; P. 15; V. 9; A. III/5; C. 19; L. I. 44-47; L. tr. 11/9. Nuptial tubercles well developed in males, cover snout and cheek.

Barbels : Two well developed pairs.

Fins : Dorsal commences midway between end of snout and caudal base, its last spine osseous strong with coarse teeth, last few anal rays enlarged in males extending to caudal base.

Scales : 6 rows between lateral line and base of ventral fin.

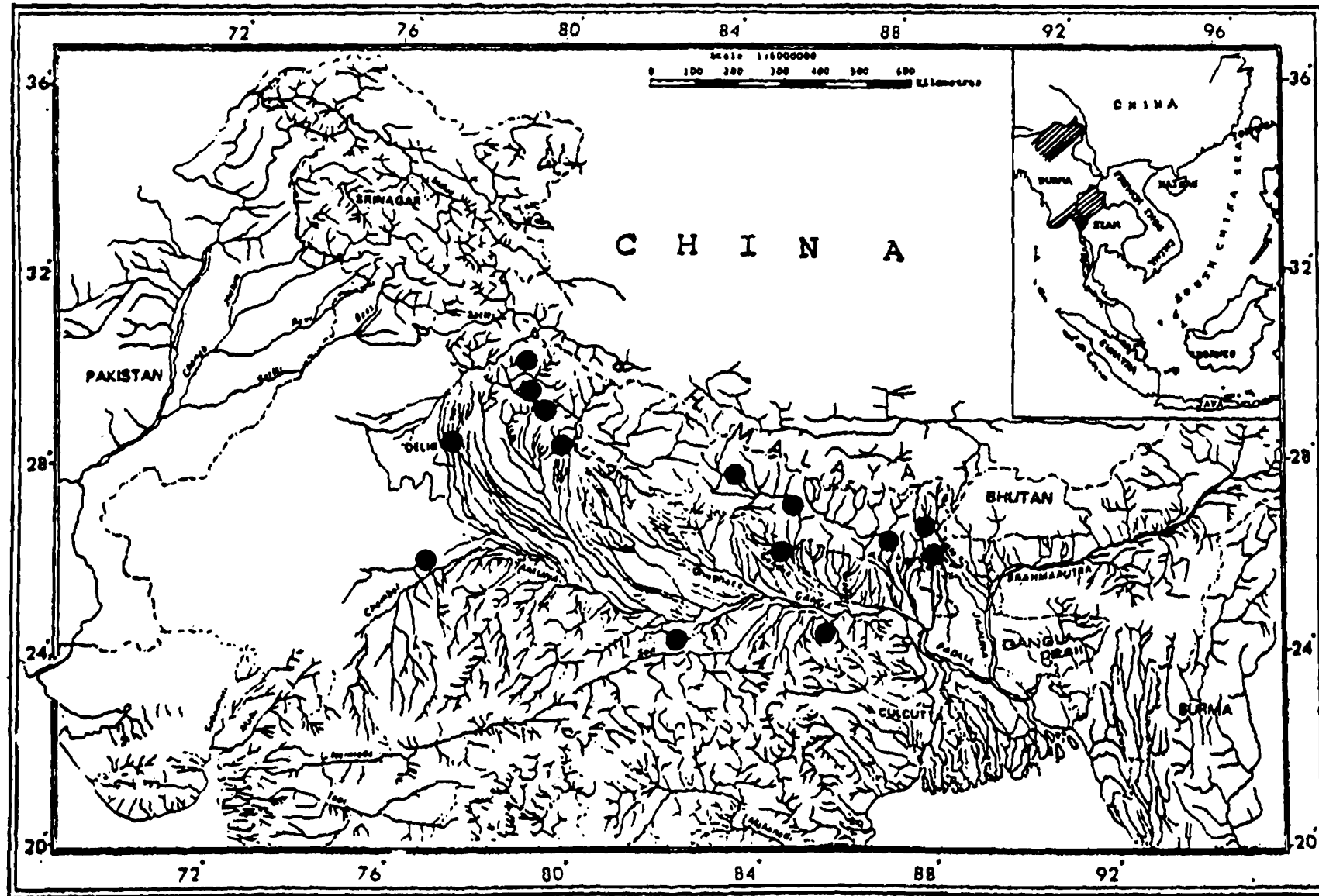


Fig. 21 : Distribution of *Chagunius chagunio*. Deforestation and increased turbidity of water have led to the decline of the species. Classified as a vulnerable species.

Habitat : Large rivers with rocky bottom, clear and fast water and little vegetation, not a long range migrant like *Tor*.

Maximum Size : 12 cm TL.

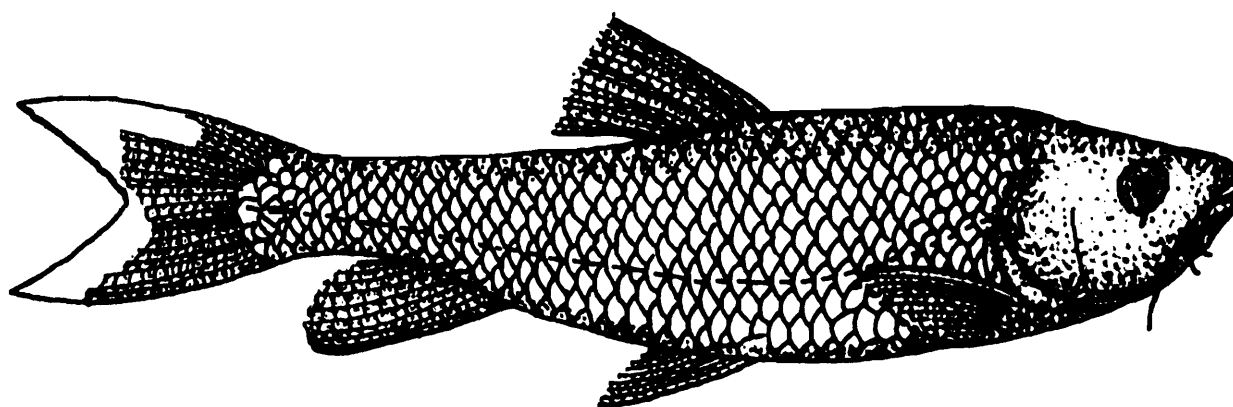
Biology : Not known.

Protective measures taken : None.

Recommendations

Suitable fast flowing large streams in Dehradun District and in Assam should be selected for the preservation of the species in the Ganga and the Brahmaputra systems.

26. *Eechathalakenda ophicephala* (Raj) (Fig. 22)



Vernacular names : Malayalam : *Eechathalakenda*; Tamil : *Eechathalaikendai*

Status : Rare.

Known only from the syntypes (4 in Madras Govt. Museum and one in Zoological Survey of India, Calcutta), collected from the Kallar stream, a tributary of Pambyar, south of Pachakani Estate, adjacent to Periyar Lake, Kerala.

Taxonomic status : Related to *Hypselobarbus* but does not belong to it. A new genus has been erected to accommodate this species. It can be easily distinguished from *Hypselobarbus* by its elongated "Channa"-like appearance and seven branched rays in the dorsal fin (9 in *Hypselobarbus*).

Salient features : D. III/7; p. 14-16; V. 9; A. II/5; C. 19; L. 1. 10-42, L. tr. 7-7 1/2/6.

Body elongate, its depth approximately 4.5 (4.0-5.5) times; head broad and depressed, its length 4 (3.6-4.3) in standard length. Mouth moderate and sub-inferior.

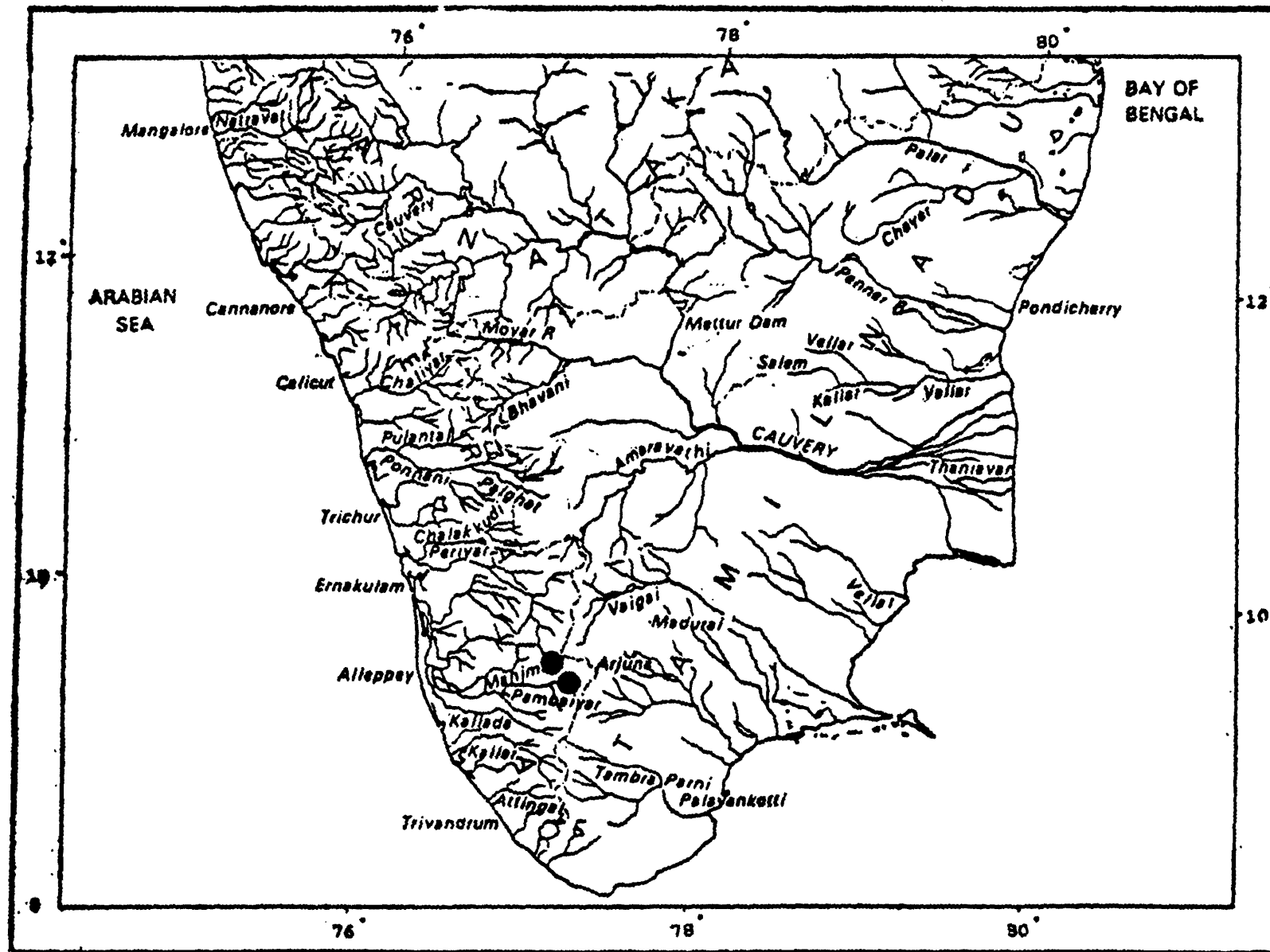


Fig. 22 : Distribution of *Eachathalakenda ophicephala*. Known only from headwater streams of Pambiyar river, Kerala, related to *Hypselobarbus*. Classified as rare.

Barbels : Two pairs, rostral pair equal to orbit; maxillary pair much longer.

Fins : Dorsal fin inserted nearer to the tip of the snout than to the base of caudal. The last undivided ray is slightly enlarged, but weak, smooth and articulated in its upper part. Pectoral does not reach ventral. Anal fin rounded posteriorly and when laid flat reaches the caudal fin base. Caudal forked.

Scales : L. l. complete; $3\frac{1}{2}$ -4 rows of scales between lateral line and base of pelvic fin.

Colour : Back rich golden brown, flank and abdomen silvery brown. A broad, dark band runs along lateral line composed of fine black spots on the base of lateral line scales. Fins golden brown.

Habitat : Clear torrential streams.

Maximum size : 196 mm in length.

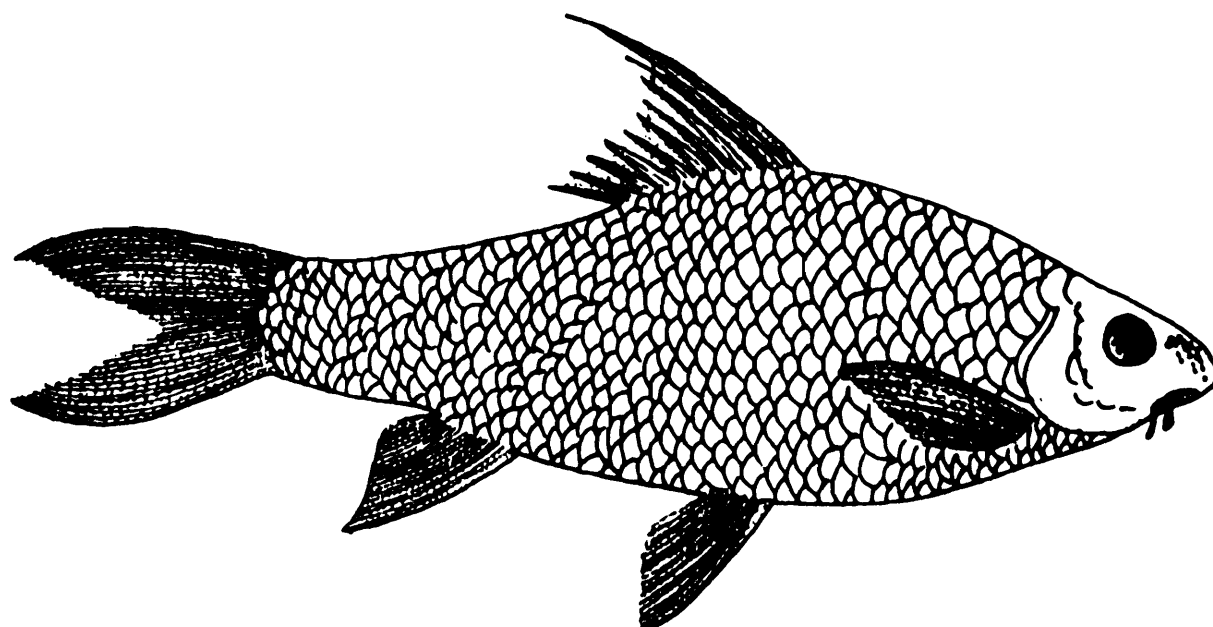
Biology : Unknown.

Protective measures taken : None.

Recommendations

A sanctuary in a suitable habitat in the headwater of Pambyar river should be established for the protection of this species.

27, *Hypselobarbus dobsoni* (Day)
(Fig. 23)



Vernacular name : Nil.

Common English : *Krishna carp*.

Status : Endangered.

Known only from Deccan, in the Krishna river drainage. Its record from Nilgiris needs further confirmation. The catches in Anjanapur reservoir (Shimoga dist.) and in the other reservoirs of Tungabhadra subdrainage of the Krishna system, have declined both in number and size.

Taxonomic status : The species has been confused with *Hypselobarbus jerdoni* (Day), a species known from Dakshina Kannada. The deeper body $3\frac{1}{4}$ - $3\frac{1}{2}$ in total length (4 in *H. jerdoni*) and $3\frac{1}{2}$ rows of scales between lateral line and pelvic fin base ($2\frac{1}{2}$ in *H. jerdoni*) easily distinguish the species from *H. jerdoni*.

Salient features : D. III-IV/9; P. 14; V. 9; A. III/5; C. 19; L. 1. 29-32; L. tr. $5\frac{1}{2}$ -6.

Dorsal and ventral profiles arched, with a distinct rise up to the dorsal base. Head small, 6 times, depth of body $3\frac{1}{4}$ - $3\frac{1}{2}$ in total length. Snout obtuse, without tubercles. Interorbital space slightly concave. Mouth narrow, lower labial fold interrupted.

Barbels : 2 pairs; maxillary as long as the eye, rostral somewhat shorter.

Fins : Dorsal commences in advance of ventral, and nearest to snout than to the base of the caudal; its last undivided ray articulated at the upper portion, lower portion smooth and strong. Pectoral as long as head. Anal fin rounded, reaches caudal base. Caudal fin not deeply forked.

Scales : L. 1. complete; $3\frac{1}{2}$ rows of scales between lateral line and base of pelvic fins.

Colour : Bluish above, becomes lighter towards sides and beneath; fins edged with grey, upper corner of dorsal and tips of caudal blackish; each scale with brownish black lunule.

Habitat : Deeper parts of fast flowing rivers.

Maximum size : 90 to 120.0 cm. in length, more commonly 45.0 cm.

Biology : Nothing has been known on the biology.

Protective measures taken : A temple sanctuary exists at Sringeri on Tungabhadra drainage where fishing is prohibited on religious grounds.

Recommendations

- 1 Mesh regulations to avoid catching of smaller size fishes should be introduced wherever the species constitutes a fishery in the Krishna river system.

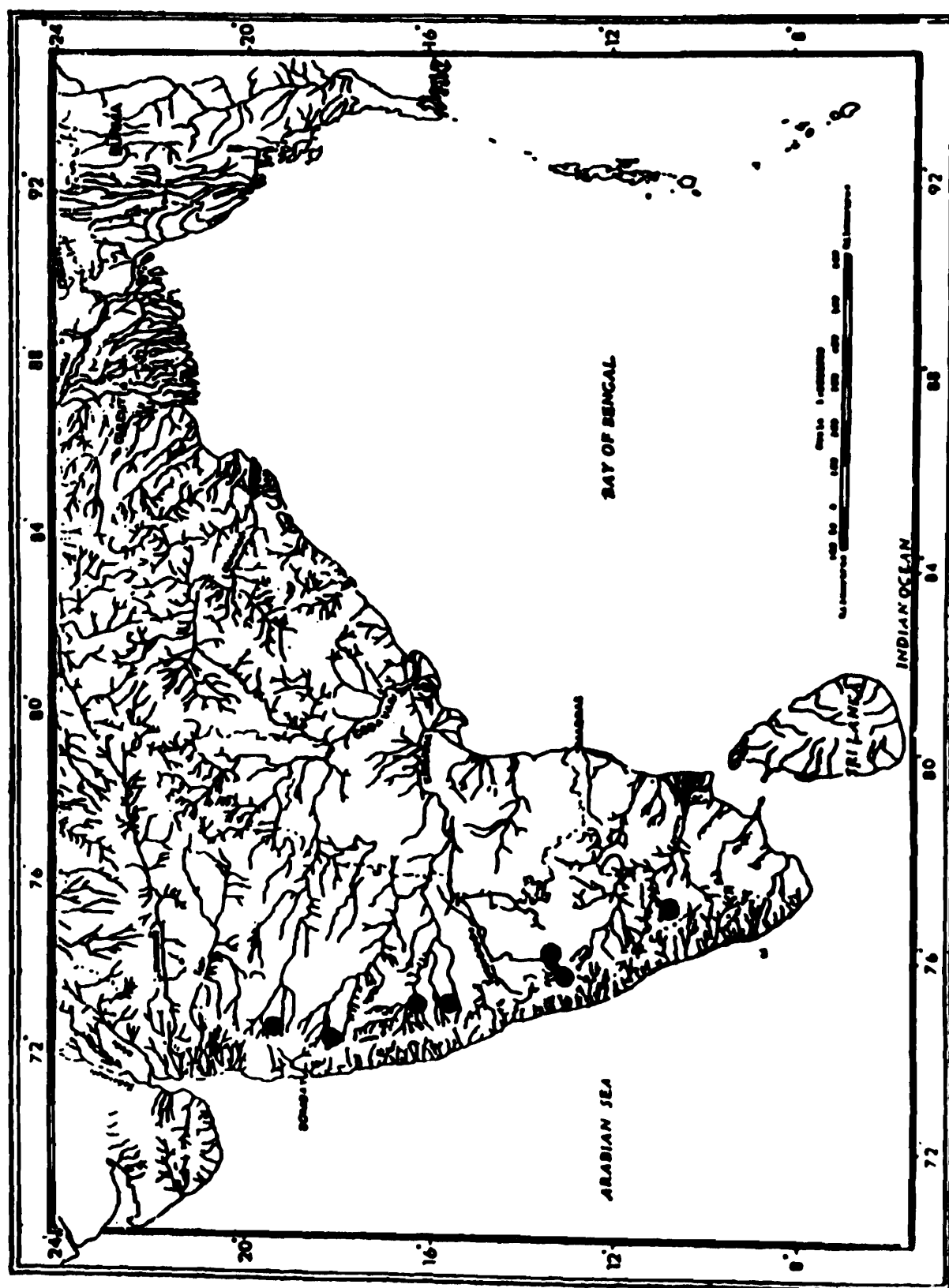
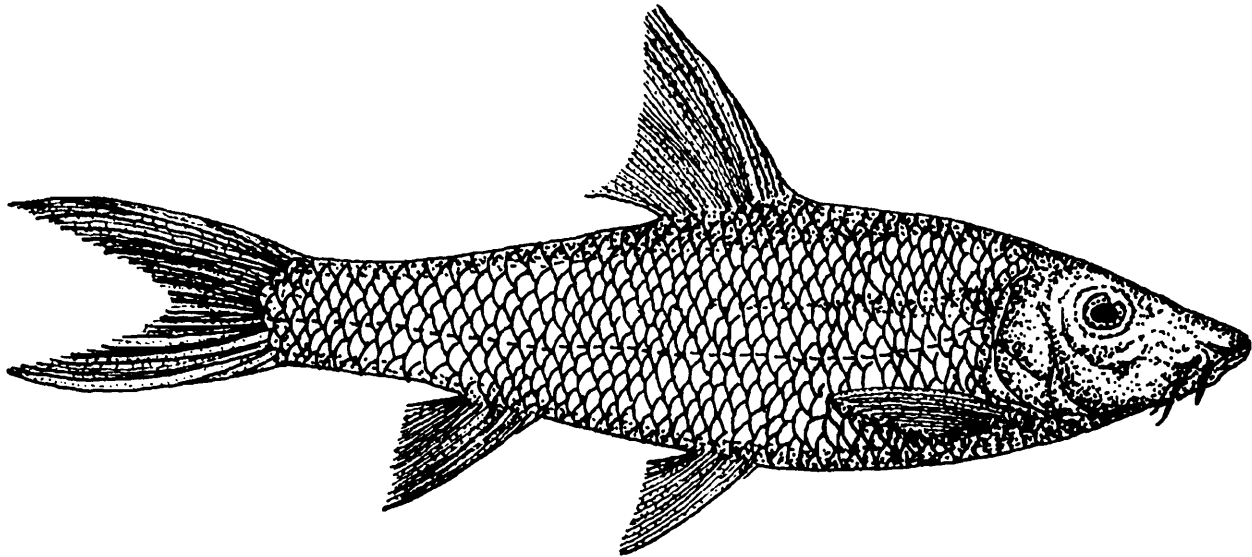


Fig. 23 : Distribution of *Hypseobarbus dabsoni*, a bottom dwelling browser of clean waters, is affected by habitat modifications.

2. Some of the deep pools in the course of the river where the fish rests during the period of low discharge of water in summer months should be selected and declared as fish sanctuaries.

28. *Hypselobarbus dubius* (Day)
(Fig. 24)



Vernacular names : Kannada : Oorlu; Tamil : Kozhimeen, Kozhiarinjan kendai.

Status : Endangered.

Found in the Cauvery drainage at the foot of Nilgiris and the Mysore Plateau, in small numbers. The construction of dams on Cauvery has obstructed the spawning run of the fish to the higher reaches and resulted in the depletion of the species.

Taxonomic status : Closely related to *H. micropogon* from which it can be distinguished by its longer snout and greater number of lateral line scales (42-45 versus 39-41).

Salient features : D. IV/9; P. 17; V. 9; A. II/5; C. 19; L. 1. 42-45; L. tr. 9/9.

Dorsal profile more convex than that of abdomen, snout elevated, more than 2 times in head, devoid of tubercles. Mouth sub-inferior; lips thick, post labial groove interrupted.

Barbels : Two pairs, rather short, rostral pair being about equal to half the diameter of eye, while maxillary is a little longer.

Fins : Dorsal fin inserted slightly nearer to the snout than the base of caudal. Its last undivided ray osseous, strong and smooth; it is nearly as long as the head. Anal fin when laid flat reaches the caudal base in females while in the male it falls short.

Scales : L. 1. complete; $4\frac{1}{2}$ -5 rows of scales between it and base of pelvic fin.

Colour : Uniform silvery, with the bases of the scales darkest.

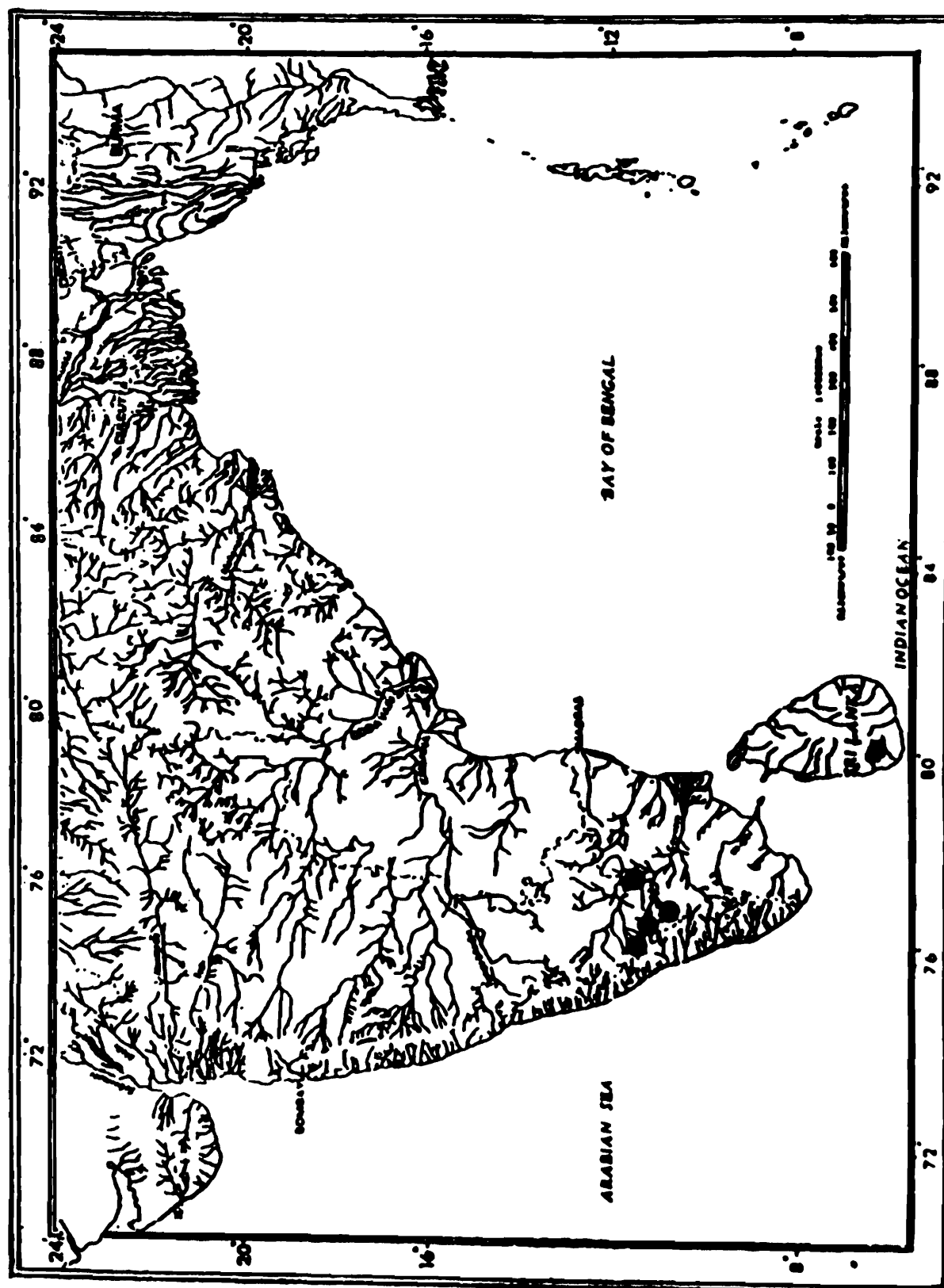


Fig. 24 : Distribution of *Hypselobarbus dubius*. Dams impede its spawning run.

Habitat : In the upper reaches of the rivers in the hilly region.

Maximum size : 25.5 cm TL.

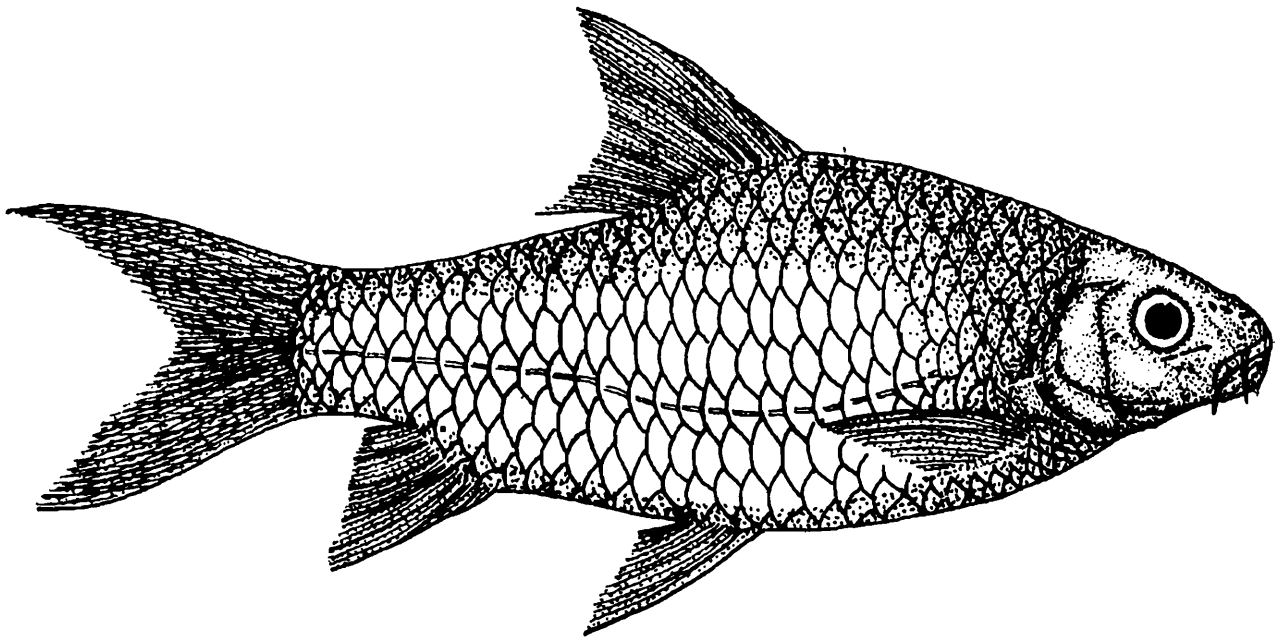
Biology : Unknown.

Protective measures taken : None.

Recommendations

1. A survey should be conducted in the higher reaches of the Mysore plateau to determine the population strength and obtain life history information.
2. A sanctuary in the Mysore Plateau should be set up for the protection of this species.

29. *Hypselobarbus jerdoni* (Day) (Fig. 25)



Vernacular names : Kannada : Saymeen; Malayalam; Tameen; Telugu : Chameen.

Status : Endangered.

Known only from Dakshina Kannada. Day (1870) described the species from Mangalore, Dakshina Kannada, and since then no specimen has been collected from there. Deforestation and spread of agricultural practices during the last century have changed the physical habitat of the rivers of the western face of the Western Ghats and caused the disappearance of the species from a former wider range of its distribution. Probably it is limited today to a small fragment of its previous range and further efforts are needed to locate its present habitat and take necessary action to protect the species. A recent search for the fish in the Kumaradhara drainage was in vain.

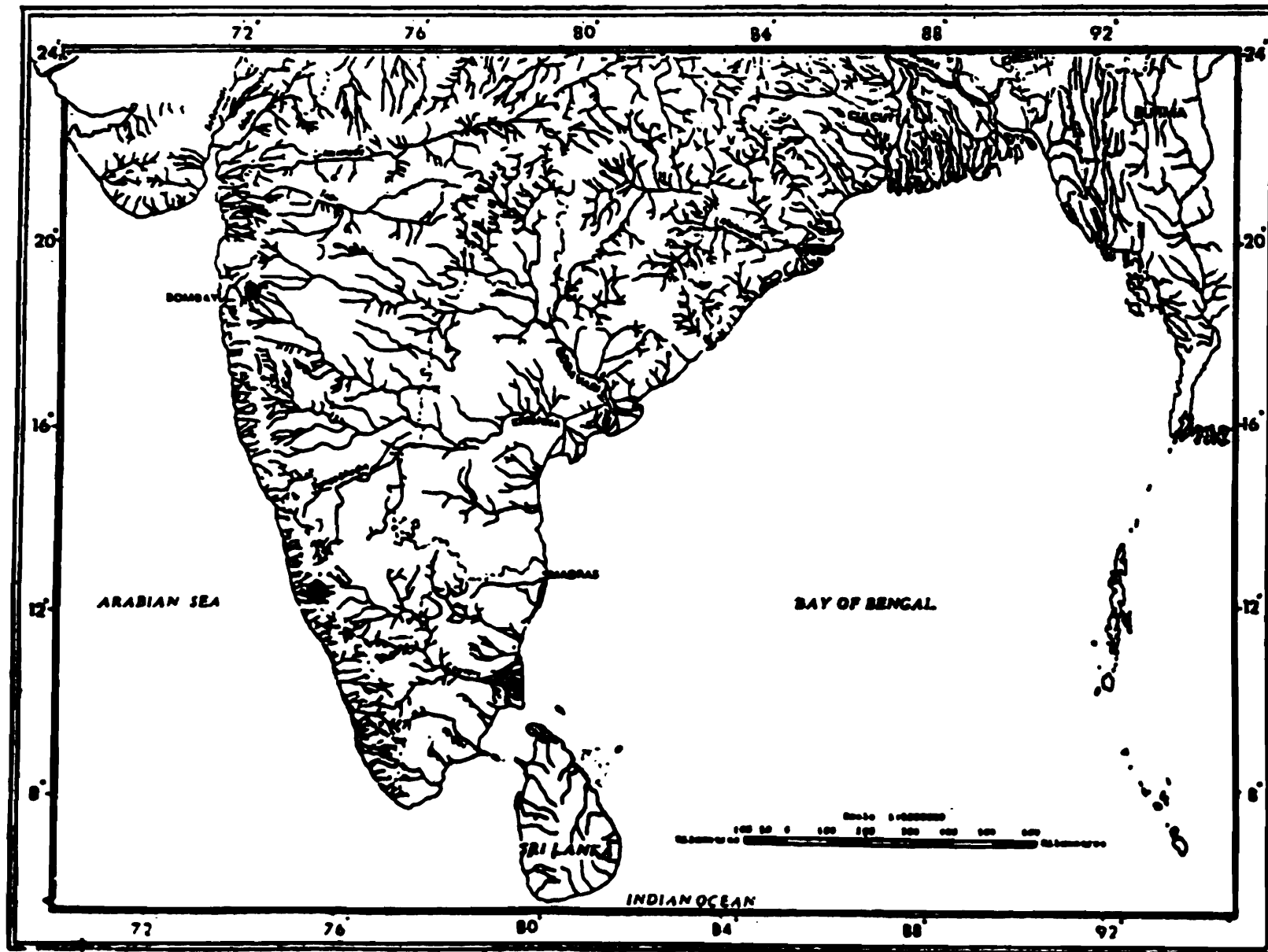


Fig. 25 : Distribution of *Hypselobarbus jerdoni*, a bottom dwelling browser of clean waters is threatened by habitat distribution.

Taxonomic status : Hora and Misra (1942) synonymised *H. pulchellus* (Day) and *H. dobsoni* (Day) with this species.

Salient features : D. III-IV/9; P. 14; V. 9; A. III/5; C. 19; L. 1. 27-28; L. tr. 6/4.

Dorsal and ventral arched with a distinct rise up to dorsal base. Head short, length of head $5-5\frac{1}{2}$, depth of the body 4 in the total length. Snout obtuse, mouth narrow, upper jaw longer. Lower labial fold interrupted.

Barbels : 2 pairs; thin, maxillary being as long as the orbit, the rostral slightly shorter.

Fins : Dorsal fin inserted midway between the tip of the snout and the base of caudal fin (nearer to the snout than to the caudal in *H. dobsoni*). Last undivided dorsal ray articulated and weak, not enlarged at the base. Pectoral as long as the head and not touching the ventral, which is of almost the same length. Anal rounded in the female and when laid flat reaches somewhat beyond the root of caudal fin which is deeply forked.

Scales : L. 1. complete; $2\frac{1}{2}$ - $3\frac{1}{2}$ rows of scales between it and the base of the pelvic.

Colour : Silvery, the fins with an orange tint, tipped with black.

Habitat : Rivers below the ghats.

Maximum size : 45 cm TL.

Biology : Not known.

Protective measures taken : None.

Recommendations

Some of the deep pools in the course of the river Netravati where the fish rests in summer months should be declared fish sanctuaries.

30. *Hypselobarbus lithopidos* (Day) (Fig. 26)

Vernacular name : Kannada : *Kuri-meen*.

Status : Endangered.

Day (1878) described the species based on specimens obtained in South Canara and the next records of the species are by Jenkins (1909) and Pillay (1929) from Trivandrum. Since then no specimen of the species has been collected. In December 1991 an

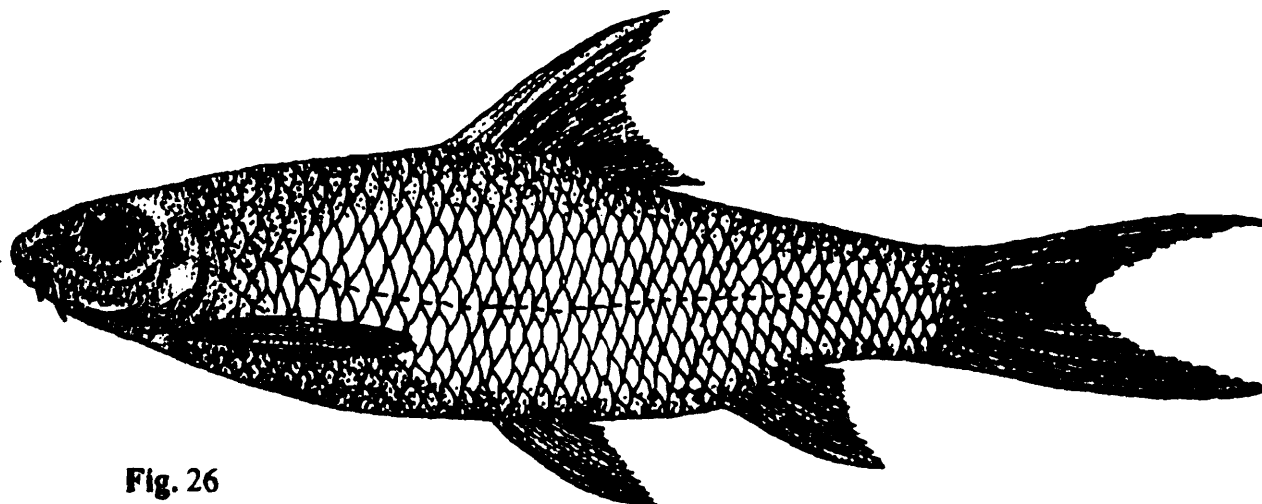


Fig. 26

intensive survey of South Canara was carried out by the author and no specimen of this species was procured. There is a specimen, (23.5 cm) kept in the Madras Museum collected by Sundar Raj from Nilambur, Kerala on 5th April 1939. This is the only voucher specimen available of this species. Even though the last record was over 50 years the species is kept here as critically endangered in the hope of rediscovery of the species in the west flowing rivers of Western Ghats around Nilambur where still exists some riparian forests.

Taxonomic status : Rainboth (1989) reviewed the taxonomic status of Genus *Hypselobarbus* and ascertained the availability of the name *Hypselobarbus* for the large indigenous barbs of the Peninsula. Earlier Rainboth (1986) used the name *Gonoproktopterus* because of the uncertainty of the identity of the type species of *Hypselobarbus*. Bleeker (1859-60) listed *Gonoproktopterus* (type-species *Barbus kolus* Sykes) as a sub-genus of *Hypselobarbus* (type species *Barbus musullah* Sykes). Hora (1942) considered *B. musullah* to belong to the genus *Tor* Gray and that Sykes' illustration was incorrect. However Rainboth has established that the figure of *B. musullah* is accurate and that *B. musullah* does not belong to *Tor*, thus making the name *Hypselobarbus* available for the indigenous large barbs of the peninsula.

Salient features : D. III/9; P. 15; V. 10; A. III/5; C. 19; L. 1. 38-40; L. tr. 7/7.

Body compressed, dorsal and abdominal profiles equally and moderately convex. Inter-orbital space somewhat convex. Upper jaw slightly longer; lower labial fold interrupted; a thin cartilaginous covering internally on either jaw. Large specimens with pores on sub-orbital.

Barbels : Two pairs, about as long as orbit.

Fins : Dorsal fin as high as of the body; its upper edge concave; its origin is anterior to the insertion of ventral, nearer to the tip of the snout than to the base of the caudal; its last undivided ray weak and articulated. Pectoral as long as the head; ventral slightly shorter. Caudal deeply forked.

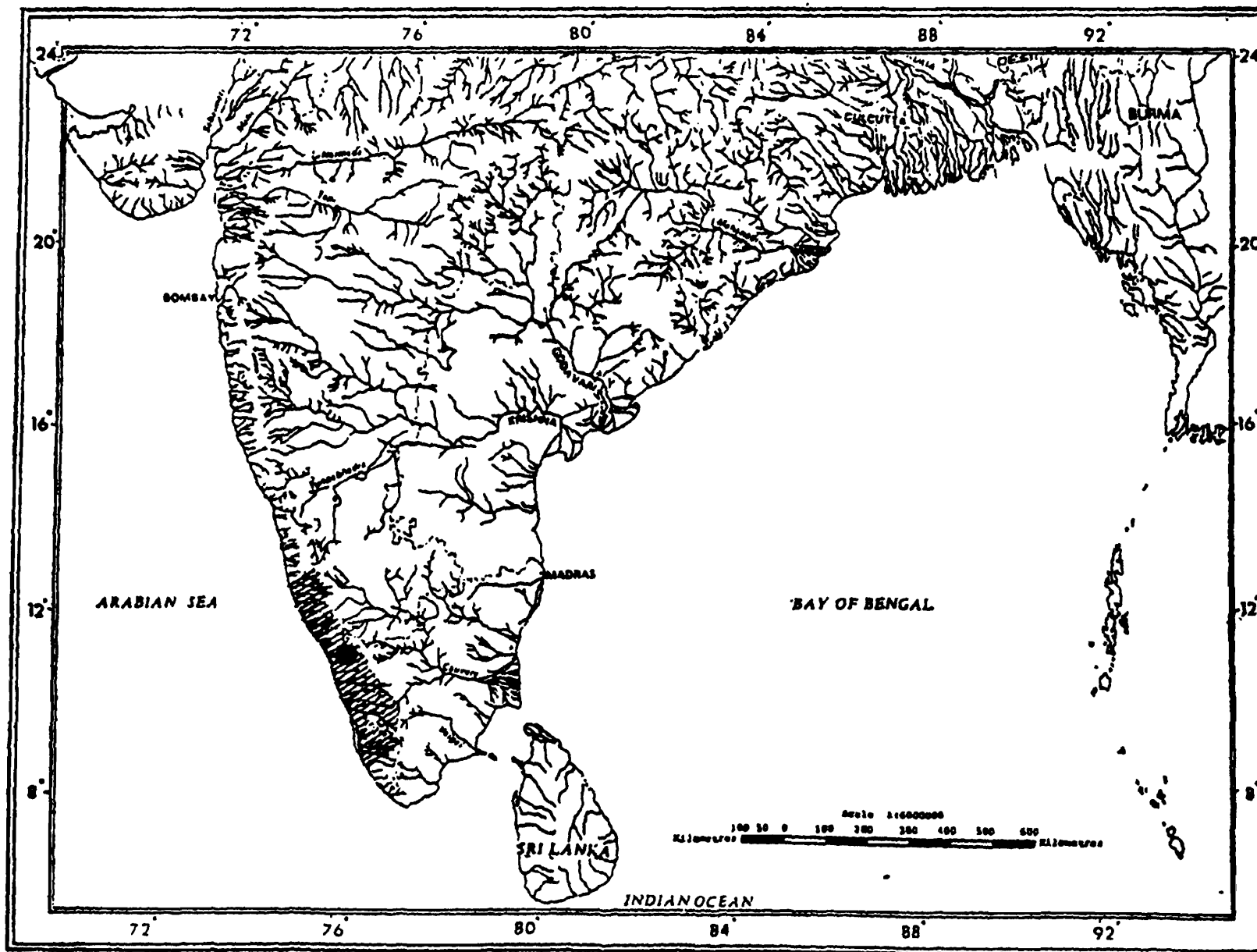


Fig. 26 : Distribution of *Hypselobarbus lithopidos* probably survives today in Nelambur, Kerala, from where Sundara Raj collected a specimen in 1939. Endangered.

Scales : L. 1. Complete; 4 rows of scales between lateral line and base of pelvic.

Colour : Somewhat yellowish with a grey band behind the opercle and some of the scales scarlet in the adult. Fins slaty having its outer rays whitish, pectoral yellowish, tail greenish.

Habitat : Fast-flowing rivers and streams in forested areas.

Maximum size : 60 cm in length.

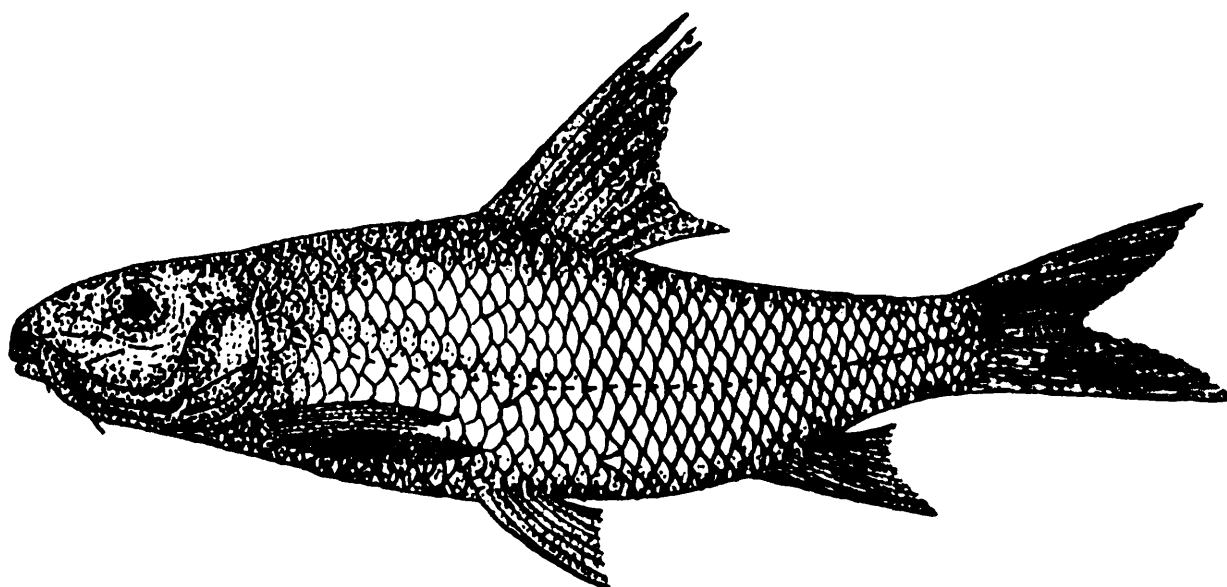
Biology : Nothing has been reported on the biology of the species.

Protective measures taken : None.

Recommendations

1. The vestiges of the riparian forests of Nilambur area should be protected and fishing prohibited in the rivers where the target species is likely to occur.
2. A thorough survey of Nilambur and its vicinity should be conducted to locate the habitat of the surviving population.
3. Taxonomic studies of this species complex should be encouraged.

31. *Hypselobarbus micropogon* (Valenciennes) (Fig. 27)



Vernacular name : Tamil : *Coatee kendai*.

Status : Endangered.

Found in the Cauvery drainage in Nilgiris, Wynaad and Mysore. Its breeding migratory movements are affected by the dams across the Cauvery which has resulted in the depletion of the species, both in number and size.

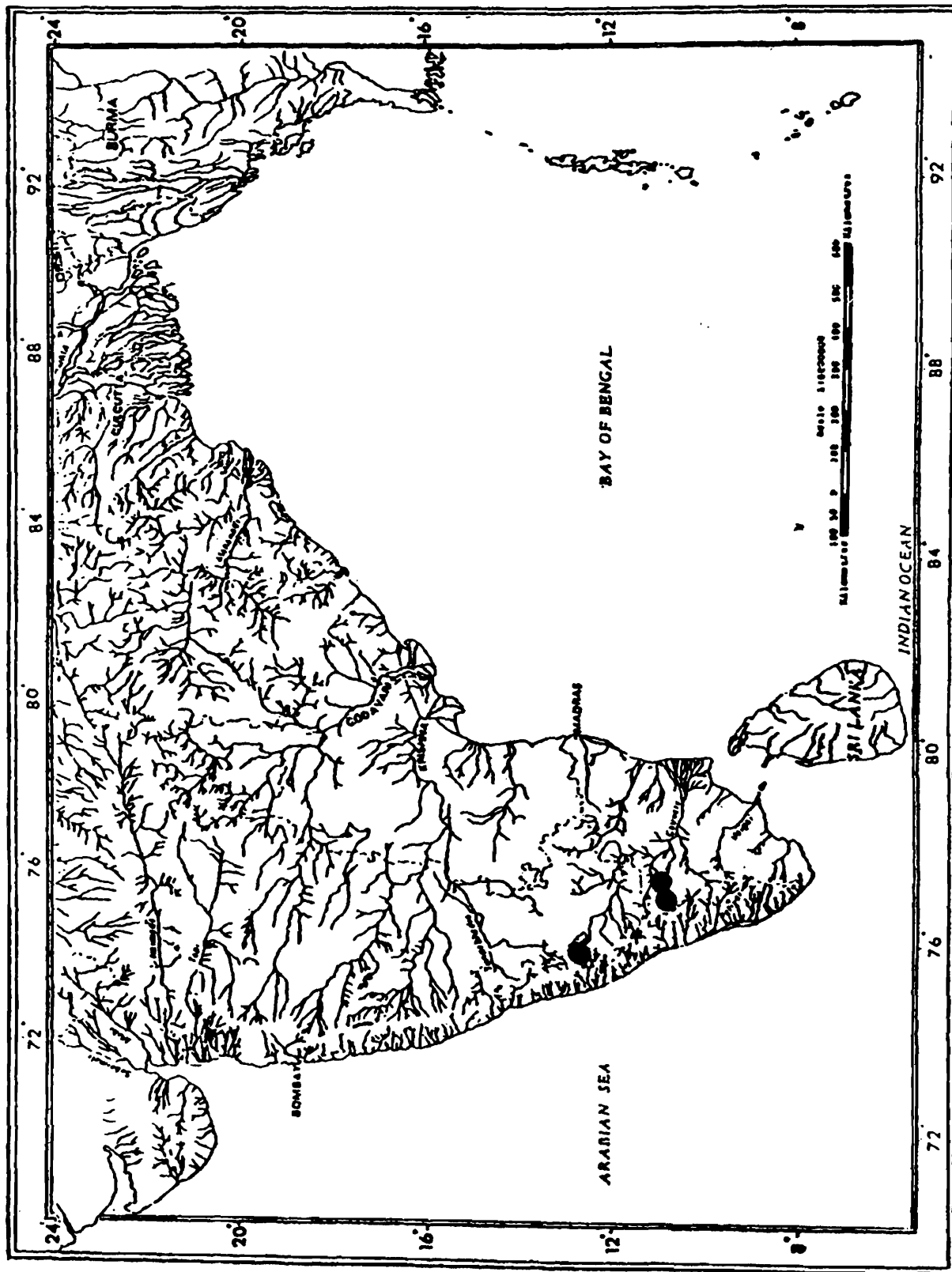


Fig. 27 : Distribution of *Hypselobarbus micropogon*. Dams impede its spawning run.

Taxonomic status : Closely related to *H. dubius* from which it can be distinguished by its small number of scales (39-41 versus 42-45).

Salient features : D. IV/9; P. 17; V. 10; A. II-III/5; C. 19; L. 1. 39-41; L. tr. 6-7/7.

Body elongate. Dorsal profile elevated. Snout conically pointed and adults have pores on the preorbitals and even all across the snout. Mouth moderate, extending about half the distance to below the anterior margin of orbit; upper jaw slightly longer. Inner labial fold interrupted.

Barbels : Two pairs; rostral pair extends to below the anterior third of the orbit, maxillary pair to below its posterior edge.

Fins : Dorsal commences slightly before the ventral and nearer to the snout than the base of caudal; its osseous ray strong, smooth and somewhat compressed; its stiff portion is longer than the head. The anal fin is rounded in the female while in the male it is straight.

Scales : L. 1. Complete, $3\frac{1}{2}$ rows of scales between it and pelvic fin base.

Colour : Greenish tinge superiorly, white tinged with gold below; fins darkest along centre. Cheeks golden.

Habitat : Rapid rivers at foothills and clear waters of highlands.

Maximum size : 30 cm in length.

Biology : Breeds in upper reaches of Cauvery in the Nilgiris and Karnataka. Other aspects of the biology have not been studied.

Protective measures taken : None.

Recommendations

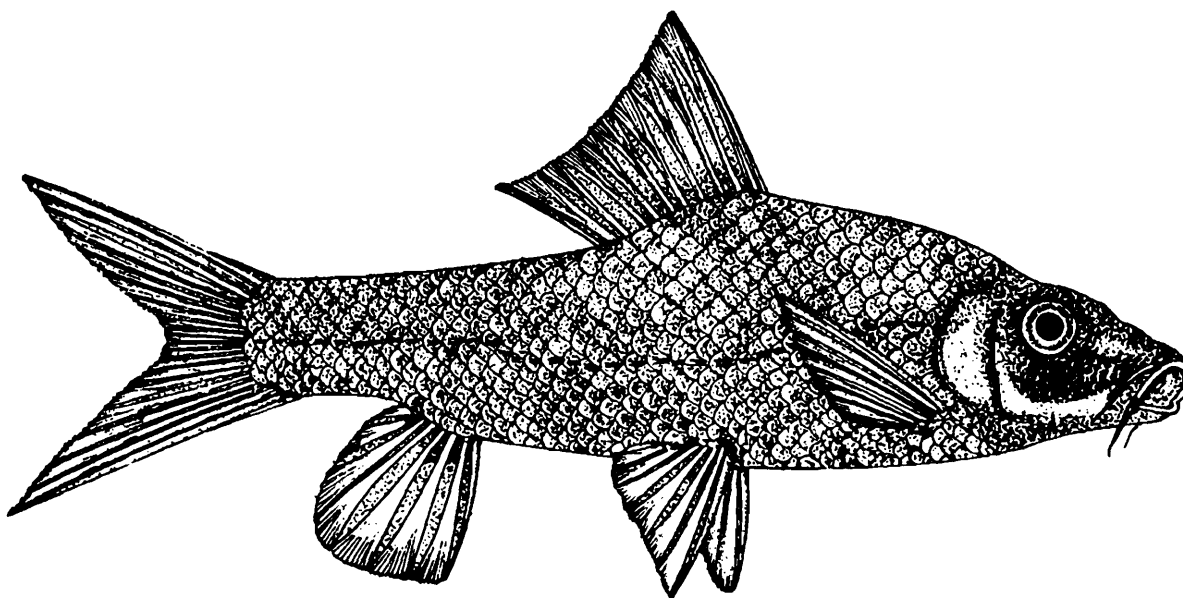
1. A survey should be conducted in the higher reaches in Nilgiris and Mysore Plateau to determine the population strength and life history information.
2. Deep pools in the course of the river where the fish rests during periods of low discharge of water should be identified and some of them declared as fish sanctuaries.

32. *Hypselobarbus musullah* (Sykes) (Fig. 28)

Vernacular name : Marathi : *Masundi*.

Status : Endangered.

It is known only from Ghod river at Sirur, Maharashtra. Our efforts to collect



specimens from Ghod river have been in vain. Habitat destruction and changes in ecological characteristics of the river at Sirur have contributed to the disappearance of the species from there. The earlier wider range of the fish has been reduced and probably it is limited to a smaller fragment of its previous range today. Further efforts are needed to locate the species in suitable habitats in a clear fast flowing stream in forested areas in Krishna drainage, probably in the higher reaches of Tungabhadra river if it is a species of migratory habit for breeding.

Taxonomic status : *Hypselobarbus* with type *B. musullah* Sykes (1840) was erected by Bleeker (1859) based on Syke's illustration of *B. musullah*. This illustration turned out to be a controversial subject and Hora (1942-43) considered it to belong to Genus *Tor* Gray, 1833, on the assumption that Sykes' illustration was incorrect. If *musullah* were treated as a member of genus *Tor* then *Hypselobarbus* would have been a subjective synonym of *Tor* Gray. But Rainboth (1989) rightly pointed out that *B. musullah* does not belong to *Tor* Gray making available the name *Hypselobarbus* for the poorly known highly endangered barbs of the Indian Peninsula. *B. musullah* is the type species of Genus *Hypselobarbus*.

Salient features : D. III/9; P. 16; V. 9; A. III/5; C. 19; L. 1. 32-33.

The dorsal profile somewhat more arched than the ventral, there is a distinct rise at the base of dorsal. There is a prominence between upper lip and nostril; snout is long, approximately two times in head, tuberculated.

Barbels : Two pairs, long; almost of equal length.

Fins : The dorsal arises somewhat in front of the ventral, nearer to the snout than to caudal base. Anal fin somewhat rounded posteriorly. The caudal is deeply forked.

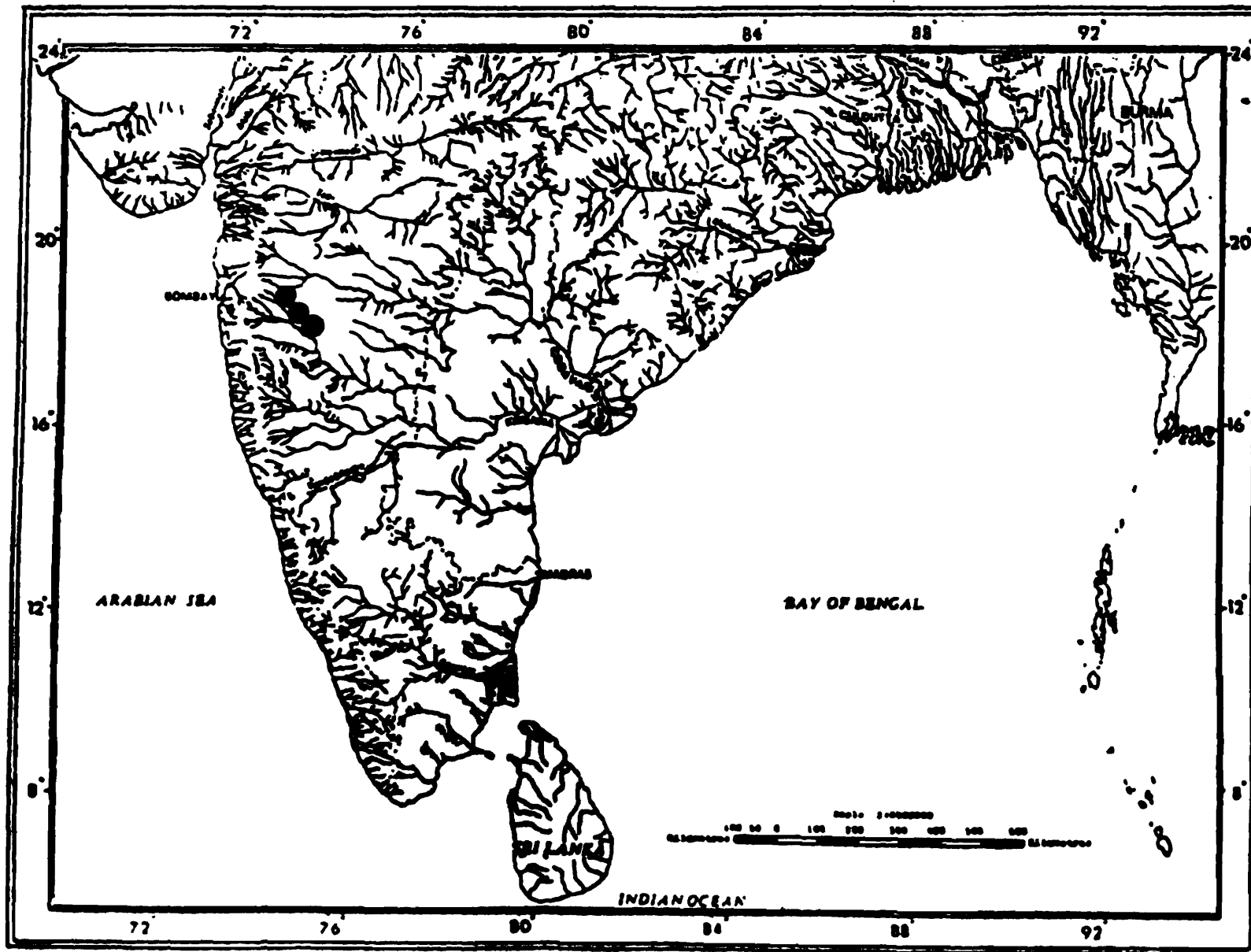


Fig. 28 : Distribution of *Hypselobarbus mussullah*, known only from Ghod river, at Sisur, Maharashtra. Despite recent search, it was last found in 1840. Endangered.

Scales : L. 1. Complete; $5-5\frac{1}{2}$ rows of scales between lateral line and base of the ventral fin.

Colour : Upper part silvery, having red reflections, lower part yellowish.

Habitat : Small and medium size clear streams or rivers in forested areas.

Maximum size : 100 cm in length.

Biology : Unknown.

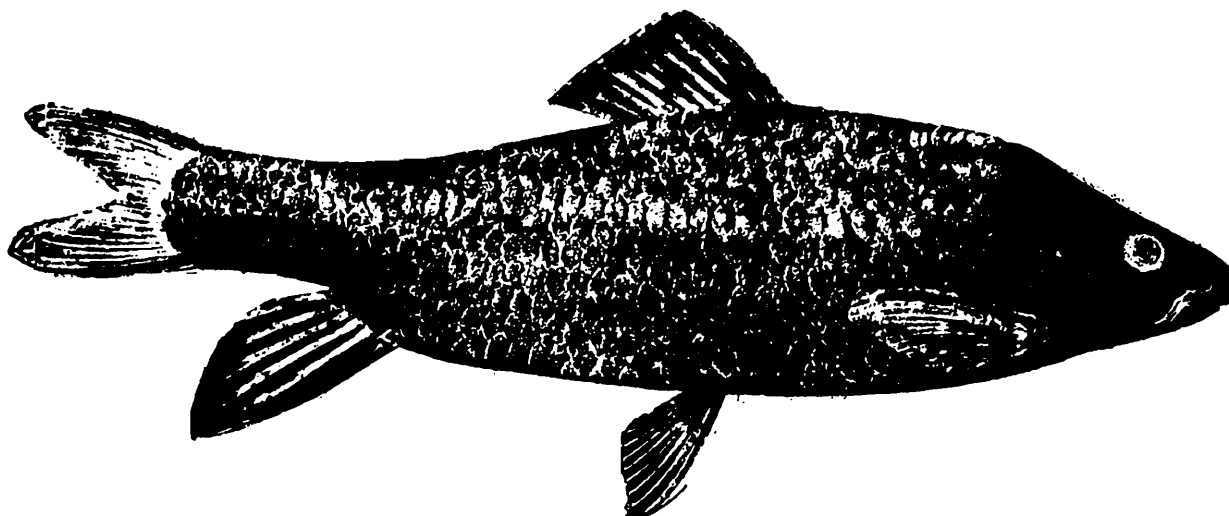
Protective measures taken : None.

Recommendations

- 1 Further efforts should be made to locate the fish in suitable habitats of clear water.
2. Establishment of a sanctuary should be considered if survivors are found.

33. *Hypselobarbus periyarensis* (Raj)

(Fig. 29)



Vernacular name : Malayalam : *Karivan*.

Status : Vulnerable.

It is known only from Periyar lake, in small numbers. A small population still exists in the lake but the introduction of the exotic common carp in the lake is a threat to its continued existence.

Taxonomic status : Talwar and Jhingran (1991) considered the species as the same as *H. micropogon*. Raj (1941) originally described it as a subspecies, *B. micropogon periyarensis*. It is considered here as a distinct species on morphological and ecological considerations.

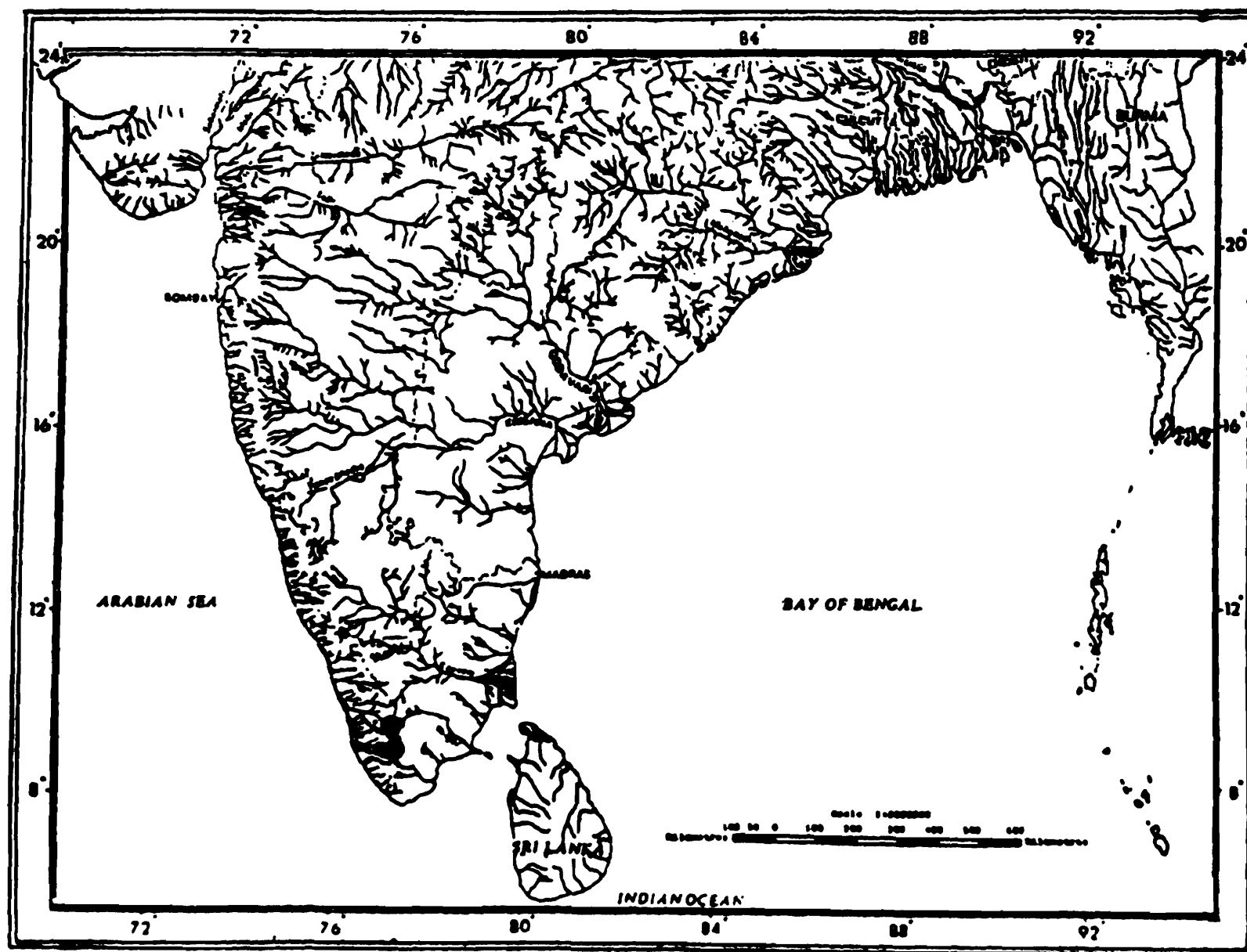


Fig. 29 : Distribution of *Hypselobarbus periyarensis*. The "Karivan" probably only survives today in the Periyar lake. Exotic common carp in the lake is a threat to it.

Salient features : D. III/9; P. 16; V. 10; A. III/5; C. 19; L. 1. 42-43; L. tr. 7/5.

Body elongate; head rather small, conical, 4.5 times in standard length. Snout conically pointed, $2\frac{3}{4}$ times in head length. Mouth moderate with post-labial fold interrupted.

Barbels : Two pairs, rostral and maxillary of equal length.

Fins : Dorsal inserted nearer to the tip of the snout than to the base of the caudal; its last undivided ray smooth, osseous, larger than head; its free margin concave. Pectoral about as long as the head. Anal fin rounded in the female and obliquely truncate in male and when laid flat reaches base of caudal fin. Caudal deeply forked, lower lobe the longer.

Scales : L. 1. complete; $3\frac{1}{2}$ rows of scales between lateral line and pelvic fin base.

Colour : Body and fins dark in colour.

Habitat : Endemic to Periyar lake. The lake water is clear, its bottom is mainly sand and pebbles with scattered vegetation. The area of the lake is 10.2 sq miles and a depth of 122 ft.

Maximum size : 50 cm TL.

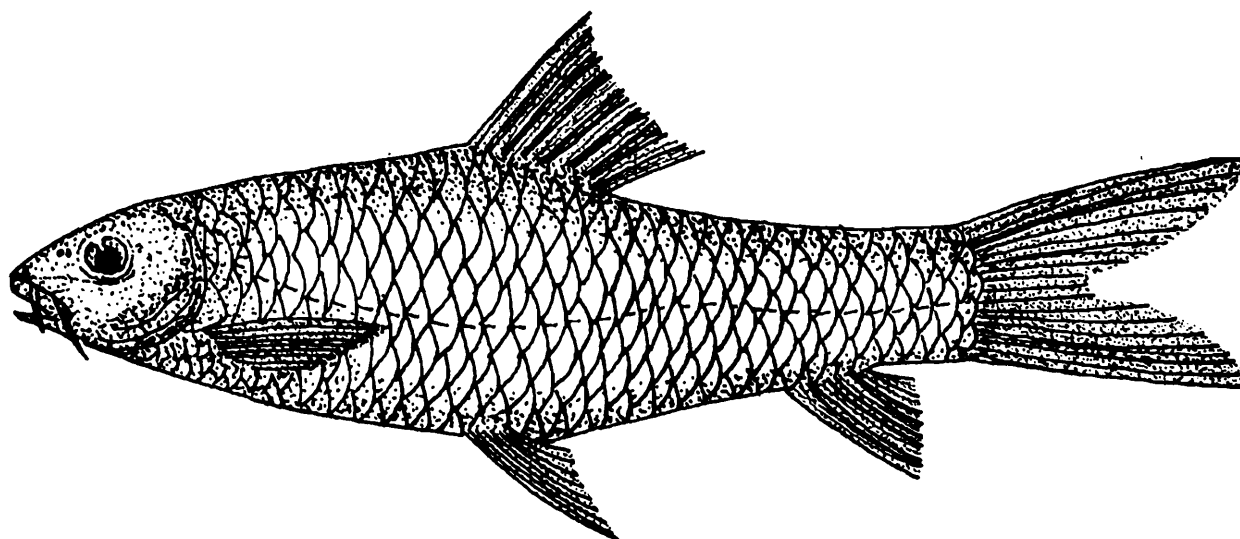
Biology : Unknown.

Protective measures taken : Nil.

Recommendations

All introduced exotic fishes, especially the common carp, should be eradicated.

34. *Hypselobarbus pulchellus* (Day) (Fig. 30)



Vernacular names : Kannāḍa : *Khatladi*; Malayalam : *Tulu*; Marathi : *Khudia*.

Status : Endangered.

Day (1870) described the fish from South Canara and since then no specimen of this species has been procured from there. Recent searches in the lower reaches of Kumaradhara, a tributary of Netravati in South Canara, were in vain. Deforestation and spread of agricultural practices during the last century have changed the physical habitat of the rivers of the western face of the Western Ghats which has caused the disappearance of the species from a former wider range of its distribution. Probably it has a very restricted distribution today.

Taxonomic status : Hora and Misra (1942) synonymised *H. dobsoni* (Day) and *H. jerdoni* (Day) with this species.

Salient features : D. III/9; P. 17; V. 9; A. II/5; C. 19; L. 1. 30-32; L. tr. 5-6/5 $\frac{1}{2}$.

Body somewhat elongated with the dorsal profile more elevated than the abdomen. Head short, length of the head 6, depth of the body 4 $\frac{1}{2}$ -5 in total length. Snout obtuse with pores, mouth narrow, upper jaw the longer. Interorbital space nearly flat. Lower labial fold interrupted.

Barbels : Two pairs; maxillary pair almost as long as eye; rostral pair is almost as long as the maxillary pair.

Fins : Dorsal commences somewhat in advance of the ventral and nearer to the snout than the base of the caudal; its upper part is slightly concave, having its last undivided ray weak, smooth and articulated. Pectoral as long as the head, separated from the pelvic by about $\frac{2}{3}$ of its own length. The pelvic as long as the pectoral. Anal moderate, reaches the root of the caudal fin. Caudal deeply forked.

Scales : L. 1. Complete; 3 $\frac{1}{2}$ rows of scales between it and the base of pelvic fin.

Colour : The scales above the line going direct from the eye to the centre of the caudal fin are of a deep grey, with dark bases; below all are silvery grey; a distinct whitish band along the sides of the body; fins with grey edges.

Habitat : Large streams and rivers.

Maximum size : 44 cm TL.

Biology : Nothing has been known.

Protective measures taken : None.

Recommendations

The deep pools in the course of the river where the brooders generally rest during summer should be identified and some of them declared as fish sanctuaries for the protection of species.

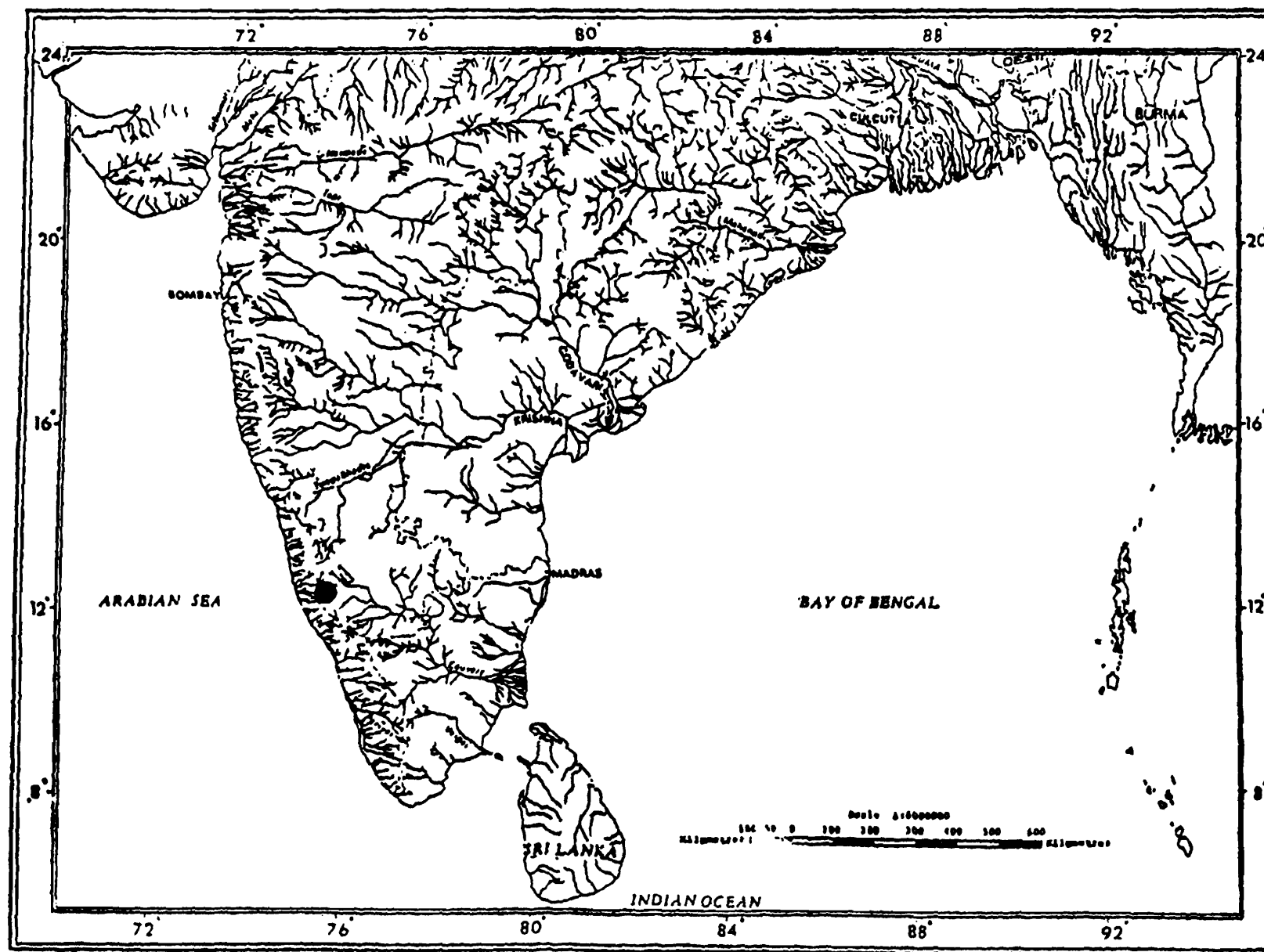
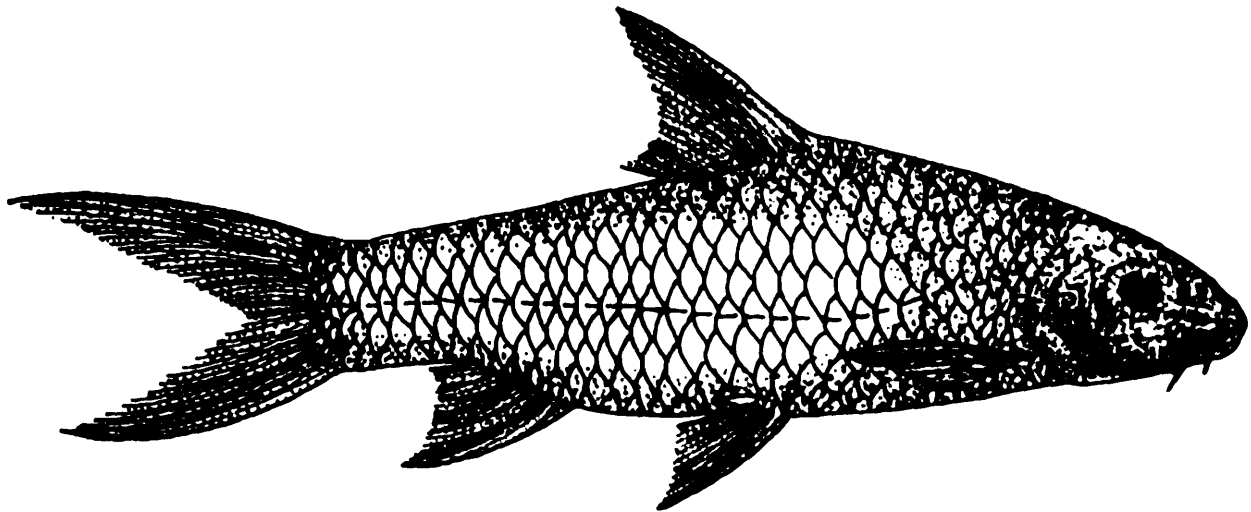


Fig. 30 : Distribution of *Hypselobarbus pulchellus*, a bottom dwelling browser of clean waters, is threatened by habitat destruction.

35. *Hypselobarbus thomasi* (Day)

(Fig. 31)

Vernacular name : Kannada : *Kempu-paruwal*.**Status :** Endangered.

Day (1878) described the species based on specimens obtained in South Canara. The next record is by Jayaram *et al.* in 1976 from Cardamom hills, Kerala. Since no specific locality in Cardamom hills is mentioned and no voucher specimen is available, this record needs further confirmation. Recent efforts to obtain specimens from South Canara were rewarded by the discovery of a specimen, 119 mm in length from river Netravati near Uppinangudi, Dakshin Kannada. It is also known from the Chalakudi River, Trichur District, Kerala (*vide* Dr. M. P. Thobias, in Litt., Ph. D. thesis, 1976).

Taxonomic status : This species has been assigned to the Genus *Hypselobarbus* Bleeker (see para on taxonomic status of *H. lithopidos* (Day)).

Salient features : D. III-IV/9; P. 17; V. 10; A. III/5; C. 19, L. I. 31-34; L. tr. $6\frac{1}{2}/5\frac{1}{2}$.

Barbels : Two pairs, maxillary as long as the eye, rostrals shorter.

Fins : Dorsal fin as high as the body, its upper edge concave; its origin is anterior to the origin of ventral and somewhat nearer to the snout than the base of caudal fin; its last undivided ray weak and articulated. Pectoral as high as head and the ventral slightly shorter. Caudal deeply forked with the upper lobe longer.

Scales : L. I. Complete; $3\frac{1}{2}$ rows of scales between lateral line and pelvic base.

Colour : Silvery along the back; each scale with a red lunule. Dorsal and caudal fins

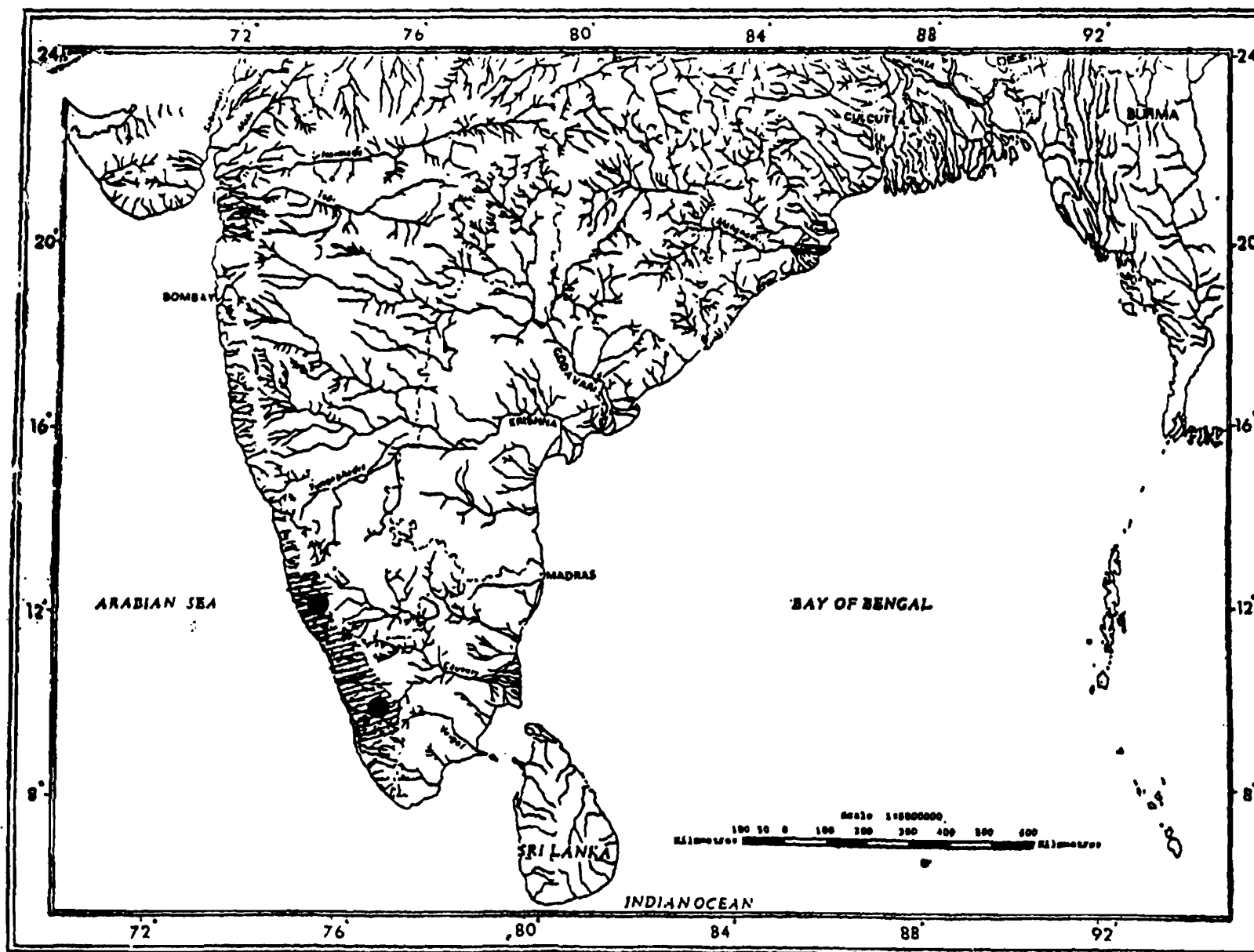


Fig. 31 : Distribution of *Hypselobarbus thomasi*. Recent extensive search in South Canara turned up only 1 specimen. Endangered.

lake colour, with the last being usually edged with black. Most of the scales with dark base.

Habitat : Fast flowing hill streams in forested areas.

Maximum size : 23 cm in length. As Red Mahseer it is known to grow to a length of over 100 cm (Thomas, 1897).

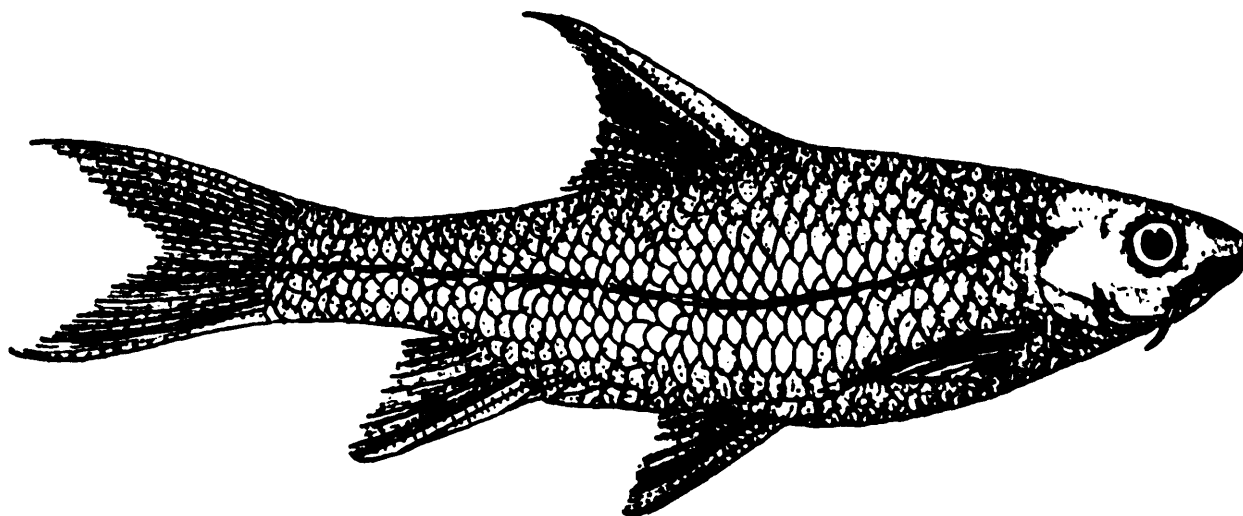
Biology : Nothing has been reported about the biology of the species.

Protective measures taken : None.

Recommendations

1. The vestiges of the riparian forest upstream of the Chalakudi river should be protected and fishing prohibited where the target population of the species still exists.
2. An intensive survey of the upper reaches of the Chalakudi river should be carried out to locate the existing population.
3. Identification and Information pamphlets should be made available to forest staff and other agencies.

36. *Poropuntius clavatus* (McClelland) (Fig. 32)



Vernacular name : Naga : Ngasang, Pachak, Khaisang.

Common English name : Stedman barb.

Status : Rare.

Found at foot of Sikkim and Naga Hills (Brahmaputra drainage), and Manipur and upper Burma (Chindwin drainage).

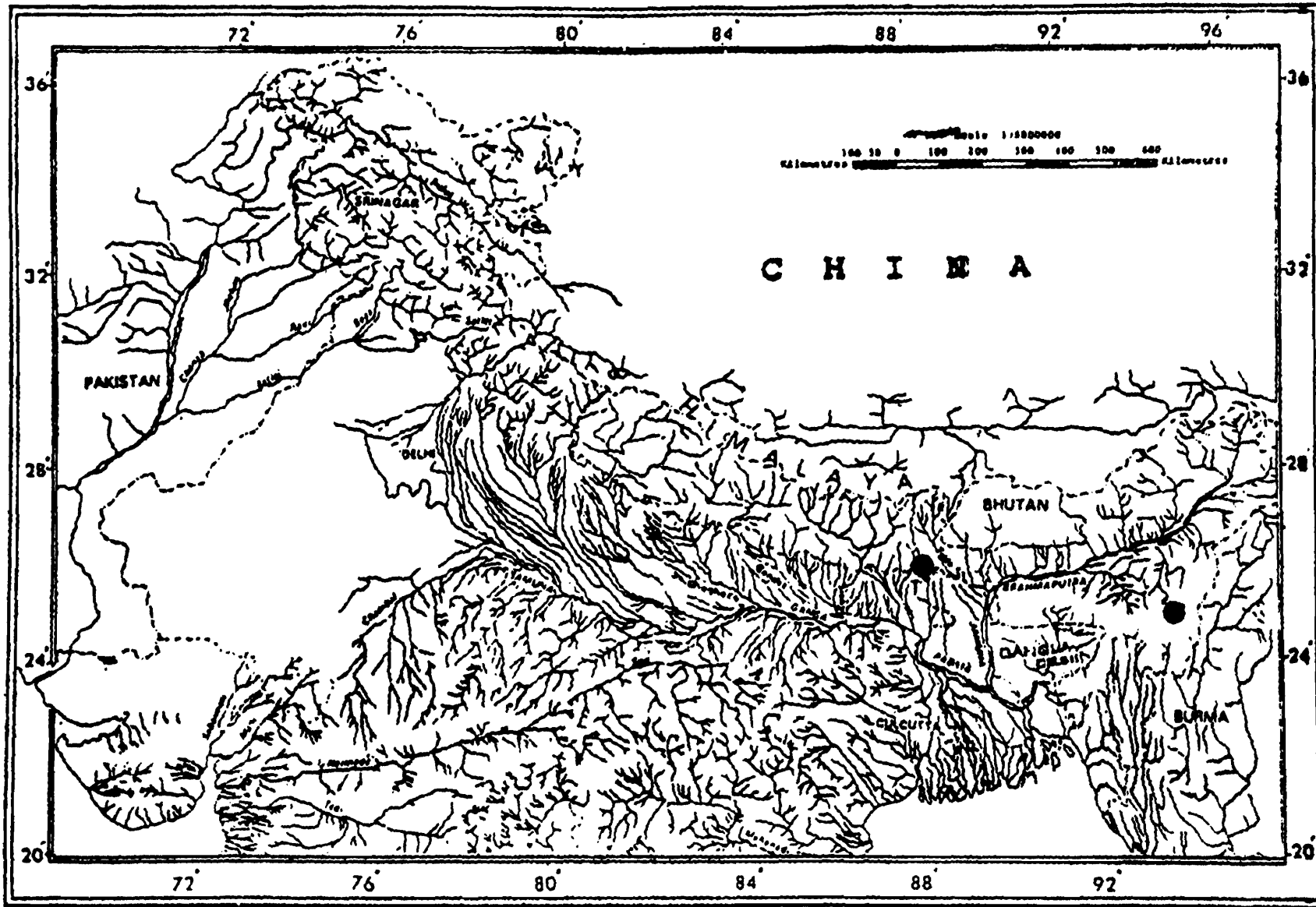


Fig. 32 : Distribution of *Poropuntius clavatus*. Deforestation with changes in water quality has led to the decline of this species. It is classified as a vulnerable species.

Taxonomic status : This species has so far been included in the heterogenous generic assemblage of *Barbus*. Often it has been confused with *Chagunius changunio* (Hamilton) (*vide*, Hora, 1921). *Chagunius* and *Poropuntius* are parapatric with *Hypselobarbus*, a related genus in peninsular India.

Salient features : D. III/8; P. 14-15; V. 8; A. III/5; C. 19; L. l. 42; L. tr. 6/4.

Barbels : Two well developed pairs.

Fins : The origin of dorsal is almost in the middle between end of snout and caudal base, its last spine is denticulated posteriorly and is as high as depth of body. Caudal long and deeply forked.

Scales : $3\frac{1}{2}$ - $4\frac{1}{2}$ rows between lateral line and base of ventral fin.

Colour : Dorsal surface blackish blue above the lateral line, below it, the sides and ventral surface dull white.

Habitat : Streams and rivers at foothills.

Maximum size : 24 cm TL.

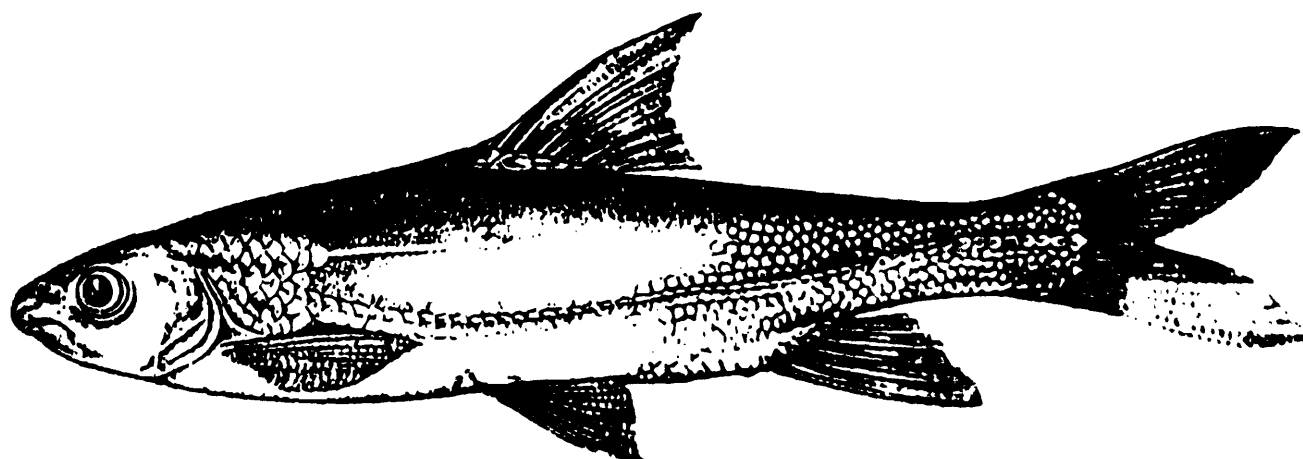
Biology : Not known.

Protective measures taken : None.

Recommendations

A suitable stream in the Naga Hills at Kairong be selected as sanctuary for the protection of this rare species.

37. *Lepidopygopsis typus* (Raj) (Fig. 33)



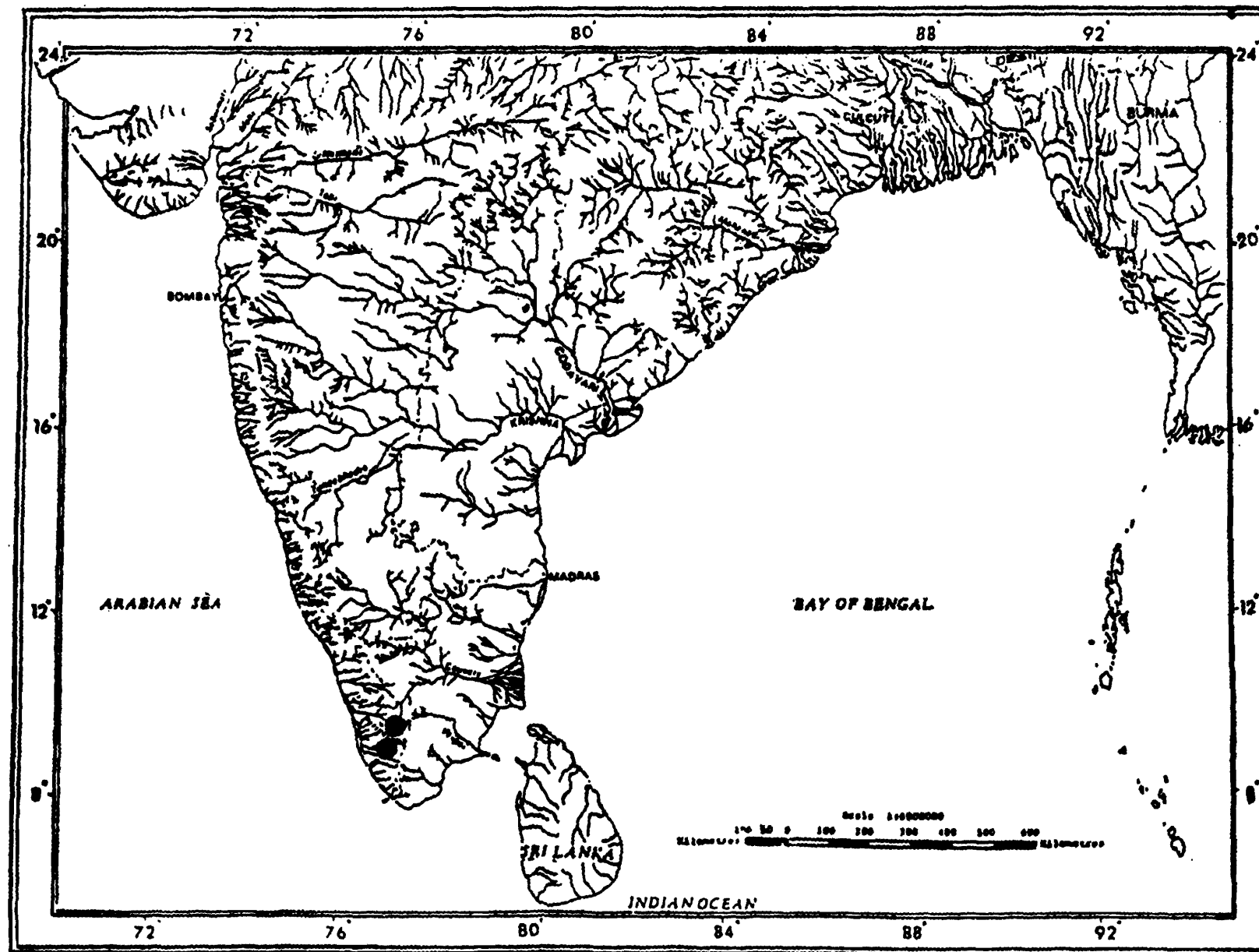


Fig. 33. Distribution of *Lepidopygopsis typus*. The Periyar river above the reservoir should be declared as fish sanctuary.

Vernacular names : Malayalam : *Brahmanakenda*; Tamil : *Brahmanakendai*.

Status : Rare.

Known only from Periyar lake and river, Kerala. They are in small numbers, probably only a small population survives there today. A recent survey in December 1990 yielded 4 specimens from Thannikudi area of the Periyar river.

Taxonomic status : This is the only member of the Schizothoracinae found in the Peninsular India. The sheath at the base of anal fin easily distinguishes Schizothoracinae fishes from other Cyprinoides.

Salint features : D. IV/7; P. 15; V. 10; A. III/5; C. 19; L. I. 54-60.

The body is elongated and compressed, the dorsal profile ascends obliquely from the snout to the base of dorsal fin almost in a straight line from where it descends more gently to the base of caudal fin. Head is conical, moderately large and compressed. Mouth inferior, fairly broad and transverse but curved at angles.

Barbels : Two pairs; a rostral and a maxillary, subequal, shorter than the diameter of the eye.

Fins : Dorsal fin is almost as high as the depth of the body; its last undivided ray osseous, stout and strongly denticulated along the posterior margin.

Scales : L. I. complete. No scales on head, a few on the anterior part on the body consisting of a patch on the scapular region, a few scattered scales on the base of dorsal spine, a continuous row of enlarged scales along lateral line; elongated tile like scales forming a sheath to vent and base of anal fin.

Colour : Back olive brown, flank and ventral surface of body silvery. Pectoral, ventral and anal hyaline, terminal half of dorsal fin with a broad indistinct dusky band in preserved specimens.

Habitat : Lacustrine.

Maximum size : 25 cm TL.

Biology : Unknown.

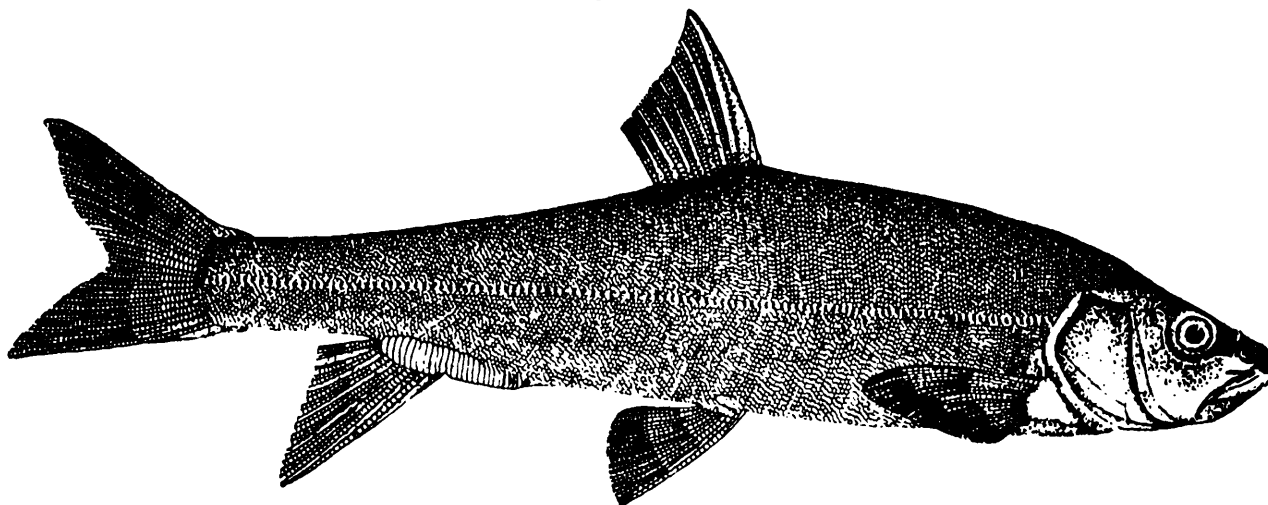
Protective measures taken : None.

Recommendations

1. Population estimation and life history studies should be undertaken.
2. The Periyar river above the reservoir should be declared as a general sanctuary to protect this fish and the Mahseer.

38. *Schizothorax curvifrons* (Heckel)

(Fig. 34)



Vernacular name : Kashmiri : Zotteer Sattar.

Common English name : Snow trout, Snow carp.

Status : Vulnerable.

Found in Kashmir Valley, Indus system in Pakistan and also Afghanistan; in the Kashmir Valley it is facing competition from the introduced common carp and the populations are steadily declining. Common carp has higher fecundity and can spawn in confined water.

Taxonomic Status : The Schizothoracine fishes, a specialised group of fishes inhabiting torrential streams of higher altitudes of the Himalayas and Central Asia with one genus *Lepidopygopsis* isolated in Kerala, S. India, are characterised by a tiled row of enlarged scales along the anal flap. McClelland proposed a sub-family name : Schizothoracinae. Here it is not recognized as a sub-family but only as a subtribe under tribe Cyprinini under sub-family Cyprininae. McClelland (1839) created a sub-genus *Oreinus* for fishes with a hard labial plate while retainig the other fishes in the sub-genus *Schizothorax* s. str. This arrangement is followed here with the elevation of *Schizothorax* and *Oreinus* into generic levels.

Salient features : D. II/7; P. I/18; A. III/5; C. 19; L. l. 115-125; L. tr. 20/1/15-16.

Barbels : 2 pairs, rostral smaller.

Fins : The dorsal originates opposite to pelvic and nearer to tip of snout than to caudal base.

Scales : 23-26 enlarged scales along the anal sheath, width of each scale is contained 5-6 times in eye diameter.

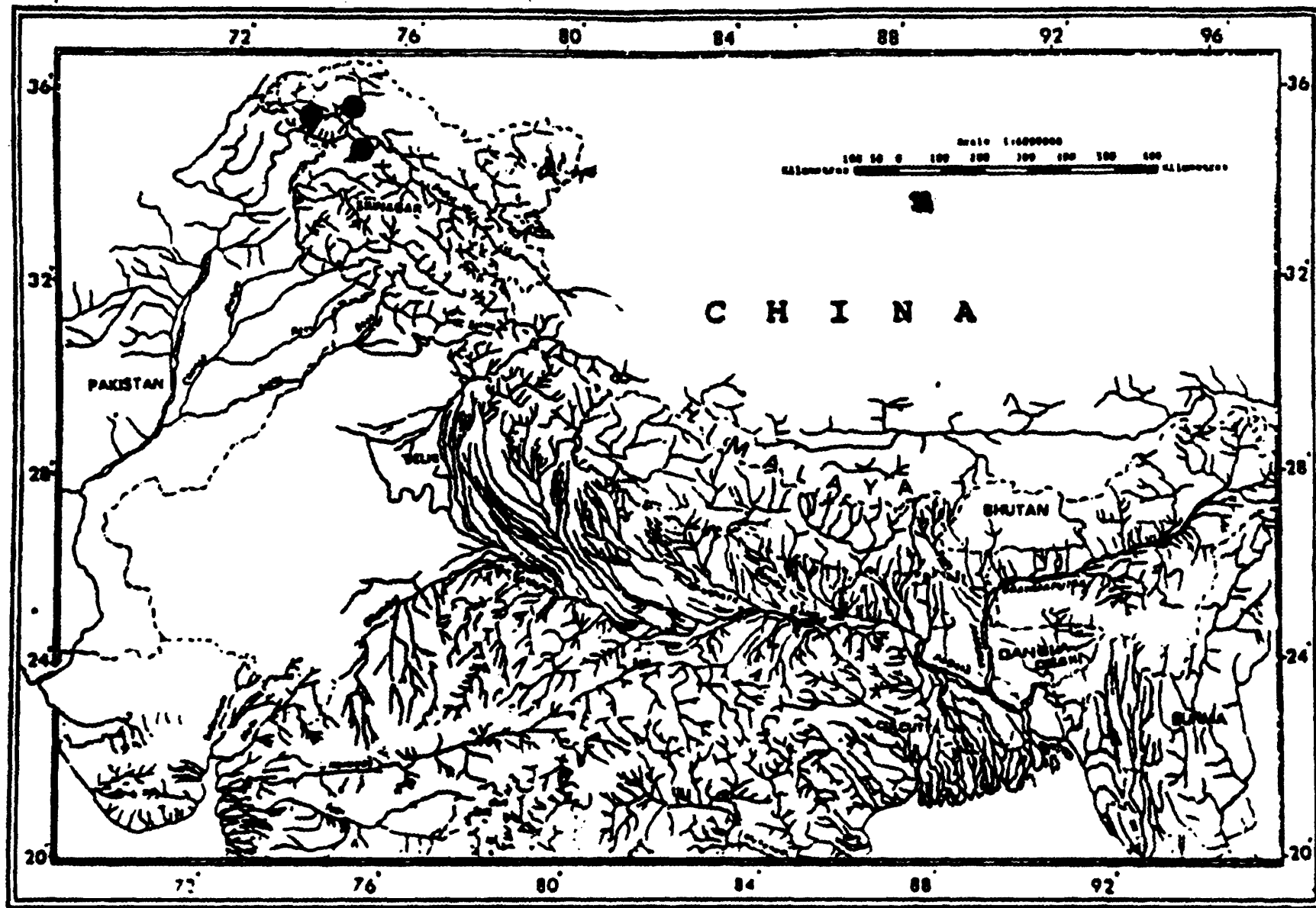


Fig. 34. *Schizothorax curvifrons*, snow trout of mountain streams and lakes. Common carp introduced for culture, in Kashmir valley is a threat to this species. classified as a vulnerable species.

Colour : Body light brownish, belly silvery.

Habitat : Mountain rivers and lakes.

Maximum size : 14 cm TL., 1.25 kg.

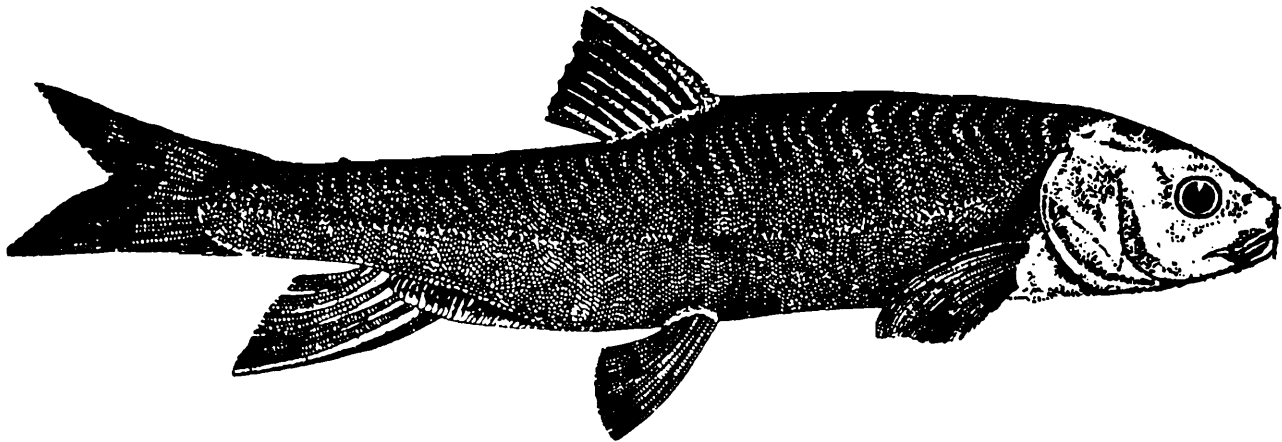
Biology : Not much is known, probably breeds during April-June.

Protective measures taken : None.

Recommendations

1. The fish should be protected in sanctuaries in certain selected streams leading to the Dal Lake.
2. Hatcheries for the fish should be established and artificial propagation encouraged with a view to produce stocking material to transplant depleted natural waters.
3. Identification pamphlets should be circulated among the agencies concerned and considerable public awareness should be created to conserve the stocks of this endemic fish of the Kashmir Valley.

39. *Schizothorax hugelii* (Heckel)
(Fig. 35)



Vernacular name : Kashmiri : *Grot*.

Common English name : *Snow trout*, *Snow carp*.

Status : Vulnerable.

Found in Kashmir Valley. The introduction of Common Carp has adversely affected the fish and populations are steadily declining.

Taxonomic status : See remarks under *S. curvifrons*.

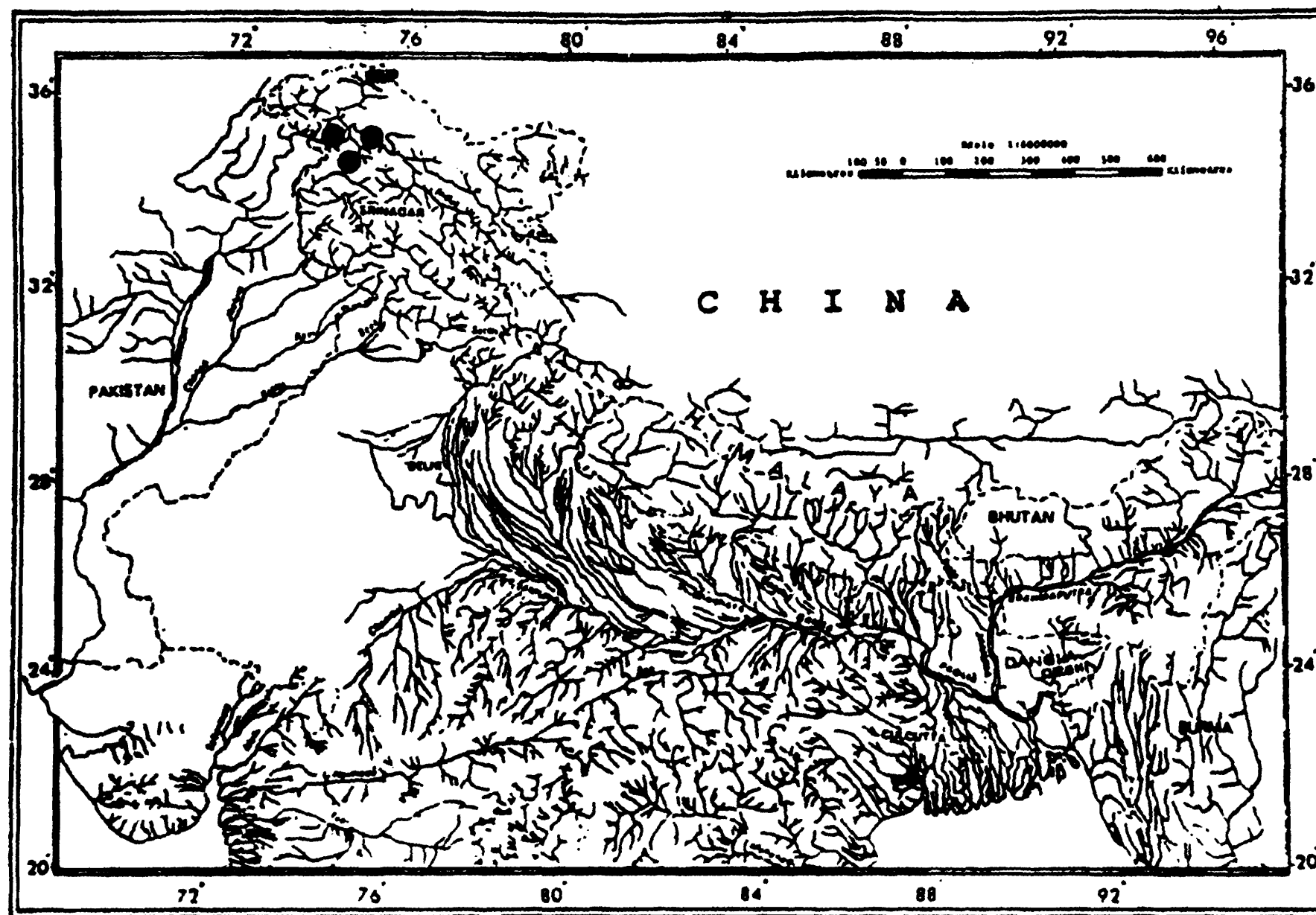


Fig. 35. *Schizothorax hugelii*, snow trout of Kashmir valley. Introduction of Common carp is a direct threat to this species.

Salient features : D. II/7; P. I./17; V. 1/9; A. III/5; C. 19; L. l. 120; L. tr. 28/1/21 (up to base of pelvic fin).

Barbels : Two pairs, both smaller than eye.

Fins : Origin of dorsal distinctly near base of caudal fin than tip of snout.

Scales : 27 enlarged anal scales along the anal sheath, covering only 2/3 of anal base, width of each scale is equal to or less than the eye diameter.

Colour : Dark greyish on back, becoming lighter on sides and yellowish white on under side.

Habitat : Rapidly running streams and rivers entering lakes.

Maximum size : 25 cm TL.

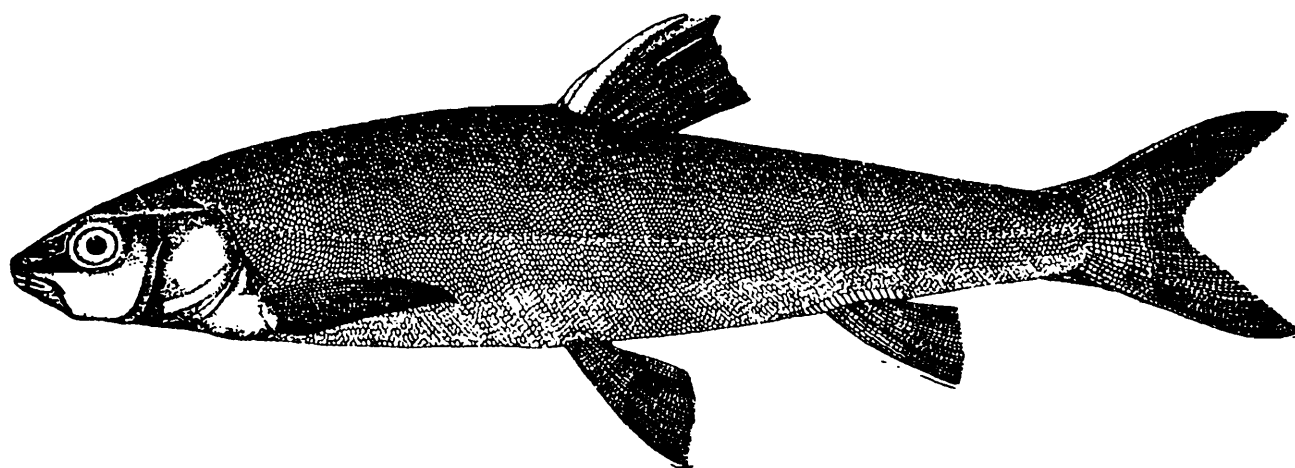
Biology : Not much known.

Protective measures taken : None.

Recommendations

1. A sanctuary should be set up in one of the streams entering the lake to protect the species.
2. Hatcheries should be established for artificial propagation to produce stocking material to transplant depleted natural waters.
3. Identification and information pamphlets should be circulated to the agencies concerned and public awareness created to conserve the fish.

40. *Schizothorax nasus* (Heckel) (Fig. 36)



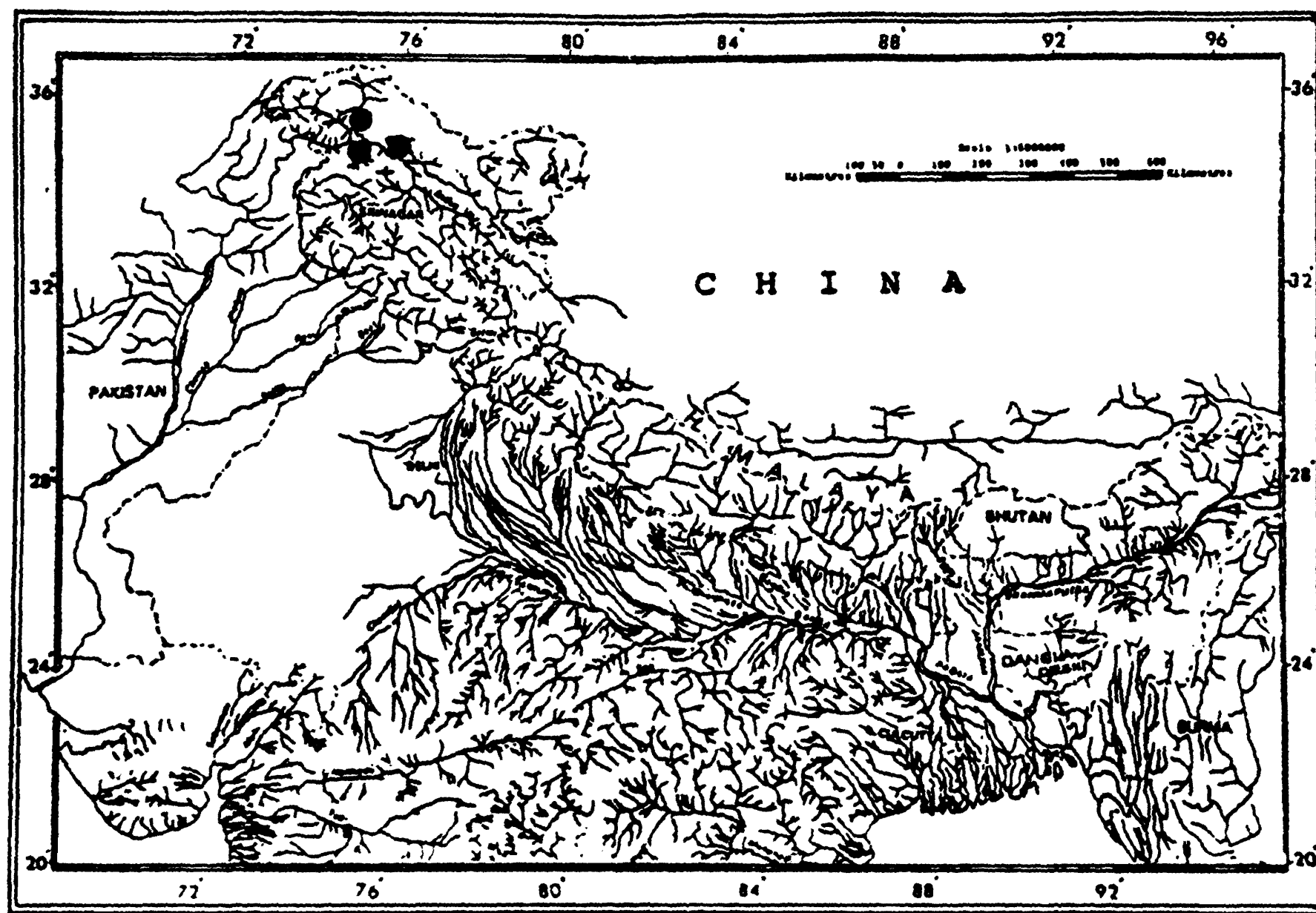


Fig. 36. *Schizothorax nasus*, snow trout of mountain and lakes. Introduction of exotic carp is the major threat.

Vernacular name : Kashmiri : *Dongu*.

Common English names : *Snow trout, Snow carp*.

Status : Vulnerable.

The introduction of the exotic Common Carp is the major threat to the fish in the Kashmir Valley.

Taxonomic status : See remarks under *S. curvifrons*.

Salient features : D. III/7; P. I/17; V. II/9; A. III/5; C. 19; L. l. 105; L. tr. 27/1/31.

Barbels : Two pairs, rostral pair smaller than maxillary and both smaller than eye.

Fins : Dorsal fin originates opposite pelvic fin and is nearer to base of caudal than tip of snout.

Scales : 21 enlarged scales along the anal sheath covering the entire anal base, width of each scale is contained 3 times in the diameter of eye.

Colour : Dark brown on back becoming lighter on sides of body. Fins dusky brown.

Habitat : Mountain rivers, streams and lakes.

Maximum size : 30.0 cm TL.

Biology : Not much known.

Protective measures taken : None.

Recommendations

1. A suitable sanctuary should be selected in one of the streams entering the lake.
2. Identification and information pamphlets should be circulated among the agencies concerned and public awareness created to conserve the stocks of our endemic fish.
3. Hatchery rearing should be encouraged and attempts made to transplant the depleted natural waters.

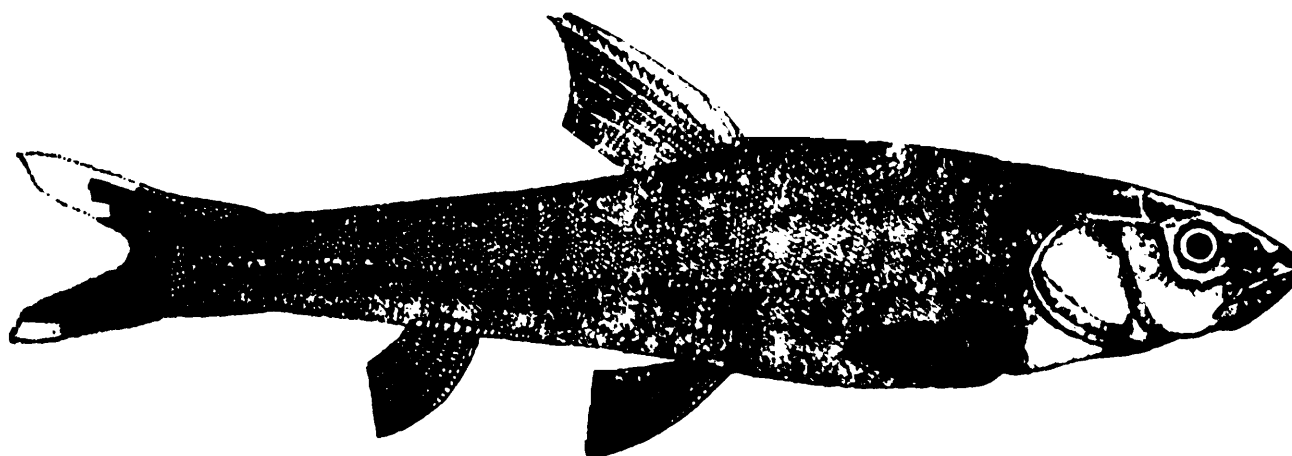
41. *Schizothorax niger* (Heckel) (Fig. 37)

Vernacular name : Kashmiri : *Alghad*.

Common English names : *Snow trout, Snow carp*.

Status : Vulnerable.

Found in Kashmir Valley. Introduction of Common Carp is the major threat.



Taxonomic status : See remarks under *S. curvifrons*, *S. planifrons* is the same as this species.

Salient features : D. III/7; P. I/17; V. II/9; A. III/5; C. 19; L. I. 97-99; L. tr. 26/1/37

Barbels : Two pairs, smaller than eye, maxillary extends to below middle of eye.

Fins : Dorsal originates slightly anterior to pelvic fin, origin nearer to base of caudal than tip of snout.

Scales : 20 enlarged rows along the anal sheath, width of enlarged scale 1.5 to 2.6 times in diameter of eye.

Colour : Dark brown on back becoming lighter on sides and pale yellowish on underside. The fish has a much darker colour than the other species of *Schizothorax*.

Habitat : Lakes and adjoining channels.

Maximum size : 30 cm TL. 2.7 kg.

Biology : Not known.

Protective measures taken : None.

Recommendations

1. The fish should be protected in sanctuaries in certain selected streams adjoining the lake.
2. Identification pamphlets should be circulated amongst anglers and concerned agencies involved in conservation and public awareness created to conserve this valuable endemic fish of Kashmir Valley.
3. Hatchery and cultural practices should be evolved in order to produce stocking material to transplant depleted waters.

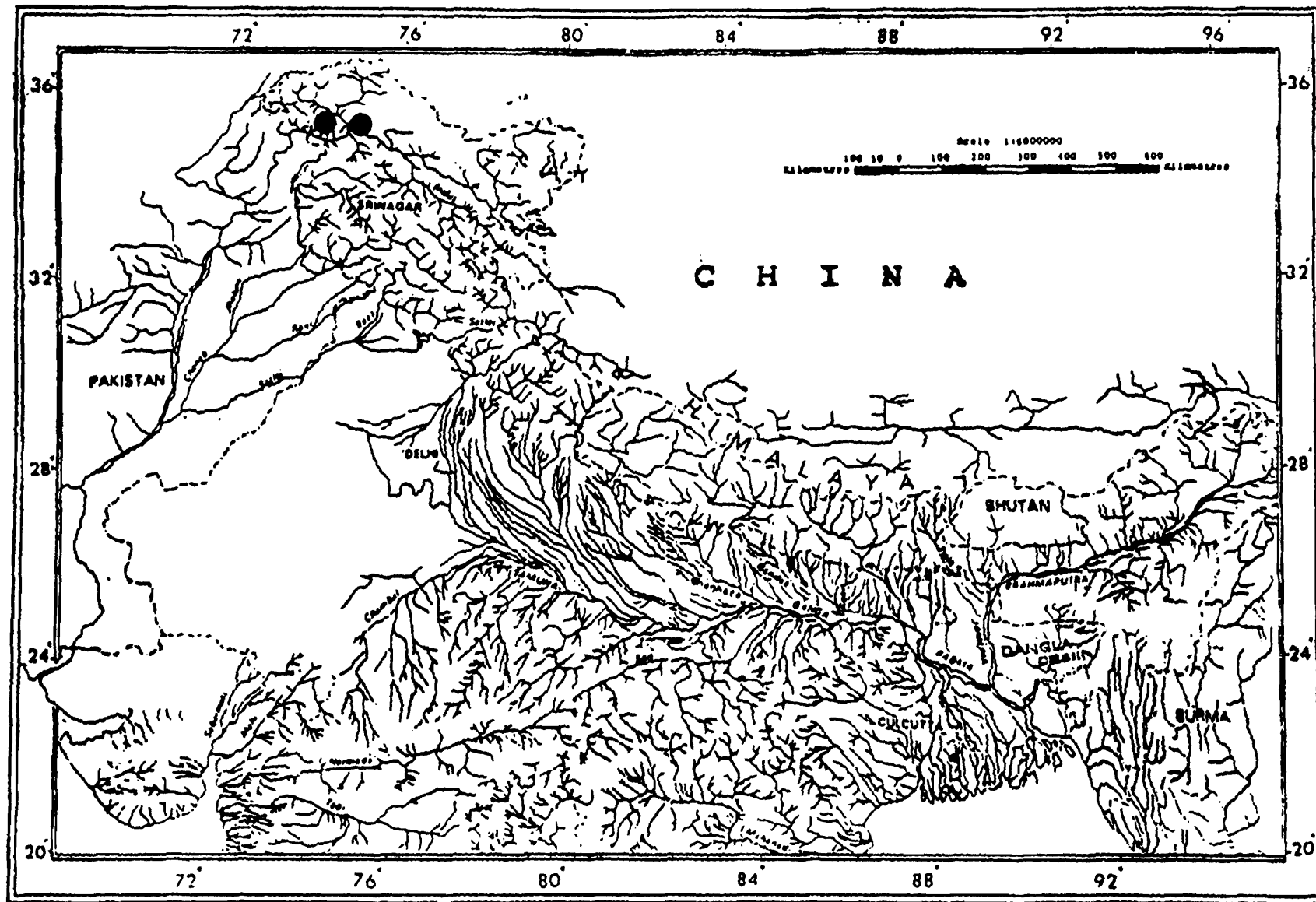
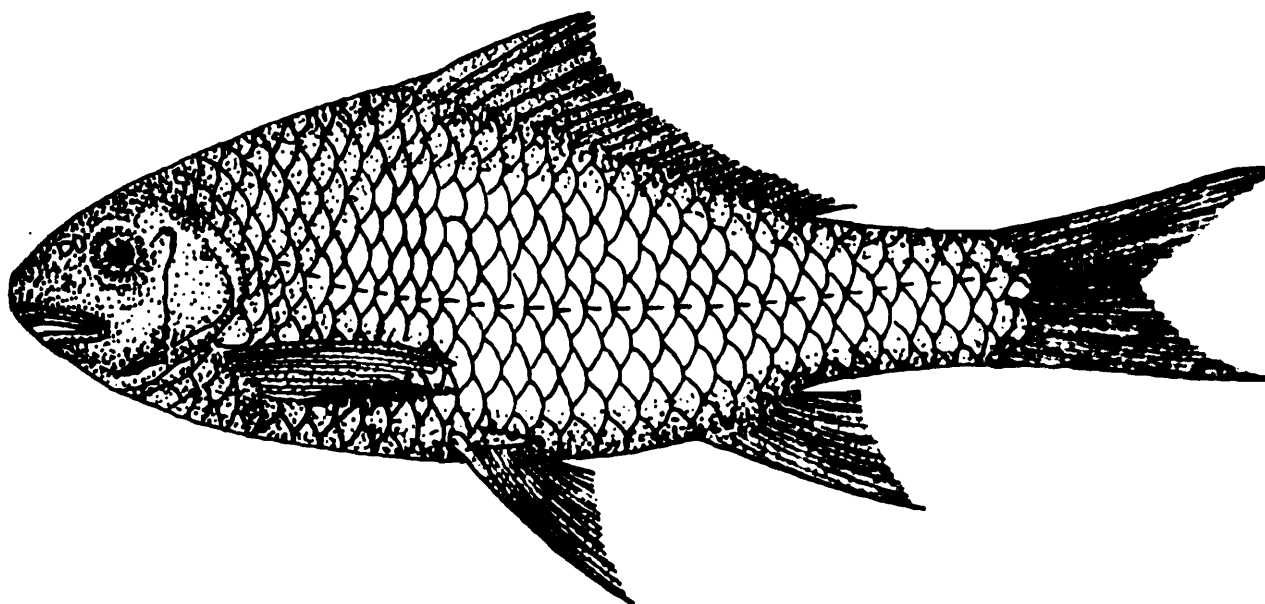


Fig. 37. *Schizothorax niger*, snow trout of Kashmir lakes. Introduction of common carp has led to its decline in the valley. It is classified as a vulnerable species.

**42. *Cyprinion semiplotus* (McClelland)
(Fig. 38)**

Vernacular names : Assamese : *Sundaree, Sentore, Loh boe*; Bengali : *Badangi*.

Common English name : *Assamese King-fish*.



Status : Endangered.

According to Day it is found in "rivers of Assam, especially the upper portions but found as low as Goalpara" Recent surveys reveal that the fish is confined to upper Assam and has declined in number and size (Sen, 1985).

Taxonomic status : This fish is placed under a sub-tribe *Semiplotina* of tribe *Cyprinini* of subfamily *Cyprininae*. *Semiplotus*, *Scaphiodonichthys* and *Scaphiodontopsis* are synonymous with *Cyprinion* (Howes, 1982).

Salient features : D. III/24-25; P. 16; V. 10; A. II/7; C. 19; L. I. 27-33; L. tr. 6/6.

Barbels : Absent.

Fins : Origin of dorsal midway between end of snout and end of base of anal fin. the last undivided ray strong, sseous, entire.

Scale : $3\frac{1}{2}$ rows between the lateral line and base of pelvic fin.

Colour : Leaden silver, darkest superiorly. Pectoral, pelvic and anal orange.

Habitat : Mountain streams and rivers.

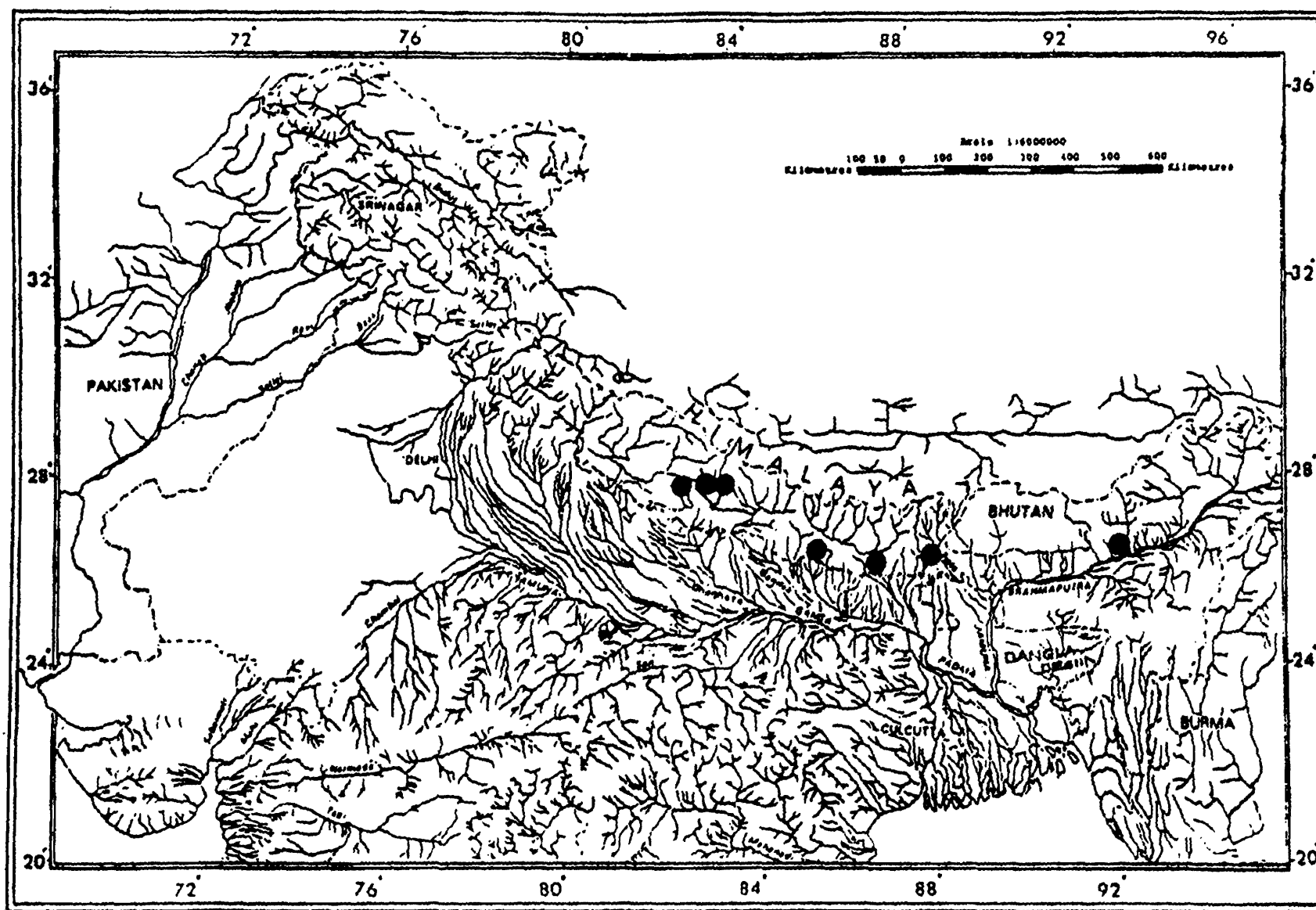


Fig. 38 : Distribution of *Cyprinion semiplotus*. Earlier it had a wider distribution. Suitable streams in upper Assam should be protected. Classified as an Endangered species.

Maximum size : 60 cm TL.

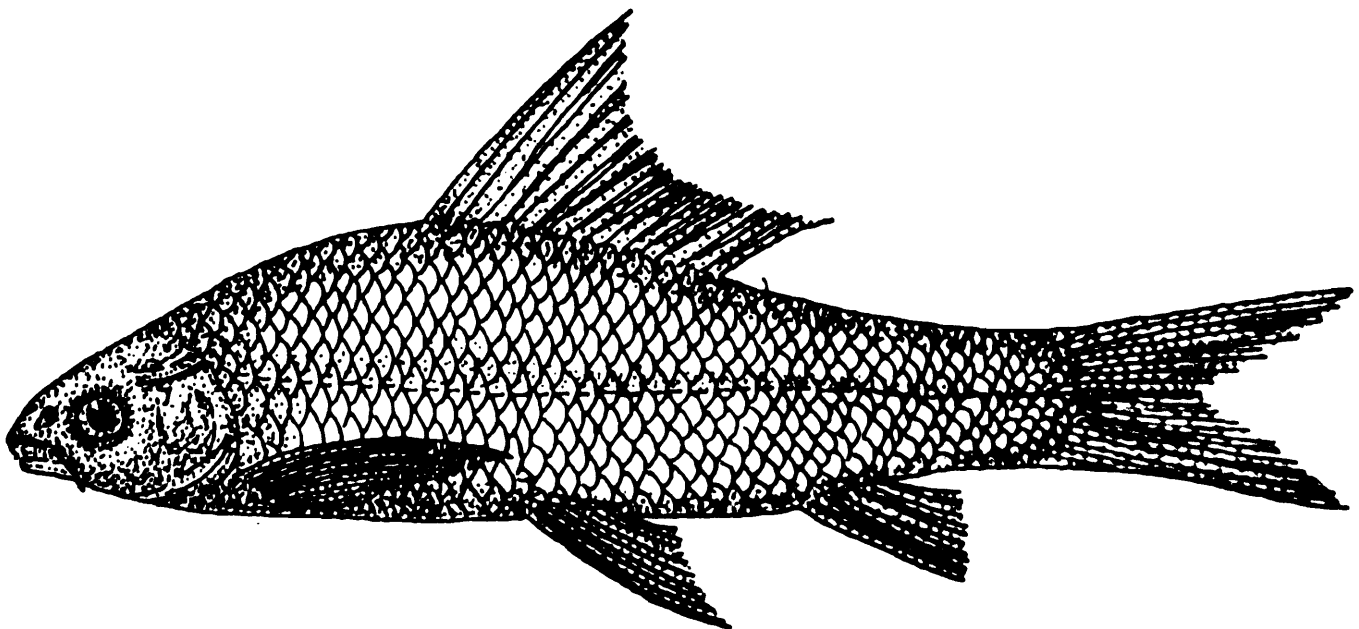
Biology : Not known.

Protective measures taken : None.

Recommendations

1. A sanctuary should be set up in a suitable stream in upper Assam.
2. Identification and information pamphlets should be circulated to agencies concerned in conservation.

43. *Cirrhinus cirrhosus* (Bloch)
(Fig. 39)



Vernacular names : Malayalam : *Venkanta*; Tamil : *Venkandai*, *Venkendai*, Telugu : *Aruzu*.

Status : Endangered.

(Day 1878) has shown its range to be Godavari, Krishna and Cauvery rivers. At present it is known only from Cauvery river system and its range has been diminishing in the Peninsula. There has been transplantation of indigenous fishes from one river to other and the major carps have been introduced as fry in different water bodies in the Peninsula since 1934. Major carps have established in all the major river systems of the Peninsula but proved a threat to the indigenous carps.

Taxonomic status : Closely resembling *Labeo* but differs from it in the lower lip closely adnate to the lower jaw and in the absence of inner transverse labial folds. In having 14-15 branched dorsal rays, the species is distinct from all other species of the genus.

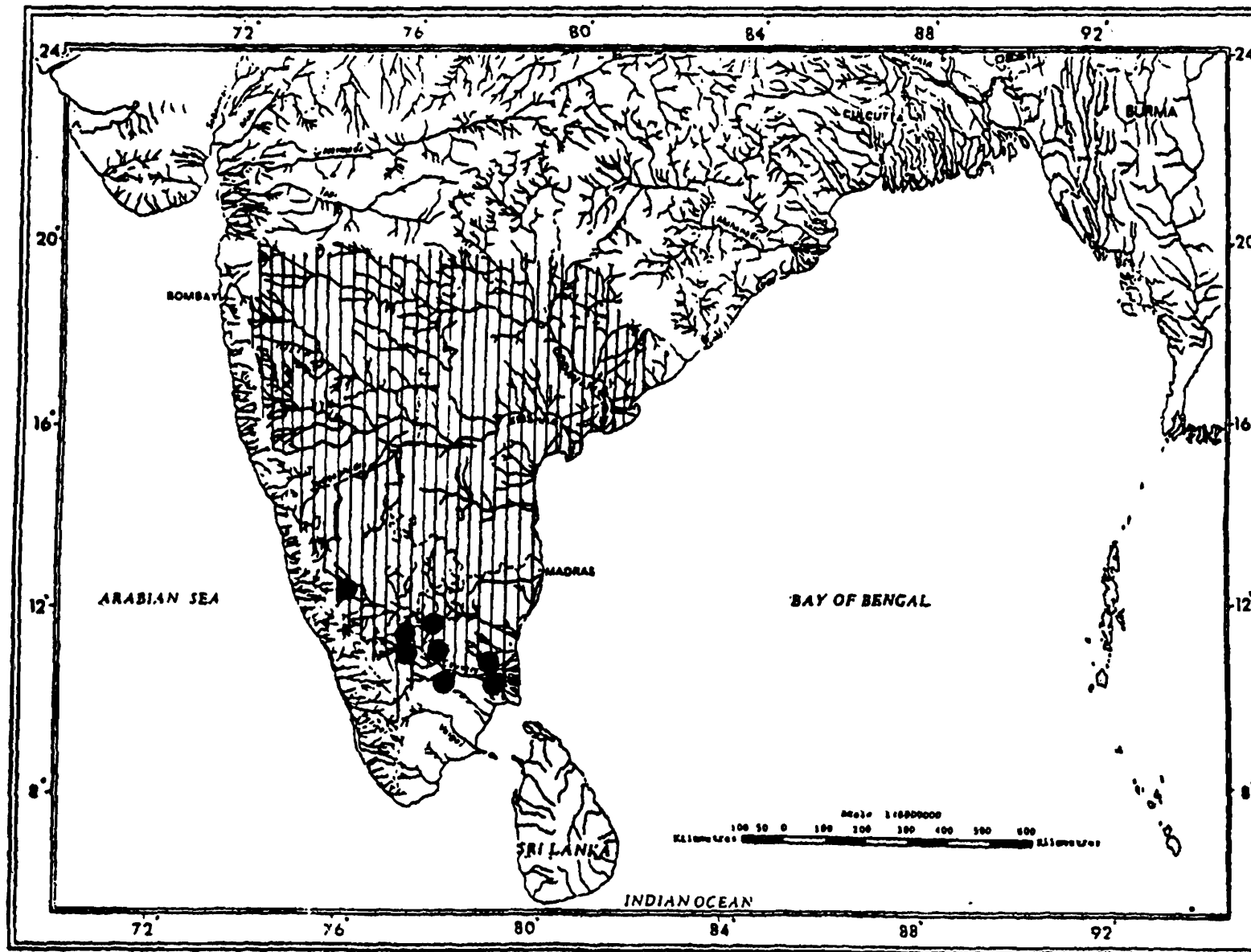


Fig. 39 : Distribution of *Cirrhinus cirrhosa*. This species has disappeared from the Krishna river system. It is classified as endangered.

Salient features : D. III/14-15; P. 19; V. 9; A. III/5; C. 19; L. l. 42-44; L. tr. 8/9.

Body elongate, dorsal profile more convex than that of abdomen. Mouth broad; lower lip fairly thick, upper lip entire. The snout does not project beyond the jaw, usually with fine pores.

Barbels : 2 pairs; rostral pair longer than maxillary.

Fins : Dorsal fin as high as the body, it rises considerably in advance of the ventral, and midway between tip of snout and base of anal. Caudal deeply forked.

Scales : L. l. Complete; $5\frac{1}{2}$ - $6\frac{1}{2}$ rows of scales between lateral line and base of pelvic fin.

Colour : Silvery, on back and flanks; belly dull yellowish white; dorsal and caudal stained with grey, also the outer end of the anal and pectoral.

Habitat : Fast-flowing rivers.

Maximum size : 60 cm length.

Biology : Grows to 25-30 cm and 330 gm in one year and 61 cm and 1 to 2 kg in two years. It is essentially a planktonic feeder but also browses on algae in marginal shallows. It thrives in tanks, attains sexual maturity when 20-25 cm long.

Protective measures taken : None.

Recommendations

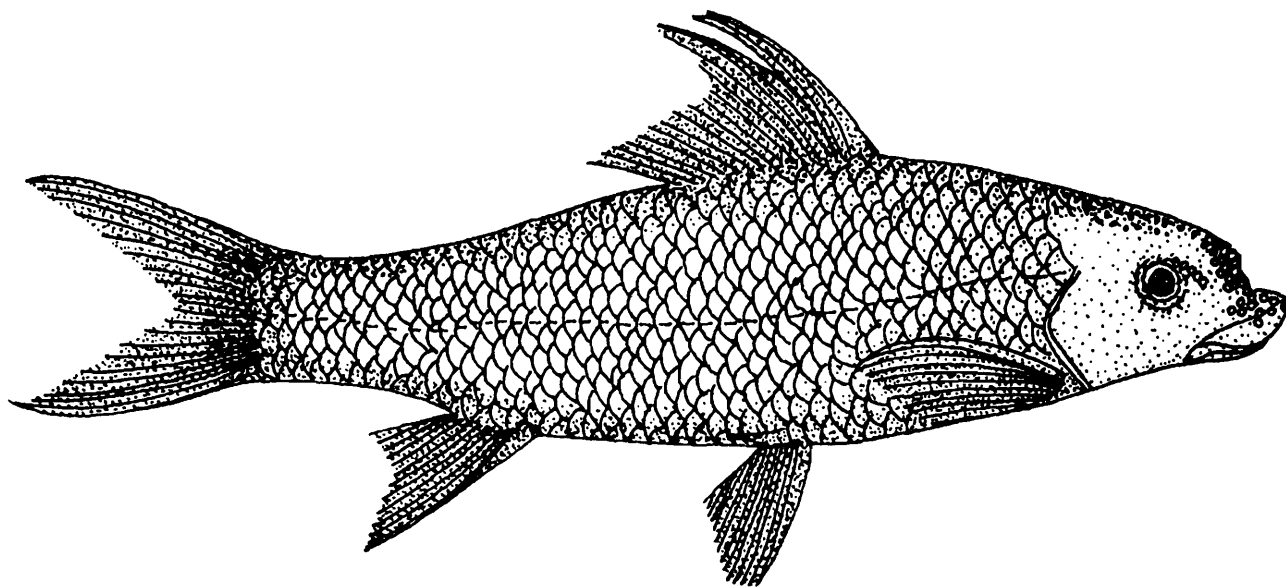
1. To avoid extirpation of the local commercially important carps, the stocking of major gangetic carps in the river systems of Peninsular India should be done with caution.
2. Some of the deep pools in the course of rivers should be declared as sanctuaries and fishing strictly prohibited in them to protect the brooders especially when they rest there during the period of low discharge of water in summer months.

44. *Labeo dero* (Hamilton) (Fig. 40)

Vernacular names : Assamese : *Nepura*, *Silgharia*; Bengali : *Kursha*, *Katalkusi*, *Kul-ka-batta*; Hindi : *Bongsa*, *Mohaybea*, *Arangi*, *Gola raia*, *Basanahua Raia*; Nepali : *Gurdi*, *Goddi*; Oriya : *Laya*; Panjabi : *Gid*, *Giddah*.

Status : Vulnerable.

Though distributed all along the base of the Himalayas, Satpura-Vindhya, Deccan and south as far as Cauvery the populations are steadily declining due to indiscriminate killing and pollution of streams in the hilly regions.



Taxonomic status : Day (1878) referred this species as *Labeo diplostomus*; closely related to *L. pangusia* (Ham.) but can be easily distinguished from it by papillated nature of the inner side of the lower lip (striated in *pangusia*).

Salient features : D. III/9-10; P. 17; V. 9; A. II/5; C. 19; L. I. 41-44; L. tr. 8/9.

Body cylindrical and elongate, dorsal profile more convex than ventral.

Barbels : A pair of short maxillary.

Fins : Origin of dorsal midway between snout end and end of base of anal fin.

Scale : Six or seven rows between lateral line and base of ventral fin.

Colour : Greyish, darkest along back, each scale tinged with red.

Habitat : Mountain streams and rivers.

Maximum size : 75 cm TL.

Biology : Bottom feeder and culturable in the hilly regions.

Recommendations

1. Indiscriminate killing by damming the streams and using explosives in mountainous regions should be prohibited.
2. Abatement of pollution of hill streams.
3. Some of the deep pools in the course of rivers at base of the Himalayas where the fish rests during periods of low discharge should be considered for establishment of sanctuaries for the fish.

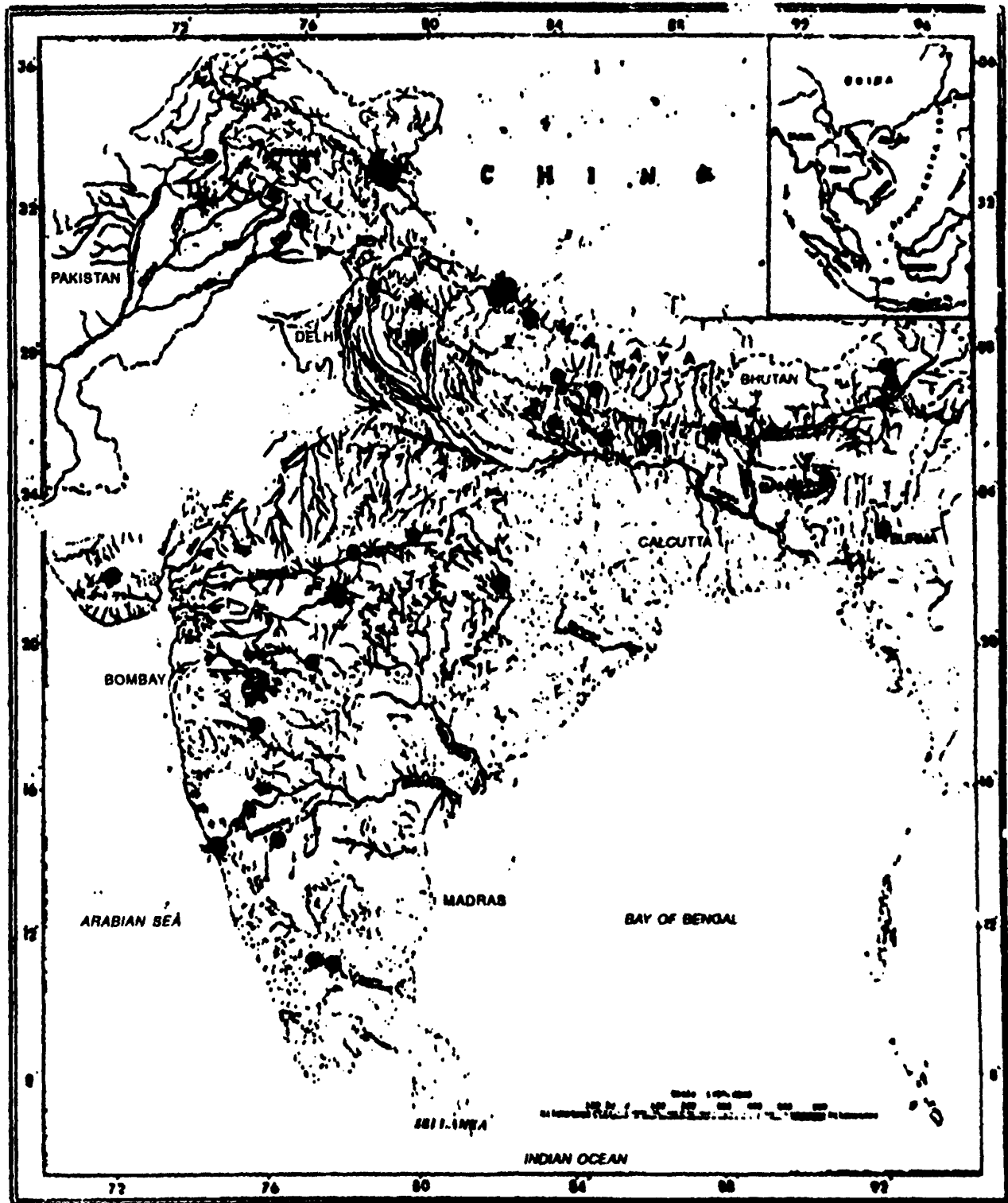
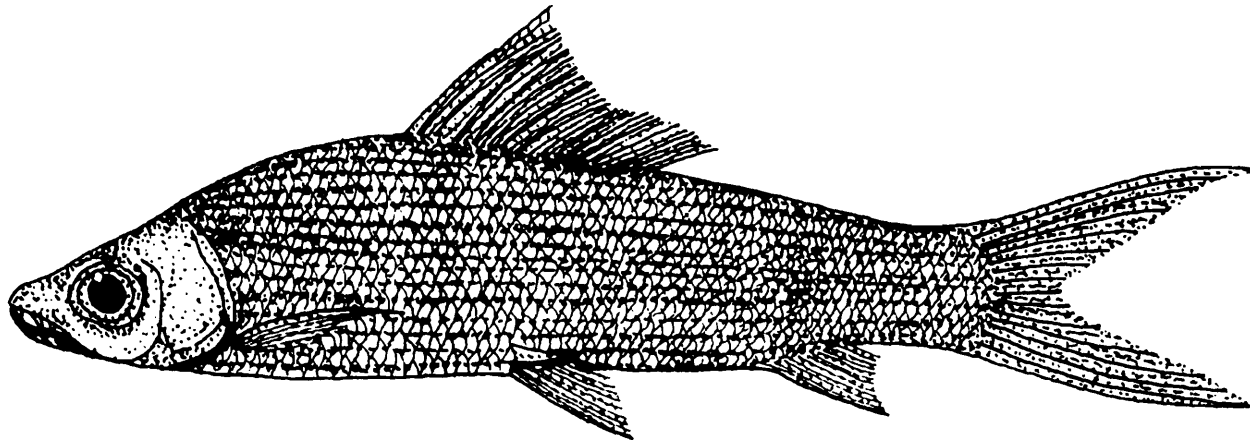


Fig. 40 : Distribution of *Labeo dero*. Though widely distributed its populations are steadily declining. Pollution and indiscriminate killing are the direct threats to this species. Classified as a vulnerable species.

45. *Labeo dussumieri* (Valenciennes)
(Fig. 41)



Vernacular names : Malayalam : *Toulee*; Sinhalese : *Hirikanaya* (Young); *Gan kanaya* (Adult).

Status : Vulnerable.

Known only from the west flowing rivers of Kerala and Sri Lanka at present, though it had been recorded as far north as Bombay and Gujarat. Habitat destruction caused by deforestation and consequent increase in the turbidity of water has caused the reduction in the range of distribution of the species.

Taxonomic status : The species can be distinguished from all the other known species of *Labeo* by its small body scales (53-60 rows along the lateral line).

Salient features : D. III/12-13; P. 17; V. 9; A. II/5; C. 19; L. l. 53-60; L. tr. 8-9/9.

Body elongate, compressed, dorsal profile more convex than that of abdomen; rounded ventrally. Rostral fold not well developed; it does not cover upper lip; its free edge entire; no lateral lobes although a lateral groove present on each side of rostrum. Lips fleshy, both lips have a single row of large papillae in their outer margin.

Barbels : Two pairs, short, rostral smaller.

Fins : Dorsal inserted nearer to tip of the snout than to the base of caudal; it is slightly in advance of the ventral, upper edge concave. Caudal deeply forked.

Scales : L. l. Complete; $5-5\frac{1}{2}$ rows of scales between lateral line and pelvic fin base.

Colour : Pale golden dorsally with distinct longitudinal, fine dark stripes on body. Each scale with darker edge; usually with a dull dark spot at the base of caudal fin. Fins dusky.

Habitat : Rivers and large streams of moderate current.

Maximum size : 35 cm TL.

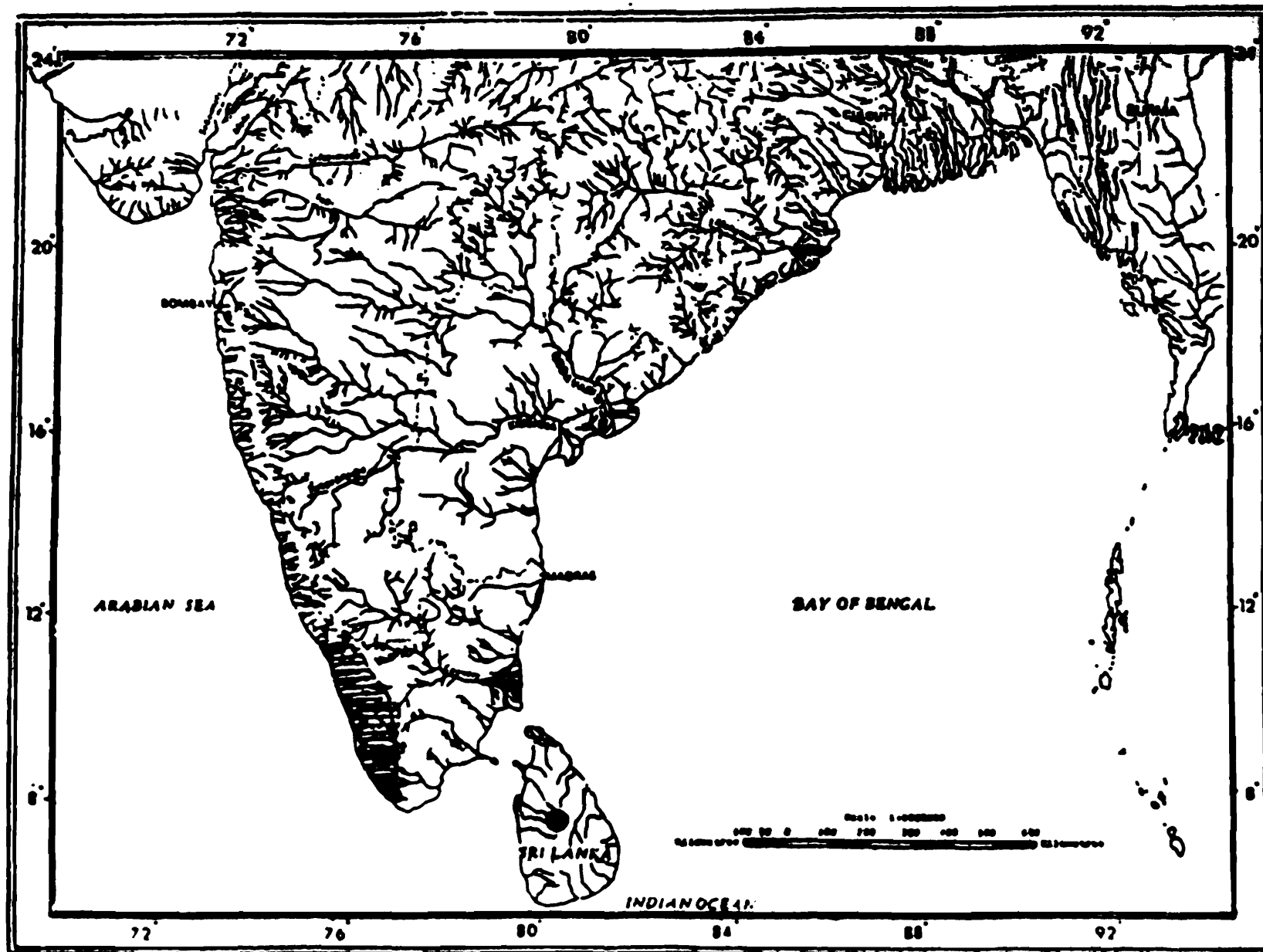


Fig. 41 : Distribution of *Labeo dussumieri*. This species has disappeared from two localities from which it was earlier known, due to habitat modification.

Biology : Unknown.

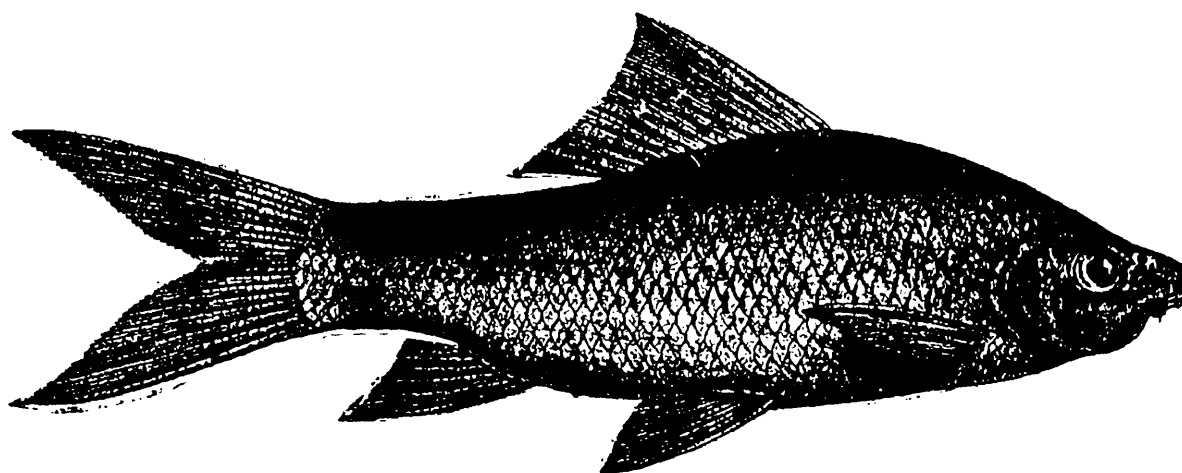
Protective measures taken : None.

Recommendations

Deep pools in the course of rivers where the fish usually rests in summer months should be identified and some of them declared as sanctuary for the protection of this species.

46. *Labeo kontius* (Jerdon)

(Fig. 42)



Vernacular names : Tamil : *Currumunnee candee* and *Curoo-mootee-candee*, *Karimuli*, *Kalchel*.

Status : Vulnerable.

Known only from Cauvery and Coleroon and in their branches down to the coast. The species forms an important fishery but in recent times the size and the number of the fish caught have declined. The introduction of Gangetic carps in the Peninsula for culture is a threat to the indigenous species.

Taxonomic status : Closely related to *Labeo potail* of the Krishna systems, but it can be easily distinguished by the snout over-hanging the mouth and the possession of 4 short barbels (2 in *L. potail*).

Salient features : D. III-IV/12-13; P. 15; V. 10; A. II/5; C. 19; L. l. 38-41, L. tr. 7-8/8.

Body elongate, its dorsal profile more convex than ventral with a characteristic distinct hump at the base of dorsal fin. Head small, 6-7 times, height of body $3\frac{3}{4}$ -4 in total length. Snout blunt, truncated, covered with pores, and having a short fleshy prolongation. Mouth subterminal; lips thick with a distinct inner fold below, while the lower one fringed. Snout over-hanging the mouth.

Barbels : Two pairs; maxillary and rostral, both short.

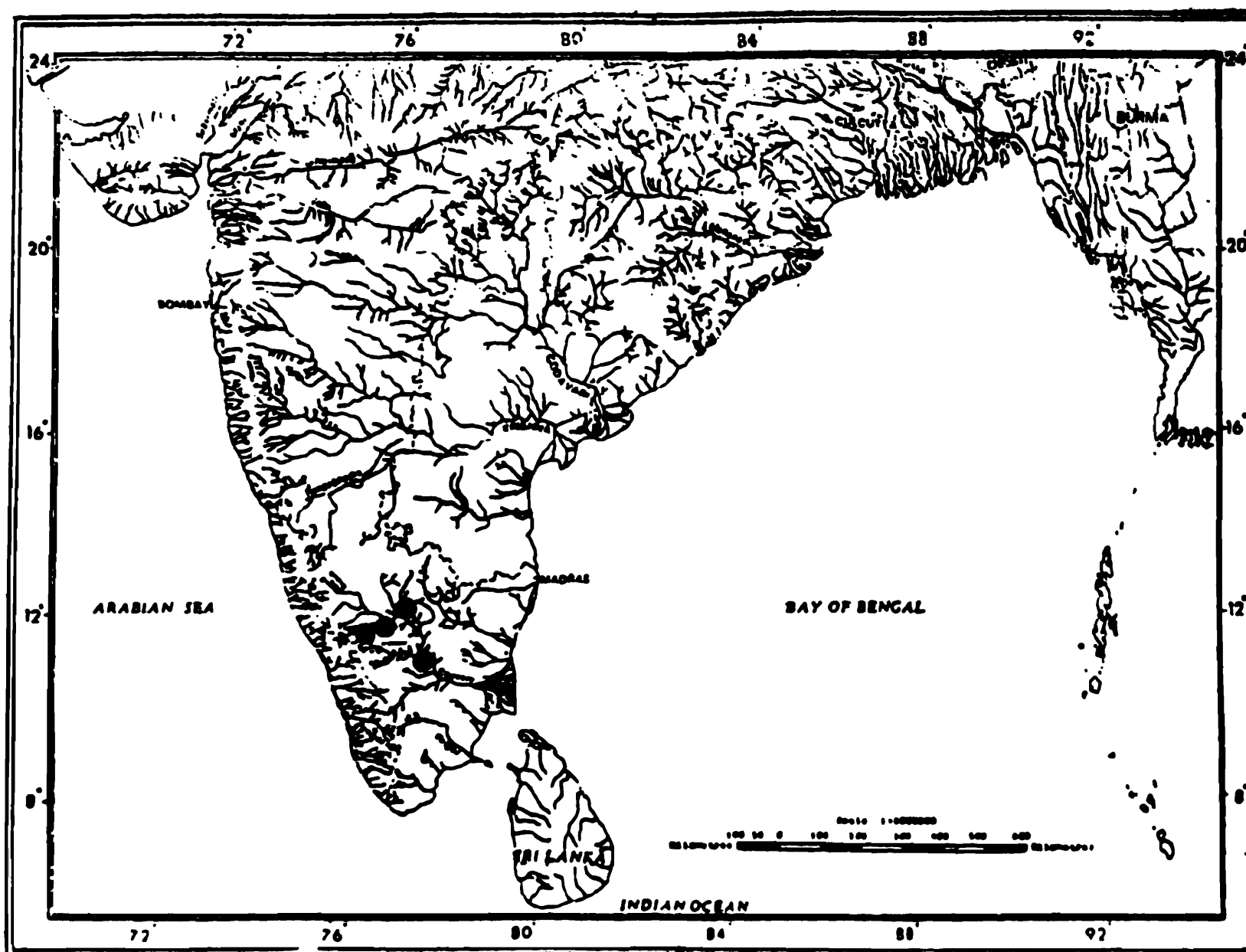


Fig. 42. Distribution of *Labeo kontius*. Gangetic carps introduced in Peninsular waters is a threat to this species.

Fins : Dorsal inserted nearer to the tip of the snout than to the caudal base. Pectoral fins long, extend to about the pelvic fins. Caudal fin deeply forked.

Scales : L. 1. Complete; 5 rows of scales between lateral line and pelvic base.

Colour : Reddish or fleshy tinge, darkest along the back; each scale with a red mark at centre.

Habitat : Rivers and large streams of moderate current.

Maximum size : 60 cm in length.

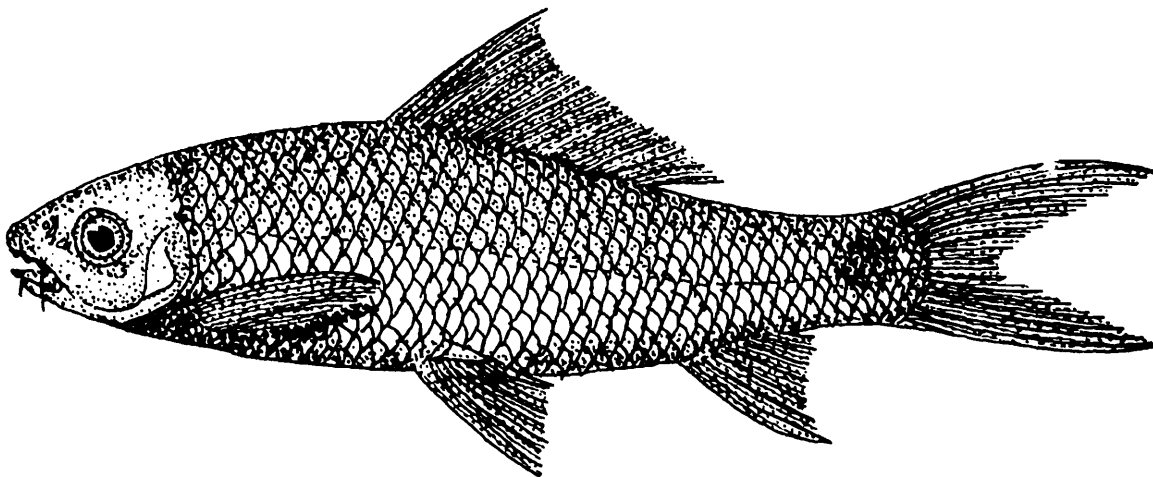
Biology : Alikunhi and Rao (1951) studied the bionomics, development and growth of the Cauvery carp.

Protective measures taken : None.

Recommendations

1. All deep pools in the course of the Cauvery river where the fish rests during period of low discharge of water in summer should be identified and some of the suitable ones considered for establishment of sanctuaries for the protection of this species.
2. Transfer of species from one river basin to another where it does not normally occur should be carried out with caution.

47. *Labeo porcellus* (Heckel) (Fig. 43)



Vernacular name : None.

Status : Vulnerable.

Known only from Deccan in the Godavari and Krishna systems. The species forms an important fishery but during the recent days the size and number of the fish caught

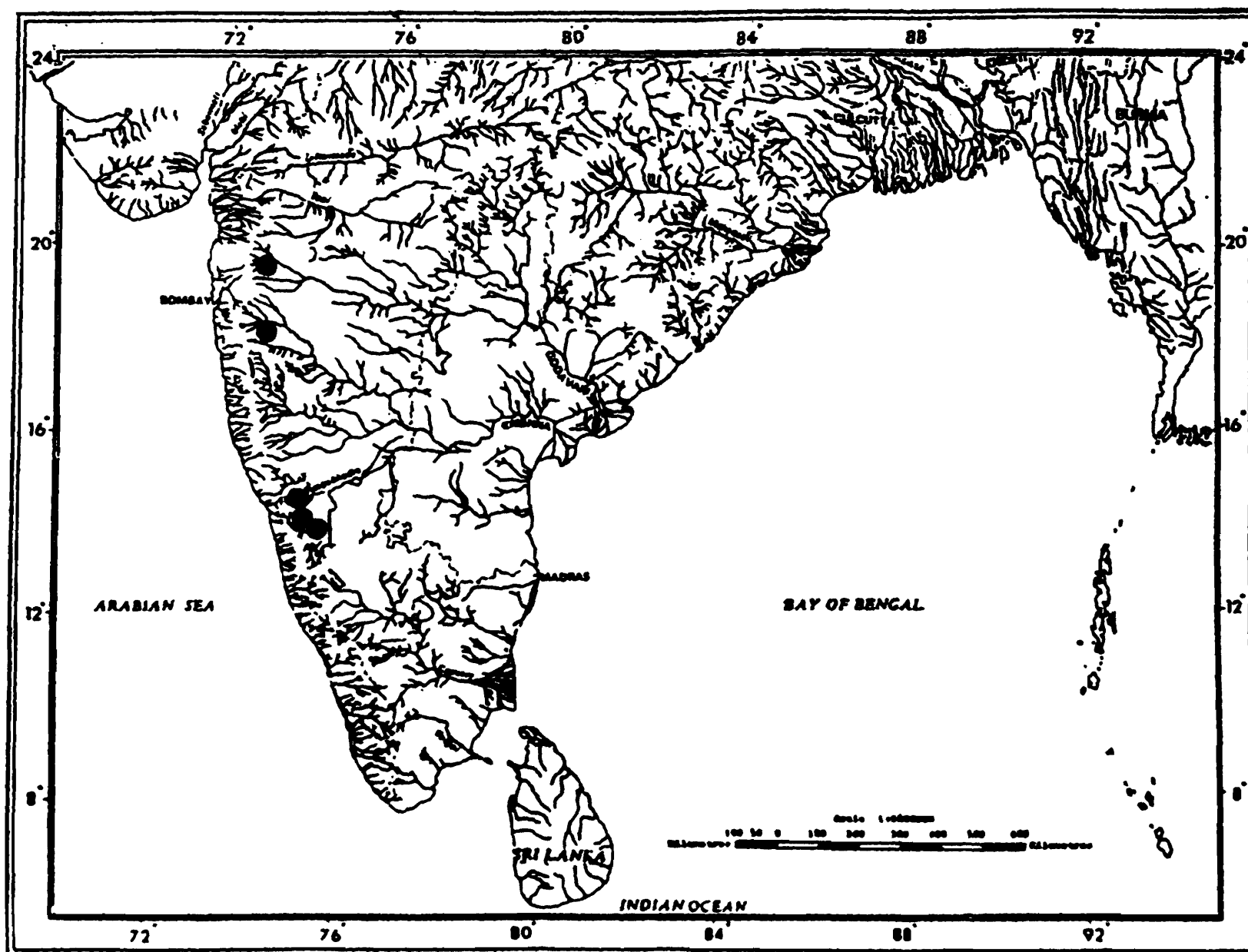


Fig. 43. Distribution of *Labeo porcellus*. Gangetic carps introduced for culture is a threat to this species.

have declined. The introduction of Gangetic carps for culture in the Peninsula is a threat to the indigenous species.

Taxonomic Status : Talwar and Jhingran (1991) synonymised *L. porcellus lankae* Deraniyagala with *L. porcellus* (Heckel) but the two are distinct, *L. porcellus* has 14 branched dorsal rays (12 in *L. porcellus lankae*).

Salient features : D. II/13-14; P. 17; V. 9; A. II/ 5; C. 19; L. 1. 39; L. tr. 7/8.

Body elongate, dorsal profile more convex than ventral. Head 6 times, height of body $4\frac{1}{2}$ times in total length. Snout slightly projecting over mouth, with a small lateral lobe. Lips thick with a distinct inner fold to both jaws which have thick cartilaginous internal covering.

Barbels : Two pairs, maxillary pair slightly longer than rostral pair.

Fins : Dorsal fin inserted nearer to snout than to the caudal fin base. Pectoral as long as head, pelvic rather shorter; caudal forked.

Scales : L. 1. Complete; 5 rows of scales between lateral line and base of pelvic fin.

Colour : Greyish on back, silvery white on flanks and abdomen, most of the scales darkest at their edges, a dark spot at the edge of the caudal fin, and a bluish spot on the operculum. Fins greyish.

Habitat : Rivers and large streams of moderate current.

Maximum size : 30 cm in length.

Biology : Unknown.

Protective measures taken : None.

Recommendations

Deep pools in the course of rivers of Godavari and Krishna where the fish rests during periods of low discharge of water should be identified and some of them declared as sanctuary for the protection of the species.

48. *Labeo potail* (Sykes) (Fig. 44)

Vernacular name : Marathi : *Dotondi*.

Status : Vulnerable.

Known only from Krishna river system. The species form a good fishery in Maharashtra, but in the recent times the size and the number of fish caught have

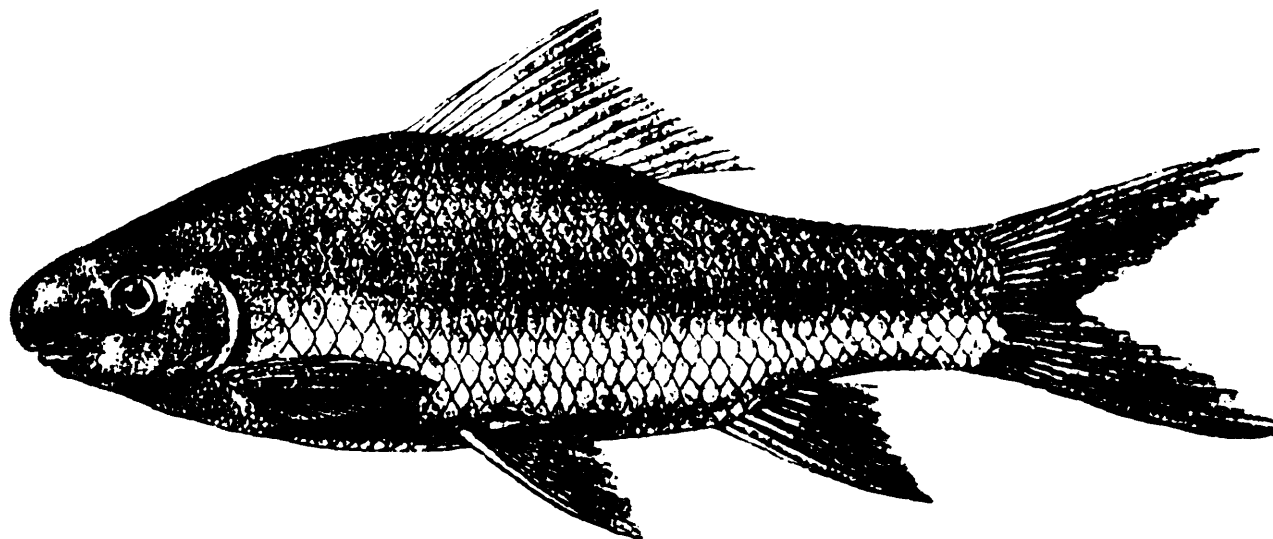


Fig. 44

declined. The introduction of Gangetic carps in the Peninsula for culture is a threat to the indigenous species.

Taxonomic status : Closely related to *Labeo kontius* (Jerdon) of the Cauvery river system but it can be easily distinguished by the possession of only a pair of small maxillary barbels (two pairs of barbels in *L. kontius*).

Salient features : D. II/12; P. 17; V. 9; A. II/5; C. 19; L. l. 39-40; L. tr. 8/7.

Body elongate, its dorsal profile more convex than ventral. Head about $4\frac{1}{2}$ in TL. Snout overhanging mouth with a slightly produced lateral lobe. A deep groove exists across the chin. Snout smooth. A cartilaginous layer is present in the inner side of both jaws.

Barbels : A small maxillary pair.

Fins : Dorsal fin inserted nearer to the snout than the base of caudal. Pectoral fin nearly as long as the head, and equals that of the ventral. Caudal forked, upper lobe the longer.

Scales : L. l. Complete; $5\frac{1}{2}$ rows of scales between lateral line and pelvic base.

Colour : Greyish, each scale with a lunule. Fins greyish.

Habitat : Rivers and large streams of moderate current. Maximum size : 30 cm in length.

Biology : Unknown.

Protective measures taken : None.

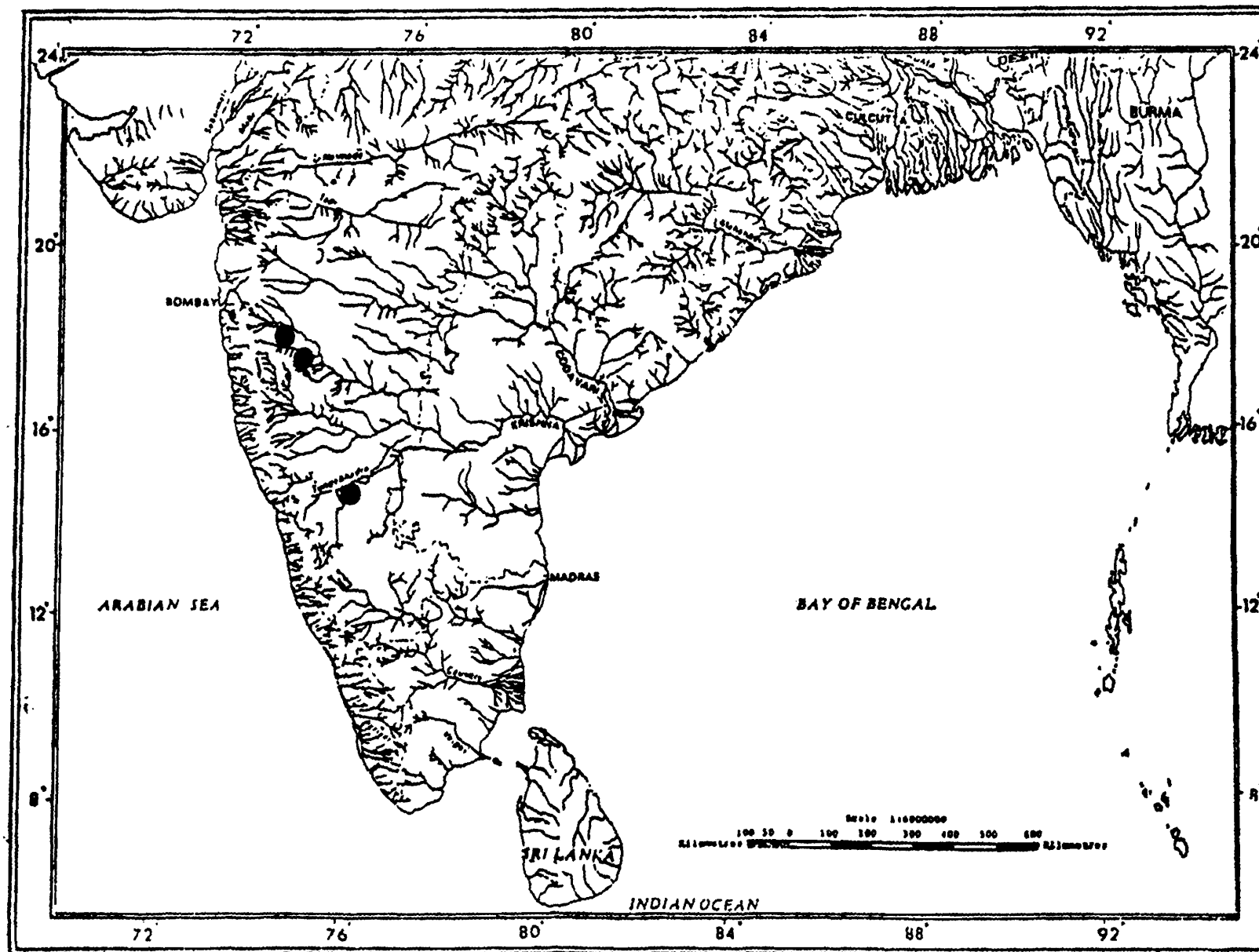
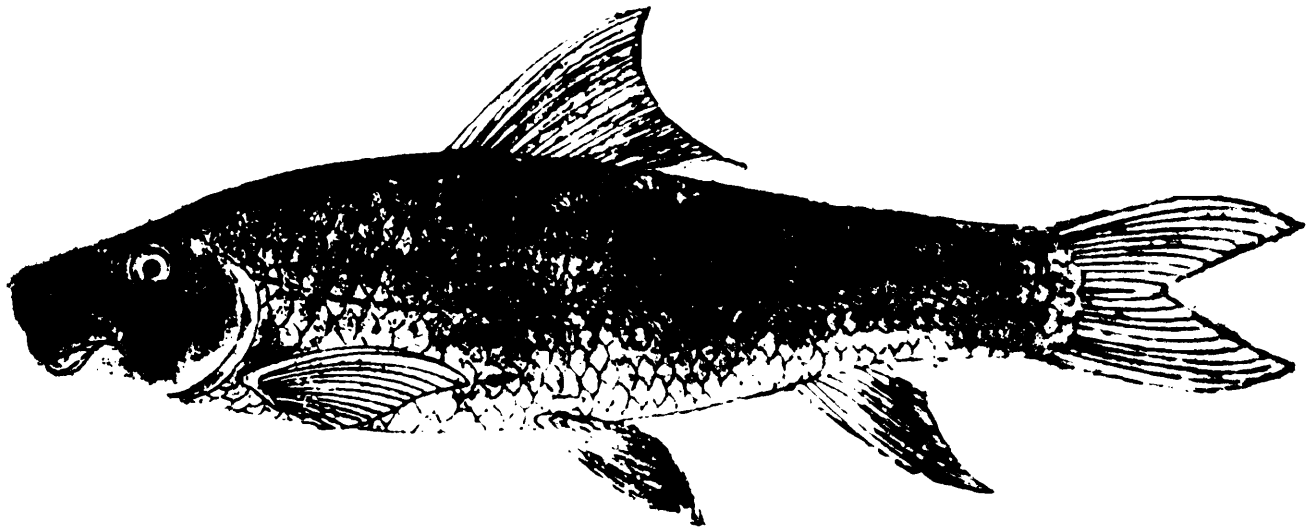


Fig. 44. distribution of *Labeo potail*. gangetic carps introduced for culture is a threat to this species.

Recommendations

Deep pools in the course of the Krishna and Tungabhadra where the fish settles down in summer during the period of low discharge of water should be identified and some declared as sanctuaries for the protection of the species.

49. *Labeo pangusia* (Hamilton) (Fig. 45)



Vernacular names : Assamese : *Lasu*; Bengali : *Loannee, Utti*; Hindi : *Boalla, Rewa, Loanee*

Status : Vulnerable.

Though distributed all along the base of the Himalayas, Satpura-Vindhya, Deccan and south as far as Cauvery the populations are steadily declining due to indiscriminate killing and pollution of streams in the hilly regions.

Taxonomic status : *Labeo dyocheilus* (McClelland, 1839) is a junior synonym of *Labeo pangusia* (Hamilton, 1822); closely related to *L. dero* (vide. see remarks under taxonomic status of *L. dero*).

Salient features : D. III/9-10; P. 17; V. 9; A II/5; C. 19; L. I. 41-44; L. tr. 8/7-9.

Body cylindrical and elongate; dorsal profile more convex than ventral.

Barbels : A pair of short maxillary.

Fins : Dorsal origin midway between snout end and end of base of anal fin.

Scales : Five to six rows between lateral line and ventral fin.

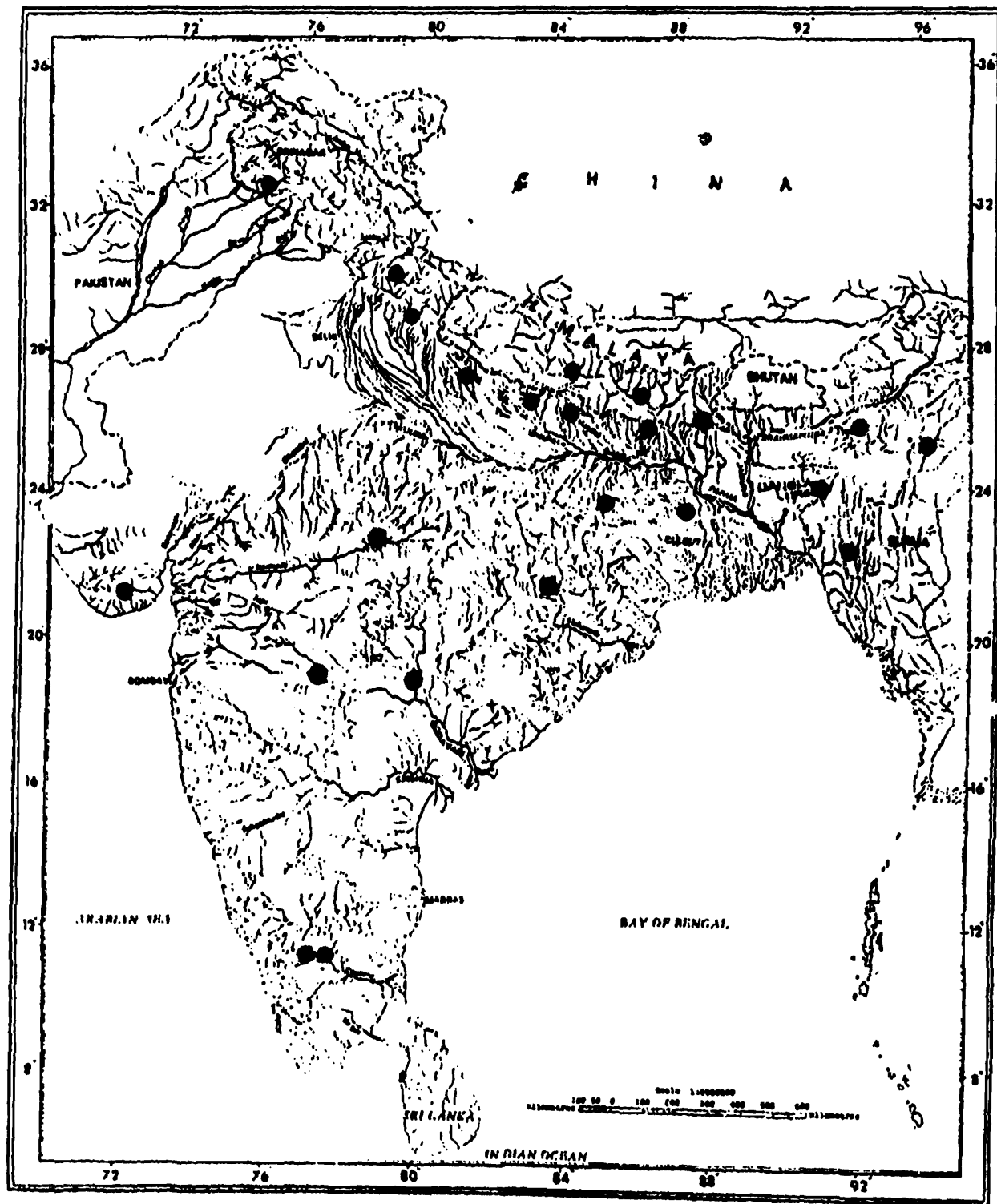


Fig. 45. Distribution of *Labeo pangusia*. Increasing pollution and indiscriminate killing are the threats to this species. Classified as a vulnerable species.

Colour : Dull green, becoming lighter on sides and beneath, sometimes the base of each scale with a dark mark.

Habitat : Mountain streams and rivers.

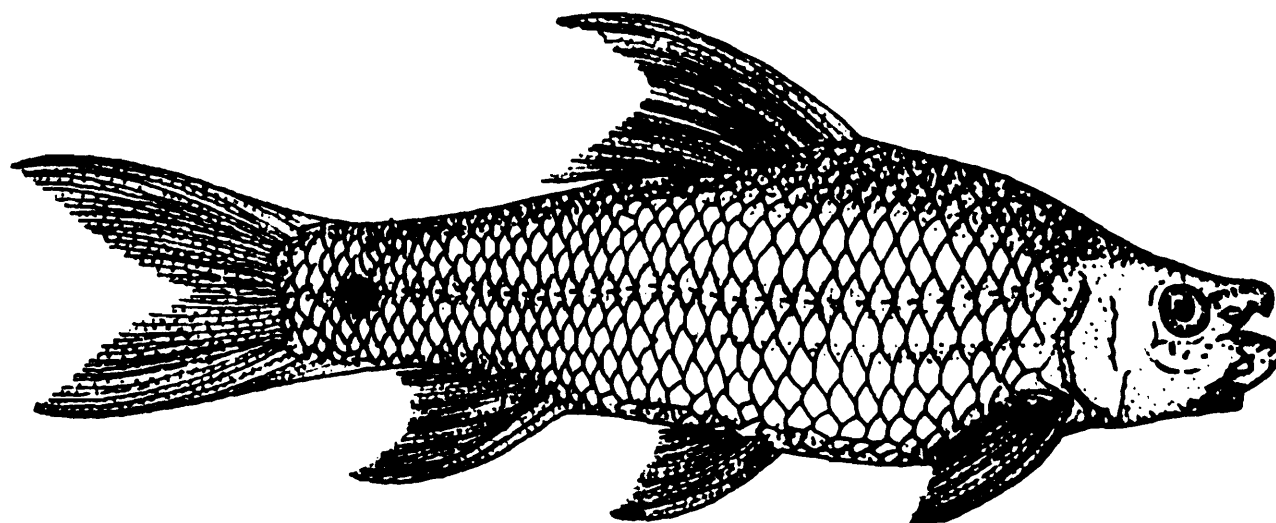
Maximum size : 90 cm TL.

Biology : Bottom feeder and culturable in the hilly areas.

Recommendations

1. Indiscriminate killing by damming the streams and using explosives on mountainous regions should be prohibited.
2. Abatement of pollution of hill streams.
3. Some of the deep pools in the course of rivers at base of the Himalayas where the fish rests during periods of low discharge should be declared as sanctuaries.

50. *Schismatorhynchus nukta* (Sykes) (Fig. 46)



Vernacular names : Marathi : *Nukta*; *Nakata*; *Nanktashendra*; Kannada : *Nukta*.

Status : Rare.

Confined to rivers of Deccan and Mysore plateau and in small numbers.

Taxonomic status : Day (1878) referred the species to the genus *Labeo*. The closest relative of species *S. heterorhynchus* occurs in Sumatra and Borneo. It is remarkable that a number of Malayan Cyprinoid genera have undergone structural changes as a result of long isolation in Peninsular India. *Schismatorhynchus* has shown only a subgeneric level of change (Hora 1942).

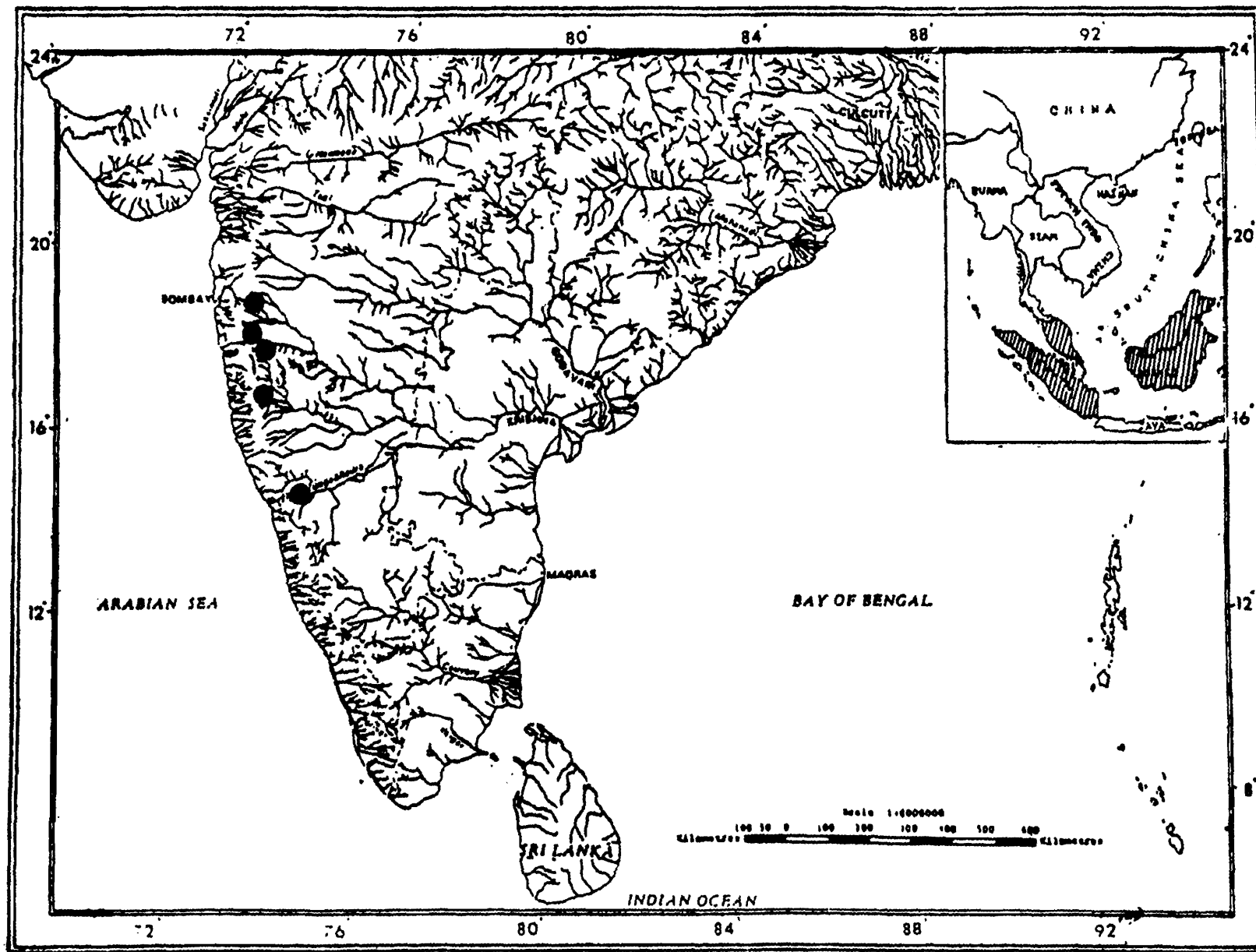


Fig. 46. Distribution of *Schismatorhynchos nukta*, a rare species, whose closest relative is found only in Borneo and Sumatra.

Salient features : D. II-III/8-9; P. 15; V. 9; A. II/5; C. 19; L. I. 37-38; L. tr. 6/9.

Body elongate and head compressed, snout projecting over mouth, and having a deep groove passing from one orbit to the opposite one, thus giving an appearance as if there is blunt compressed knob between and before the orbits. Mouth moderate, its corners not prolonged; lower lip reflected, its inner surface studded with large papillae, continuous with upper lip; labial groove restricted to corner of mouth; neither lips are fringed.

Barbels : None.

Fins : Dorsal fin arises midway between the tip of snout and posterior extremity of base of anal fin, its anterior three rays much elongated and higher than the body, the last besides being divided to its roots, is also prolonged, making the upper edge concave. Ventral arises under the middle of the dorsal, scarcely reaches anal, the latter concave posteriorly.

Scales : L. I. Complete; $4\frac{1}{2}$ rows of scales between lateral line and base of ventral fin.

Colour : Silvery with some red marks on scales; fins reddish, caudal edged with grey.

Habitat : Rapid streams and rivers with sand and boulder bed.

Maximum size : 30 cm TL.

Biology : Unknown.

Protective measures taken : None.

Recommendations

Regular monitoring of the population abundance of the species in streams should be carried out. Any deterioration in the water quality through pollution in the higher reaches may affect the species downstream and the whole population is likely to be extirpated. Abatement of deterioration of water quality should be taken up as soon as any such deterioration is detected.

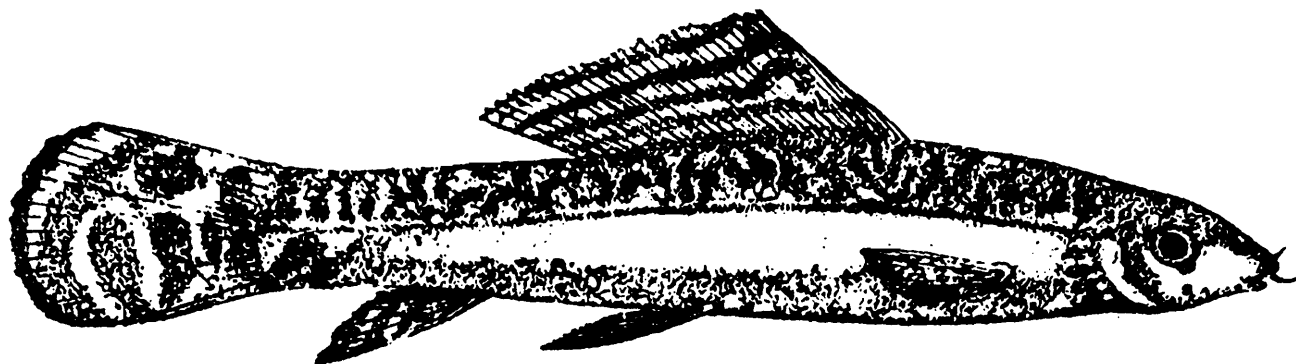
Family VII. COBITIDAE

51. *Enobarbichthys maculatus* (Day) (Fig. 47)

Vernacular name : None.

Status : Extinct.

Known only from the holotype preserved in the British Museum Natural History



(BMNH No 68. 10. 27. 36). Day (1867) described the species based on a lone specimen, 38 mm in standard length from Madras, India. Intensive surveys for the last 6 years in Madras, and its environs to obtain fresh specimens have been in vain. It is almost certain that the fish is extinct.

Taxonomic status : Originally referred to *Platacanthus maculatus* Day (1867) and *Jerdonia maculatus* Day (1870), this is a very distinctive form characterised by a long dorsal fin with 31 rays. Its scale characteristic and the bifid suborbital spine point to its close affinity with *Lepidocephalus* than to any other genus of the Cobitidae (Silas 1960).

Salient features : D. III/27; P. 6; V. 8; A. III/5; C. 21.

Body elongate, moderately compressed. The dorsal profile is lightly arched, ventral profile is almost straight. Head short; snout blunt; eye rather small, situated in the middle of head; nostrils situated immediately before eye, contiguous, anterior with raised tube, posterior without raised rim, oval. Interorbital strongly convex. Two bifid suborbital spines below each eye, their bases inserted slightly before eye; anterior prong small, longer prong terminates before posterior border of eye. Mouth small, inferior with thick lips.

Barbels : Three pairs, two rostral close together near apex of snout, maxillary and, maxillo-mandibular pair near angle of mouth, all short.

Fins : Dorsal long; its origin nearer to tip of snout than to caudal base; ventrals commencing below the middle of the dorsal, extending to anal opening when pressed. Anal long, behind dorsal, extending to well beyond caudal base; pectoral falciform. Caudal forked.

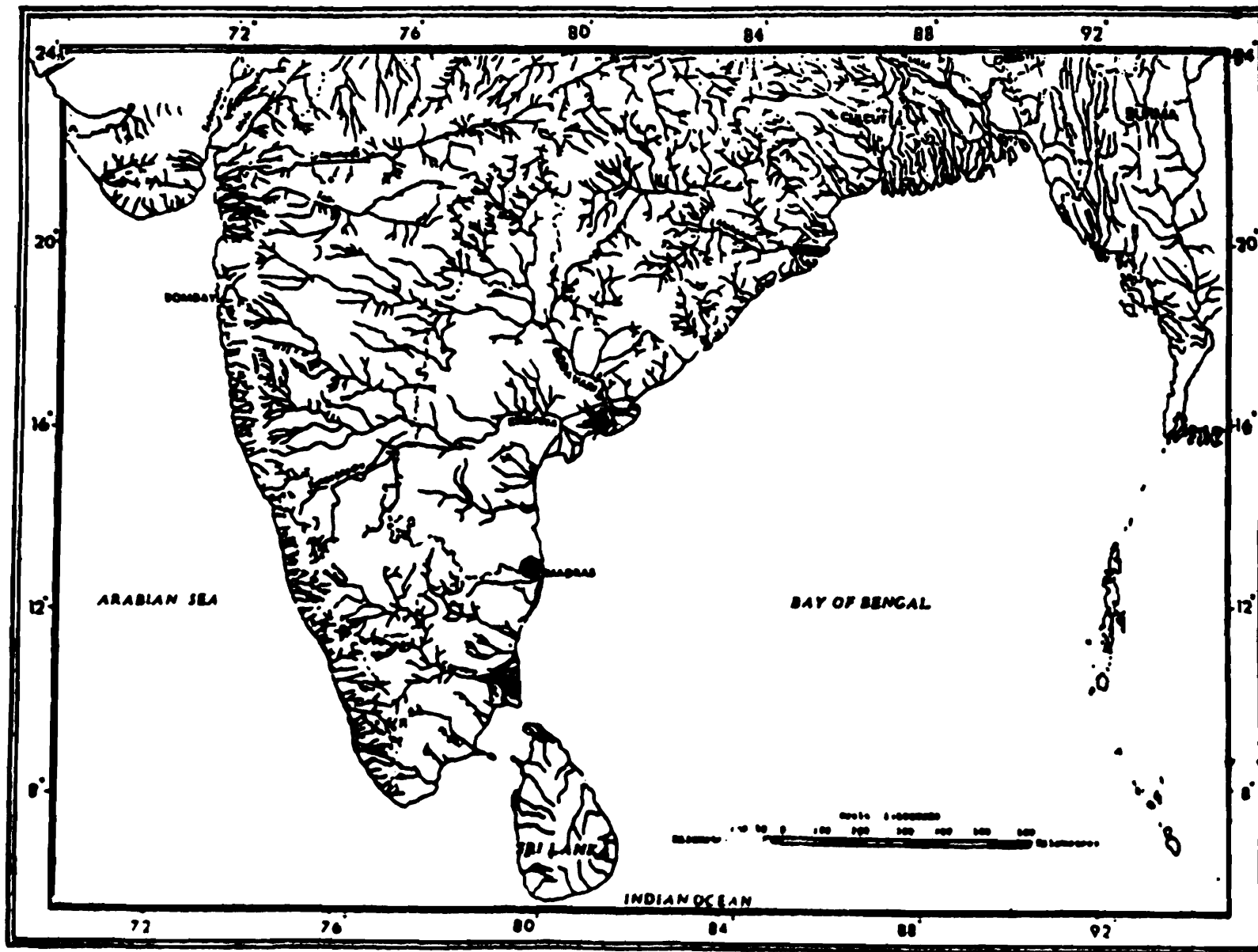


Fig. 47 : Distribution of *Enobarbichthys maculatus*, originally described by Day (1867) based on a lone specimen, it has not been collected since then. It is almost certain that the fish is extinct.

Scales : Minute, oblong, markedly longer than broad with eccentric focal area, imbricate, present all over the body. Lateral line complete.

Colour : "Greyish becoming dirty white below the centre of the body. A dark line passes from the eye to the centre of the tail. Along its first half are six black spots, whilst the whole extent of the back is irregularly lineated. Fins yellowish. Dorsal with four darkish bands along it. Caudal with three bands and a black margin. A black spot at the base of the tail with small one above and another below it." Day (1867).

Habitat : Streams with sandy bed.

Maximum size : 4.5 cm TL.

Biology : "When at rest it usually remained on sand or rock supported by its pectoral and anal fins, its abdomen not touching the ground. When frightened it buried under the sand with great rapidity. It consumed animal and vegetable food indifferently and grew considerably while in confinement" (Day 1867).

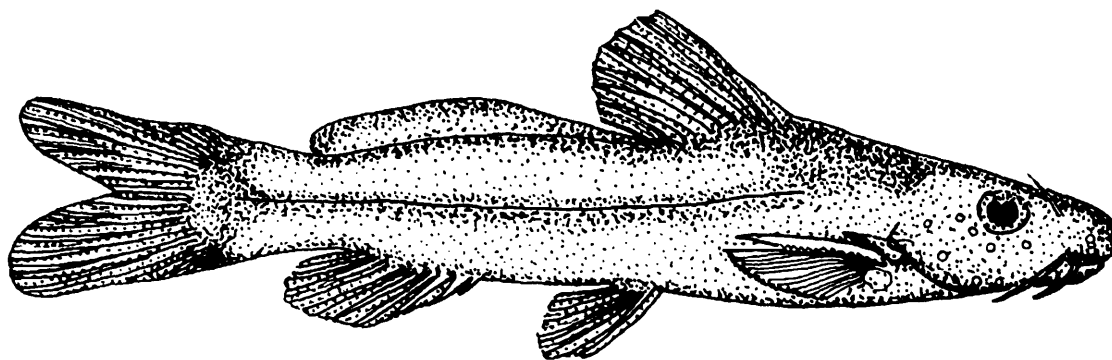
Protective measures taken : None.

Recommendations

Identification information should be made available to the concerned agencies.

Family VIII. BAGRIDAE

52. *Batasio travancoria* (Hora and Law) (Fig. 48)



Vernacular name : Nil.

Status : Rare.

The fish is confined to the upper reaches of the tributaries of Pambayar, Kallada and Chittar in the Southern and Central parts of the erstwhile Travancore State, Kerala.

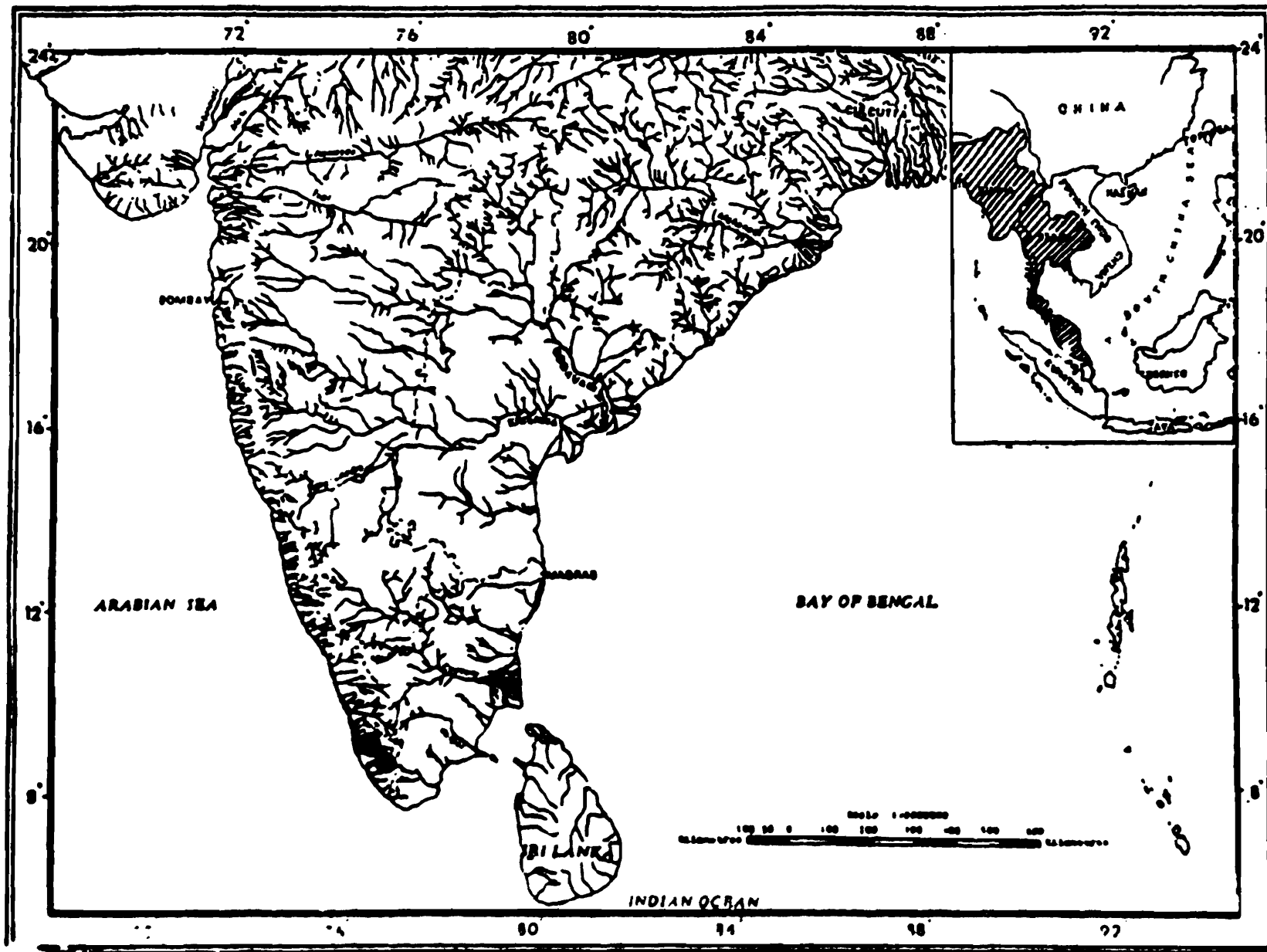


Fig. 48. Distribution of *Batasio travanconia*, a species of considerable zoogeographical significance; its close relatives are known from Burma and further east.

Taxonomic status : Members of the Genus *Batasio* are known from Eastern Himalayas, Burma and Malaya. The presence of a representative of the Genus in Travancore at such a great distance from Assam Hills is of considerable zoogeographical significance (Hora 1949).

Salient features : D. II/7; P. 8-9; V. 6; A.III-IV/9-11; C. 16-19.

B. travancoria is an elongated medium sized fish in which the dorsal profile is slightly arched, while ventral profile is horizontal in front of pelvic fins after which it is slightly arched, it is sub-cylindrical anteriorly, compressed posteriorly. Head is globular, conical and rounded anteriorly. The snout is rounded and projects beyond mouth; it is longer than the posterior part of the head. The eyes are of moderate size. The nostrils situated wide apart; the occipital process is long and sharply pointed posteriorly, it is separated from the basal bone of the dorsal fin by a considerable distance. The mouth is small, inferior, and horizontal. Oval pores present behind the lower lip and between the angles of the mouth and gill opening.

Barbels : Four pairs; maxillary barbels are short and do not extend beyond the eyes; others much shorter.

Fins : Dorsal fin is situated almost entirely in advance of the pelvics; its spine comparatively weak and is slightly crenulated along both borders. The adipose dorsal commence as a slightly raised ridge behind the base of the rayed dorsal, but after the termination of dorsal when laid flat it becomes a long prominent ridge; the length of its base is considerably greater than that of head. The pectoral fin is shorter than head; its spine is moderately developed. The pelvic fins are horizontal and extend beyond anal opening. The anal fin is low, its base is almost equal to the base of rayed dorsal fin. Caudal forked, the lower lobe is better developed.

Colour : In preserved specimens, it is uniformly grey with a narrow dark streak along the lateral line. Fins are dusky.

Habitat : Streams at the bases of hills.

Maximum size : 9.7 cm TL.

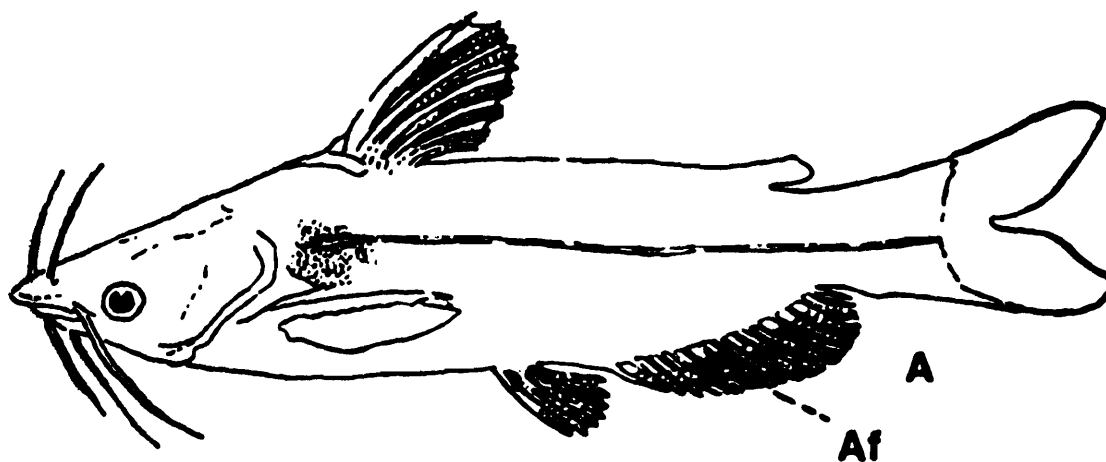
Biology : Unknown.

Protective measures taken : None.

Recommendations

1. Regular monitoring of the water quality of the small streams in southern tip of the peninsula where the fish lives is essential in the protection of this species and several other rare forms.
2. Measures should be taken to avoid construction of dams across the small west flowing rivers.

53. *Pseudobagrus chryseus* (Day)
(Fig. 49)



Vernacular names : Hindi : *Neela-Katurnee*; Malayalam : *Mungil-yata*.

Status : Vulnerable.

This fish is confined to the west flowing rivers of Western Ghats from South Canara to Southern Kerala. Environmental alterations by deforestation and extensive rubber cultivation in the area are gradually changing the water quality of the rivers and streams there. This could very well reduce this species to extinction.

Taxonomic status : Previous records of this species have been referred to *Pseudobagrus brachysoma* (Gunther 1864; Misra 1976). Misra (l. c., p. 109) considered that since *Pseudobagrus* (= *Horabagrus*) is a genus of Japan, China and Cochin-China, the home of *Pseudobagrus brachysoma* is Cochin-China, not Cochin as presented by Jayaram (1952). Gunther's description of *P. brachysoma* differs from that of Day's (1864) description of *P. chryseus* (Dorsal ray 20 in *P. brachysoma* 26-28 in *P. chryseus*).

Salient features : D. 1/7; V. 6; A. 26-28; C. 17-19.

Body elongate; occipital process exposed, extending to predorsal plate. Eyes ventrolateral in position, visible from underside of head. Mouth sub-terminal; teeth in villiform bands on jaws.

Barbels : Four pairs; maxillary barbels extending to pectoral base, outer mandibulars shorter than maxillaries; inner mandibulars; 1/4 shorter than outer mandibulars, nasal's nearly 1/2 as long as head.

Fins : Dorsal spine as long as head behind the middle of the eyes, strong with about

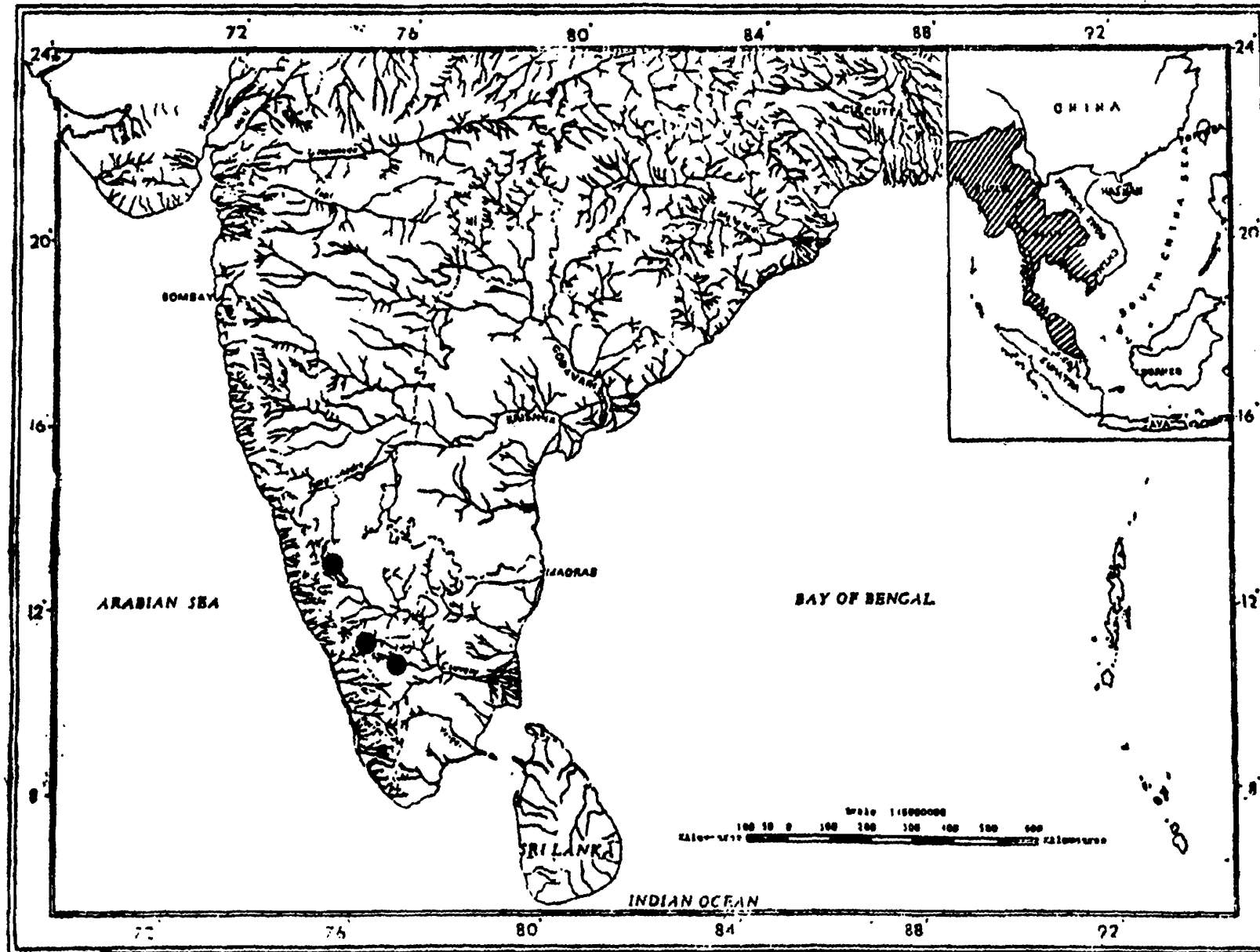


Fig. 49 : Distribution of *Pseudobagrus chryseus*. Over exploitation by traps and long lines has reduced its numbers. Classified as vulnerable.

ten denticulations posteriorly; three or four anteriorly near its summit; adipose fin short, commencing over the last fourth of the anal. Pectoral just reaching or not reaching pelvics; its spine stronger than that of dorsal and as long as the head, excluding the snout, serrated externally and with 16-18 strong teeth internally. Ventral fin about half as long as the pectoral and reaches the anal; the base of the anal fin almost equals length of the head. Caudal slightly or deeply lunate or even forked.

Colour : Back greenish yellow, sides golden; a large round black mark on the shoulder surrounded by a light yellow ring. Dorsal and anal fins yellowish orange, stained darker at their margins. Caudal yellow with black base and dark edges.

Habitat : Rivers, preferring deepest pools.

Maximum size : 45 cm TL.

Biology : The biology of the species has received little attention, though it forms an important element of the fishery in Kerala during the rainy season.

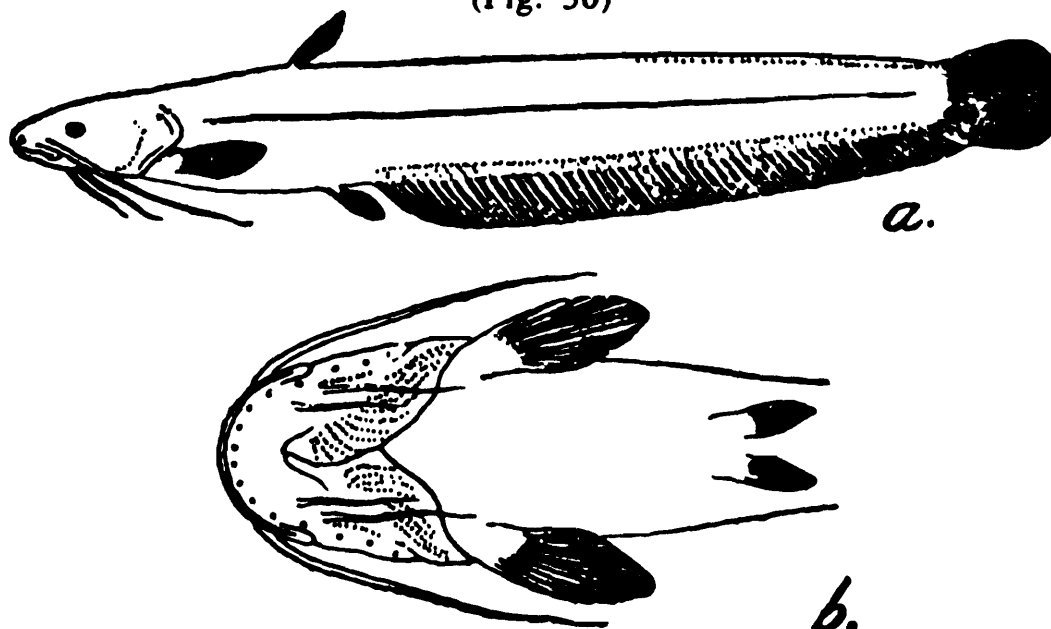
Protective measures taken : None.

Recommendations

1. The extensive use of traps and long lines in deep pools should be curtailed.
2. Some of the deep pools in the course of the big rivers should be declared as sanctuaries and catching of brooders from these pools during the period of low discharge of water in summer months should be prevented.

Family IX. SILURIDAE

54. *Silurus wynaadensis* (Day) (Fig. 50)



Vernacular name : Nil.

Status : Rare.

This species is known from two closely separated localities in the Western Ghats, the Wynaad Hills and Jagger Valley, the Cauvery and Tungabadhra drainages respectively. The growing agricultural practices and the removal of gravel and sand from the area would cause the extirpation of the species.

Taxonomic status : Bhimachar and Rau (1941) and Haig (1952) confused this species with *Silurus cochinchinensis*, a widely distributed species of Southeast Asia. *Silurus* seems to have diverged in the peninsular India as *S. wynaadensis* which has its nearest relative in *S. berdmorei* (Blyth) of Burma.

Salient features : D. 5; P. 11; V. 8; A. 58-62; C. 19.

Body elongate, compressed, dorsal profile nearly horizontal. Head depressed, covered with skin, and with a row of large open pores along the lower jaw and cheeks. Upper jaw longer than lower; vomerine teeth in two closely placed oval hatches.

Barbels : Three pairs; maxillary barbels extending slightly beyond the middle of the pectorals, the outer to the pectoral base, the inner shorter. In adult the outer mandibular gets absorbed.

Fins : Dorsal short without spine in the anterior 3rd of the standard length; pectorals with a short but strong spine, ending in a soft termination. Ventrals reach the origin of anal, the anal long, separated from the caudal by a notch. Caudal rounded.

Colour : In life, leaden becoming purplish beneath and covered all over with small black spots.

Habitat : Mountain streams with gravely and sandy beds.

Maximum size : 30 cm in length.

Biology : Unknown.

Protective measures taken : None.

Recommendations

1. A suitable sanctuary with human disturbance minimized should be set up for its protection.

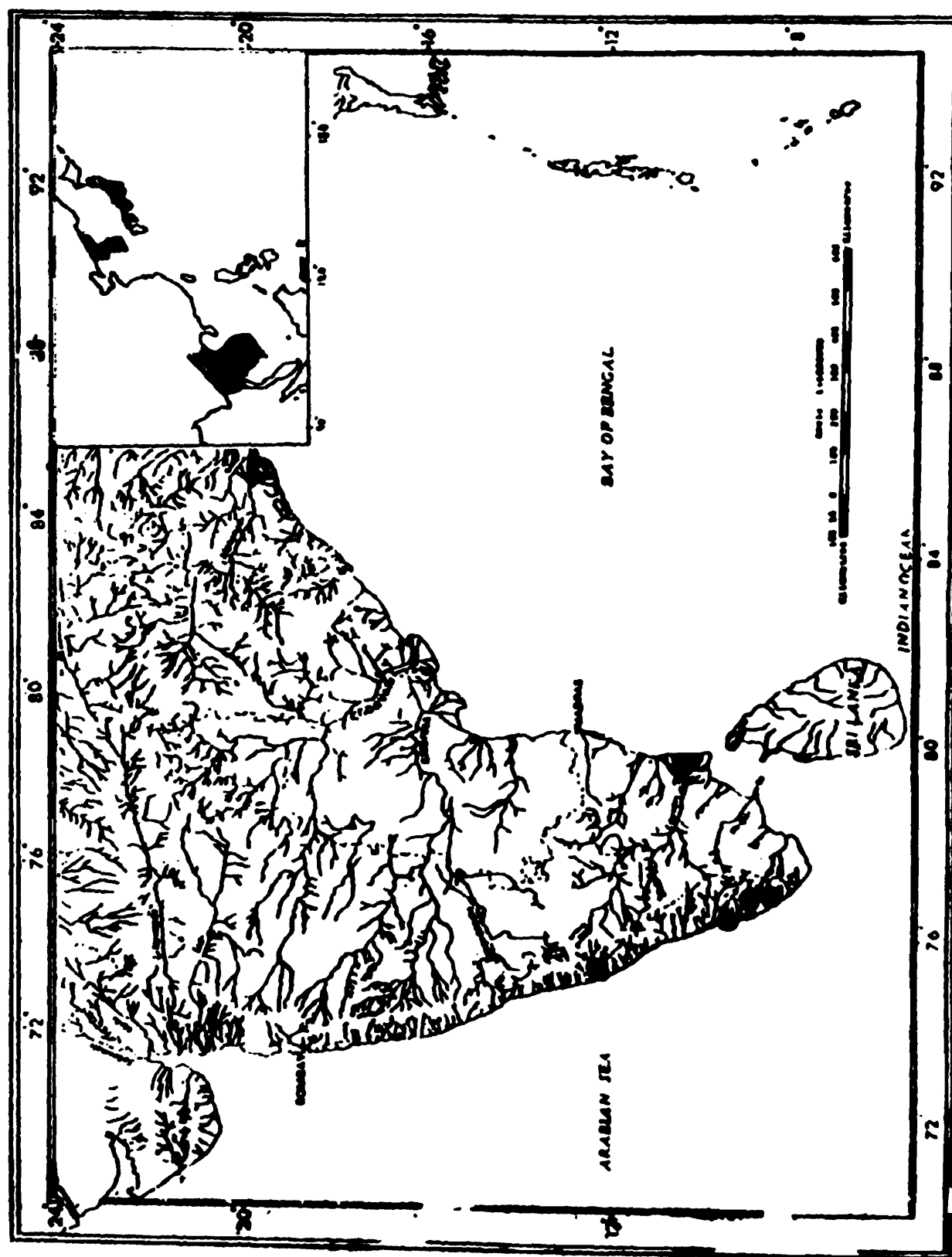
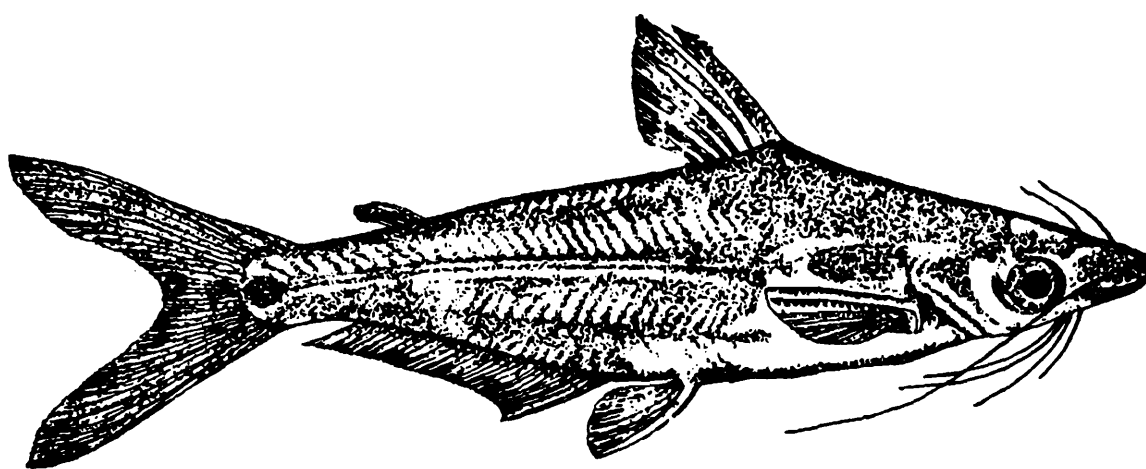


Fig. 50 : Distribution of *Silurus wynadensis*. Which lives in medium to large hill streams with considerably current over gravely and sandy bottom.

2. The collection of gravel and sand from the river bed in the restricted habitat of the species should be avoided.
3. Identification and information pamphlets should be made available to the persons and agencies concerned in conservation of wildlife.

Family X. SCHILBEIDAE

55. *Neotropius khavalchor* (Kulkarni)
(Fig. 51)



Vernacular name : Marathi : *Khavalchor*.

Status : Rare.

Found only in Krishna river near Islampur, Dist. Satara and Panchaganga river, Kolhapur, Maharashtra. Any small change in the quality of water in the upper reaches of Krishna system would have adverse effects on the quality of the water downstream which may result in the loss of this interesting hill stream catfish.

Taxonomic status : Kulkarni (1951) discussed the taxonomic status. It is close to *P. acutirostris* Day of Irrawaddy river and might have evolved from it.

Salient fetures : D. I/6-7; P. 8; V. 6; A. II-III/22-23; C. 17.

Body elongate and compressed and rather deep in the anterior half. The dorsal profile is almost a straight line, ascending from the tip of the snout to the insertion of the dorsal fins from where it descends abruptly and proceeds posteriorly in straight curve up to the base of caudal fin. The ventral fin is uniformly arched but it is slightly straightened below the dorsal fin. Head rather small, somewhat tapering; snout protruded. Mouth wide, almost devoid of lips except at corners of jaws; denticulated part of the upper jaw extends over entire undersurface of the snout excepting tip; teeth within gape of jaws in villiform bands; teeth on palate in three separate patches, vomerine teeth in

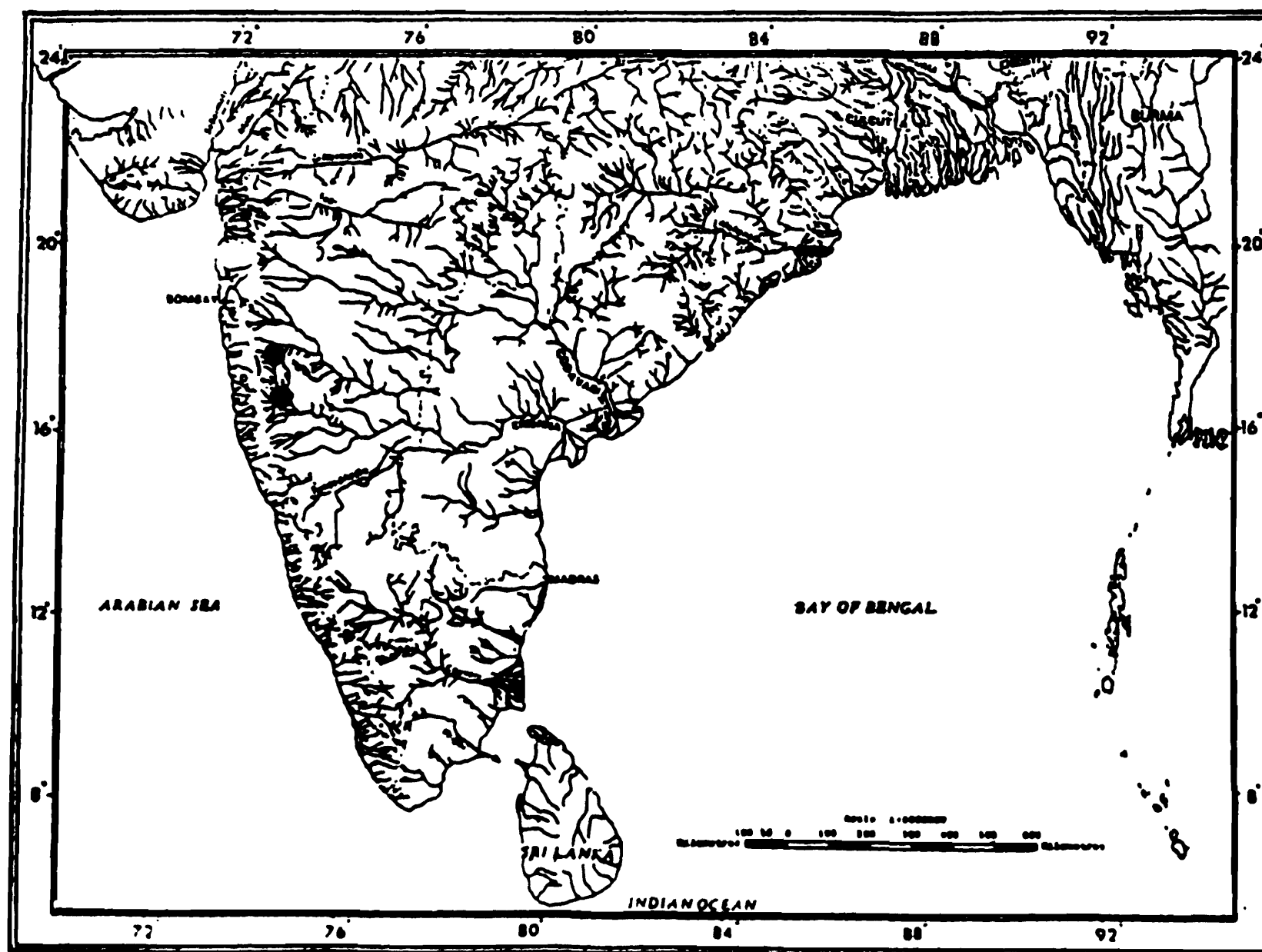


Fig. 51 : Distribution of *Neotropius khavalchor*. A lepidophagous fish, known from the Krishna river in Satara district, classified as a rare species.

a continuous crescentic band running almost parallel to the rounded margin of upper jaw; palatine teeth form two small irregular patches.

Barbels : Four pairs; one nasal pair, one maxillary, and two mandibular pairs.

Fins : Dorsal fin situated between pectoral and pelvic fin, but nearer to the latter. It has a strong but slender spine which is serrated internally; its outer surface is smooth except at its distal end where there are 3 or 4 barb-like serrations. Adipose fin is small but well developed. The pelvic fins are rather well grown compared to pectoral and dorsal fins, reach the anal fin. Anal is moderately long. Caudal is forked.

Colour : Silvery grey on back, paler below; a pair of triangular dark areas in the occipital region and a dark blotch present at the base of caudal fin.

Habitat : Slow moving turbid streams.

Maximim size : 15 cm TL.

Biology : Food consists of almost solely of minute scales (Kulkarni *loc. cit.*, p. 237).

Protective measures taken : None.

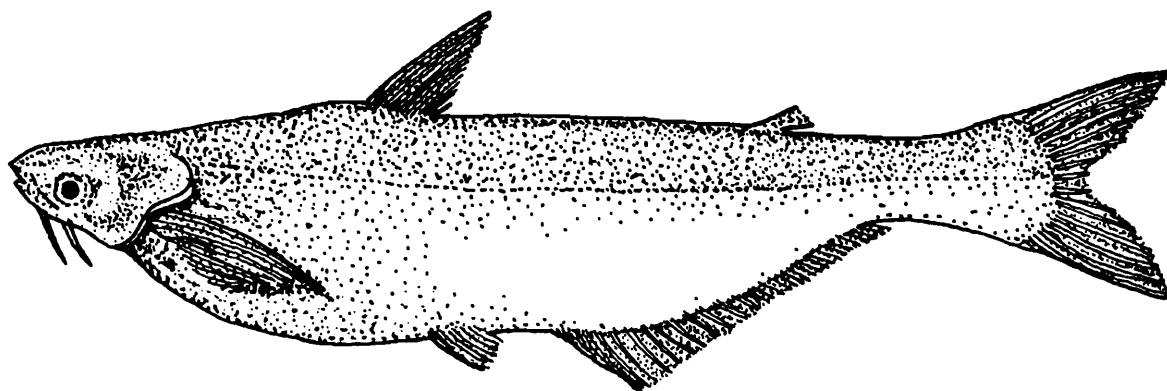
Recommendations

A portion of the river Panchaganga should be protected as a natural history reserve to ensure the continued existence of this fish and other typical elements of the biota.

Family XI. PANGASIIDAE

56. *Pangasius pangasius* (Hamilton)

(Fig. 52)



Vernacular name : Assamese (Goalpara) : *Pungas*; Bengali : *Pungas*; *Pungwas*; Oriya : *Jellum*; Tamil : *Coola Kellette*.

Common English name : *Pungas*.

Status : Vulnerable.

Though widely distributed, the catch of this species in the Godavari (Rajalakshmi, 1972) has been steadily decreasing despite increase in fishing efforts. The waters of

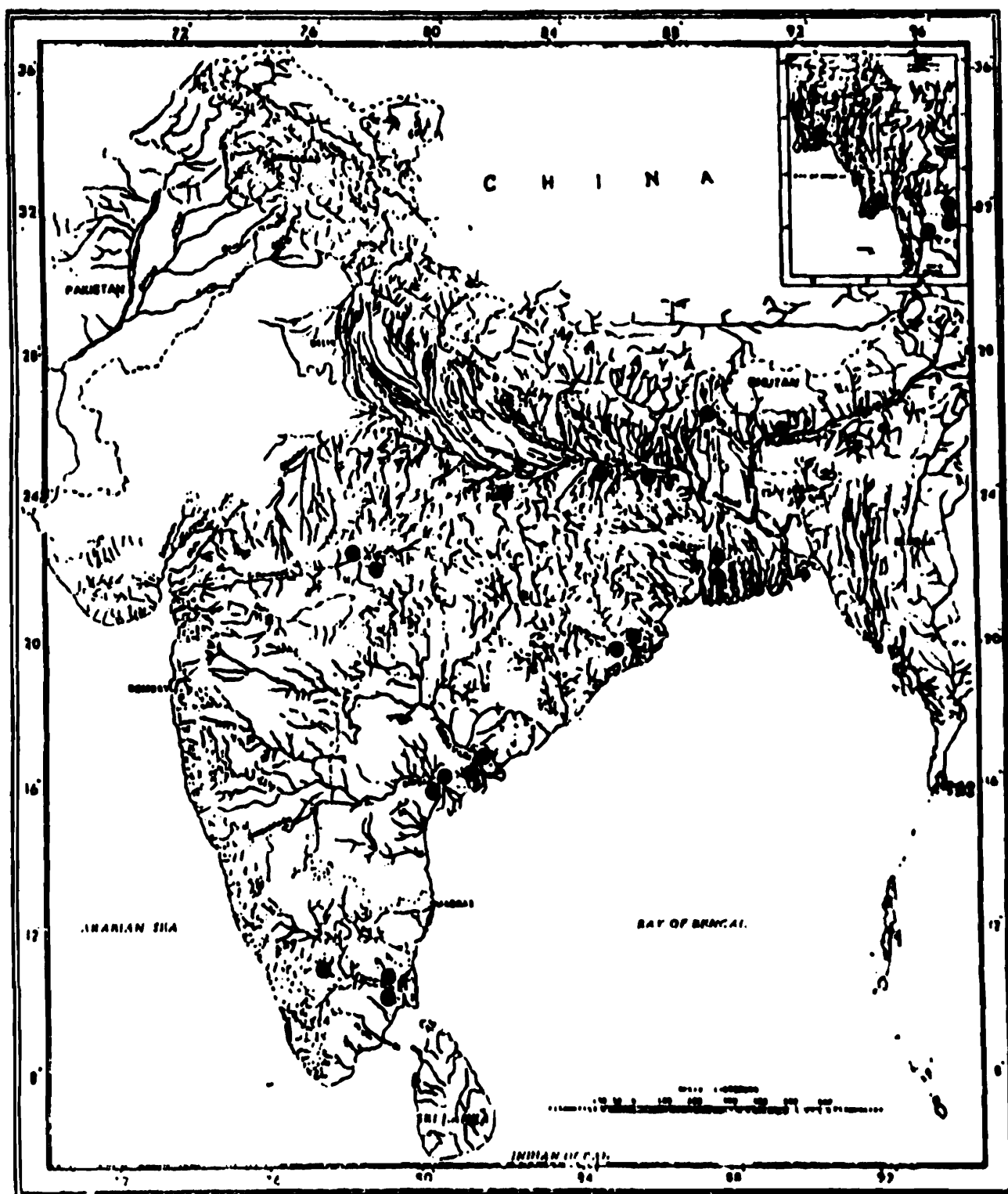


Fig. 52 : Distribution of *Pangasius pangasius*. Over fishing has led to the decline of the species. Mesh regulation should be introduced.

Godavari and Krishna are overfished as far as this fish is concerned. Though widespread elsewhere, the peninsular population is likely to show genetic combinations that do not occur elsewhere in the range of the species and therefore the conservation of this genetic resource is considered essential.

Taxonomic status : Regan (1911), Jordan (1923) and Hora (1938) have restricted the family Pangasidae to the genus *Pangasius*. Tilak (1964) has brought morphological differences in favour of the validity of the family and its differences from the family Schilbeidae.

Salient features : D. III/6-7; P. 30-34; A. 28-40; V. I/5; C. 19.

Barbels : 2 pairs, maxillary reach base of the pectoral fin, mandibular are half the head length. Teeth small villiform.

Fins : Dorsal with a strong denticulated spine. Anal with 28-40 rays.

Colour : Back dusky green, lateral sides purple gloss and underside white.

Habitat : Large rivers and estuaries.

Maximum size : 1-1.5 meters in length.

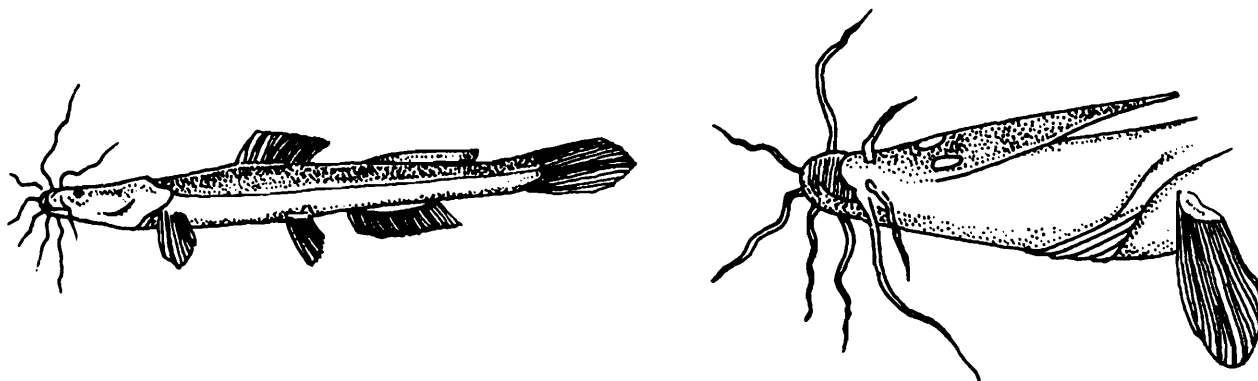
Biology: Feeds on foul and decaying animal, chiefly molluscs and vegetable matter at the bottom of estuaries and lower portions of large rivers. Breeds during rains in the estuaries. In Mettur reservoir it breeds in June-July and grows up to 122 cm in length.

Recommendations

Mesh regulation should be introduced and over exploitation of the fish in the Godavari, Krishna and other large rivers in India be avoided.

Family XII. AMBLYCIPITIDAE

57. *Amblyceps laticeps* (McClelland) (Fig. 53)



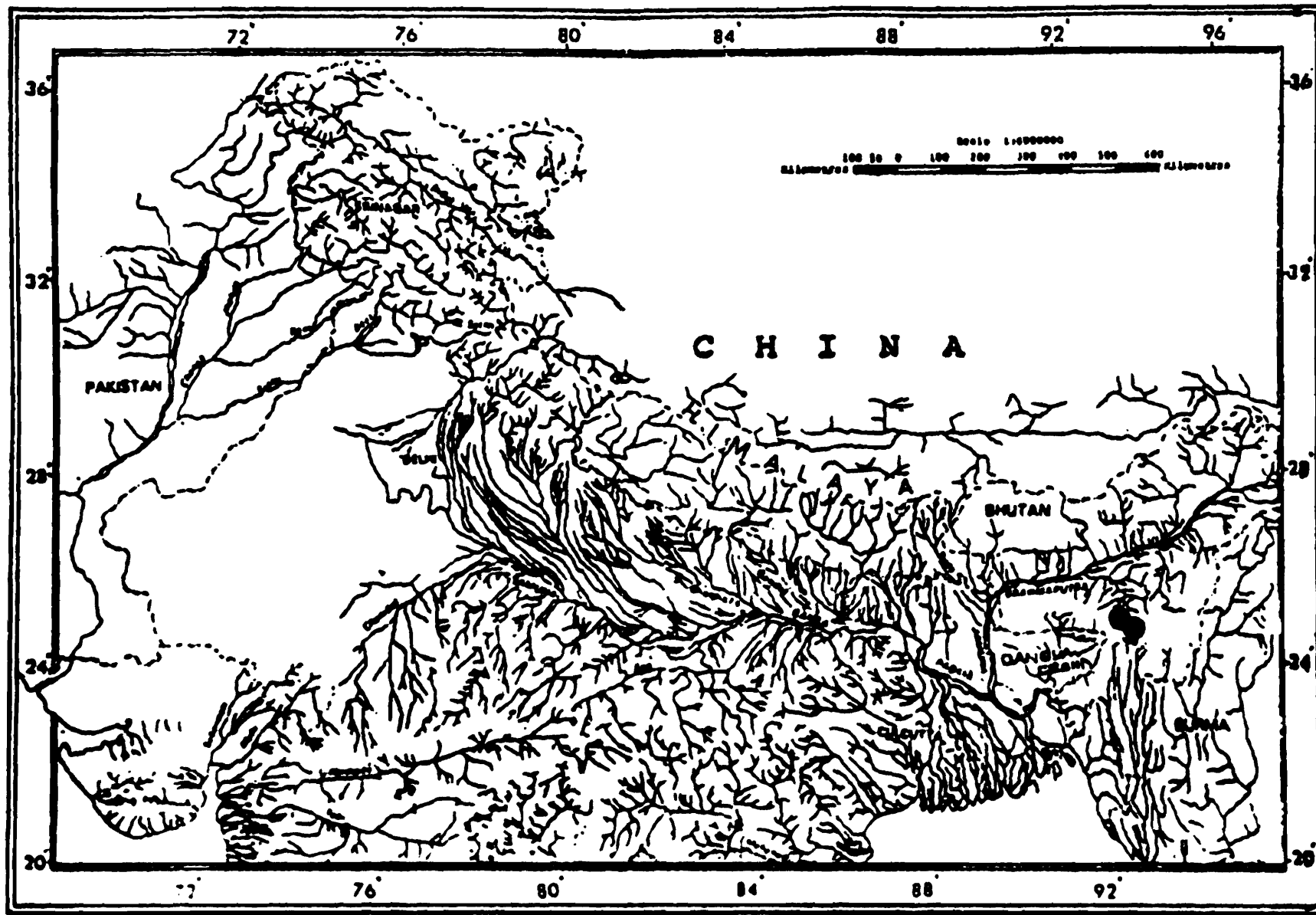


Fig 53 : Distribution of *Amblyceps laticeps*. Habitat destruction through excessive removal of boulders from river beds in Bangladesh is a direct threat to this species. It was feared that this species was already extinct but a small population was discovered recently. McClelland's (1842) figure is reproduced. It is classified as endangered.

Vernacular name : None.

Status : Endangered.

Found in small numbers in Jayanti Hills, Meghalaya and northeast Khasi Hills in Bangladesh.

Taxonomic status : Day (1889) included the species under *Olyra*. Destruction of its unique habitat by removing the boulders for construction in Bangladesh has proved the greatest threat to the species.

Hora (1936) considered *Olyra laticeps* McClelland as an *Amblyceps* in the absence of a rough spine in pectoral fin, smaller number of anal rays and the forward position of the rayed dorsal. It is now recognised as a species of *Amblyceps*.

Salient features : D. I/6; P. I/9; V. 6; A. 15; C. 18.

Fins : Dorsal fin situated in the commencement of the second fifth of the length of the fish, totally in front of the pelvic fin. Anal with 15 rays, the anal is long with 23 rays in *O. longicaudata*.

Colour : Cream-coloured.

Habitat : Huge boulder outcrops in river beds at base of hills leading nearly a subterranean existence.

Maximum size : 4.6 cm TL.

Biology : Not known.

Protective measures taken : None.

Recommendations

1. Removal of river substrate to build roads should be discouraged.
2. Identification pamphlets should be circulated among the agencies concerned for conservation.

Family XIII. SISORIDAE

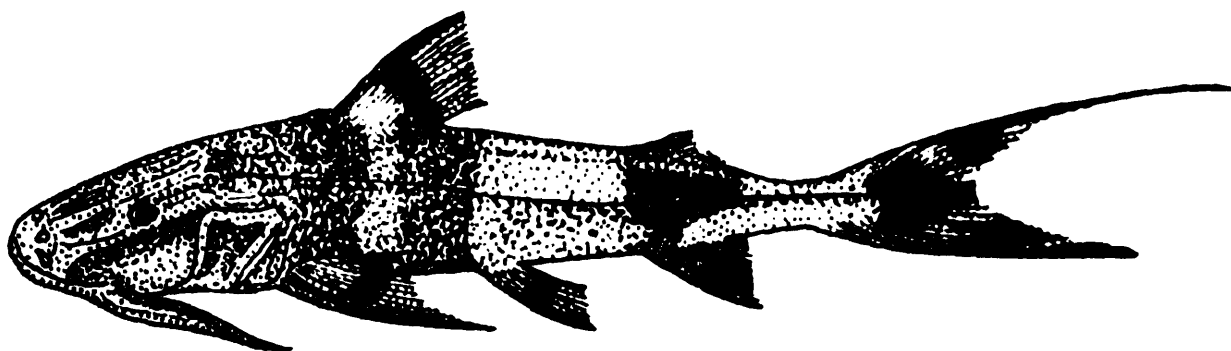
58. *Bagarius bagarius* (Hamilton)

(Fig. 54)

Vernacular names : Hindi : *Boonch, Goonch*; Assamese : *Goreah*; Telugu : *Rahti gellah*; Oriya : *Sahlum*; Marathi : *Mustauda, Tharota*.

Common English name : *Freshwater shark*.

Status : Vulnerable.



See remarks under status of *P. pangasius*.

Taxonomic status : Hamilton described the species in his composite genus *Pimelodus*. Swainson (1939) included it under *Pachypterus* and named it *P. luridus*. Bleeker (1853) proposed the generic name *Bagarius* for its reception and called it *Bagarius buechanani*. Sykes described the Goonch from Poona under the specific name *B. yarrelli*. The correct specific name should be *B. bagarius*. Robert's (1983) separation of *B. bagarius* and *B. yarrelli* as distinct species is not correct.

Salient features : D. 1/6; P. 13; V. 1/5; A. 12-15; C. 17.

Barbels : 4 pairs, one nasal, one maxillary and two mandibular; maxillary with broad bases and longer than head.

Fins : Dorsal spine smooth with elongated soft termination. Adipose dorsal as long as rayed fin. Pectoral spine stronger than dorsal and equally long.

Colour : Body grey or yellowish with large irregular brown or black markings and cross bands.

Habitat : Large rivers, usually of rapids and rocky pools entering into lower reaches and estuaries.

Maximum size : 2 m TL. 125 kg.

Biology : Piscivorous, feed mostly on small fishes like *Clupea chapra*, *Mastacembelus armatus* and other small fishes.

Protective measures taken : None.

Recommendations

Indiscriminate killing by spearing and over exploitation especially in the Godavari and Krishna rivers should be avoided.

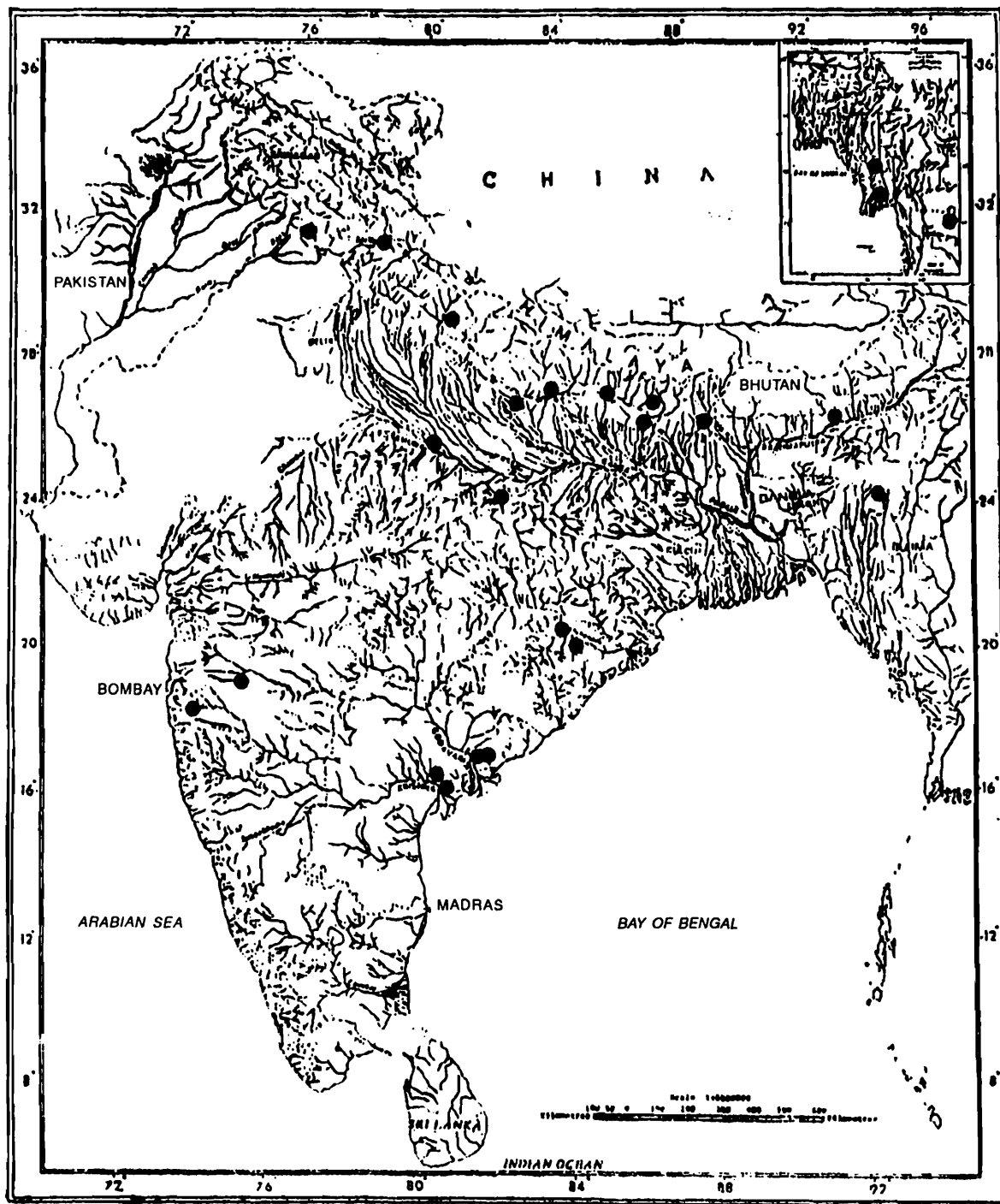
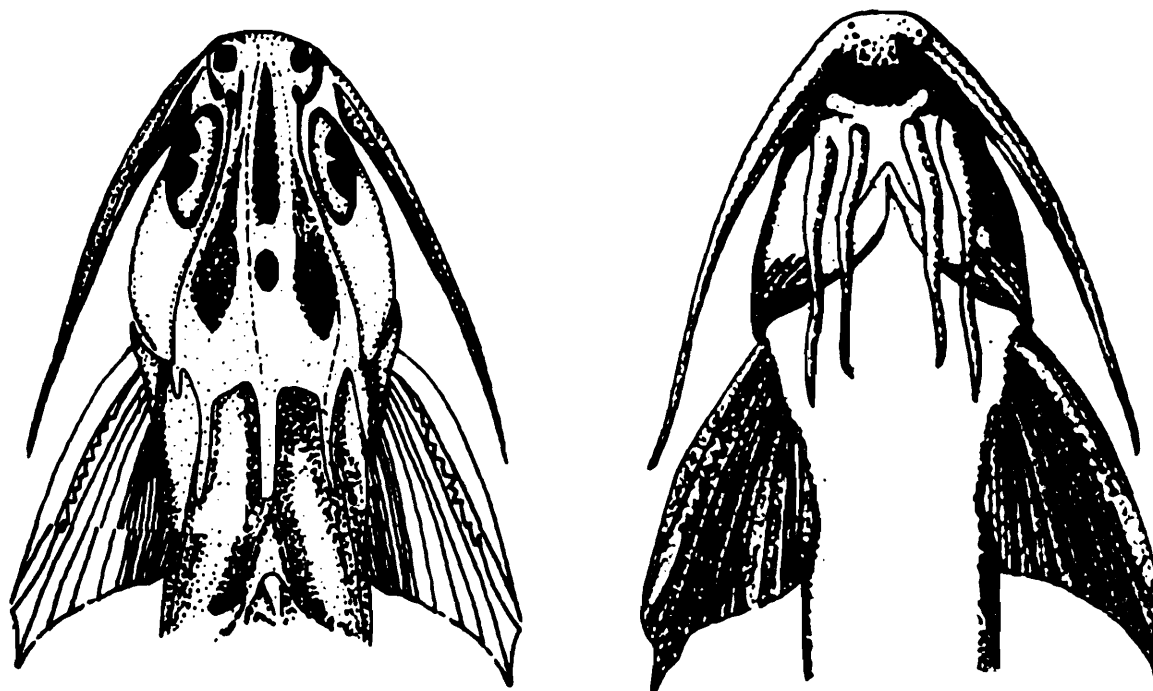


Fig. 54 : Distribution of *Bagarius bagarius*. A good sport fish. The Deccan populations are declining due to overfishing.

59. *Gagata itchkeea* (Sykes)
(Fig. 55)



Vernacular name : Marathi : *Bihua; Padhnah*

Status : Rare.

It is confined to streams in the Northern division of Western Ghats, namely, Deolali, Satara and Poona. Occurrence of this species in the Cauvery river, Coorg, needs further confirmation.

Taxonomic status : Hora (1941) considered the Genus *Nangra* Day as a synonym of *Gagata* Bleeker. Jayaram (1972) resurrected *Nangra* from the synonym of Genus *Gagata*. The character of gill membrane united with a fairly broad isthmus or united with a narrow isthmus cannot be taken as a valid character in separating the species of this group of small sisorid hill catfishes into two separate genera.

Salient features : D. II/6; P. 9; V. 6; A. III-IV/9-10; C. 9.

Body elongate, cylindrical, flattened ventrally to the pelvic. Head is short, globular, rounded anteriorly. The snout is rounded; it projects beyond the mouth for a short distance. Eyes are large and dorso-ventral in position, they are not visible from the ventral surface. The middle groove of the head extends from between the nostrils to base of occipital process, but anteriorly there are lodged in it one large and one small fontanelles. The mouth is small, inferior and horizontal; lips fleshly and continuous at the angles of the mouth. The gill membranes are attached to isthmus but the gill openings are separated by a distance.

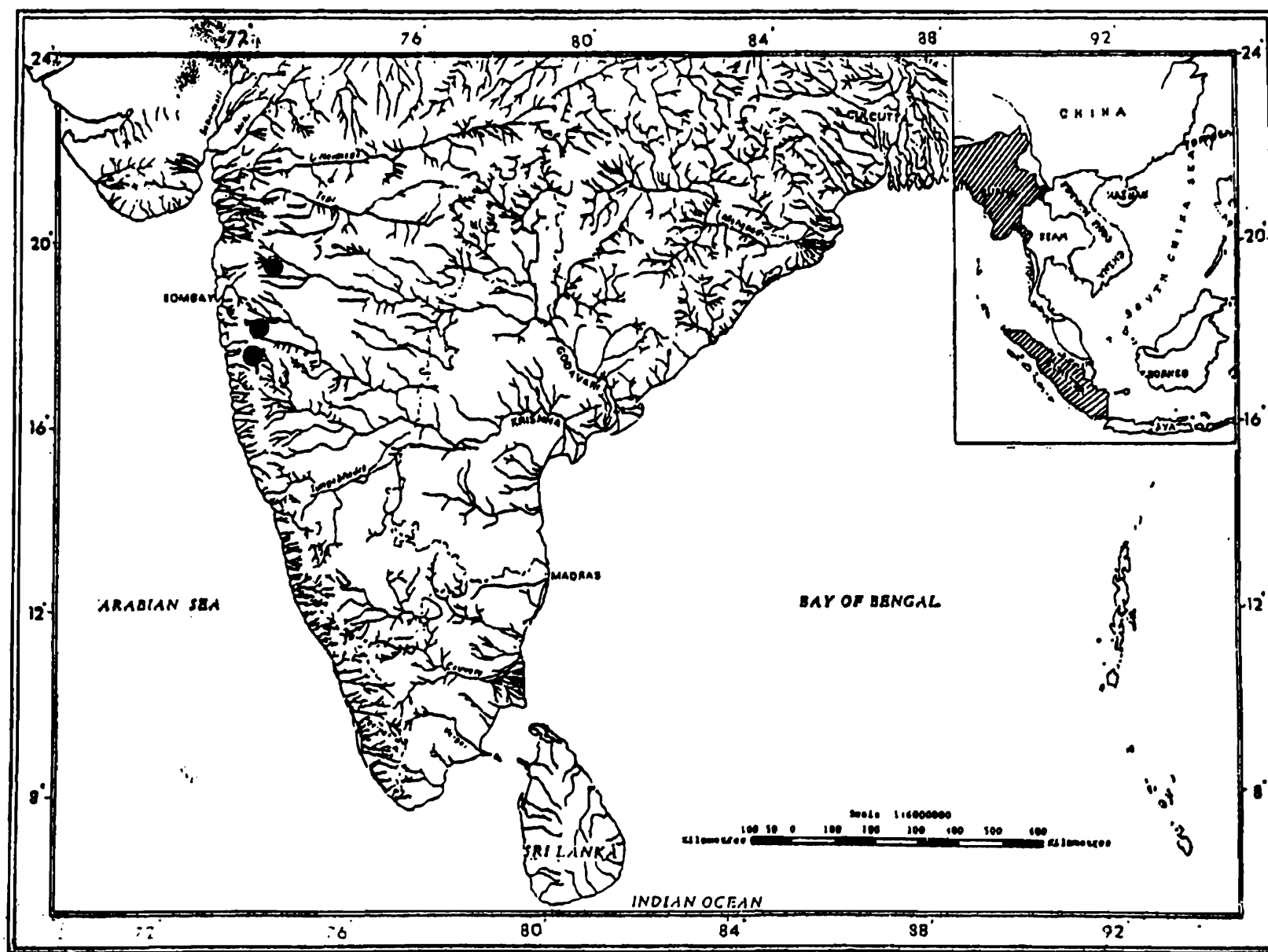


Fig. 55. Distribution of *Gagata itchkeea*, which lives in large hill streams with strong current over rocky and gravelly bed.

Barbels : Four pairs of barbels; nasal barbels are small, maxillaries are longer than head; the two pairs of mandibular barbels are almost equal, and as long as head behind the anterior border of the orbit. The bases of mandibular barbels are not situated in a transverse line but those of the inner pair are slightly in advance to those of outer.

Fins : The dorsal fin is situated in advance to the pelvic fins, which is shorter than head; the dorsal spine is strong which is smooth along both the borders; the adipose dorsal small, well developed. The pectoral fin pointed and reaches the base of pelvic fins; its spine is strong and crenulated; the pelvic fin extends beyond the anal opening but separated from the anal fin; the anal fin is short, like the dorsal. Caudal is deeply forked.

Colour : Yellowish bronze above, becoming silvery on sides and abdomen. Some dark blotches along the back; a black blotch on each lobe of the caudal and another on dorsal fin.

Habitat : Rapid flowing hill streams; young are found under stones and pebbles.

Maximum size : 5 cm TL.

Biology : Unknown.

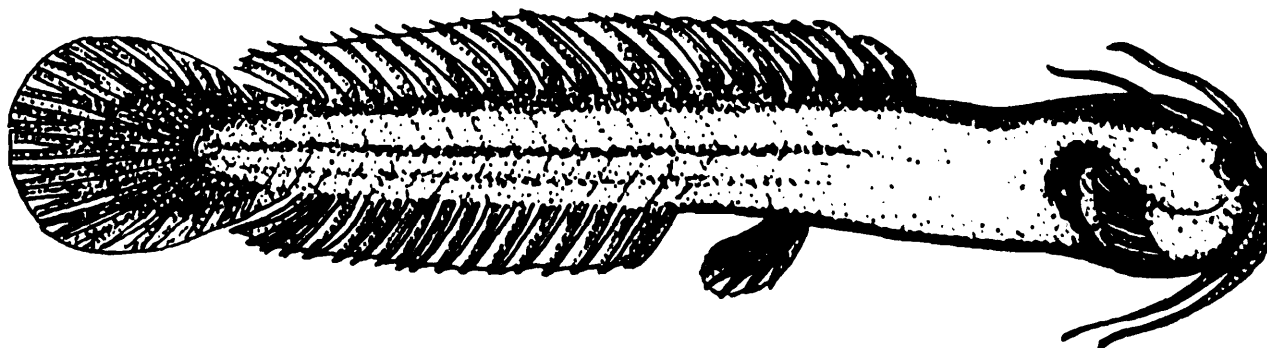
Protective measures taken : None.

Recommendations

The habitat of the fish should be protected from pollution by anthropogenic activities. Regular monitoring of the water quality of the streams in Deolali, Satara and Poona is essential to protect this species and many other rare and interesting fish species occurring there.

Family XIV. CLARIIDAE

60. *Horaglanis krishnai* (Menon) (Fig. 56)



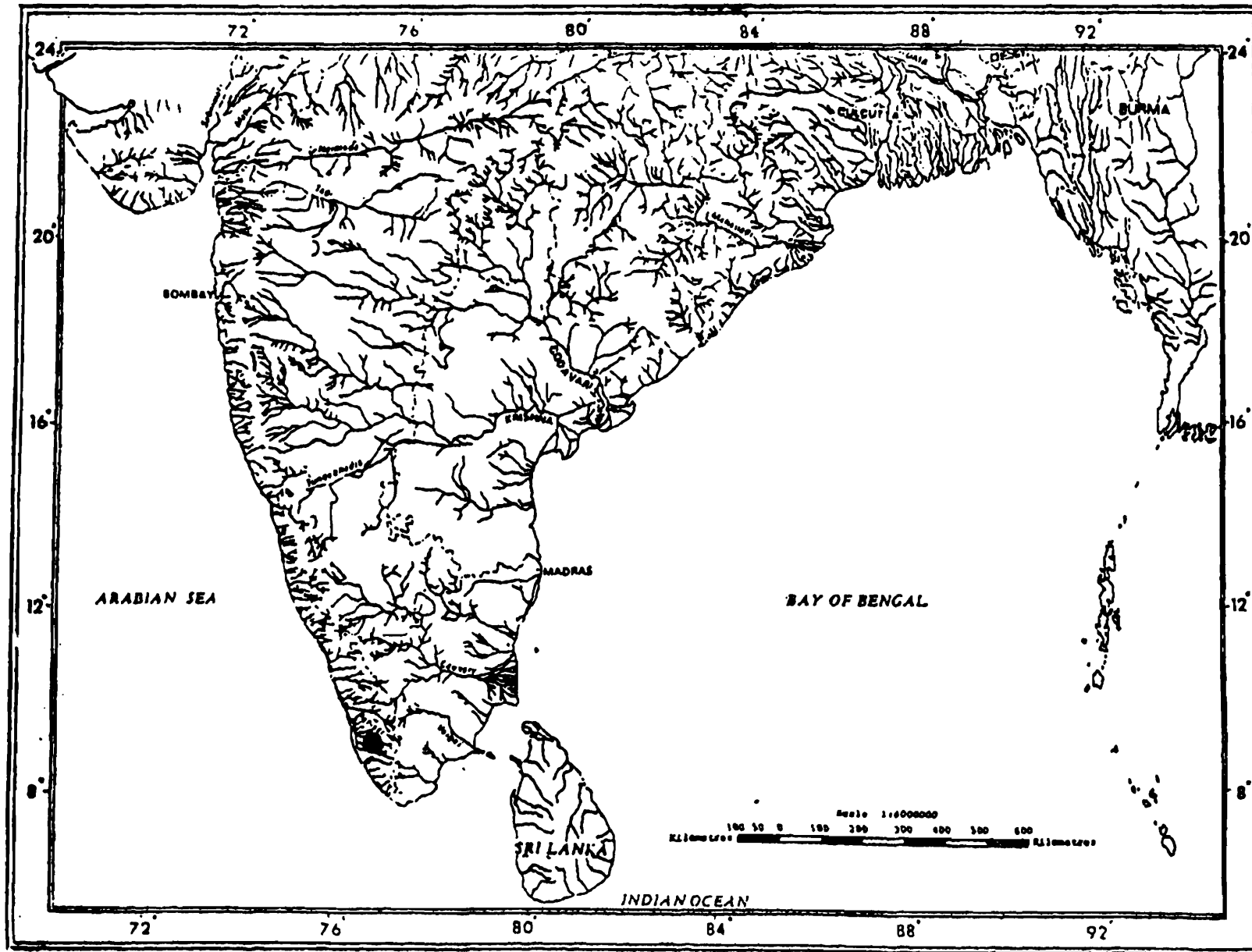


Fig. 56 : Distribution of *Horaglanis krishnai*, the only Blind fish known from India, classified as a rare species.

Vernacular name : Nil.

Status : Rare.

The blind catfish *Horaglanis krishnai*, the only blind fish so far recorded from India, is known from deep wells at Kottayam, Kerala. Since its first report (Menon, 1950) a few more specimens have been collected by the staff and students of the Freshwater Biological Station of Kerala University, Trivandrum and some work on the osteology of the fish is in progress.

Taxonomic status : Menon (1951) showed that the Indian blind fish could be only a secondarily simplified clarid and not a primarily simple form.

Salient features : D. 21; P. vestigial; V. 6; A. 17; C. 24.

Body elongate, narrow, sub-cylindrical, dorsal and ventral profiles nearly horizontal. Head globular, eyes absent. Mouth wide, upturned, crescentic, extending across entire width of snout; lower jaw slightly longer; teeth villiform, in bands in jaws, in upper jaw a broad deeply curved band; in the lower jaw the band consists of two continuous patches produced backwards.

Barbels : Four well developed pairs; maxillary and outer mandibular pair longer than head and extending beyond tip of the pectoral fins. The inner mandibular and nasal barbels are shorter.

Fins : Dorsal long extending to the base of caudal; its origin is in the second-fourth of total length, and four dorsal rays before pelvic origin; no adipose dorsal. Pectorals vestigial; pelvics reaching beyond vent to anal origin. Anal long extending to base of caudal. Caudal rounded.

Colour : Yellowish white without any pigment.

Habitat : Subterranean in deep wells.

Maximum size : 4.2 cm TL.

Biology : Unknown.

Protective measures taken : None.

Recommendations

1. There may be several surviving populations in different wells in and around Kottayam district. Further efforts should be made to locate the surviving populations.
2. If by chance, a fairly big population is found existing in any of the wells it should be declared as a natural reserve in an effort to protect the species from extinction.

3. Distribution and identification information should be made available to all concerned in the area where it is likely to be present.
4. The life history of the fish should be fully investigated.

Family XV. ARIIDAE

61. *Arius dussumieri* (Valenciennes)

Vernacular name : Kannada; *Mungam shede*; Malayalam : *Valiaethah*; Marathi : *Magarushedde*; Tamil : *Mandaikaliru*, *Keluthy*; Telugu : *Jeddingella*, *Nellahjella*, *Thogadam*.

Common English name : *Dussumier's catfish*, *Black-tip sea catfish*.

Status : Vulnerable.

Purse seine operation along the coasts of Goa, Karnataka and Kerala and destruction of male brood carriers has lead to recruitment overfishing (Silas, *et al.*, 1980; James *et al.*, 1989).

Taxonomic status : *Arius nella* (Valenciennes) of Day (1877). The name *Tachysurus* Lacepede, 1803, is inadmissible as the type (*T. sinensis* Lacepede is based on a painting and hence unidentifiable).

Salient features : D. 1/7; A. IV-V/10-11; P. I/12; V. I/5.

Body elongate, head depressed. Supra-occipital process wide, as long as broad at base and extends to basal plate, basal plate before dorsal fin, narrow and S-shaped.

Teeth : Pre-maxillary band of teeth 3 times as long as broad, teeth on palate in 2 patches on each side arranged in a longitudinal series, vomerine patch small, palatine large, elliptical.

Barbels : 3 pairs around mouth extending to pectoral base or slightly beyond.

Colour : Bluish-black on dorsal surface and side, dull white below, fin tips edged with black.

Habitat : Marine, coastal, down to 50 m depth.

Maximum size : 56 cm TL.

Biology : Feeds mainly on invertebrates and small fishes; detailed studies of fecundity, maturity, breeding and buccal incubation have been carried out by Muthiah and Syda Rao (1985).

Protective measures taken : None.

Recommendations

1. Regulation and control of purse seiners along the coastal waters.
2. Purse seine fishermen should be educated to identify shoaling cat fishes before encircling operation is carried out to avoid fishing catfishes with incubating eggs.
3. Mesh regulation and restriction of the size of the species in the fishery.

62. *Arius sona* (Hamilton)

Vernacular name : Telugu : *Jellalu*; Marathi : *Sonatengra*, *Shingala*.

Common English name : *Husky Catfish*.

Status : Vulnerable.

Purse seine operation along the coasts especially of Bombay during the breeding season, September-October, and destruction of male brood carriers. (Silas *et al.*, 1980; James *et al.*, 1989).

Taxonomic status : *Pimelodus sona* of Hamilton (1822); Day (1877) assigned it to *Arius*, Munro (1955) to *Hexanematichthys*, and Misra (1976) to *Tachysurus*.

Salient features : D. I/7; A. VI/10-11; P. I/12; V. I/5; C. 17.

Body elongate; head broad and depressed. Supra-occipital process wide or wider at its base than long, convex at its posterior extremity, basal plate before dorsal fin narrow, S-shaped.

Teeth : Pre-maxillary band villiform, continuous, 6 times as broad as long. teeth on palate villiform in two patches.

Barbels : 3 pairs around mouth.

Colour : Brownish above, dashed with gold on sides, dull whitish below, fins with bluish black-tinge, glossed with purplish yellow.

Habitat : Marine coastal waters, enters into estuaries and tidal rivers.

Maximum size : 92 cm TL.

Biology : Feeds mainly on invertebrates and small fishes. The intensity of feeding is high during Sept.-Feb. coinciding with its post-spawning period (Singh and Rege, 1970). Breeds once a year, Sept-Jan.

Protective measures taken : None.

Recommendations

1. Regulation and control of purse seine operation.
2. Purse seine fishermen should be educated to identify catfish shoals from other shoaling fishes before encircling operation is carried out to avoid fishing catfishes with incubating eggs.
3. Mesh regulation and restriction of size of the species in the fishery.

63. *Arius thalassinus* (Ruppell)

Vernacular names : Kannada : *Mogarushedde*; Malayalam : *Valiaettah*; Marathi : *Shingala*; Telugu : *Thogadam*; Tamil : *Mandai-kaliru*.

Common English name : *Giant marine catfish*.

Status : Vulnerable.

Purse-seine operation along the coasts especially of Bombay during the breeding season, Sept. Oct. and destruction of male brood carriers (Silas *et al.*, 1980; James *et al.*, 1989).

Taxonomic status : *A. serratus* Day represents the juvenile of *A. thalassinus* (Jayaram & Dhanze, 1978).

Salient features: D. I/7; A. III-V/12-13; P. I/12; V. I/5.

Body elongate and robust; snout rather obtuse; dorsal profile before dorsal fin nearly straight and somewhat steep. Supra-occipital process narrow, longer than broad at its base, median longitudinal groove short, not reaching base of supraoccipital process.

Teeth : Palatine teeth in 3 patches on each side, forming a triangle, posterior patch longest, patches, usually fused.

Barbels : 3 pairs, maxillary reaching pectoral base.

Habitat : Coastal waters down to about 100 m often found in and around estuaries.

Maximum size : 185 cm TL.

Biology : Feeds mainly on crabs, prawns, *Squilla*, small fishes and molluscs. Biology of this species has been discussed by Menon and Muthiah (1987).

Protective measures taken : None.

Recommendations

1. Regulation and control of purse seiners along the coastal and estuarine waters.
2. Purse seine fishermen should be educated to identify catfish shoals from other

shoaling fishes before encircling operation is carried out to avoid fishing catfishes with incubating eggs.

3. Mesh regulation and restriction of size of the species in the fishery.

64. *Arius tenuispinis* (Day)

Vernacular name : Marathi : *Shingala*.

Common English name : *Thinspine sea catfish*.

Status : Vulnerable.

Purse seine operation along the coast of Maharashtra, Karnataka and Andhra-Orissa and destruction of male brood carriers (Silas *et al.*, 1980; James *et al.*, 1989).

Taxonomic status : *Arius satparanus* Choudhuri (1916) is a synonym of this species.

Salient features : D. I/7; A. V/13; P. I/10; V. I/5.

Body robust and elongate. Head depressed, the snout highly depressed and angular. Supra-occipital process 4 times as long as broad, basal plate before dorsal fin small, V-shaped. Median fontanelle groove on top of head reaching base of supra-occipital process.

Teeth : Palatine teeth villiform along outer margin, globular along inner margin, in a single elliptical shoe-shape large patch on each side, placed far back on buccal cavity.

Colour : Cement-grey on the dorsal surface of head and upper half of body, merging to silvery to silvery-grey on belly; tips of dorsal, pectoral and caudal fins dark.

Habitat : Marine coastal waters to 50 m depth.

Maximum size : 36 cm TL.

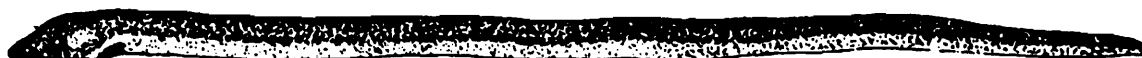
Biology : Feeds mainly on invertebrates and small fishes. Biology of this species has been discussed by Menon and Muthiah (1987).

Protective measures taken : None

Recommendations

1. Regulation and control of purse-seine operations along coastal waters.
2. Purse seine fishermen should be educated to identify catfish shoals from other shoaling fishes before encircling is carried out to avoid fishing catfishes with incubating eggs.
3. Mesh regulation and restriction of the size of the species in the fishery.

Family XVI. SYNBRANCHIDAE

65. *Monopterus fossorius* (Nair)
(Fig. 57)

Vernacular names : None.

Status : Rare.

Found only in slushy mud at two to three feet down in the fields adjoining the Karamanai river near Karamanai village, Trivandrum. Any reclamation for urbanisation of the area may result in the extirpation of this fish.

Taxonomic status : Originally described as *Amphipnous fossorius* (Amphipnoidae), Rosen and Greenwood (1976) placed Amphipnoidae in the synonymy of Synbranchidae.

Salient features : Body eel-like and robust, not whiplike. Head conspicuous from rest of body; snout rather pointed. Eyes very small, covered by skin. Gill opening crescentic, divided into a pair of pore-like, lateral apertures by a broad midventral fusion between branchiostegal membrane and isthmus; gills greatly reduced. Skin of branchial region of ventral sides of head drawn into deep longitudinal pores.

Fins : Dorsal and anal (fin folds) very narrow; dorsal fin commences from a point midway between the anus and the posterior tip of the body and posteriorly it is confluent with the anal fin. Anal fin reaches forward, only half the length of dorsal; the fins are devoid of fin rays. The fish thus is adapted to a burrowing mode of life.

Scales : The body is covered over by minute cycloid scales which are arranged in distinct longitudinal rows. A distinct lateral line extends from head to posterior tip of the body.

Vertebrae : There are 126-129 vertebrae of which 73 are precaudal and 53-56 caudal.

Colour : Reddish brown and deep red towards ventral side.

Habitat : Marshy areas in paddy fields and banana plantations at about two to three feet depth. The fish has abandoned its aquatic habitat and taken to a burrowing mode of life.

Maximum size : 23 cm TL.

Biology : The air breathing organs consist of a pair of air-sacs one on either side of neck region. Air is taken in through the mouth and used air expelled through the

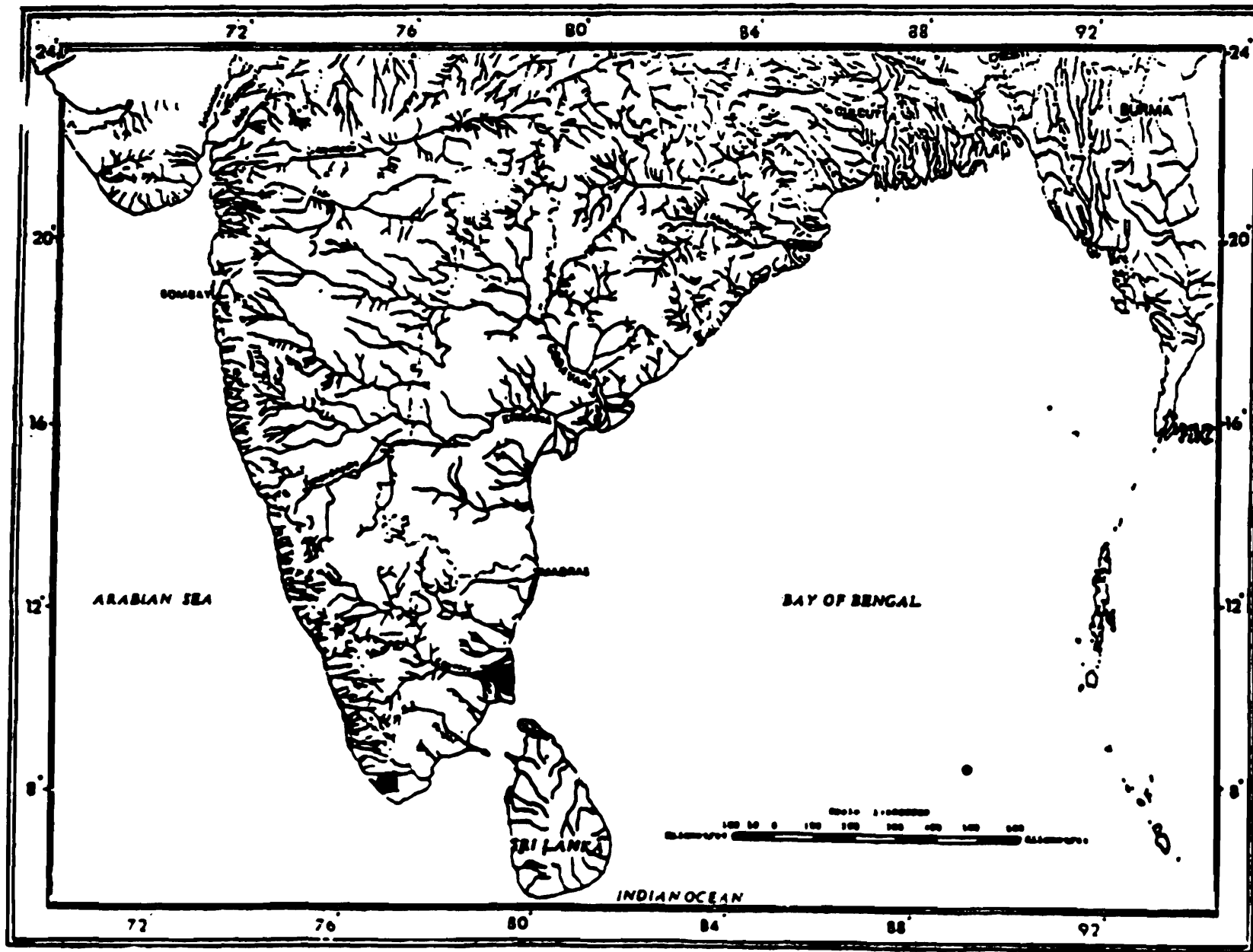


Fig. 57 : Distribution of *Monopterus fassorius*, a rarely found in specious slushy mud near Trivandrum. Reclamation of area may result in extirpation of this species.

ventral gill opening (Das, 1927). When fish burrows deeper where there is lack of oxygen probably the skin acts as a accessory organ of respiration.

Protective measures taken : None.

Recommendations

1. A natural history reserve should be set up near Karamanai, Trivandrum for the protection of this species.
2. A study of ecology, life history and population structure should be undertaken.

Family XVII. PLATYCEPHALIDAE

66. *Grammoplites suppositus* (Troschel)

Vernacular names : Nil.

Common English name : *Soft fin flathead*.

Status : Vulnerable.

Trawl catch has been steadily declining along south-west coast due to indiscriminate exploitation and mass destruction of spawners and juveniles by coastal trawlers.

Taxonomic status : All species belonging to family Platycephalidae were formerly kept in the genus *Platycephalus*, but recent workers recognise 22 distinct genera (Nelson, 1984). *Platycephalus maculipinna* Regan, is synonymous with *G. suppositus* (Troschel) (*vide*, Knapp, 1984).

Salient features : D. I/VIII/12; A. 13; P. 21-23; V. I/5; L. 1. 51-55, GR. 1 + 8.

Body robust and sub-cylindrical; head depressed; supra-orbital and sub-orbital ridge bearing larger spines. Pre-opercular spines 3, the lower two small the upper one long, reaching beyond margin of opercular membrane.

Scales : Backwardly directed spines on lateral series of pored scales, scale rows slanting downward and backward above lateral line, about the same as the number of pored lateral line scales.

Colour : Brownish above, whitish below, fins more or less dusky; first dorsal fin with a large black blotch posteriorly; upper pectoral rays, upper caudal rays and second dorsal rays with dark spots.

Habitat : A benthic fish found on sand or mud bottom of the continental shelf at depths from 45 to 94 m.

Maximum size : 25 cm TL.

Biology : Not much known.

Protective measures taken : Nil.

Recommendations

1. Restriction and control of operation of mechanised trawlers of coastal areas.
2. Population studies of the species should be initiated.

Family XVIII. LACTARIIDAE

67. *Lactarius lactarius* (Schneider)

Vernacular names : Gujarati : *Dangri*; Kannada : *Saundala*; Marathi : *Saundala*, *Perivi*; Malayalam : *Parava*; Tamil : *Suthumbu*; Telugu : *Kuthuppu*.

Common English name : *False trevally white fish*.

Status : Vulnerable.

Catches steadily declining along the south-east and south-west coasts of India due to over exploitation by modern fishing techniques especially trawling. The fishery has assumed importance from late fifties and reached a peak of 25, 334 t in 1985. Since then there has been a steady decline reaching 6685 t in 1986. The decline is marked in south-west coast. The production which stood at 62.4 t in 1970 had fallen to 0.1 t in 1979 (Luther, 1982).

Taxonomic status : Schneider (1801) described the species as *Scomber lactarius*; Day (1876) as *Lactarius delicatulus*. Only one genus *Lactarius* with one species in Indian waters.

Salient features : D. VII-VIII/I/20-22; A. III/25-28; P. 17; V. I/5; L. I. 62-78; GR. 16-21.

Body oblong and strongly compressed; head large, subequal to height of body; mouth large and oblique, with a prominent lower jaw, maxilla reaching to posterior third of eye; one pair of small sharp canines at front of each jaw.

Fins : Dorsal fins separate, pectoral fins long and pointed, pelvic fins just below pectoral fin bases, half as long as the pectorals, anal fin base longer than that of second dorsal fin, caudal fin forked.

Scales : Soft rayed portion of dorsal and anal fins covered with scales; all scales easily shed.

Colour : Silvery grey with a blue iridescence above, silvery white below, a dusky spot on upper part of gill cover; fins all pale yellow, dorsal and caudal fin sometimes with dusky margins.

Habitat : Shallow coastal waters of sandy bottom up to 100 m depth.

Maximum size : 35 cm TL., 520 gms.

Biology : Feeds on a range of bottom-living animals.

Protective measures taken : Nil.

Recommendations

1. Restriction of mechanised trawling of coastal waters.
2. Use of vertical high opening trawl nets in order to avoid destruction of juveniles of the species.

Family XIX. HAEMULIDAE

68. *Pomadasys argenteus* (Forsskal)

Vernacular names : Marathi : *Karkara*; Malayalam : *Karukaruppan*; Telugu : *Karuppi*; Tamil : *Ghorakkan*.

Common English name : *Silver grunt*.

Status : Vulnerable.

“Karkara” fishery has dwindled very much along the Bombay-Gujarat coast mainly through over exploitation by trawling the coastal waters.

Taxonomic status : *Pomadasys argenteus* (Forsskal, 1775) is a senior synonym of *Pomadasys hasta* (Bloch, 1790) (McKay, 1984).

Salient features : D. XII-XIII/13-15; A. III/7-8; P. 16-17; V. I/5; L. 1. 45.

Body oblong and compressed; head blunt, its upper profile convex; mouth small; maxilla reaching to eye.

Scales : Ctenoid, 5 scale rows between lateral line and dorsal fin origin.

Colour : In juveniles, body pale brownish, lighter below, back with irregular longitudinal streaks on alternate scale rows; dorsals fin with dusky membrane; a dark spot on gill cover. In adults, body silvery with dark blotches on dorsal fin and numerous scattered dark brown to blackish spots on body.

Habitat : Coastal waters, to depths of 60 m.

Maximum size : 52 cm TL.

Biology : Not much known.

Protective measures taken : Nil.

Recommendations

Control of shore-seine and barrier-nets in the inshore waters of Maharashtra to prevent the destruction of juveniles.

Family XX. SCIAENIDAE

69. *Otolithoides biauritus* (Cantor)

Vernacular names : Marathi and Gujarati : *Koth*.

Common English name : *Bronze-croaker*.

Status : Vulnerable.

The catch along the Gujarat and Maharashtra coast has steadily dwindled due to indiscriminate exploitation and destruction of spawners and juveniles from the breeding ground by coastal trawlers (*vide*, Rao 1973).

Taxonomic status : *Otolithus brunneus* Day 1873 is a junior synonym of *Otolithus biauritus* Cantor, 1850.

Salient features : D. VIII-IX/1/27-32; A. II/7-8; P. 17; V. I/5; L. I. 50-60; Lower GR. 10-11.

A large species with an acute snout. Mouth terminal, teeth strong and spaced in both jaws, with one upper pair enlarged as canine.

Fins : Two dorsal fins, separated by a low notch; pectoral fins moderately long. Caudal fin acutely pointed.

Scales : Cycloid on head and upper part of front of body, elsewhere finely ctenoid.

Colour : Head and back green/grey, flanks gold/orange, paler toward belly, minutely dotted with brown, lateral line golden yellow; dorsal, anal and caudal fins brown/yellow to pale orange, pelvic fins pale orange, pectoral fins brown with a black spot at base.

Habitat : Coastal and inshore waters.

Maximum size : 160 cm TL.

Biology : Feeds on small fishes and invertebrates.

Protective measures taken : None.

Recommendations

1. Restriction and control of intensive mechanised trawling of coastal areas.
2. Mesh size of cod end of trawls should be regulated.
3. Encourage use of vertical high opening trawl nets in the middle and outer shelf regions.

70. *Protonibea diacanthus* (Lacepede)

Vernacular names : Gujarati and Marathi : *Ghol*; Kannada : *Balde, Gholi*; Malayalam : *Kora*; Tamil : *Koorai*; Telugu : *Nella-katchels*.

Common English name : *Spotted croacker*.

Status : Vulnerable.

The catch along the Gujarat and Maharashtra coast has steadily declined due to indiscriminate exploitation of the spawners and juveniles from the breeding ground by coastal trawlers. (*vide*, Rao 1973).

Taxonomic status : Lacepede (1802) described it as *Lutjanus diacanthus*; various generic and specific names were used by later workers (Lal Mohan 1984).

Salient features : D. IX-X/22-25; A. II/7; P. 17-18; V. I/5; L. 1. 51-52; lower GR 7-8.

A large rather slender species, snout acute, mouth large, terminal and horizontal. Teeth villiform, inner row enlarged and spaced, but no canines.

Fins : Pectoral fins small, caudal rhomboid.

Colour : 5 dark bars along back and many small black spots on top of head, upper half of body and caudal fin; pectoral, pelvic, anal and lower part of caudal fin black. In larger specimens bars and spots absent.

Scales : Cycloid on snout and below eyes; elsewhere ctenoid.

Swimbladder : Carrot shaped with 16 to 20 pairs of arborescent appendages.

Habitat : Coastal waters, above muddy grounds, down 60 m depth.

Maximum size : 120 cm TL.

Biology : Feeds mainly on crustaceans and small fishes. Spawning occurs during June to August.

Protective measures taken : None.

Recommendations

1. Restriction and control of intensive mechanised trawling of coastal waters.
2. Mesh size of cod end of trawlers should be regulated.
3. Encourage use of vertical high opening trawl nets in the middle and outer shelf areas.

Family XXI. POLYNEMIDAE

71. *Polydactylus indicus* (Shaw)

Vernacular names : Gujarati : *Dara, Dabha*; Kannada : *Ramas*; Malayalam : *Yeta*; Marathi : *Dara, Chelna*; Tamil : *Tahlunkala*; Telugu : *Maga-booshe*.

Common English name : *Giant threadfin*.

Status : Vulnerable.

The impressive fishery of "Dara" of the fifties of Gujarat-Maharashtra coast when the trawling was started has dwindled during the sixties and has become rare in trawl catches of the eighties (Kagwade, 1973, 1989).

Taxonomic status : Three genera, *Eleutheronema*, *Polydactylus* and *Polynemus* with about 9 species in Indian coastal waters.

Salient features : D. VIII/13-14; A. II-III/11-12; P. 15 + 15; V. I/5; L. I. 70-75; lower GR. 16.

Body oblong, somewhat compressed; snout projecting, mouth large, with small teeth.

Fins : Two widely separated dorsal fins; pectoral fins inserted low, divided into two parts, upper pectoral rays mostly branched; lower part with 5 free filamentous rays, the upper one is the largest reaching to anal fin origin; caudal fin deeply lunate, with pointed lobes ending in filaments.

Colour : Golden-olive, dark above, with faint dusky lines along sides of body; fins yellowish.

Habitat : Shallow coastal waters over muddy and sandy bottoms of the continental shelf, occasionally entering rivers, rare beyond depths of 60 m.

Maximum size : 142 cm TL.

Biology : Feeds mainly on small bottom living crustaceans, especially prawns and crabs, and small fishes (Karekar and Bal, 1958). Sexes are separate, but sometimes exhibiting hermaphroditism (Kagwade, 1970). Maturity attained at 80 cm length (Karekar and Bal, 1960). Spawning takes place throughout the year with two peak periods during April-June and Oct.-Dec. (Nayak, 1959 a). See Kuthalingam (1960) for details of embryonic and larval development.

Protective measures taken : None.

Recommendations

Restriction and control of trawling of coastal waters to prevent indiscriminate exploitation and mass destruction of spawners and juveniles from the feeding and breeding grounds.

72. *Polydactylus heptadactylus* (Cuvier)

Vernacular names : Gujarati : *Shiri*; Tamil : *Ma-kala*; Marathi : *Shende*; Telugu : *Maga*; Kannada : *Shendya-rawas*; Malayalam : *Bameen*.

Common English name : *Seven threadfin*.

Status : Vulnerable.

Steady decline in trawl catches along the north-west coast of India (Kagwade, 1989).

Taxonomic status : Day (1878) described the species as *Polynemus heptadactylus*.

Salient features : D. VIII/I/11-13; A. III/11-12; P. 12-14 + 7; V. I/5; L. 1. 48-50.

Body oblong and somewhat compressed, snout projecting, mouth large with small teeth.

Fins : Pectoral fin in two parts, upper part with all unbranched rays and lower part with 7 free filamentous rays, of which 3rd, 4th and 5th are largest and reaching to anal fin origin.

Colour : Brown above, flanks golden; pectoral fin black, other fins with dark margin; no black shoulder blotch (fishes from Bombay sometimes have a distinct shoulder blotch).

Habitat : Shallow coastal waters over muddy bottom and also enters brackish waters.

Maximum size : 27 cm TL.

Biology : Feeds mainly on crustaceans, especially prawns, fishes and other bottom living organisms, maturation at about 13 cm size. Sexes separate, but hermaphrodite individuals not uncommon (Nayak, 1959 b). Spawns twice a year with two peak periods during March-June and August-November. Nothing known regarding larval development (Kagwade, 1970).

Protective measures taken : None.

Recommendations

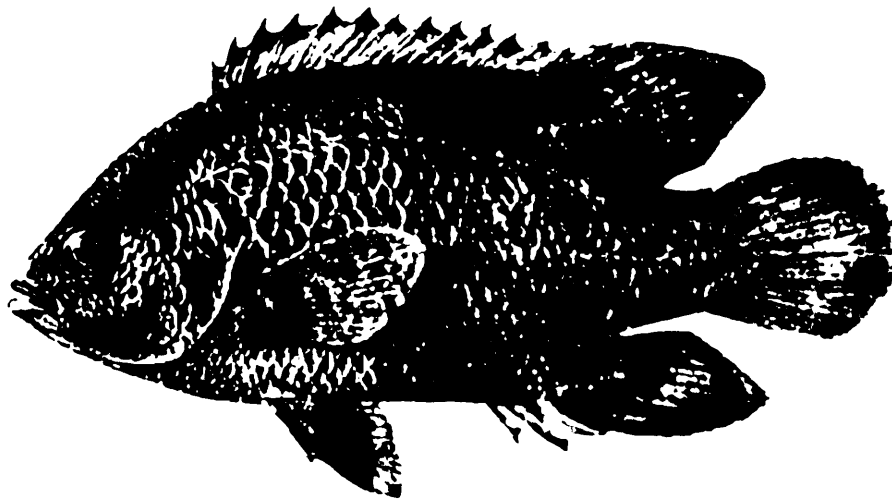
Restriction and control of trawling of coastal waters to prevent indiscriminate exploitation and mass destruction of spawners and juveniles.

Family XXII. NANDIDAE

73. *Pristolepis fasciatus* (Bleeker)
(Fig. 58)

Vernacular names : None.

Status : Rare.



Although common in Thailand in rivers, lakes and swamps and its range extend to Indo-China, Burma, Malaya and some parts of the East India islands, this species was collected from India only once from Vembanad lake, Alleppy, Travancore, by Pillay (1929); John (1936) recorded *P. malabaricus* Day from the coasts of Kuttanad but did not collect *P. fasciatus* there. No specimen of *P. fasciatus* has since been reported from India. Probably the habit of the fish living close to the banks hiding beneath overgrowth of vegetation is responsible for the fish not being caught in the fishermen's cast net.

Day (1878) recorded three species, *P. marginatus* Jerdon from Wynaad, *P. malabaricus* Gunther from Western Ghats of Malabar and *P. fasciatus* Bleeker from Burma. Hora and Law (1946) gave its distribution as : Travancore, Burma, Siam, Malay Archipelago and Cochin China. They also did not collect any specimen from India but only made a mention of its occurrence in Travancore. Further search is, therefore, needed to confirm the existence of the fish in the coastal areas of Kerala.

Taxonomic status : *P. fasciatus* is closely related to *P. marginatus* (= *P. malabaricus*), the main difference between the species being number of dorsal rays, 12-13 spines in *P. fasciatus*, 14-16 in the case of *P. marginatus*. From the wide range of *P. fasciatus* in the South eastern Asia and its occurrence in Peninsular India it would seem that *P. marginatus* in the Peninsula have diverged from a *P. fasciatus*-like form.

Salient features : D. XII-XIII/14-15; P. 15; V. 6; A. III/3; C 14; L. 1. 26-28; L. tr. 4½ / 12.

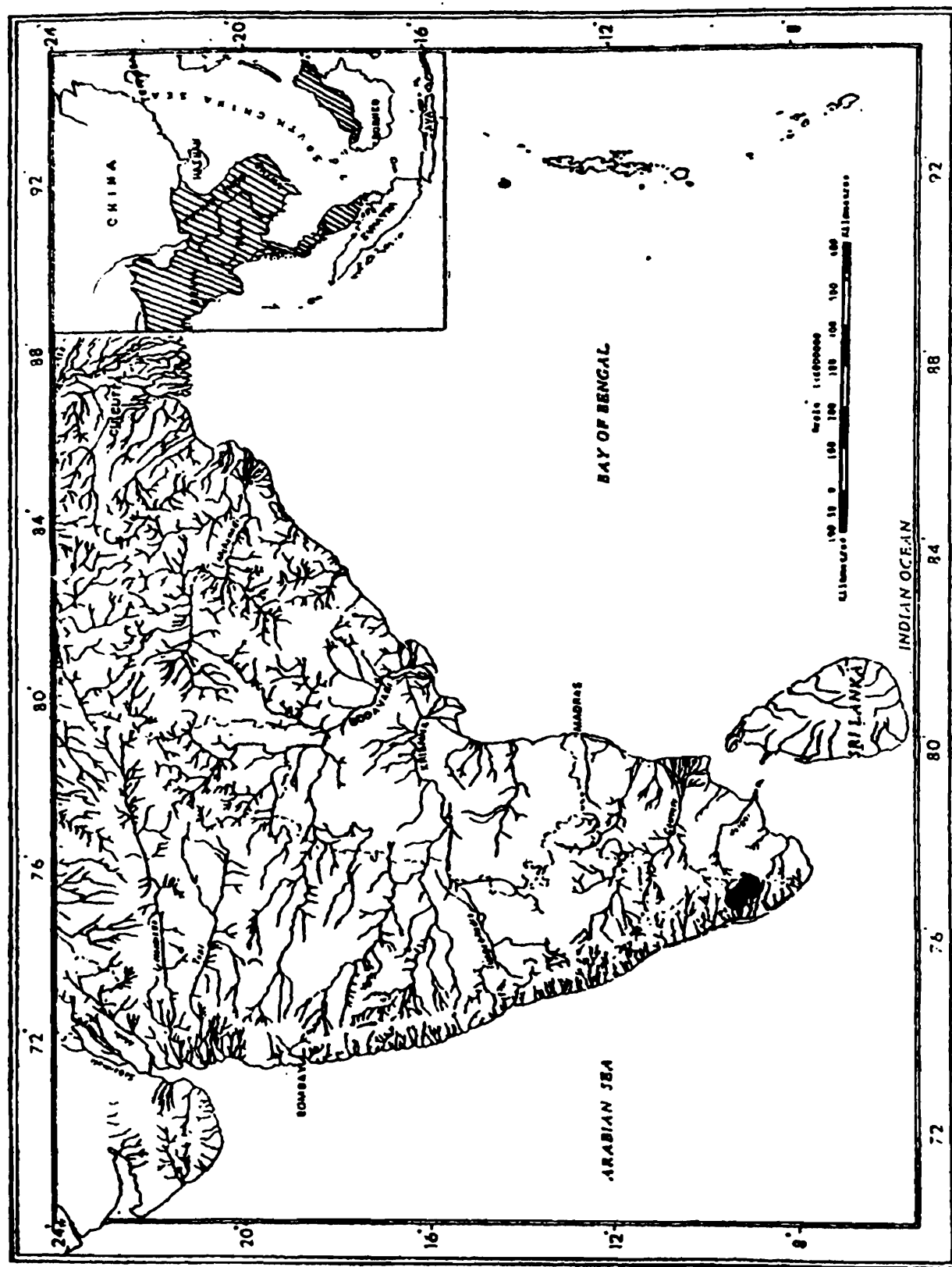


Fig. 58. Distribution of *Pristolepis fasciatus*. Fresh search for it near Vembanad Lake, Kerala, is needed.

Body thick set, very deep and compressed. Mouth moderate, teeth villiform on jaws and palates, globular in vomer.

Barbels : Absent.

Fins : Dorsal spines strong, inter-spinous membrane deeply emarginate, central rays the longest; second anal spine the strongest but not so long as third; caudal rounded.

Scales : L. 1 interrupted opposite to the posterior end of the dorsal fin, being continued on the 3rd row of scales below it; 4 rows of scales between the lateral line and base of the anal fin; 16-17 between the ventral and base of dorsal.

Colour : Dull greyish, having a deep black spot in the axilla and over the upper part of the base of pectoral fin; the pectoral fin is yellowish, the other fins are slate coloured. Young with 8-12 blackish cross bands on the body.

Habitat : In rivers, lakes, swamps and ponds.

Maximum size : 20 cm TL.

Biology : Unknown.

Protective measures taken : None.

Recommendations

1. The occurrence of the species near Vembanad lake should be monitored.
2. Distribution and identification information should be made available to concerned agencies.

Family XXIII. CICHLIDAE

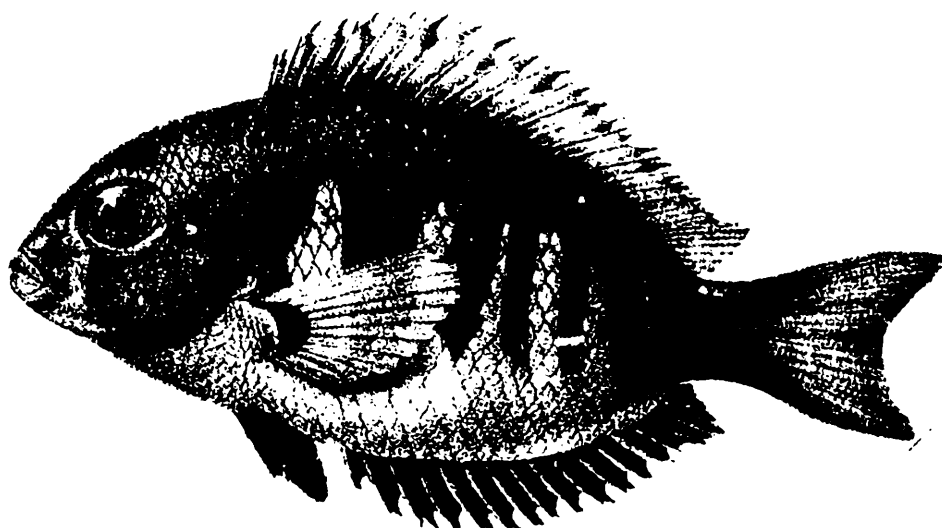
74. *Eetroplus canarensis* (Day) (Fig. 59)

Vernacular names : Nil.

Status : Endangered.

First collected in South Canara (Day, 1878); it has not been collected since. Recently in January 1992, three examples were collected from River Kumaradhara at Kalikai, South of Kaikamba and one example from river Kumaradhara near Pullikkayam, Uppinangudi, both in Dakshin Kannada, by the author. The Dakshin Kannada population is ruthlessly exploited today by local people for food and the fish has become a rarity.

Taxonomic status : The genus *Eetroplus* C. & V. is represented in India by 3 species of which *E. suratensis* and *E. maculatus* are widely distributed in Peninsular India and



Sri Lanka, whereas *E. canarensis* is endemic to Dakshin Kannada, Karnataka. The latter species can be easily distinguished from the other two species by 7-8 vertical dark bands extending to $\frac{3}{4}$ ths along the side of the body (In *E. suratensis* the bands are oblique with white spots; in *E. maculatus* there are one to three spots along the sides).

Salient features : D. XXI-XXII/7-8; P. 15; V. 6; A. XIV-XV/6-7; C. 16; L. 1. 30-31; L. tr. $5\frac{1}{2}$ -6.

Body deep and compressed; eyes large. Mouth small; teeth villiform in 2 or 3 rows in jaws.

Barbels : None.

Fins : Dorsal spine moderately strong increasing in length to the fifth, from where they continue of about equal length. Soft dorsal and anal pointed; pectoral reaching to above first few anal spines; caudal emarginate. In *E. canarensis* the number of dorsal and anal spines are more than in the other two species (in *E. maculatus* dorsal spines 17-20; in *E. suratensis* it is 18-19).

Scales : Scales very finely ctenoid; lateral line continued to 15-25 scales from whence it either ceases or exists only as small open pores.

Colour : Yellowish-buff with about 8 vertical blackish, slate coloured bands, each scale being darkest at its base and some having a light yellow spot. Dorsal and caudal greenish; pectoral yellowish with a black base. Ventral and anal black.

Habitat : In freshwaters of shallow areas of rivers, streams and also in ponds and ditches; does not descend to saline environment.

Maximum size : 9.6 cm TL.

Biology : Unknown.

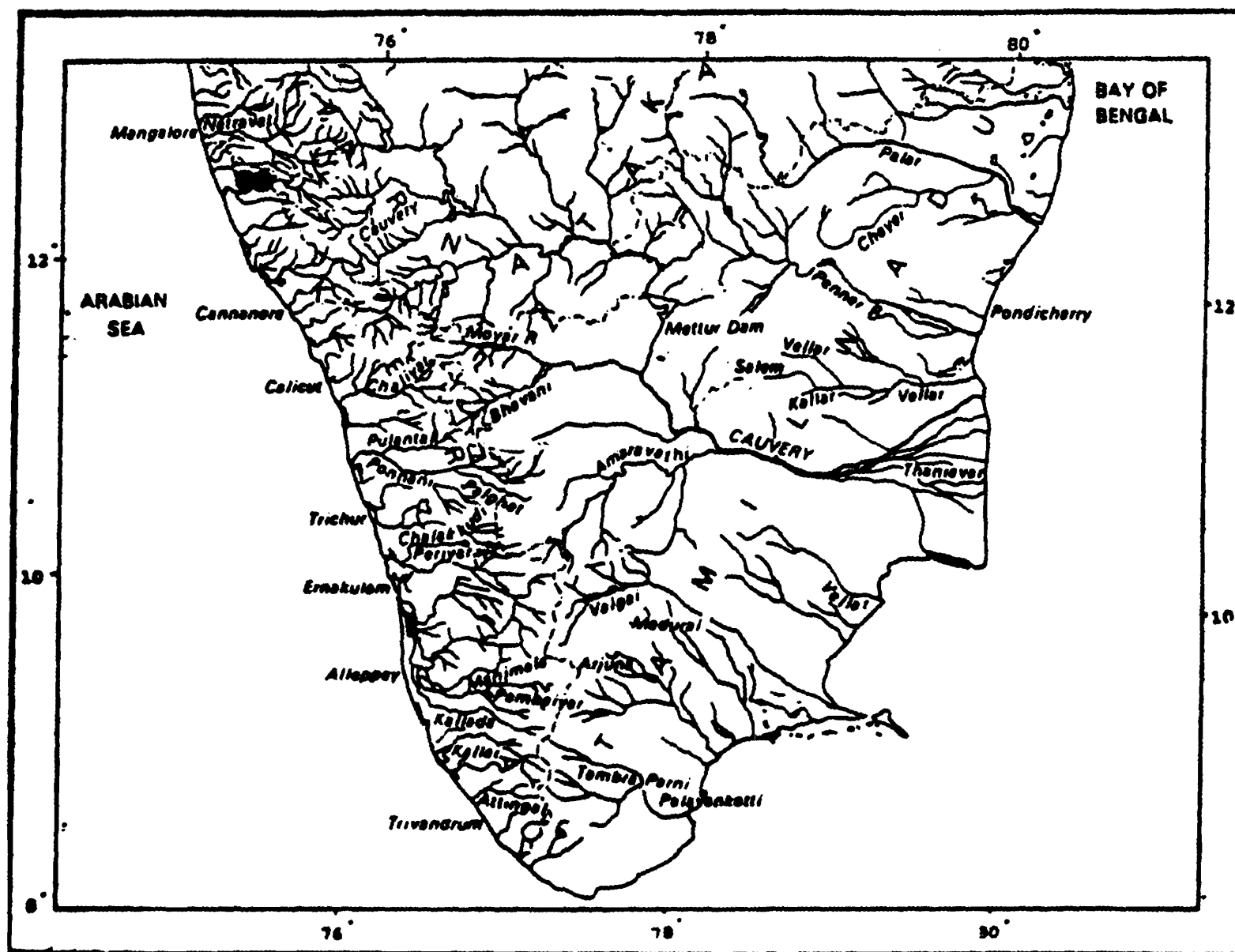


Fig. 59 : Distribution of *Etroplus canarensis*. Overfishing probably lead to the decline in numbers of the Dakshin Kannada species of *Etroplus*.

Protective measures taken : None.

Recommendations

1. Survey should be conducted in the Kumaradhara river to locate the surviving population, spawning areas, and nursery grounds of young.
2. Over exploitation by local fishermen should be stopped.
3. Identification and information pamphlets should be circulated among the agencies concerned.

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INDEX

- Accrossocheilus* 24
acutirostris, *Pseudeutropius* 126
Amblycipitidae 130
Amblyceps 132
 laticeps 130
Amphipnoidae 144
Amphipnous 144
 fossorius 144
argenteus, *Pomadasy* 148
Ariidae 140
Arius 141
 dussumieri 140
 nella 140
 satparanus 143
 serratus 142
 sona 141
 tenuispinis 143
 thalasinus 142
Bagarius 132
 bagarius 132
 buchanani 132
 yarrelli 132
Bagridae 118
bakeri, *Barilius* 12
bakeri, *Osteobrama* 47
bakeri, *Rohtee* 41
Barbodes 53
 bovanicus 50, 53
 carnaticus 52
Barbus 40, 83
 kolus 67
micropogon, *Periyarensis* 74
 musullah 67, 72
 tor 40
 wyanadensis 26, 28
Barilius 15
 bakeri 12
 bola 14, 15
 canarensis 10
 malabaricus 10
 radiolatus 12
Batasio 120
 travancoria 118
belangeri, *Osteobrama* 43
berdmorei, *Cochinchinensis* 124
biauritus, *Otolithoides* 149
biauritus, *Otolithus* 149
bola, *Barilius* 14, 15
bola, *Raiamas* 15
bovanicus, *Barbodes* 50, 53
brachysoma, *Pseudobagrus* 121
brunneus, *Otolithus* 149
buchanani, *Bagarius* 132
 canarensis, *Barilius* 10
 canarensis, *Eetroplus* 155
 carnaticus, *Barbodes* 52
 caverii, *Rasbora* 17
Chagunius 83
Chagunius chagunio 55, 83
chagunio, *Chagunius* 55, 83
cheilynoides, *Naziritor* 22
chitala, *Notopterus* 8
chryseus, *Pseudobagrus* 121
Cichlidae 155
cinereus, *Muraenesox* 4
Cirrhinus 97
 cirrhosus 97
cirrhosus, *Cirrhinus* 97
Clariidae 137
clavatus, *Poropuntius* 83
Clupea 6
 ilisha 6
Clupeidae 6
Clupeodon 6
Cobitidae 115
cochinchinesis, *Silurus* 124
Conger 5
Congridae 5
Congresox 5
 talabanoides 5

- curvifrons*, *Schizothorax* 86, 88, 92, 93
Cyprinion 95
semiplotus 95
Cyprinidae 10
Cyprinion 95
Cyprinus 15
chagunio 55
mosal 40
putitora 40
tor 40

daniconius, *Rasbora* 17, 19
delicatulus, *Lactarius* 147
dero, *Labeo* 99, 111
diacanthus, *Lutjanus* 150
diacanthus, *Protonibea* 150
diplostomus, *Labeo* 100
dobsoni, *Hypselobarbus* 59, 66, 77
dubius, *Hypselobarbus* 62, 66, 71
dussumieri, *Arius* 140
dussumieri, *Labeo* 102
dyocheilus, *Labeo* 111

Eechathalakenda 57
ophicephala 57
Eleutheronema 151
Enobarbichthys 115
maculatus 115
Etroplus 155
canarensis 155, 156
maculatus 156
suratensis 156

fasciatus, *Pristolepis* 153
fossorius, *Amphipnous* 144
fossorius, *Monopterus* 144

Grammoplites 146
suppositus 146
Gagata 135
itchkeea 135
Gonoproktopterus 67
guttatus, *Raiamas* 15

Haemulidae 148
hasta, *pomadasys* 148
heptadactylus, *Polynemus* 152
heterorhynchus, *Schismatorhynchus* 113

hexagonolepis, *Neolissochilus* 24
Hexanematichthys 141
Hilsa 6
ilisha 6
(Tenuulosa) *ilisha* 6
kelle 6
Horobagrur 121
Horaglanis 137
krishnai 137, 138
hugelii, *Schizothorax* 88
Hypselobarbus 28, 57, 67, 72, 79, 83
dobsoni 59, 66, 77
dubius 62, 66, 71
jerdoni 60, 64, 77
lithopidos 66, 79
micropogon 62, 69, 74
mussullah 71
periyarensis 74
pulchellus 66, 76
thomasi 79

ilisha, *Hilsa* 6
ilisha, *Tenuulosa* 6
ilisha (Tenuulosa) *Hilsa* 6, 7
indicus, *polycdctylus* 151
itchkeea, *Gagata* 135

Jerdonia 116
maculatus 116
jerdoni, *Hypselobarbus* 60, 64, 77

kelee, *Hilsa* 6
khavalchor, *Neotropius* 126
khudree, *Tor* 29, 31, 33
kolus, *Barbus* 67
kontius, *Labeo* 104, 109
krishnai, *Horaglanis* 137, 138
kulkarnii, *Tor* 31, 33

Labeo 97, 113
dero 99, 111
diplostomus 100
dussumieri 102
dyocheilus 111
kontius 104, 109
pangusia 100, 111
procellus 106, 108

- porcellus lankae* 108
potail 104, 108
 Lactaridae 147
Lactarius 160, 147
lactarius 147
delicatulus 147
 Lamnoidei 3
laticeps, Amblyceps 132
laticeps, Olyra 132
Lepidocephalus 116
Lepidopygopsis 86
typus 83
Lissochilus 24
lithopidos, Hypselobarbus 66, 79
longicaudata, Olyra 132
luridus, Pachypterus 133
Lutjanus diacanthus 150
maculatus, Enobarbichthys 115
maculatus, Etroplus 155
maculatus, Jerdonia 116
maculatus, Platacanthus 116
maculipinna, Platycephalus 146
malabaricus, Barilius 10
malabaricus, Pristolepis 153
marginatus, Pristolepis 153
micropogon, Hypselobarbus 62, 69, 74
micropogon, Renyarensis 74
Monopterus 144
fossorius 144
mosal, Cyprinus 40
 Muraenesocidae 2
Muraenesox 4, 5
cinereus 4
mussullah, Barbus 67, 72
mussullah, Hypselobarbus 71
Mystacoleucus 48
Mystus 8
 Nandidae 153
Nangra 135
Naziritor 22
cheilynoides 22
Neolissochilus 24, 28
hexagonolepis 24
wynadensis 26
nasus, Schizothorax 90
neilli, Osteobrama 45
neilli, Rohtee 47
nella, Arius 140
Neotropius 126
khavalchor 126
niger, Schizothorax 92
 Notopteridae 8
Notopterus 8
chitala 8
notopterus 8
nakta, Schismatorlynchus 113
ogilbii, Rohtee 47, 48
Olyra 132
laticeps 132
longicaudata 132
ophicephala, Eechathalakenda 57
Oreinus 86
Osteobrama 47
bakeri 47
belangeri 43
neilli 45
ogilbii 47
Otolithoides 149
biauritus 149
Otolithus 149
brunneus 149
biauritus 149
Pachypterus 133
luridus 133
 Pangasidae 128
Pangasius 128, 130
pangasius 128
pangusia, Labeo 100, 111
periyarensis, Hypselobarbus 74
Pimelodus 133
sona 141
planifrons, Schizothorax 93
Platacanthus 116
maculatus 116
 Platycephalidae 146
Platycephalus 146

- maculipinna* 146
Polydactylus 151
 indicus 151
 heptadactylus 152
polylepis, *Thynnichthys* 21
Polynemidae 151
Polynemus 151
Pomadasys 148
 argenteus 148
 hasta 148
porcellus, *Labeo* 106, 108
procellus lankae, *Labeo* 108
poropuntius 83
 clavatus 55, 81
potail, *Labeo* 104, 108
Pristolepis 153
 fasciatus 153
 malabaricus 153
 marginatus 153
progeneius, *Tor* 34
Protonibea 150
 diacanthus 150
Pseudeutropius 126
 acutirostris 126
Pseudobagrus 121
 brachysoma 121
 chryseus 121
pulchellus, *Hypsleobarbus* 66, 76
Puntius 52
putitora, *Cyprinus* 40
putitora, *Tor* 36
radiolatus, *Barilius* 12
Raiamas 14, 15
 bola 15
 guttatus 15
Rasbora 17
 caverii 17
 daniconius 17, 19
Rhiniodon 3
 typus 3
Rhiniodontidae 1
Rohtee 41, 43, 47, 48
 bakeri 41
 neilli 47
 ogilbii 47, 48
sandkhol, *Thynnichthys* 19
satparanus, *Arius* 143
Scaphiodonichthys 95
Scaphiodontopsis 95
Schilbeidae 126
Schismatorhynchus 113
 heterorhynchus 113
 nukta 113
Schizothorax 86, 93
 curvifrons 86, 88, 92, 93
 hugelli 88
 nasus 90
 niger 92
 planifrons 93
Sciaenidae 149
Scomber 147
 lactarius 147
Semiplotus 95
semiplotus, *Cyprinion* 95
serratus, *Arius* 142
Siluridae 123
Silurus 124
 berdmorei 124
 cochinchinesis 124
 wynaadensis 123, 124
Sisoridae 132
sona, *Arius* 141
sona, *Pimelodus* 141
suppositus, *Grammoplites* 146
Synbranchidae 144
suratensis, *Etroplus* 156
Tachysurus 140, 141
 sinensis 140
talabanoides, *Congresox* 5
Tenualosa 6
 ilisha 6, 7
tenuispinis, *Arius* 143
thalasinus, *Arius* 142
thomasi, *Hypsleobarbus* 79
Thynnichthys 19
 polylepis 21
 sandkhol 19

thynnoides 21
vaillanti 21
thynnoides, *Thynnichthys* 21
Tor 22, 28, 29, 34, 40, 57, 67, 72
khudree 29, 31, 33
kulkarnii 31, 33
mosal 40
progeneius 34
putitora 36
tor 28, 29
zhobensis 22
tor, *Cyprinus* 40

tor, *Tor* 28, 29, 36, 38
travancoria, *Batasio* 118
typus, *Lepidopygopsis* 83, 86
typus, *Rhiniodon* 3
vaillanti, *Thynnichthys* 21
wynaadensis, *Barbus* 26, 28
wynaadensis, *Neolissochilus* 26
wynaadensis, *Silutus* 123, 124
yarelli, *Bagarius* 132
zhobensis, *Tor* 22