

Miscellaneous Publication

Occasional Paper No. 8

Records of the Zoological Survey of India

**AID TO IDENTIFICATION
OF SILUROIDS
I BAGRIDAE**

by

K. C. JAYARAM

Issued by the Director
Zoological Survey of India, Calcutta

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**AID TO THE IDENTIFICATION OF THE SILUROID FISHES OF
INDIA, BURMA, SRI LANKA, PAKISTAN AND BANGLADESH**

1. BAGRIDAE

BY

K. C. JAYARAM



Edited by the Director, Zoological Survey of India

1977

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PRICE: Inland: Rs. 8-50

Foreign: £ 0.75 or \$ 1.50

PRINTED IN INDIA AT ARMA PRESS, MADRAS - 600 041 AND PUBLISHED BY
THE CONTROLLER OF PUBLICATIONS, CIVIL LINES, DELHI - 110 006.

INTRODUCTION

The catfishes or the siluroid fishes of the order Siluriformes comprise approximately 30 families and about 2000 species in their entire range of distribution from South America, Africa, Europe, Asia, to Japan. A vast majority of them are found in South America or Africa; and most are confined to freshwater. Of these 30 families, 13 are found in India, Pakistan, Bangladesh, Sri Lanka and Burma. 46 genera are found in these countries of which only three occur outside India, although they are closely related to Indian forms. Most of them occur in abundant numbers. In many landings, especially riverine, siluroids are the second or third fish of dominance. Many of them grow to a large, marketable size and fetch good prices. They command a lower price than carps, and are as such preferred by the poorer section of the community. A few can live out of water for quite some period and are relished as rejuvenators. The air-bladder of a few species are used in commerce for the manufacture of isinglass. Smaller sized species are extensively salted and dried.

Published accounts on the siluroid fishes as those by Day, 1877, 1889; Misra, 1976, are mostly of value to the specialised ichthyologists and museum taxonomists. The characters used in the keys and elaborated in the descriptions in these publications are not of easy comprehension to the field worker or fish culturists. The need for an illustrated key to the identification of fish in general is obvious, especially that of commercial value. Added to this, the scanty literature on Indian fishes, renders publication of such aids as of immediate necessity. The first part deals with the most common and also taxonomically important family Bagridae. The subsequent parts will deal with Siluridae, Schilbeidae, and other families in order of their phylogeny.

Geographic limits.—All the siluroids which inhabit the waters within the political boundaries of India, Pakistan, Bangladesh, Burma and Sri Lanka are included. The marine boundaries are as defined by Chopra (1947) and as adopted by Misra (1959).

Arrangement.—The classification and order of arrangement of families are as per Greenwood *et al.* (1966). Genera are dealt with according to their phylogeny as far as known, and species alphabetically.

Synonymy.—The first, and a recent reference to contain some revision or of taxonomic value is only given.

Descriptions.—A brief resume of the salient features is given for the families and genera. In the case of species, under the heading diagnostic characters, only those which will aid in rapid identification in the field are given. For fuller descriptions, reference may be made to the *Fauna* volumes of Day (1889) or to recent literature cited under synonymy. It should be possible to identify a taxa by the easily recognisable characters which are printed in italics in descriptions of genera and species.

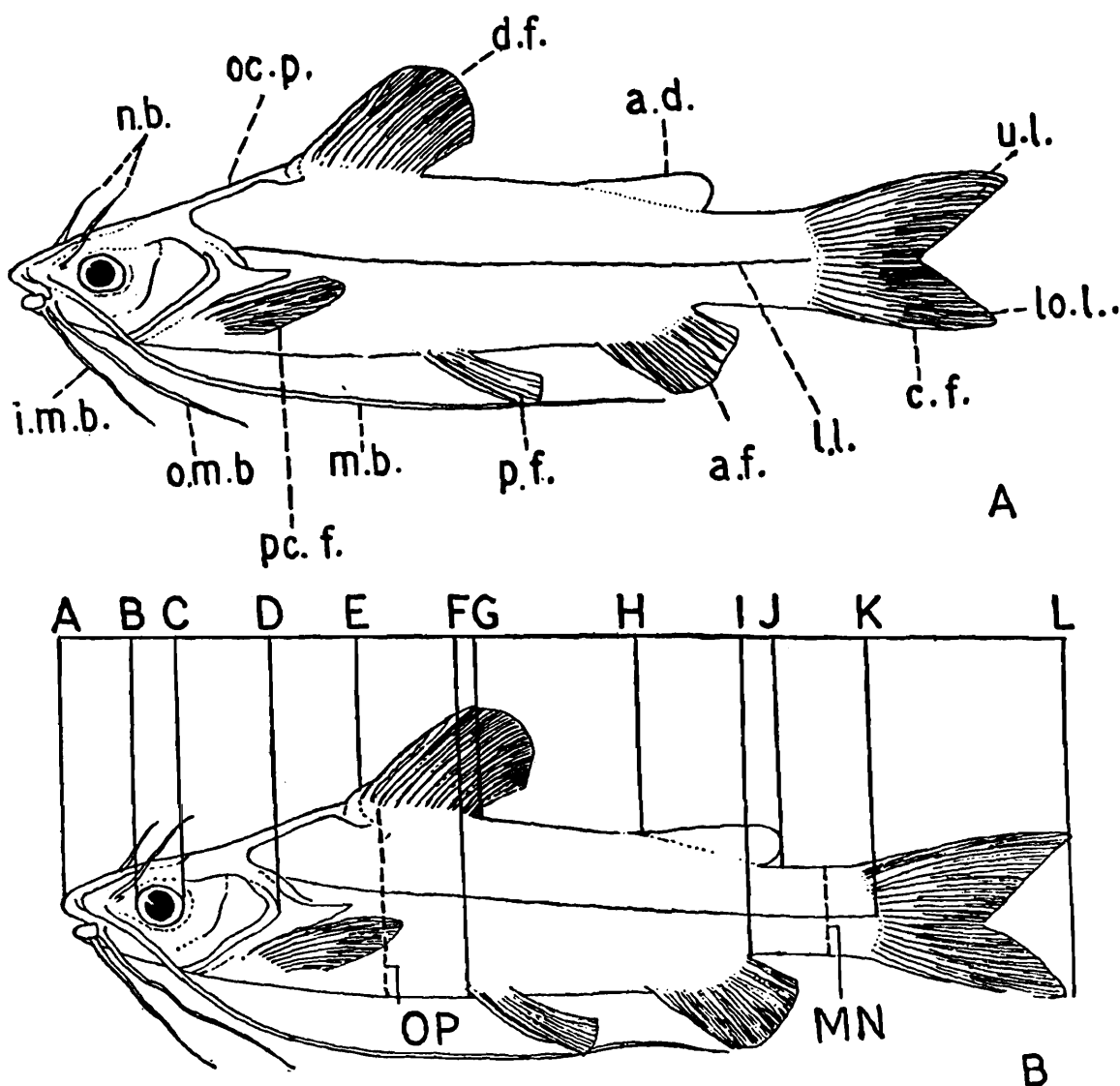
Keys.—They are based on easily identifiable characters to facilitate determination in the field. In identifying species particularly, the combination of characters will indicate the taxa; further confirmation could be made by reference to descriptions in the *Fauna*. The keys are “artificial” in the sense that they are based on characters not necessarily indicative of taxonomic or phylogenetic order.

Colour.—Wherever possible colour of the fish in live as well as after preservation in alcohol are given.

Size.—Maximum size so far recorded or known is given. It does not necessarily imply the potential size the fish may attain.

Fishery value.—Available notes on breeding habits, food preferences, and habitats are given. Brief notes on the commercial importance are also indicated.

Measurements and counts.—Data given both in the description and keys are pertaining only to the area under study. These may not hold good for taxa of a family or a genus which extend their range outside the areas covered here. Measurements used are explained diagrammatically in Text-figure 1B and some parts in 1A.



TEXT-FIG. 1(A & B).—Lateral view diagrams of *Mystus vittatus* (Bloch). A. to show various parts, B. to show different body measurements (after Hora & Mukerji, 1938).

a.d.=adipose dorsal fin; a.f.=anal fin; c.f.=caudal fin; d.f.=dorsal fin; i.m.b.=inner mandibular barbel; l.l.=lateral line; lo.l.=lower lobe of caudal fin; m.b.=maxillary barbel; n.b.=nasal barbel; oc.p.=occipital process; o.m.b.=outer mandibular barbel; p.f.=pelvic fin; pc.f.=pectoral fin; u.l.=upper lobe of caudal fin.

AB=Length of snout; AC=Postorbital length; AD=Head length; AE=Predorsal length; AF=Prepelvic distance; AK=Standard length AL=Total length; BC=Eye diameter; EG=Width of base of rayed dorsal fin; GH=Distance between rayed dorsal fin and adipose dorsal fin; HJ=Width of base of adipose dorsal fin; IK=Length of caudal peduncle; MN=Least height of caudal peduncle; OP=Body depth.

Abbreviations used.—Certain symbols have been used to denote the different museums where type-material are deposited. They are:

- BMNH — British Museum (Natural History), London; U.K.
 RML — Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands.
 SNHM — Stanford Natural History Museum, Stanford, U.S.A.
 VNHM — Naturhistorisches Museum, Wien, Austria.
 ZMB — Zoological Museum, Berlin, Germany.
 ZSI — Zoological Survey of India, Calcutta, India.

Abbreviations used in text-figures.—a.d.=adipose dorsal fin; a.f.=anal fin; a.s.=air-sac; acc.resp.org.=accessory respiratory organ; c.f.=caudal fin; d.p.=dermal papillae; d.f.=dorsal fin; d.s.p.=dorsal spine; i.mb.=inner mandibular barbel; ins=interneural shield; l.l.=lateral line; lo.l.=lower lobe of caudal fin; max.b./m.b.=maxillary barbel; mgr.=median longitudinal groove; mol.=molariform teeth; n.b.=nasal barbel; nost=nostrils; oc.p.=occipital process; o.m.b.=outer mandibular barbel; pc.f.=pectoral fin; p.f.=pelvic fin; u.l.=upper lobe of caudal fin; vli.=villiform teeth.

ACKNOWLEDGEMENTS

I am thankful to the Director, and the Officer-in-charge, Southern Regional Station, Zoological Survey of India, for facilities. Several ichthyologists readily gave information on the type specimens. I am indebted to the following scientists for their co-operation: Dr. Marie. L. Bauchot, Museum National D'Histoire Naturelle, Paris; Dr. M. Boeseman, *RML*, Leiden; Dr. Paul Kahsbauer *VNHM*, Wien; Dr. C. Karrer, *ZMB*, Berlin; Dr. T.H. Talbot, Australian Museum, Sydney; Dr. P.K. Talwar, *ZSI*, Calcutta; Dr. Peter J. Whitehead, *BMNH*, London. The sketches were drawn by Shri D. Sengupta, Senior Artist of the *ZSI*, Madras, under my supervision. My thanks are due to him also.

Class PISCES

Cohort EUTELEOSTEI

Superorder OSTARIOPHYSI

Order **Siluriformes**

Skin naked or with bony scutes or plates, never with true scales. Mouth not protractile, superiorly bordered by premaxillaries and dentaries, which are generally toothed; maxillaries much reduced, toothless, serving as bases of maxillary barbels. Nearly always one to four pairs of barbels. Adipose fin generally present. Symplectic, suboperculum, parietals, first and second pharyngobranchials, epipleural and epineural bones absent. Preopmer and opalatinies may be toothed. Pharyngeal bones with small conical or villiform

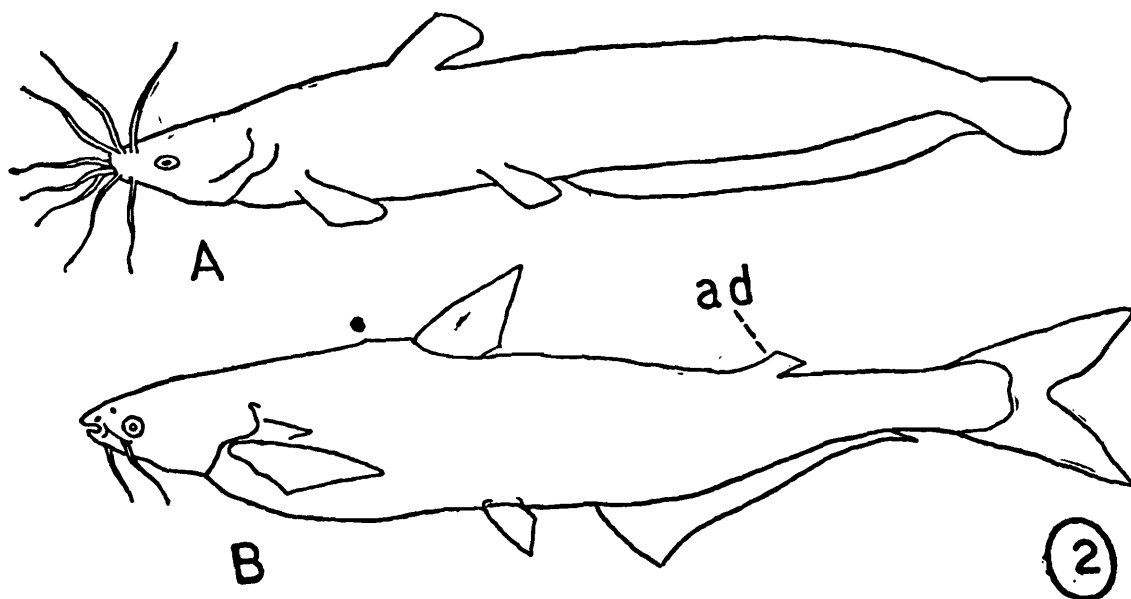
teeth. Branchiostegals 4 to 17. No psedobranchiae. Anterior vertebrae, second, third, fourth coossified to form "complex vertebra"; additional posterior vertebral centra may be frequently fused to or united by exceedingly tight joints with complex vertebra. Ribs attached to lower surface of long parapophyses. Supracleithrum complicated; its lower part deeply forked for reception of upper limb of cleithrum. Mesocoracoid may be present or absent. First pectoral, and dorsal rays complicated, hard pungent spines. Lateral line may be ramified, with or without short tubular ossicles enclosing the line. Pelvic fins abdominal in position. Air-bladder subdivided, reduced in many species.

An unusually well defined order approximately comprising 30 families and about 2000 species found in its entire range. Most are confined to fresh-water, but some are marine.

Thirteen families comprising 46 genera occur in India, Pakistan, Bangladesh, Sri Lanka, Burma—the area dealt in this publication.

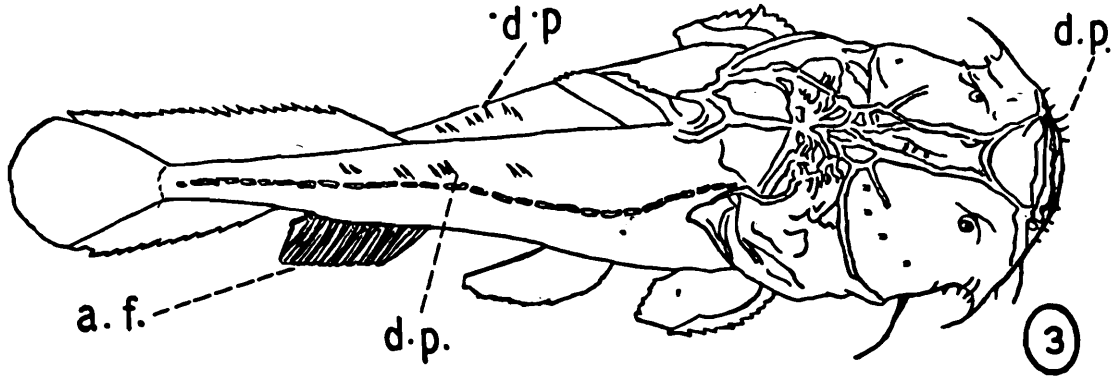
KEY TO THE FAMILIES

1. Adipose dorsal fin absent 2
(TF 2A)



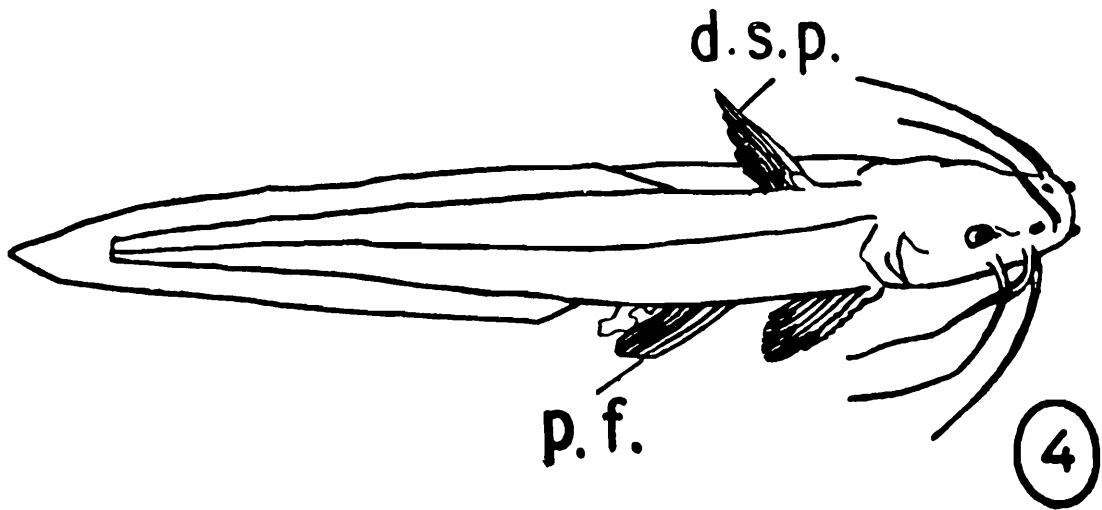
Adipose dorsal fin (ad in fig.) present as a smooth, short or long, high or low fin (exception *Clupisoma garua* (Hamilton), Schilbeidae) where it is absent. 6
(TF 2B)

2. Head squarish in outline, much depressed, head and body with many dermal papillae (d.p. in fig.). Anal fin short, with 7-10 rays Chacidae (TF 3)



- Head and body without any dermal papillae. Head obtuse, compressed. Anal fin long, with more than 40 rays 3

3. Dorsal fin with a spine (d.s.p. in fig.). Pelvic fin (p.f. in fig.) with 15 or 16 rays Plotosidae (TF 4)

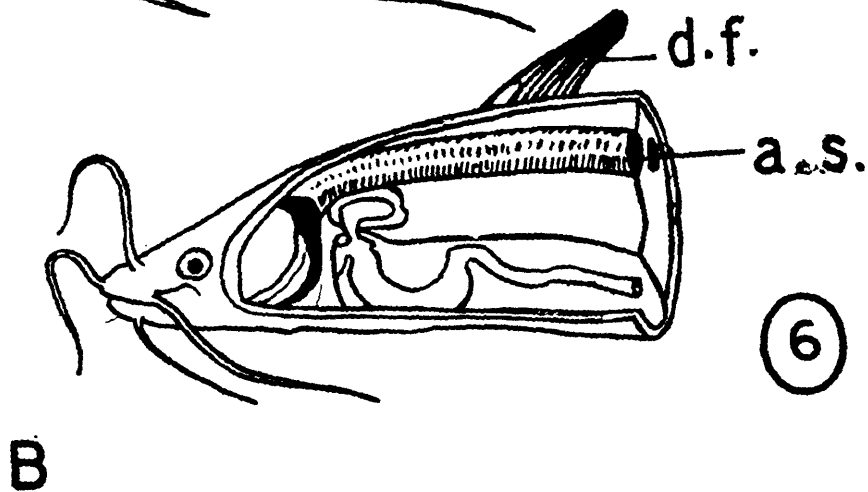
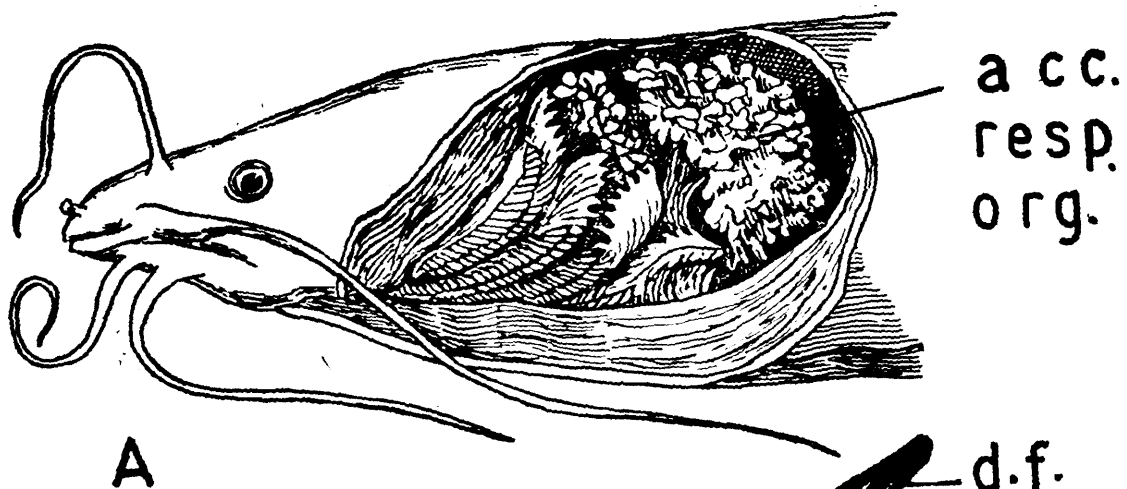
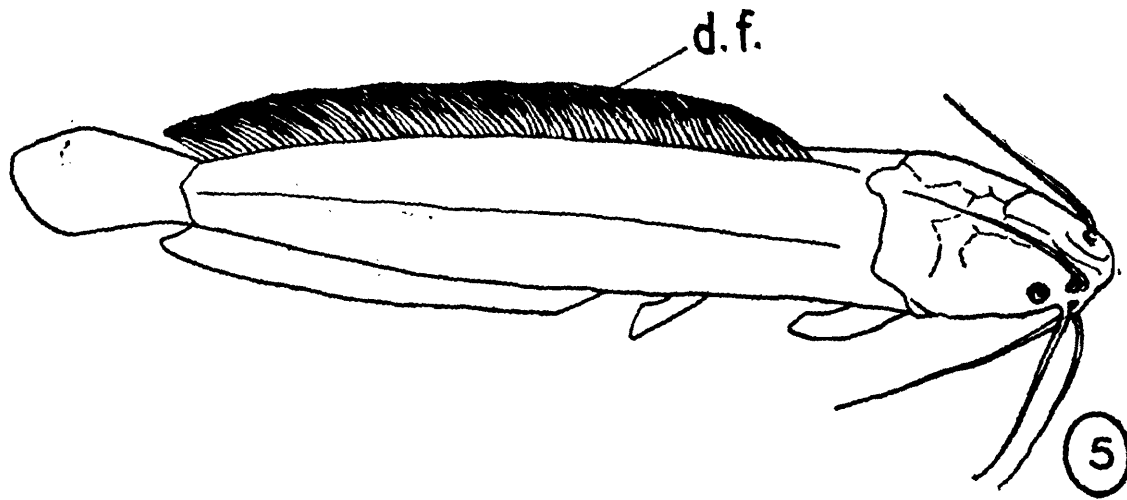


- Dorsal fin without a spine. Pelvic fin with 6 rays 4

4. Nasal barbels absent. No accessory respiratory organs present. Siluridae

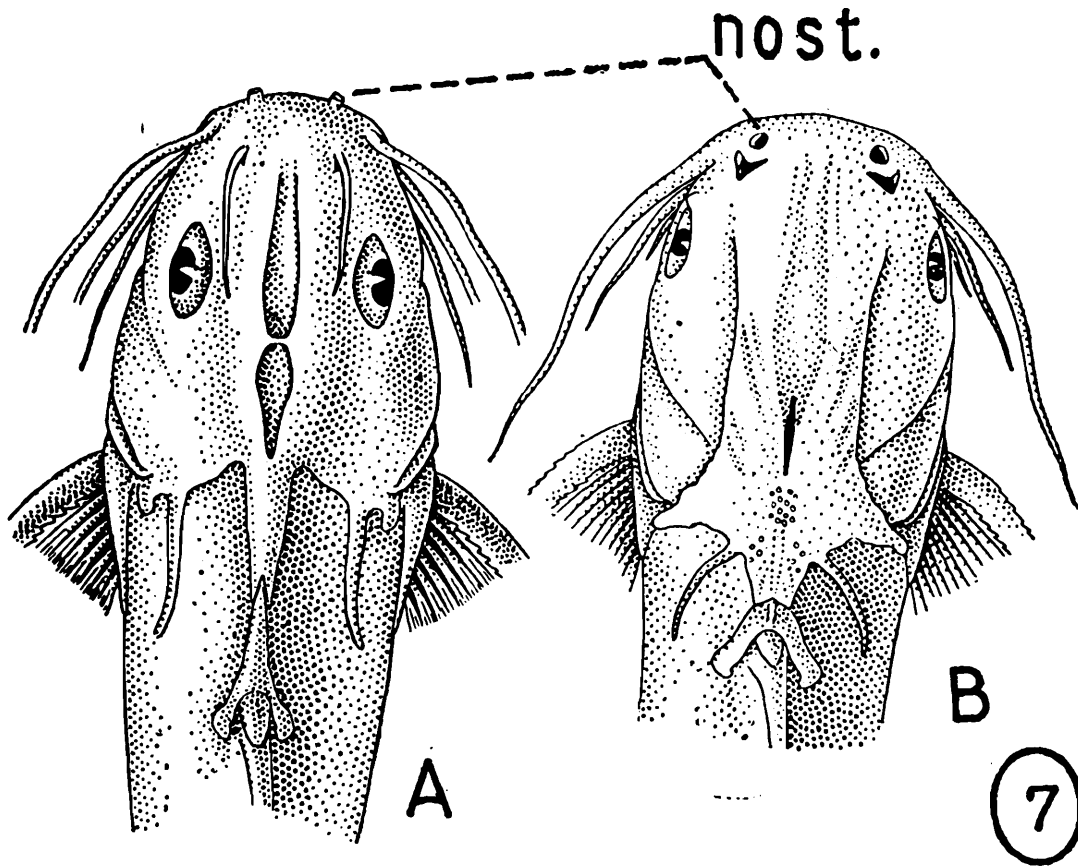
- Nasal barbels present. Accessory respiratory organs present on gills or in the body cavity 5

5. Dorsal fin long (d.f. in fig. 5) with 23 to 76 rays.
 Accessory respiratory organs (acc. resp. org. in fig.)
 on gills present. Clariidae
 ... (TF 5, 6A)



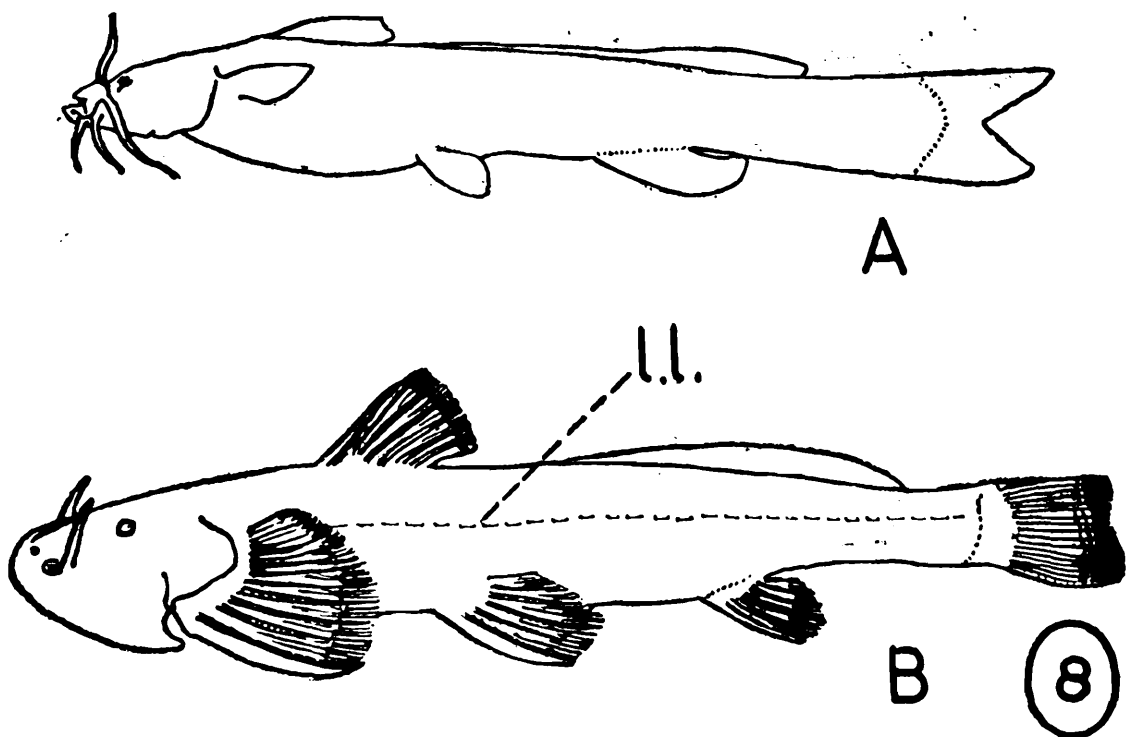
- Dorsal fin short, with 6 or 7 rays. Accessory
 respiratory organs as tubular air sac (a.s. in fig.)
 in body cavity present, Heteropneustidae
 ... (TF 6B)

6. Nostrils (nost. in fig.) close together, with very little interspace between the two ... (TF 7B) ⁷



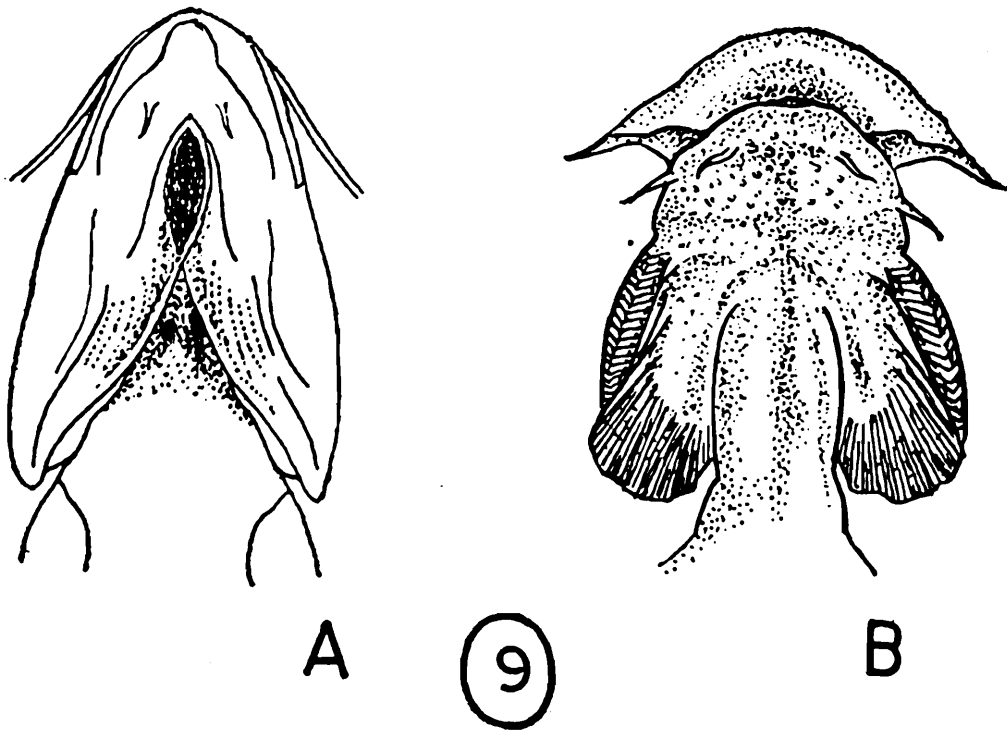
Nostrils wide apart, separated by some interspace. ... (TF 7A) ⁹

7. No nasal barbel present. Barbels two to six. Nostrils separated by a valve ... Ariidae
- A pair of distinct nasal barbels present. Nostrils separated by a barbel. Barbels eight ... ⁸
8. Lateral line entirely absent. Gill membranes free from isthmus ... Amblycipitidae (TF 8A)



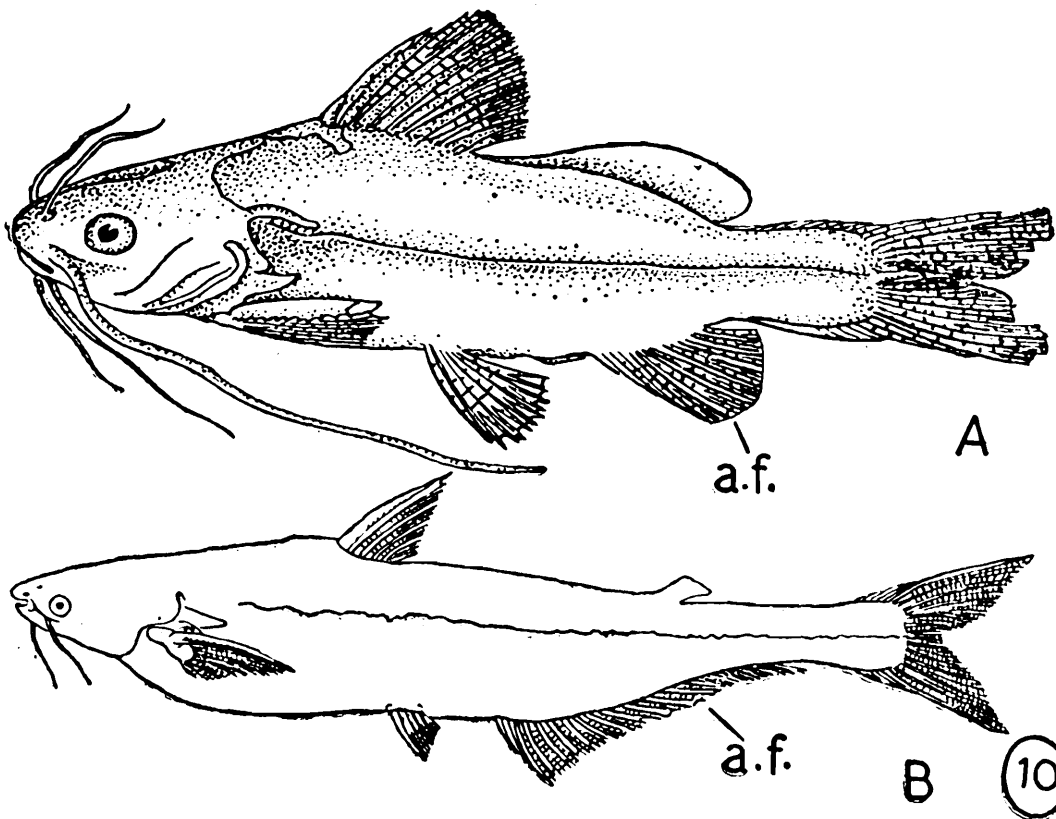
Lateral line (l.l. in fig.) always present. Gill membranes united with isthmus; (exception *Bagarius Hamilton*) ... Sisoridae (TF 8B, 9B)

- 9. Dorsal spine absent (exception *Ailia* Swainson, Schilbeidae, where dorsal fin itself is absent). Olyridae
- Dorsal spine present. 10
- 10. Gill membranes united with each other and also with isthmus (see TF 9B; fig. not of Akysidae) Akysidae



Gill membranes free from each other and also from isthmus. 11 (TF 9A)

- 11. Anal fin (a.f. in fig.) short with less than 20 rays (8-16); (exception *Horabagrus* Jayaram, from Kerala, with 23-28 rays). Bagridae (TF 10A)



Anal fin long with more than 20 rays (24-90). 12 (TF 10B)

12. Nasal barbels always present; (exception *Silonia Swainson*, with 40–46 rays and caniniform teeth on jaws) Schilbeidae
- Nasal barbels absent (Anal fin with 30–34 rays and villiform teeth on jaws). Pangasiidae (TF 10B)

Family BAGRIDAE

Generally large sized more or less elongate fishes, with a compressed body. Teeth on premaxillaries, mandible and prevomer. Nostrils widely separated, above angle of mouth, anterior tubular on tip of snout, posterior nearer eye than tip of snout and with nasal barbel. Barbels eight or six, generally well developed. Gill openings wide, extending to above base of pectoral fin.

Rayed dorsal fin inserted anteriorly above last half of pectoral fin. Adipose dorsal fin smooth, not confluent with either rayed dorsal or with caudal. Paired fins inserted horizontally. Pectoral fins with a strong spine, generally serrated. Anal fin short or moderately long, not confluent with caudal. Caudal fin forked or deeply emarginate. Lateral line present, generally complete.

Air-bladder large, free in the abdominal cavity, moderately thick-walled.

Lateral ethmoid facet for articulation of palatines more ventral than lateral, usually visible from underside of skull. Palatines rod-like. Endopterygoid absent. Ectometapterygoids present, variously developed. Metapterygoid may not be directly connected to hyomandibular. Prevomer large or small, dentigerous. Autopterotics and autosphenotics provide ventrally, articular facet for hyomandibular, but variable. Post-temporals present, united to skull by ligament. Mesocoracoid in pectoral girdle present.

Vertebrae 34 to 57.

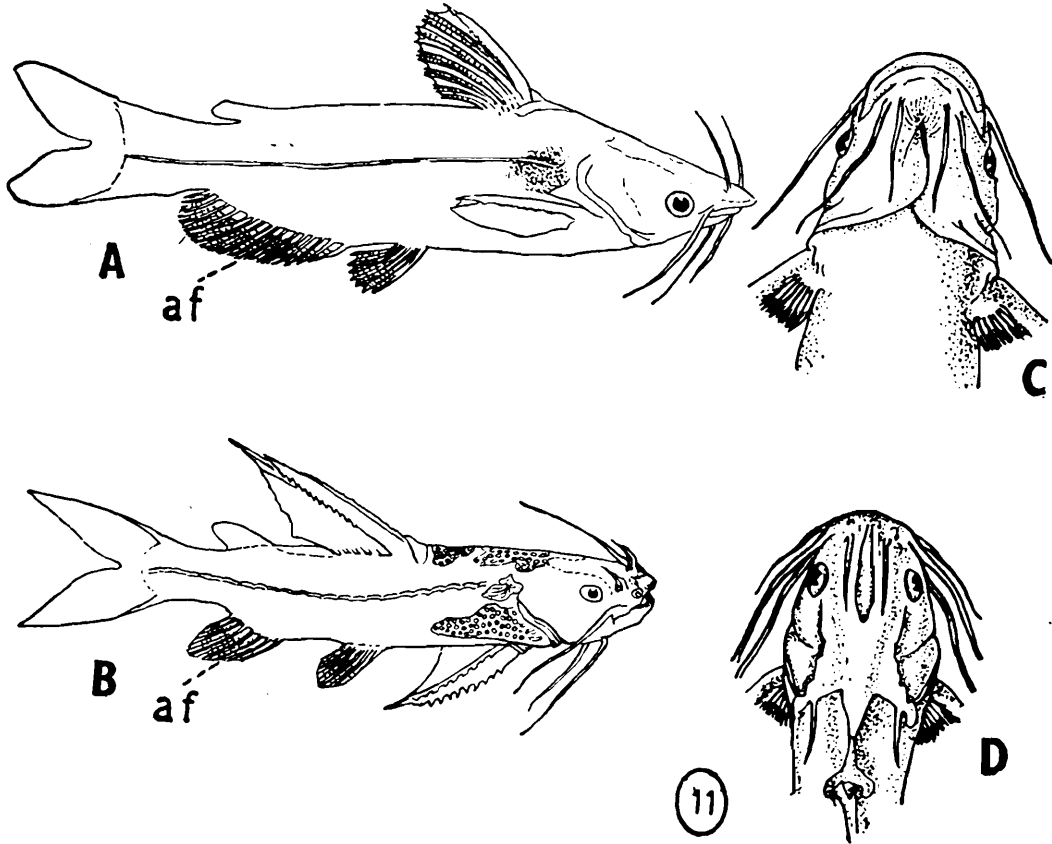
Distribution.—Freshwaters of Asia, Africa, ranging from Africa through West Asia, Pakistan, India, Bangladesh, Sri Lanka, Burma, Thailand, Malaya, East Indies, Cambodia, Laos, Viet-Nam, China, Formosa, Japan, Korea and Manchuria.

Type-genus.—*Porcus* Geoffroy St. Hilaire, from Africa.

Remarks.—A total of 27 genera are known of this family from its range as given above. Seven occur in the Indian region, of which six are only dealt here; the systematic position of the seventh genus *Rama* Bleeker is in confusion and as such omitted. It is likely to be a synonym of *Batasio* Blyth.

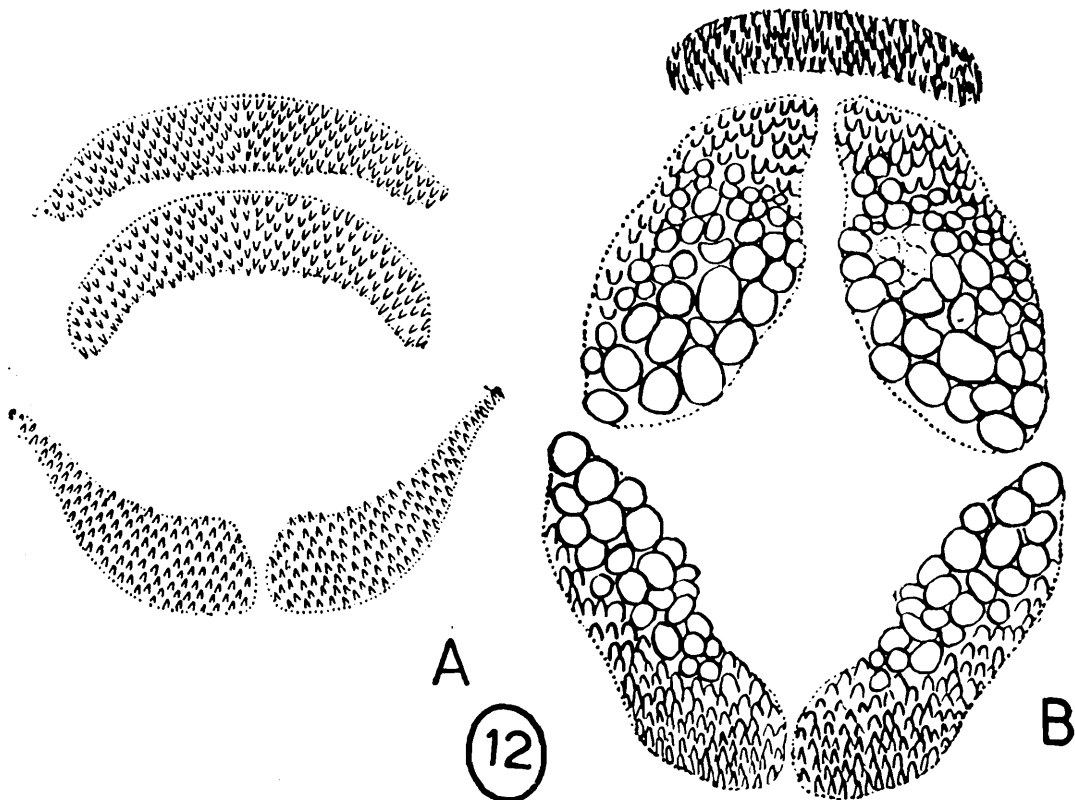
KEY TO THE GENERA

1. Anal fin short (a.f. in fig.), with less than 16 rays.
 Eyes superior, above angle of mouth, not visible from below
 (TF 11B, D)



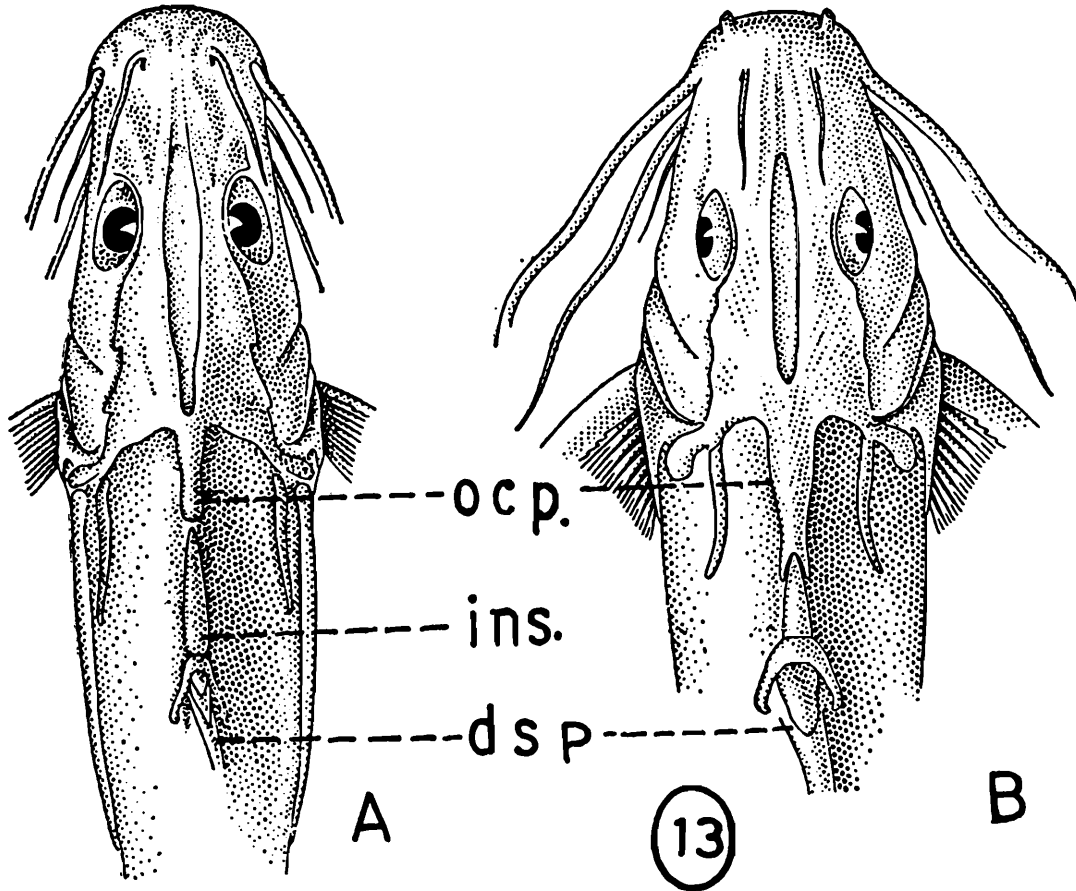
Anal fin long, with 23 to 28 rays. Eyes inferior, along angle of mouth, visible from below (see fig. 11C) *Horabagrus* Jayaram ... (TF 11A, C)

2. Pelvic fin with 6 rays. Teeth on palate entirely villiform, in bands. Four pairs of barbels
 3 ... (TF 12A)

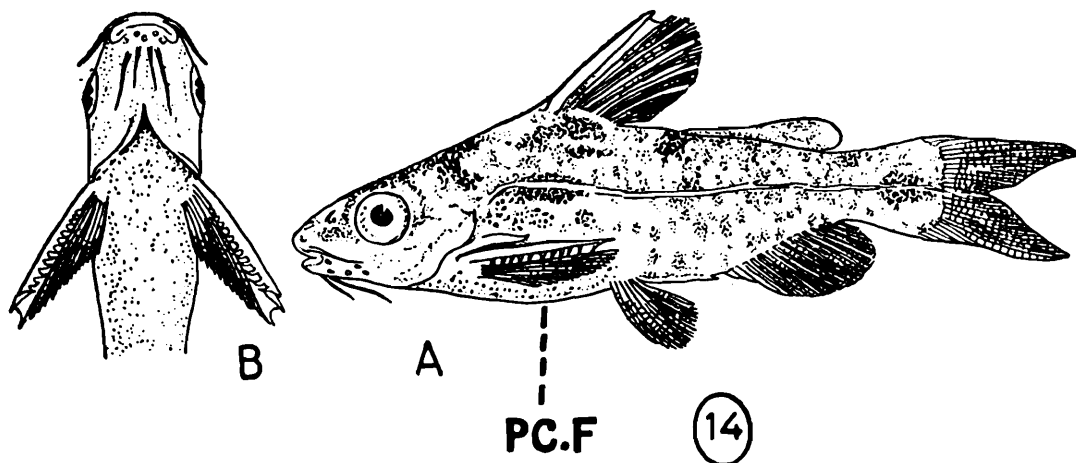


Pelvic fin with 7 or 8 rays. Teeth on palate mixed, villiform and molariform in patches. Three pairs of barbels. *Rita* Bleeker ... (TF 12B)

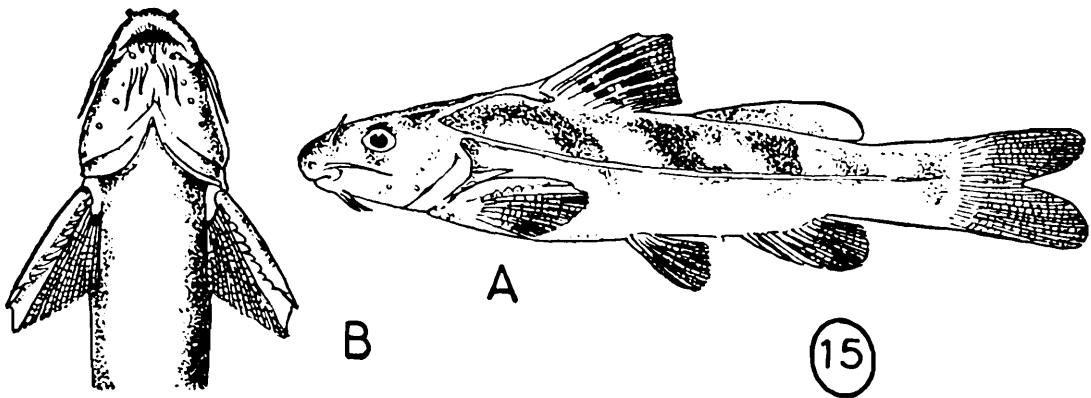
- | | |
|--|---------------------------------------|
| 3. Maxillary barbels reach beyond dorsal fin. No pores on ventral surface and sides of head. Teeth on lower jaw in a laterally prolonged, deeply curved band, separated in middle. | 4 |
| Maxillary barbels reaching not beyond pectoral fin base. Pores on ventral surface and sides of head. Teeth on lower jaw laterally prolonged, but only slightly, band not separated in middle. | 5 |
| 4. Interneural shield (ins. in fig.) in between basal bone of dorsal fin and occipital process (Oc.p. in fig.) absent | <i>Mystus Scopoli</i>
... (TF 13B) |



- | | |
|---|---|
| Interneural shield in between basal bone of dorsal fin and occipital process present | <i>Aorichthys Wu</i>
... (TF 13A) |
| 5. Pectoral fins reach pelvic base. Eyes inferior, along angle of mouth, visible from below (TF 14B) | <i>Chandramara Jayaram</i>
(TF 14A, B) |



- | | |
|--|-------------------------------------|
| Pectoral fins do not reach pelvic base. Eyes superior above angle of mouth, not visible from below (TF 15B) | <i>Batasio Blyth</i>
(TF 15A, B) |
|--|-------------------------------------|



Genus **Rita** Bleeker

Rita Bleeker, 1859, *Acta Soc. Sc. Indo-Neerl.*, **4**, p. 60 (type species, *Pimelodus rita* Hamilton, by tautonymy).

Gogra Day, 1867, *Proc. zool. Soc. Lond.*, p. 563 (type species, *Gogrius sykesii* Day, by monotypy).

Rita: Jayaram, 1966, *Int. Rev. ges Hydrobiol.*, **51**(3), p. 434 (revision of genus).

Description.—Dorsal profile arched. Head large, depressed; snout obtuse, but not produced; jaws subequal; lips thin, occasionally fimbriate. Mouth subterminal, transverse, moderately wide. *Teeth villiform, molariform or mixed, in bands and or patches on jaws and palate. Eyes small, dorsolateral. Three pairs of barbels, one pair each of maxillary, nasal and only one of mandibular; nasal barbels minute or small, with a valve-like base. Gill membranes free from each other and also from isthmus. Branchiostegals eight.*

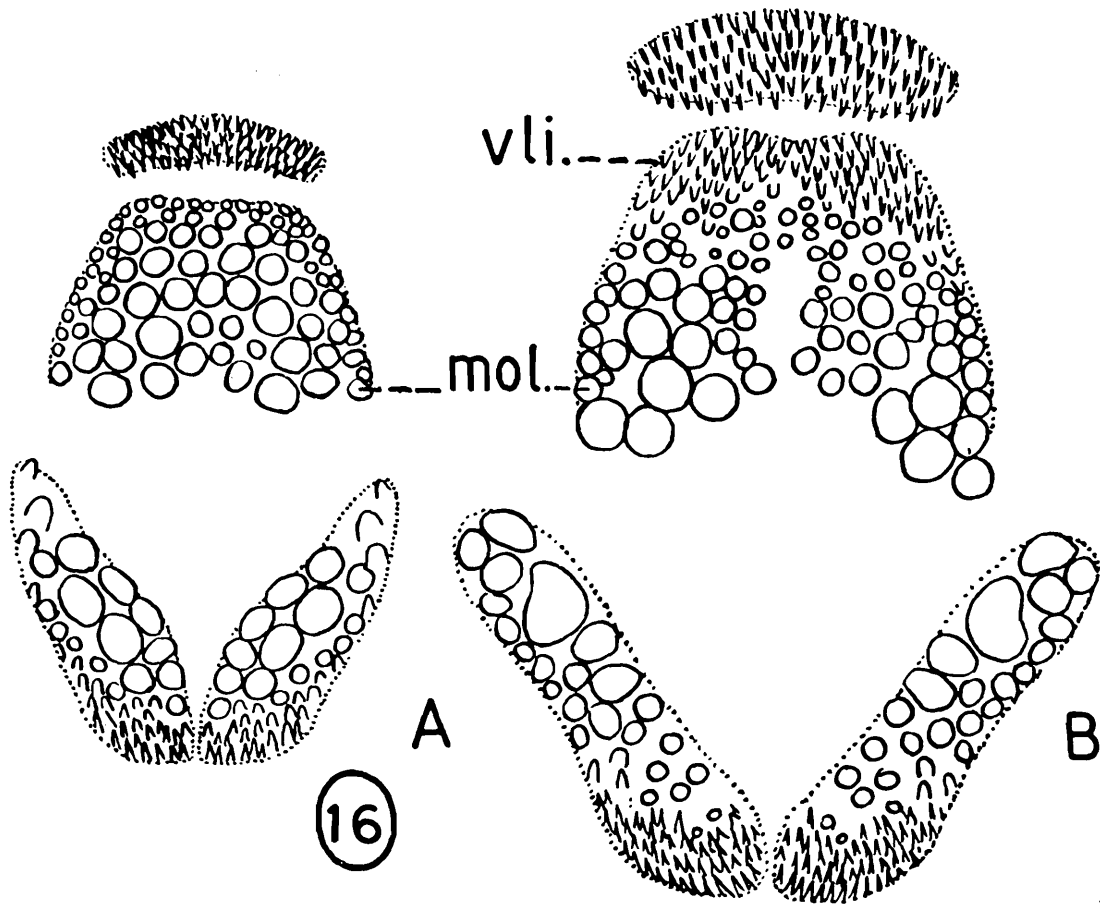
Rayed dorsal fin with six or seven rays and a spine. Adipose dorsal fin low, short. Pectoral fins with 7 to 10 rays, and a spine serrated along both the edges. Pelvic fins with 7 or 8 rays. Anal fin short, with 8 to 13 rays. Caudal fin forked. Lateral line with well developed scutes along anterior quarters, rather uniformly distinguishable in all species.

Distribution.—India, Pakistan, Bangladesh, Burma and Yunnan. The southern limit in India is the Krishna river system.

Four species are known from its entire range.

KEY TO THE SPECIES

- | | | | | | |
|--|-----|-----|-----|-----|-------------------------------|
| 1. Teeth on palate in one patch | ... | ... | ... | ... | 2 |
| Teeth on palate in two patches | ... | ... | ... | ... | 3 |
| 2. Teeth on prevomer uniformly molariform (mol. in fig.). Premaxillary band of teeth 1.0 to 1.5 times as long as broad | ... | ... | ... | ... | <i>R. chrysea</i>
(TF 16A) |

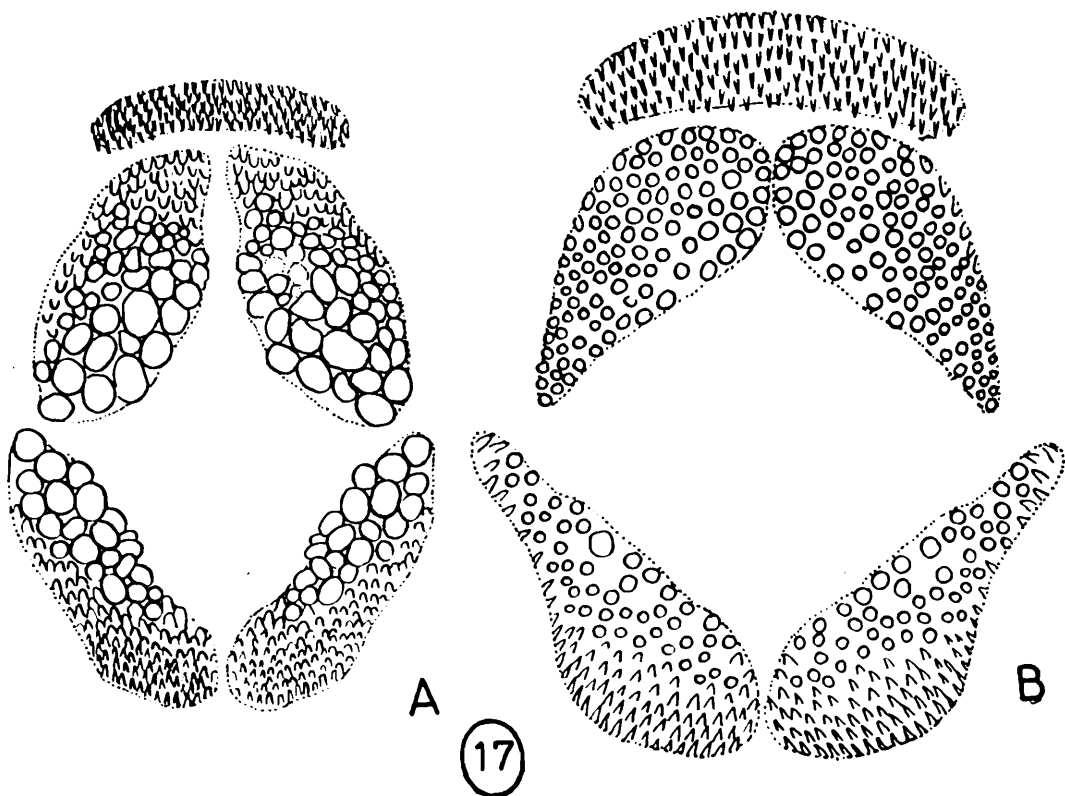


Teeth on prevomer mixed with molariform and villiform (Vli. in fig.). Premaxillary band of teeth 3.5 to 4.0 times as long as broad

R. gogra
(TF 16B)

3. Teeth on palate in pear-shaped patches

R. kuturnee
(TF 17B)



Teeth on palate in elliptical patches

R. rita
(TF 17A)

Rita chrysea Day

Rita chrysea Day, 1877, *Fish India*, p. 455, pl. 104, fig. 1 (type locality, Orissa, revised as *Aaicut*, on Mahanadi, Cuttack by Jayaram, 1966).

Rita chrysea: Jayaram, 1966, *Int. Revue ges. Hydrobiol.*, **51**(3): 435 (description with figures).

D. I, 6-7; P. I, 7-10; V 7-8; A. 8-12; C. 13-16.

Diagnostic characters.—Live specimens are of lead grey colour above, whitish beneath and with an yellow tinge along orbital rims. Some may have alternating white and grey vertical bands on sides. *Teeth on palate in a single undivided patch, composed of only molariform teeth.*

Colour.—Preserved specimens are golden or creamy yellow above and on sides, whitish yellow beneath.

Distribution.—So far known only from Mahanadi and its tributaries in Orissa State, Madhya Pradesh, in India.

Size.—Maximum size 250 mm. TL.

Fishery value.—Caught in large quantities by barrier nets in the Mahanadi, this is a common fish at Cuttack, Sambalpur and along the river upto Seorinarayan in Madhya Pradesh. Mostly eaten by the poorer classes, and is of considerable value. Spawns during monsoon.

Type-specimens.—Holotype, Regd. No. Cat. 498, "Orissa", purchased from F. Day, 12 Sep. 1878, original of Pl. 104, fig. 1 in *Fish. India.*, in ZSI, Calcutta.

Remarks.—This species is comparatively small than other species of *Rita*, but is available in large quantities in certain places all the year round except in monsoon months.

Rita gogra (Sykes)

Phractocephalus gogra Sykes, 1839, *Proc. zool. Soc. Lond.*, **2**, p. 374, pl. 66, fig. 1 (type locality, River Bhima).

Rita gogra: Jayaram, 1966, *Int. Revue ges. Hydrobiol.*, **51**(3), p. 436 (description with figures).

D. I, 6; P. I. 10; V 7-8; A. 9-11; C. 13-16.

Diagnostic characters.—Live specimens slightly golden coloured, bright yellow, body with fin tips tinged black. *Teeth on palate in a single patch, but composed of villiform and molariform types.*

Colour.—Uniformly ash-grey in spirit. Eyes bright violet and barbels black.

Distribution.—India: rivers of Deccan up to Krishna river system.

Size.—Maximum size 260 mm. TL.

Fishery value.—Common in Hyderabad, Hoshangabad, this fish is caught in limited quantities during the winter season. It secretes mucus which

helps it to live out of water by cutaneous respiration for sometime. In markets the fish is brought in earthen pots in live condition, the secreted mucus preventing dessication.

Type-specimen.—Holotype, in BMNH, London.

Rita kuturnee (Sykes)

Phractocephalus kuturnee Sykes, May, 1839, *Trans. zool. Soc. Lond.*, **2**, p. 372, pl. 14, fig. 3 (type locality, River Bhima, Pairgaon).

Rita kuturnee: Jayaram, 1966, *Int. Revue ges. Hydrobiol.*, **51**(3), p. 436 (description with figures).

D. I, 6; P. I, 7–10; V. 7–8; A. 9–13; C. 13–19.

Diagnostic characters.—*Live specimens cement grey or light ashy grey above, silvery on sides below lateral line and beneath. Teeth on palate in two separate pear-shaped patches comprising molariform type of uniform size.*

Colour.—Light brown above and on sides, pale beneath in spirit preserved specimens.

Distribution.—India: Rivers of Deccan in Andhra, Karnataka, Maharashtra States, up to Krishna river system. Burma: River Irrawaddy.

Size.—Maximum size 304 mm. TL.

Fishery value.—Very common in the Tungabhadra river at Kurnool. Large quantities are caught by drag netting during February-March. Though only of small size, it is sold in good quantity rather cheaply. A portion of the catch is also dried and salted. Not much is known of its biology. Unlike the other species of *Rita*, this is not capable of living outside water, nor does it have any mucus secretion.

Type-specimen.—Holotype, in BMNH, London.

Rita rita (Hamilton)

Pimelodus rita Hamilton, 1822, *Fish. Ganges*, pp. 165, 376, pl. 124, fig. 53 (type locality, Bengal).

Rita rita: Jayaram, 1966, *Int. Revue ges. Hydrobiol.*, **51**(3), p. 440 (description with figures).

Diagnostic characters.—*A rugose, exposed supracleithral process conspicuous on either side; a long smooth dorsal spine. Teeth on palate in two separate elliptical patches, rarely connected at top, the teeth molariform and villiform of unequal sizes.*

Colour.—Pale brown above and on sides, dull beneath, in preserved specimens.

Distribution.—India: most rivers of northern India, Pakistan, Bangladesh, Burma.

Size.—Maximum size 1219 mm. TL.

Fishery value.—One of the large sized catfishes sold in the markets, it is esteemed as food by the poorer classes. It is able to live out of water for sometime because of cutaneous respiration.

Type-specimen.—Not known.

Genus **Batasio** Blyth

Batasio Blyth, 1860, *J. Asiat. Soc. Bengal*, **29**, p. 149 (type species, *Pimelodus batasio* Hamilton, by original designation).

Rama Bleeker, 1862, *Atlas Ichthyol. Indici Prodr.*, **2**, *Siluri*, p. 8 (type species, *Pimelodus rama* Hamilton, by original designation; genus proposed provisionally).

Macronoides Hora, 1921, *Rec. Indian Mus.*, **22**, p. 179 (type species, *Macronoides affinis* (Blyth), as a subgenus).

Batasio: Hora & Law, 1941, *Rec. Indian Mus.*, **43**, p. 28 (see for synonymy, revision).

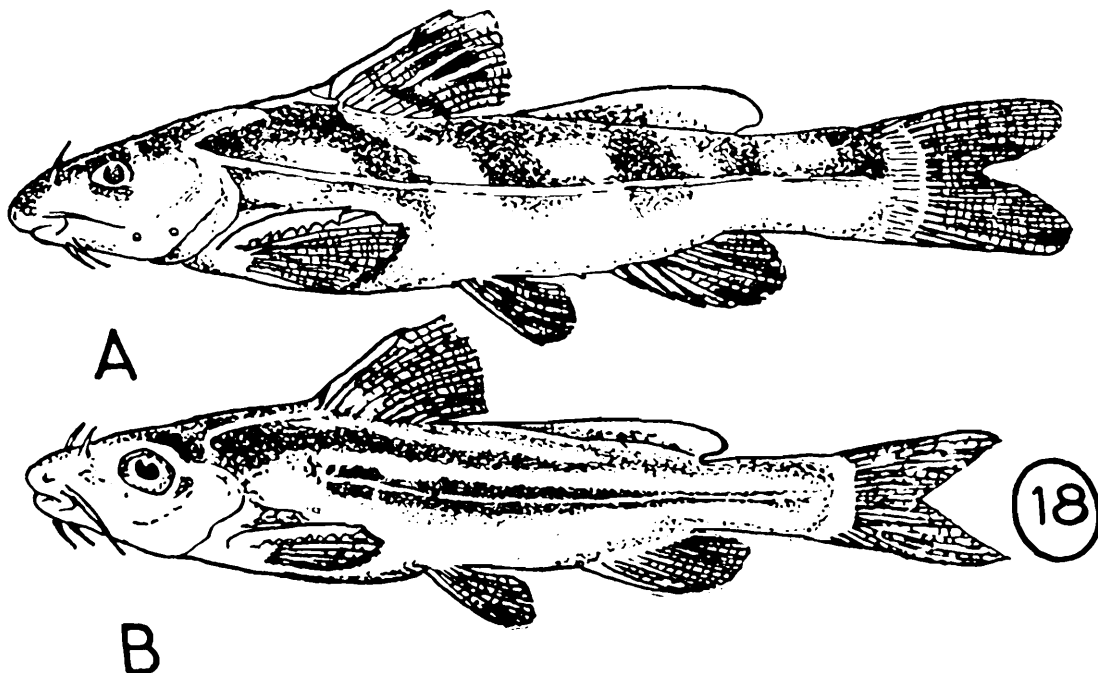
Description.—Dorsal profile moderately arched. Head small, compressed, conical, with pores ventrally and on sides; snout rounded or slightly pointed; jaws subequal or slightly overhanging; lips fleshy, fimbriated. Mouth inferior, crescentic, horizontal, not wide. Teeth uniformly villiform in bands on jaws and palate; band on lower jaw continuous. Eyes moderate, dorsolateral. Four pairs of barbels; one each of maxillary, nasal and two of mandibular, all generally not extending beyond head. Gill membranes notched anteriorly, free from isthmus. Branchiostegals six.

Rayed dorsal fin with seven or eight rays and a spine. Adipose dorsal low, of varying length. Pectoral fins with 5 to 9 rays, and a spine serrated along inner edge with antrorse teeth. Pelvic fins with 6 rays. Anal fin short, with 12 to 15 rays. Caudal fin forked or deeply emarginate. Lateral line complete, with some sensory pores anteriorly.

Distribution.—India: Assam, North Bengal, Kerala; Bangladesh: northern parts, Thailand and Malaysia.

KEY TO THE SPECIES

- | | | | |
|--|-----|-----|----------------------------|
| 1. Occipital process (Oc.p. in fig.) reaching basal bone of dorsal fin (see TF 19A, p. 22; fig. not of <i>Batasio</i>) ... | ... | ... | 2 |
| Occipital process not reaching basal bone of dorsal fin (see TF 19B, p. 22) ... | ... | ... | <i>B. travancoria</i> |
| 2. Body with longitudinal bands on either side of lateral line (as in <i>Mystus vittatus</i>) (Bloch). A black spot on shoulder ... | ... | ... | <i>B. batasio</i> (TF 18B) |



- | | | | | | |
|---|-----|-----|-----|-----|-------------------|
| Body with oblique, saddle shaped bands on body. | ... | ... | ... | ... | <i>B. tengana</i> |
| A black spot on nape | ... | ... | ... | ... | (TF 18A) |

Batasio batasio (Hamilton)

Pimelodus batasio Hamilton, 1822, *Fish. Ganges*, pp. 179, 377 (type locality, Teesta river).

Batasio batasio: Hora & Law, 1941, *Rec. Indian Mus.*, **43**, p. 33 (see for synonymy, description)

D. I, 7; P. I, 5–8; V. i, 5; A. iii–iv, 9–10; C. 17.

Diagnostic characters.—Body marked with longitudinal bands and a dark shoulder spot; a second faintly and somewhat curved band above lateral line. Adipose dorsal fin base longer than anal fin base. Occipital process reaching basal bone of dorsal fin.

Colour.—Leaden above, yellow beneath in preserved specimens.

Distribution.—India: Teesta river system, North Bengal, Bangladesh.

Size.—Maximum size 100 mm. TL.

Fishery value.—Obtained in limited quantities, this fish is common in North Bengal waters. It is sold in the markets during the winter months, when large quantities are caught and brought packed in empty biscuit tins. Not being a large sized fish, its economic value as such is only limited.

Type-specimen.—Not known.

Remarks.—This species has a remarkable resemblance to *M. vittatus* (Bloch) when freshly caught. The basic colour pattern, with two longitudinal stripes and general facies would tend to misidentify this species as *M. vittatus*. The short sized barbels which do not extend beyond the head and the continuous bands of teeth on the jaws and palate help in distinguishing it. The two species seem to coexist together in the Teesta drainage system.

Batasio tengana (Hamilton)

Pimelodus tengana Hamilton, 1822, *Fish. Ganges*, pp. 176, 377, pl. 39, fig. 58 (type locality, Brahmaputra river).

Batasio tengana: Hora & Law, 1941, *Rec. Indian Mus.*, **43**(1), p. 36 (see for synonymy, description).

D. I, 7–8; P. I, 7–9; V. i, 5; A. iii–iv, 8–11; C. 16–18.

Diagnostic characters.—Body with oblique vertical bands or spots. Adipose dorsal fin base shorter or equal to anal fin base. Occipital process reaching basal bone of dorsal fin.

Colour.—Varies considerably. In spirit preserved specimens, body grey olivaceous, deeper above, lighter beneath. A broad black spot on nape. A number of oblique saddle shaped bands on body, not extending to ventral surface, may also be seen.

Distribution.—India: North Bengal. Bangladesh: northern parts, Burma, Thailand, Malaysia.

Size.—Maximum size 70 mm. TL.

Fishery value.—Being a small sized catfish, it is not commercially important. It is mostly sold during winter months and is eaten by the poorer classes.

Type-specimen.—Not known.

Batasio travancoria Hora & Law

Batasio travancoria Hora & Law, 1941, *Rec. Indian Mus.*, **43**(1), p. 40, pl. 2, figs. 7–9, text-fig. 3 (type locality, Peruntenuvi, tributary of Pamba river at Edakadathy, Kerala State).

D. I, 7; P. I, 7–9; V i, 5; A. iii–iv, 9–11; C. 16–19.

Diagnostic characters.—Body without longitudinal bands or spots. Adipose dorsal fin base longer than anal fin base. Occipital process not reaching basal bone of dorsal fin.

Colour.—Uniformly grey with a narrow dark streak along lateral line, ventral surface lighter in preserved specimens.

Distribution.—India: Pamba, Kallada, Chittar rivers in the Anaimalai hill range, Kerala State.

Size.—Maximum size 80 mm. TL.

Fishery value.—A rare species of local importance only.

Type-specimens.—Holotype, Regd. No. F. 13449/1, Peruntenuvi, tributary of the Pamba river at Edakadathy, Travancore, C.C. John Coll., in ZSI, Calcutta.

Paratypes, Regd. No. F. 13450/1 (2 exs.), F. 13451/1 (1 ex.), F. 13452/1 (1 ex.), ZSI, Calcutta.

Genus **Chandramara** Jayaram

Chandramara Jayaram, 1972, *Int. Revue ges. Hydrobiol.*, **57**(5), p. 816 (type species, *Pimelodus chandramara* Hamilton, by original designation).

Description.—Dorsal profile arched. Body speckled with dots. Head small, compressed with pores on ventral side and also along sides; snout obtusely rounded; jaws subequal; lips thin, plain. Mouth subterminal, moderately wide. Teeth on premaxillaries, prevomer and mandible in broad, villiform bands. Eyes large, inferior, visible from below ventral surface of head. Four pairs of barbels; one each of maxillary, nasal and two of mandibular, all shorter than head. Gill membranes free from each other and also from isthmus. Branchiostegals six.

Rayed dorsal fin with seven rays and a spine. Adipose dorsal short, smooth, posteriorly free. Pectoral fins with 5 or 6 rays, with outermost ray long, reaching or almost reaching pelvic fin base, occasionally with a prolongation, pectoral fin rays very slender, often damaged. Pectoral spine strong, serrated along inner edge with antrorse teeth. Pelvic fins with 6 rays. Anal fins short, with 13 to 17 rays. Caudal fin forked, lobes equal. Lateral line complete, with a few sensory pores above pectoral fin base.

Distribution.—India: North Bengal, Assam. Bangladesh. Known so far only by its type-species.

Chandramara chandramara (Hamilton)

Pimelodus chandramara Hamilton, 1822, *An account of the fishes of the River Ganges and its tributaries*, pp. 162, 375 (type locality, River Atrai).

Chandramara chandramara: Jayaram, 1972, *Int. Revue ges. Hydrobiol.*, **57**(5), pp. 815–820 (see for synonymy, fuller description).

D. I, i, 6–7; P. I. i–iii, 2–4; V i, 5; A. i–iv, 12–14; C. 16.

Diagnostic characters.—As given under generic description.

Colour.—In preserved specimens, pale olive, speckled with innumerable black dots, irregularly distributed all over body and sides; ventral surface pale, plain. Five sensory pores on ventral surface along lower lip, about five or six along side of outer mandibular barbel, a few along lower jaw on sides, a few along anterior part of lateral line above pectoral fin. A black shoulder spot conspicuously present, also another on occiput.

Distribution.—India: North Bengal, Assam. Bangladesh.

Size.—Maximum size so far obtained 57 mm. standard length.

Fishery value.—Nil.

Type-specimen.—Not known.

Genus Horabagrus Jayaram

Horabagrus Jayaram, 1955, *Bull. nat. Inst. Sci. India*, No. 7, p. 261 (type species, *Pseudobagrus brachysoma* Günther, by original designation).

Horabagrus Jayaram, 1966, *Int. Revue ges. Hydrobiol.*, **51**(3), p. 447 (description).

Description.—Dorsal profile arched. Head large, anteriorly depressed; snout obtusely rounded; jaws subequal; lips thin, plain. Mouth subterminal, transverse, wide. Teeth uniformly villiform on jaws and palate. *Eyes large, inferior, along angle of mouth, visible when viewed from below*. Four pairs of barbels, one each of maxillary, nasal, and two of mandibular. Gill membranes free from each other and also from isthmus. Branchiostegals ten.

Rayed dorsal fin with five to seven rays and a spine. Adipose dorsal low, short. Pectoral fins with 8 or 9 rays, and a spine serrated along inner edge with antrorse teeth. Pelvic fins with 6 rays. *Anal fin long, with 23 to 28 rays*. Caudal fin forked or deeply emarginate. Lateral line complete, simple.

Distribution.—India: backwaters of Kerala State. The northern limit is Kanara and the southern limit is Neyyatinkara near Trivandrum.

A single species.

Remarks.—Day (1865, p. 185) described *Macrones chryseus* as a new species. While revising the fishes of the genus *Mystus*, it was found that in view of its long anal fin, low position of the eyes, *M. chryseus* cannot be included under *Mystus*. A new genus *Horabagrus* was proposed to accommodate it (Jayaram, 1955). Description of the species was given in Jayaram, 1966.

Horabagrus brachysoma (Günther)

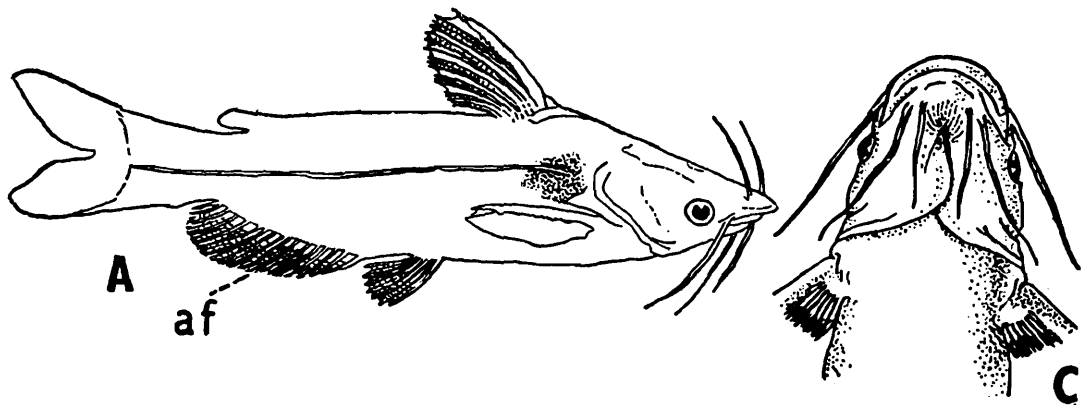
Pseudobagrus brachysoma Günther, 1864, *Cat. Fish. Brit. Mus.*, 5, p. 86 (type locality, "Cochin China" in error for Cochin).—Jayaram, 1952, *Ann. Mag. nat. Hist.*, (12) 5, p. 982 (type locality revised).

Horabagrus brachysoma: Jayaram, 1966, *Int. Revue ges. Hydrobiol.*, 51(3), p. 447 (see for synonymy description).

D. I, 6–7; P. I, 8–9; V i, 5; A. 23–28; C. 17.

Diagnostic characters.—Live specimens are golden or deep yellow on sides, white beneath. Anal fin long with 23 to 28 rays. Eyes inferior.

Colour.—Brownish black above and on sides above lateral line, pale yellow beneath in preserved specimens. A thick black shoulder spot and a semilunar thick black ring at caudal base generally present.



Distribution.—India: Kerala backwaters.

Size.—Maximum size 450 mm. TL.

Fishery value.—A very common catfish in Kerala particularly at Alleppey, Alwaye, Trichur. Specimens are slimy and are sold in live condition. Mostly caught by traps, long lines, this species forms a good constituent of the local fishery during the rainy season, October to February.

Type-specimen.—Holotype, Regd. No. 62.9.18.5, from "Cochin China" (in error for Cochin), in BMNH, London.

Genus *Mystus* Scopoli

Mystus Scopoli, 1777, *Introductio ad historium naturalem*, p. 451 (type species, *Bagrus halepensis* Valenciennes=*Mystus pelusius* (Solander), by subsequent selection).

Mystus: Jayaram, 1959, *Proc. First All-India Congr. Zool.* Part 2, p. 633 (see for synonymy, nomenclature).

Mystus: Jayaram, 1966, *Int. Revue ges. Hydrobiol.*, 51(3), p. 444 (list of valid species, generic composition).

Description.—Dorsal profile arched. Head of moderate size, compressed; snout rounded or obtuse; jaws subequal; lips thin. Mouth terminal, transverse, moderately wide. Teeth uniformly villiform in bands on jaws and palate; that on latter always uninterrupted, exception *M. horai*. Eyes moderately large, supralateral. *Four pairs of barbels, one each of maxillary, nasal and two of mandibular, generally longer than head.* Gill membranes free from each other, occasionally overlapping, and also free from isthmus. Branchiostegal six to twelve.

Rayed dorsal fin with seven rays and a spine. Adipose dorsal low, of varying length. Pectoral fins with 6 to 10 rays, and a spine serrated along inner edge with antrorse teeth. Pelvic fins with 6 rays. *Anal fin short, with 9 to 16 rays.* Caudal fin forked. Lateral line complete, simple. An axillary pore generally present.

Distribution.—Syria in West Asia through India, Pakistan, to Sri Lanka in south, through Bangladesh, Burma, Thailand, Indo-China, Malaysia to East Indies and China in the east. A few species enter the seas and estuaries.

Jayaram (1966) discussed the geographic and generic composition of this genus.

Remarks.—A total of 38 species are known of this genus from its entire range, of which 13 found in India, Pakistan, Bangladesh, Ceylon, and five from Burma, are described here.

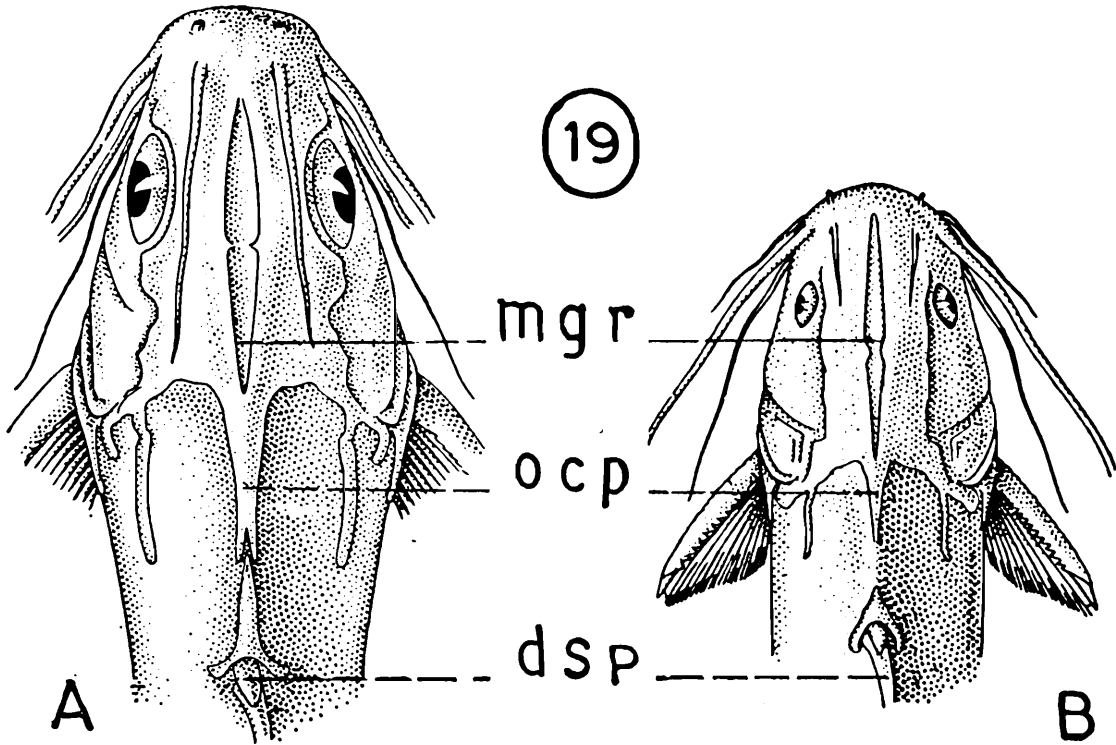
Fishes of the genus *Mystus* are much generalised. Species such as *M. montanus* var. *dibrugarensis* (Chaudhuri) represent only some variant of the closely allied species *montanus*. Others as *M. rufescens* (Vinciguerra), *M. peguensis* (Boulenger) have not been recorded subsequent to their first description. To prepare a useful key as such for the species is considerably difficult. Characters like the length of barbels, nature of skin cover of head, length of adipose fin base etc., are all variable within the same species. Species such as *M. tengara* (Hamilton), *M. vittatus* (Bloch) and *M. bleekeri* (Day) have remarkably similar colour patterns; this character also as such cannot be used to distinguish individual species.

I have therefore selected characters which are related to the basic structural pattern of the fish such as the length of the occipital process, its relationship with the basal bone of the dorsal fin, the median longitudinal groove and its extent. The median longitudinal groove represents the fontanelle on the skull and in many examples the skin covering this groove may obliterate the true nature of the groove. A little cleaning and occasional peeling of the covering skin will give a clear clue. In larger specimens the median groove may appear as not reaching the base of the occipital process. If the specimen is allowed to dry, the extent of the groove becomes visible.

A separate key for the five species from Burma has been given.

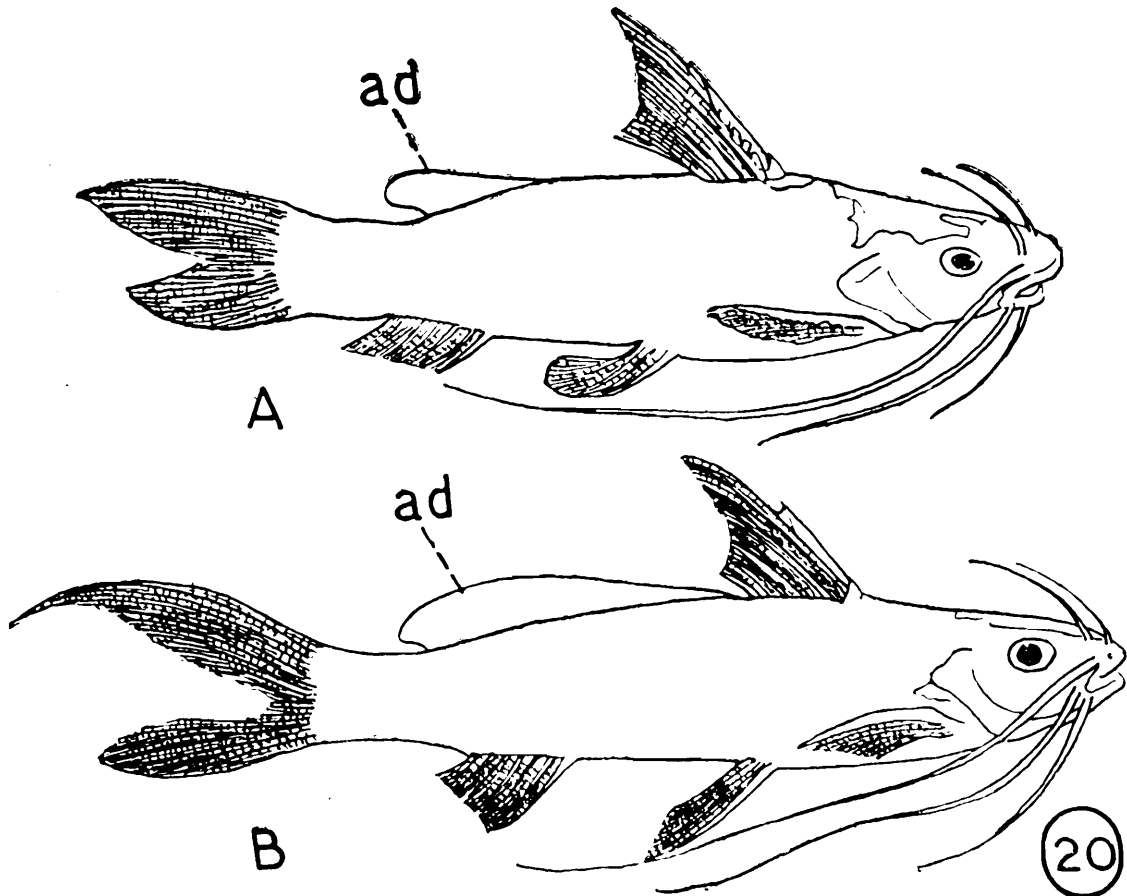
KEY TO THE SPECIES FROM INDIA, PAKISTAN, SRI LANKA & BANGLADESH

1. Occipital process (Oc.p. in fig.) reaching basal bone of dorsal fin (TF 19A) 2



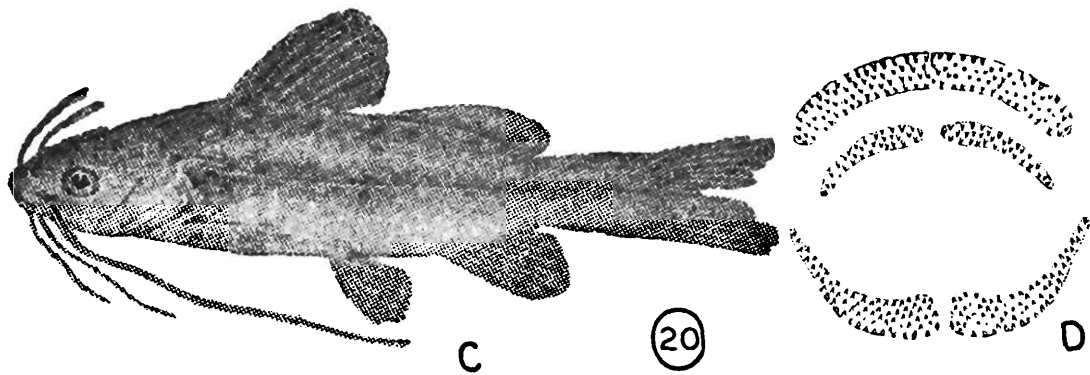
- Occipital process not reaching basal bone of dorsal fin (TF 19B)

2. Adipose dorsal fin (ad. in fig.) commencing almost after rayed dorsal fin (TF 20B) 3



- Adipose dorsal fin short, commencing after an interspace from rayed dorsal fin (TF 20A) 6

3. Caudal peduncle constricted, its least height about 3 times in its length *M. horai* (TF 20C, D)

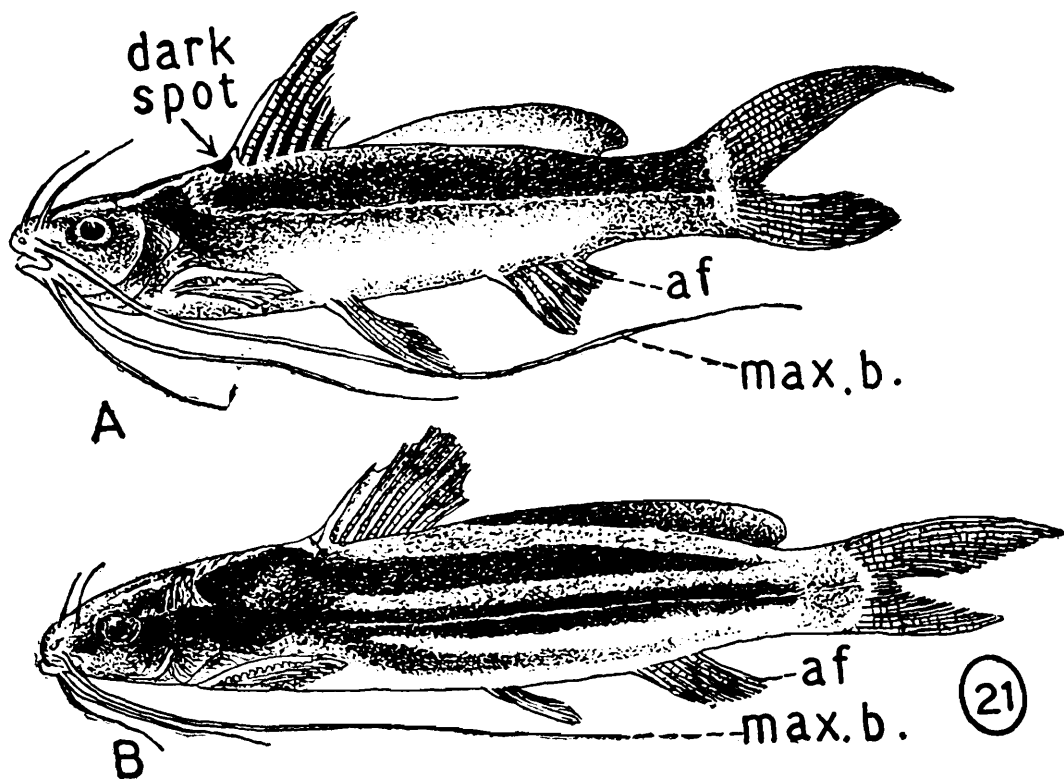


Caudal peduncle not constricted, its least height about 2 times in its length 4

4. Maxillary barbels reach base of pelvic fins. Head length not more than 4 times in total length *M. tengara*

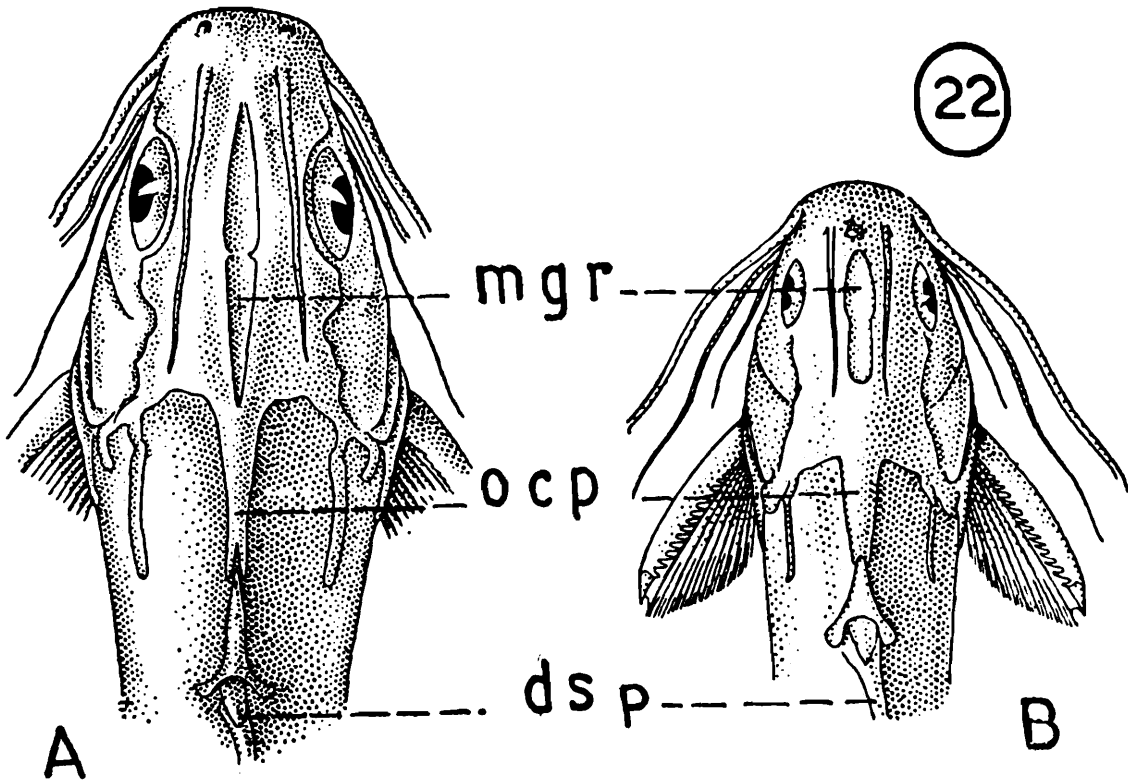
Maxillary barbels reach anal fin or beyond. Head length more than 5 times in total length 5

5. Maxillary barbels (max. b. in fig.) reach anal fin. Interorbital width less than 3.0 (2.0 to 3.0) in head length. No dark spot at base of dorsal fin. *M. bleekeri* (TF 21B)



- Maxillary barbels reach caudal fin base or beyond. Interorbital width more than 3.0 (3.0 to 4.0) in head length. A dark spot at base of dorsal fin, *M. cavasius* (TF 21A)

6. Median longitudinal groove (mg.r. in fig.) on head short, as two fontanelles, reaching base of occipital process (TF 22A). Adipose dorsal fin base longer than anal fin base. *M. oculatus*

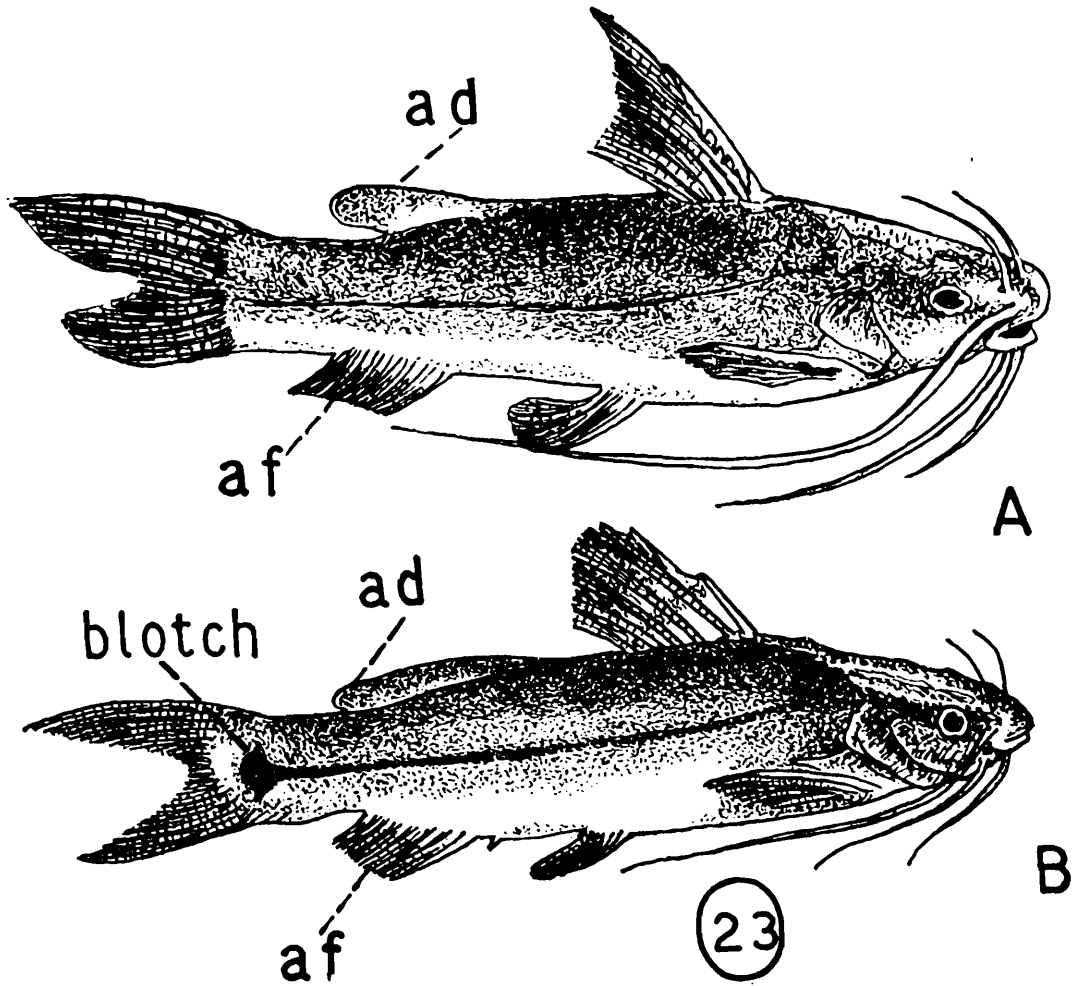


Median longitudinal groove on head short, or long, as one or two fontanelles, not reaching base of occipital process (TF 22B). Adipose dorsal fin base shorter than anal fin base. 7

7. Body plain, without any colour bands 8

Body with one or two longitudinal colour bands on either side of the lateral line 9

8. Body plain. Occipital crest rugose. No blotch at base of caudal fin. Adipose dorsal fin (ad. in fig.) base shorter than or equal to anal fin (af. in fig.) base. Median longitudinal groove short, extending slightly beyond posterior border of orbit, *M. gulio* (TF 23A)

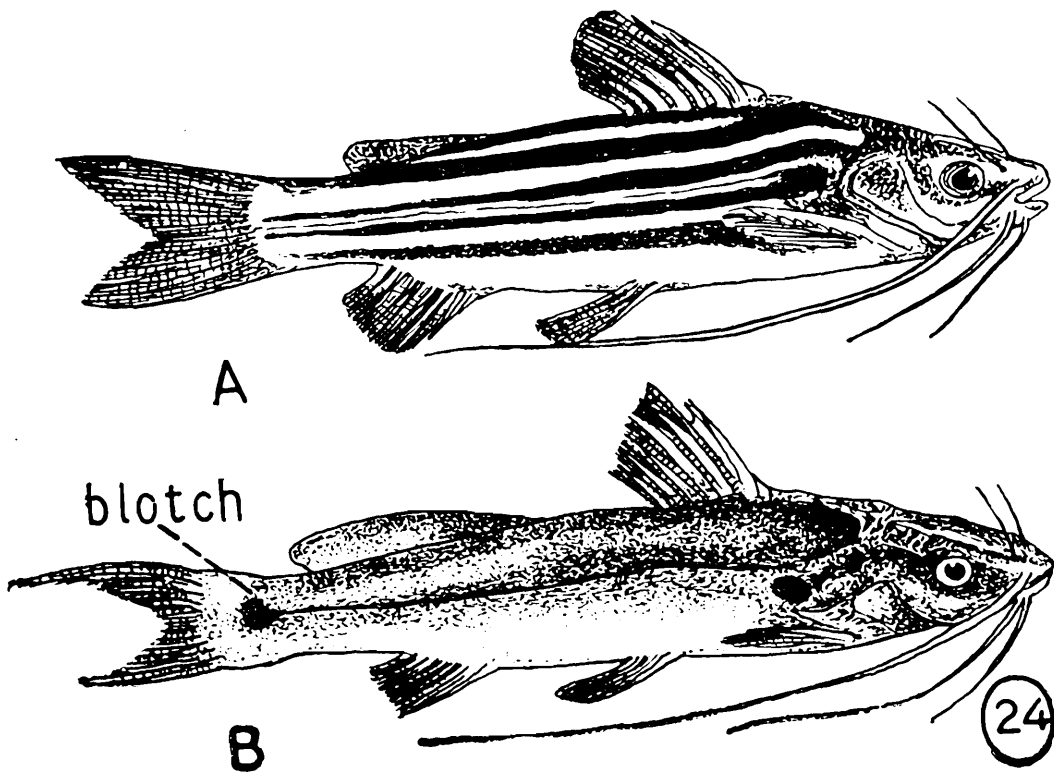


Body plain. Occipital crest smooth. A dark blotch at base of caudal fin. Adipose dorsal fin base longer than and fin base. Median longitudinal groove extending beyond posterior border of orbit, and nearly reaching base of occipital process. ...

M. armatus
... (TF 23B)

9. Eye diameter 3.5 to 4.0 in head length. Pectoral fins with six rays. Body with a bluish shoulder spot, and a silvery line along the side ending in a dark spot at base of caudal (TF 24B); one or two light bands along sides above lateral line. (South India, W. Ghats, occasionally in Madhya Pradesh also). ...

M. montanus



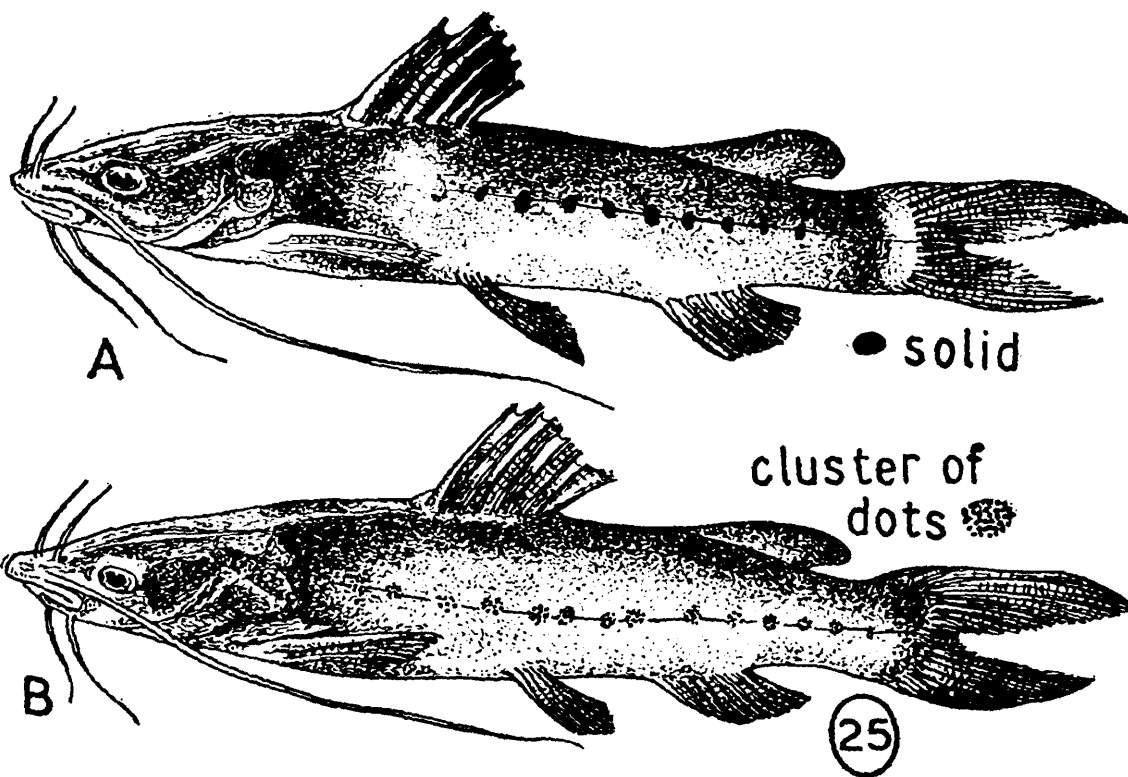
Eye diameter 4.5 to 6.0 in head length. Pectoral fins with nine rays. Body with 3 or 4 longitudinal colour bands above and below lateral line (TF 24A). A dark shoulder spot. No spot at base of caudal fin. (Widely distributed).

M. vittatus

10. Median longitudinal groove on head reaching base of occipital process (see TF 22A, p. 24). 11

Median longitudinal groove on head not reaching base of occipital process (see TF 22B, p. 24) 12

11. Ten black rounded solid spots along lateral line. *M. punctatus*
Body depth 7.8 to 8.4 in standard length. (TF 25A)

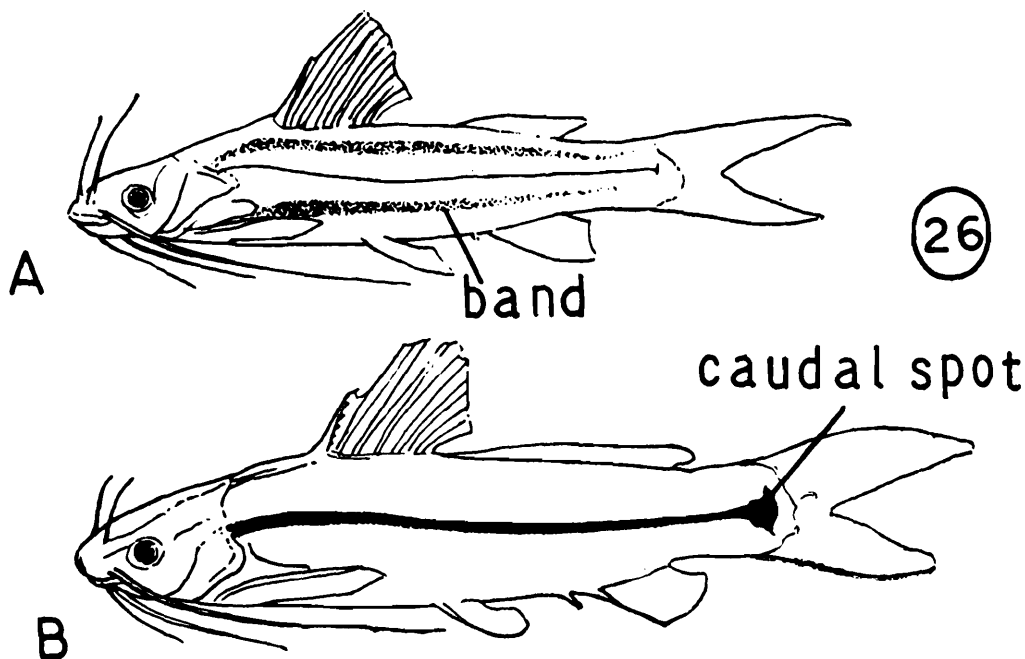


Several clusters of small vertical spots along anterior half of lateral line. Body depth 4.4 to 5.0 in standard length. *M. menoda menoda*
... .. (TF 25B)

12. Similar to *M. menoda menoda*, but with lower lobe of caudal fin prolonged into a filament. *M. menoda trachacanthus*

Unlike *M. menoda menoda*, and with lower lobe of caudal fin not prolonged, 13

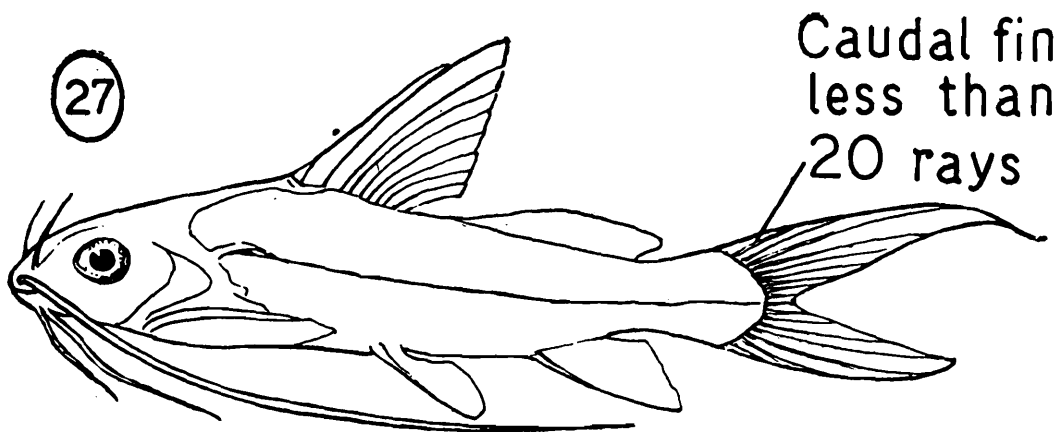
13. Occipital process long, 5.0 times longer than wide at base. Body depth about 4.0 times in standard length. A light band above and below lateral line. No spot at base of caudal fin. *M. kellicus* (TF 25A)



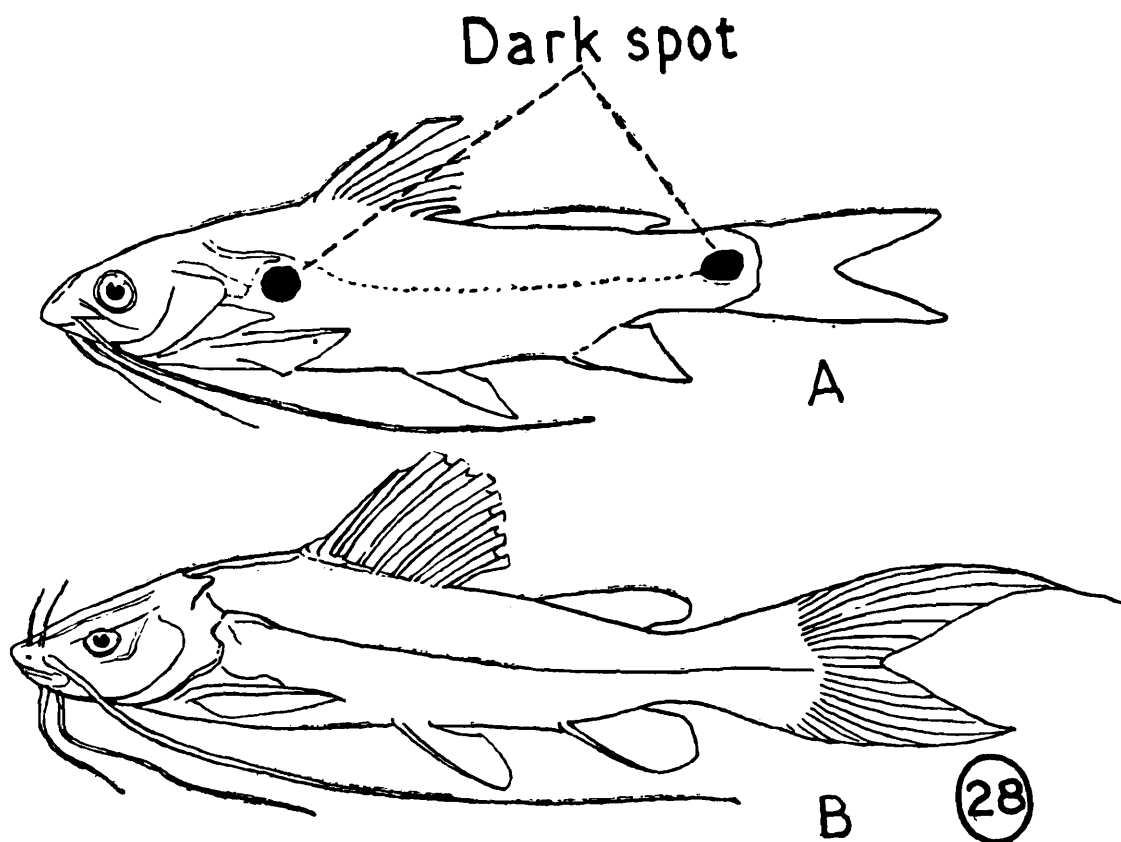
- Occipital process short, 1.0 to 2.0 times longer than wide at base. Body depth 4.5 to 6.0 times in standard length. A dark band only along lateral line ending with a dark blotch at base of caudal fin. *M. malabaricus* (TF 26B)

KEY TO THE SPECIES FROM BURMA

1. Maxillary barbels reach middle of pectoral fins. *M. peguensis*
 Maxillary barbels reach pelvics or beyond. 2
2. Median longitudinal groove on head reaching base of occipital process (see TF 22A, p. 24). 3
 Median longitudinal groove on head not reaching base of occipital process (see TF 22B, p. 24). 4
3. Caudal fin with 24 rays. A black spot at base of caudal fin. Adipose dorsal long and low. *M. rufescens*
 Caudal fin with less than 20 rays. No black spot at base of caudal fin. Adipose dorsal long and high. *M. leucophasis* (TF 27)



4. Occipital process reaching basal bone of dorsal fin. Eye diameter 3·8 to 4·3 in head length. A black shoulder spot and another at base of caudal fin. *M. pulcher* (TF 28A).



Occipital process not reaching basal bone of dorsal fin. Eye diameter 6·0 to 8·0 in head length. No spot at base of caudal fin. *M. microphthalmus* (TF 28B)

***Mystus armatus* (Day)**

Hypselobagrus armatus Day, 1865, *Proc. zool. Soc. Lond.*, p. 289 (type locality, Malabar).

Mystus (Mystus) armatus: Jayaram, 1954, *Rec. Indian Mus.*, 51(4), p. 539, text-fig. 5 (specimen from Burma recorded).

D. I, 7; P. I, 8-9; V i, 5; A. iii, 8; C. 17.

Diagnostic characters.—Adipose dorsal fin base longer than that of rayed dorsal fin. Median longitudinal groove on head shallow, a single long groove nearly reaching base of occipital process. *No dots on body. Anal fin with a pre-anal papilla. Upper caudal lobe longer.*

Colour.—In preserved specimens leaden or brown anteriorly, lighter beneath with or without a brown band along the sides, and a *dark blotch at base of caudal*. Upper half of dorsal fin darkish, anal fin with a dark band.

Distribution.—India: Wyanad range of hills, Western Ghats. Burma.

Size.—Maximum size 146 mm. S.L.

Fishery value.—Not commercially important as it is obtained occasionally.

Type-specimen.—Syntype, 1 ex., in ZSI, Calcutta.

Remarks.—Hora (1931, p. 1) recorded a single specimen from Kyenchong river in the Cinchona reserve, 16 km. off La-pokechong, Mergui district, Burma. This species has not been reported subsequently from Burma. It is mainly found in south India restricted to the hill ranges of Western Ghats.

***Mystus bleekeri* (Day)**

Bagrus keletius (nec Valenciennes) Bleeker, 1846, *Nat. Geneesk Arch. Ned. Ind.*, (2) 3, p. 135 (type locality, Bengal).

Macrones bleekeri Day, 1877, *Fish. India*, p. 451, pl. 101, fig. 1 (new name for *Bagrus keletius* Bleeker).

Mystus (Mystus) bleekeri: Jayaram, 1954, *Rec. Indian Mus.*, 51(4), p. 530, text-fig. 1 (see for synonymy).

D. I, 7; P. I, 9–10; V i, 5; A. iii, 6–7; C. 17.

Diagnostic characters.—Brownish grey in colour, with two light longitudinal bands one above the other, below the lateral line. A dark shoulder spot generally present. Maxillary barbels reach anal fin.

Colour.—As cited above, in preserved and fresh condition.

Distribution.—India; generally confined to north India; the southernmost limit being the Mahanadi headwaters, recorded by Hora (1940), where it is rare. Commonly found up to Bengal only. Pakistan, Bangladesh, Burma, Sumatra.

Fishery value.—No major fishery exists for this species, but it is obtained along with other fishes in many fishing operations. Inhabits lakes, tanks, and rivers being caught in traps and drag nets.

Type-specimens.—Syntypes 2 exs., Regd. Nos. 1076, 781, in ZSI, Calcutta.

***Mystus cavasius* (Hamilton)**

Pimelodus cavasius Hamilton, 1822, *Fish. Ganges*, pp. 203, 279, pl. 11, fig. 67 (type locality, Gangetic province).

Mystus (Mystus) cavasius: Jayaram, *Rec. Indian Mus.*, 51(4), p. 532 text-fig. 2 (see for synonymy).

D. I, 7; P. I, 8; V i, 5; A. iv, 7–9; C. 16.

Diagnostic characters.—Maxillary barbels reach caudal fin or beyond. Adipose dorsal fin long, commencing almost immediately after rayed dorsal fin.

Colour.—Live specimens are leaden above, yellowish along abdomen and cheeks. A bluish band along lateral line may be occasionally seen. Specimens from North Bengal may have a black spot on the shoulder. A dark spot at base of dorsal fin may be present.

Distribution.—India, Pakistan, Bangladesh, Burma, Thailand, Malaysia, Java, Sumatra, Borneo.

Size.—Maximum size 450 mm. TL. Weight up to 10 kg.

Fishery value.—A very common fish obtained along with others in routine fishing operations. Inhabits lakes and rivers at a distance from the sea. It is esteemed as food by many. The pectoral spines cause painful wounds (Raj, 1916, p. 264).

Remarks.—A very highly variable species especially in regard to the length of the different barbels. In halfgrown and young individuals the maxillary barbels do not as a rule extend beyond the anal fin while in adults they reach the base of caudal fin or even beyond.

Type-specimen.—Not known.

Mystus gulio (Hamilton)

Pimelodus gulio Hamilton, 1822, *Fish, Ganges*, pp. 201, 379, pl. 23, fig. 66 (type locality, upper parts of Gangetic estuaries).

Mystus (Mystus) gulio: Jayaram, *Rec. Indian Mus.*, 51(4); p. 542, text-fig. 7 (see for synonymy).

D. I, 7; P. I, 8–9; V i, 5; A. iv, 9–11; C. 17.

Diagnostic characters.—Median longitudinal groove on head short, not very conspicuous, not reaching base of occipital process. Upper surface of head rough and granulated. Maxillary barbels reach pelvic fin end.

Colour.—Dark or bluish brown on head and back, dull white beneath, in preserved specimens.

Distribution.—India, Pakistan, Bangladesh, Burma, Thailand, Sri Lanka, Malaysia, Java, Sumatra, Borneo. Found in the seas, estuaries and tidal waters.

Size.—Maximum size 457 mm. TL.

Fishery value.—A most common gregarious catfish obtained in good numbers consistently in all fishing operations especially in estuaries. Eggs are numerous, small.

Type-specimen.—Not known.

Remarks.—The occipital process reaches the basal bone of the dorsal fin in most examples. In a very few cases however, it may not reach. Day (1889, p. 152) stated that an interspace is present, but in his *Fish. India*, (1877, p. 445) in a footnote he observed that it is related to growth. Since the specimens which are obtained in commercial catches are mostly adults, the occipital process is described as reaching the basal bone of the dorsal fin.

Mystus horai Jayaram

Mystus (Mystus) vittatus horai Jayaram, 1954, *Rec. Indian Mus.*, 51(4), p. 536, text-fig. 4, pl. 19 (type locality, River Indus, Kalabagh, West Pakistan).

D. I, 7; P. I, 8; V i, 5; A. iii, 8; C. 17.

Diagnostic characters.—Teeth on palate in two separate bands, interrupted in the middle. Caudal peduncle much constricted. Body without any parallel stripes along sides.

Colour.—As cited above.

Distribution.—West Pakistan: River Indus, Kalabagh. Not recorded from elsewhere.

Size.—Maximum size 106 mm. TL.

Fishery value.—A rare species and as such of limited value.

Type-specimens.—Syntypes, 4 exs., in ZSI, Calcutta.

Remarks.—This is the only species of the genus which has an interrupted band of teeth on the palate. It was described as a subspecies of *vittatus*, but having now studied the entire Bagridae from its world-wide range, I am convinced that this deserves a separate specific status.

***Mystus keletius* (Valenciennes)**

Bagrus keletius (nec Bleeker) Valenciennes, 1839, *Hist. nat. Poiss.*, **14**, p. 411 (type locality, Pondicherry).

Mystus (Mystus) keletius: Jayaram, 1954, *Rec. Indian Mus.*, **51**(4), p. 540 (see for synonymy).

D. I, 7; P. I, 10; V. i, 5; A. ii–iii, 7–8; C. 17.

Diagnostic characters.—Similar to *M. cavasius*, but with *maxillary barbels reaching only up to middle of anal fin and the median longitudinal groove not reaching the base of occipital process. Colour silvery white with yellowish tinge on dorsal side and back.*

Colour.—A dark shoulder spot, a light band along lateral line, and a silvery one above and below may be present, in preserved specimens.

Distribution.—India: Tamil Nadu, Kerala, Karnataka, Western Ghats. Sri Lanka. Inhabits rivers, tanks and ponds.

Size.—Maximum size 125 mm. TL.

Fishery value.—Being only of a small size, catches are extensively dried and sold in the markets; but not many are obtained.

Type-specimen.—Syntype, 1 ex., A 9011, Pondicherry, Leschenault, coll., 90 mm. SL, Paris Museum.

***Mystus leucophasis* (Blyth)**

Bagrus leucophasis Blyth, 1860, *J. Asiat. Soc. Beng.*, **29**, p. 148 (type locality, Sittang and other Burmese rivers).

Mystus (Osteobagrus) leucophasis: Jayaram, 1954, *Rec. Indian Mus.*, **54** (4), p. 550, text-fig. 11 (see for synonymy).

D. I, 7; P. I, 8–10; V. i, 5; A. ii–iii, 7–8; C. 17.

Diagnostic characters.—*Body olive green or yellow in live condition, purple black with some white dots on body in preserved condition. Dorsal spine as long as head length.*

Colour.—As cited above.

Distribution.—Burma: Sittang and other rivers.

Size.—Maximum size 304 mm. TL.

Fishery value.—Grows to a large size and as such is of local importance. Not much is known about its fishery.

Type-specimens.—Not known.

Remarks.—Prashad and Mukerji (1929) reported 19 examples of this species from Chaungwa, a large fishing village at the junction of Indaw and the Nam Ting rivers in the Myitkyina district, Burma. It is said to be very common in these rivers.

***Mystus malabaricus* (Jerdon)**

Bagrus malabaricus Jerdon, 1849, *Madras J. Lit. Sci.*, **15**, p. 338 (type locality, Mountain streams in Malabar).

Mystus (Mystus) malabaricus: Jayaram, 1954, *Rec. Indian Mus.*, **51** (4), p. 544, text-fig. 8 (see for synonymy).

Mystus maydelli Rossel, 1964, *Mitt. Hamburg. Zool. Mus. Inst.*, **61**, p. 149, fig. 1 (type locality, Wadgaon, Bhima R.).

D. I, 7; P. I, 9; V i,5; A. 10–11; C. 18.

Diagnostic characters.—A dark blotch on shoulder surrounded by a lighter edge, another at base of caudal fin; a dark band along lateral line. Upper caudal lobe the longer.

Colour.—Deep leaden. Fins with minute dark spots in preserved specimens, besides those cited above.

Distribution.—India: Western Ghats from Kerala, Karnataka, Maharashtra.

Size.—Maximum size 150 mm. TL.

Fishery value.—Obtained occasionally, it is only of limited value and importance.

Type-specimens.—Syntypes, 2 ex., in ZSI, Calcutta.

Remarks.—*M. maydelli* Rossel described from a single specimen 90 mm. long from Bhima river is relegated to the synonymy of this species. *M. maydelli* is reported to differ from *M. malabaricus* in having a smooth head, and longer caudal fin. Both these characters fall within the range of variation of *malabaricus*. The occurrence of *maydelli* in Bhima river is insignificant since *malabaricus* has also been collected from localities far north from its nominal range.

Mystus menoda menoda (Hamilton)

Pimelodus menoda Hamilton, 1822, *Fish. Ganges*, pp. 203, 379, pl. 1, fig. 72 (type locality, Kosi, Mahananda, North Bihar and Bengal).

Mystus (Mystus) menoda: Jayaram, *Rec. Indian Mus.*, 51(4), p. 546, text-fig. 9 (see for synonymy).

D. I, 7; P. I, 9; V i, 5; A. iii-v, 8; C. 17.

Diagnostic characters.—Several vertical black spots along anterior portion of lateral line, but without any punctuated marks. Eyes small. Occipital process long, 5.0 times longer than wide at base. Upper surface of head exposed. Snout slightly flat.

Colour.—Greyish brown above, dull white beneath, in preserved specimens; fins greyish stained with black.

Distribution.—India: Orissa, Bengal, Assam, Bangladesh, Burma.

Size.—Maximum size 300 mm. TL.

Fishery value.—Commonly dug out from bottom of ponds, where they lie buried in the soft, wet clay. Eaten by the poorer classes, occasionally it is sold in good numbers.

Type-specimen.—Not known.

Remarks.—The occipital process and the median groove appear as reaching the basal bone of dorsal fin and the occipital process respectively in old well grown specimens, especially from Burma. The occipital process is very thin and lies deep under the skin, but does not reach the basal bone of the dorsal fin. Similarly, the median groove tapers towards the occiput.

Mystus menoda trachacanthus (Valenciennes)

Bagrus trachacanthus Valenciennes, 1839, *Hist. Nat. Poiss.*, 14, p. 419 (type locality, Bengal).

Mystus (Mystus) menoda trachacanthus: Jayaram, *Rec. Indian Mus.*, 51(4), p. 546 (see for synonymy).

D. I, 7; P. I; V i, 5; A. 12; C. 17.

Diagnostic characters.—Lower lobe of caudal fin prolonged into a filament.

Colour.—Greyish brown on top becoming dull white beneath, in preserved specimens.

Distribution.—India: Bengal, Bombay.

Size.—Maximum size not known.

Type-specimen.—Holotype, in Museum National D'histoire Naturelle, Paris.

Remarks.—Chaudhuri (1912) recorded a single specimen of this species from Bombay. The specimen No. F. 5598/1 is in a poor state of preservation in the collections of the Zoological Survey of India, Calcutta. Barring the holotype in Paris Museum, and this specimen, no further records of this interesting species are known. Its occurrence in Bombay, far west of its type-locality, is of considerable zoogeographical interest,

Mystus microphthalmus (Day)

Macrones microphthalmus Day, 1877, *Fish. India*, p. 446, pl. 100, fig. 4 (type locality, Irrawaddy, Burma).

Mystus (Mystus) menoda microphthalmus: Jayaram, *Rec. Indian Mus.*, 51(4), p. 547 (see for synonymy).

D. I, 7; P. I, 9; V i, 5; A. iii, 9; C. 17.

Diagnostic characters.—Similar to *M. menoda menoda*, differing from it in having the *upper lobe of caudal fin prolonged with a filamentous elongation*. Body depth 7.0 to 8.0 in standard length; pectoral spine with 9 or 10 antrorse teeth along inner margin.

Colour.—Light brown shot with purple, fins darkest externally, in preserved examples.

Distribution.—Burma: along the valley of Irrawaddy river.

Size.—Maximum size 140 mm. TL.

Fishery value.—A rarely caught species of not much value.

Type-specimen.—Syntype, 1 ex., original of pl. 100, fig. 4 in *Fish. India*, in ZSI, Calcutta.

Remarks.—In my review of the genus *Mystus* (Jayaram, 1955) this species was considered as a subspecies of *M. menoda menoda* (Hamilton). Having now examined a large number of species of bagrids, the character of a low body (7.0 to 8.0 in standard length), is sufficiently distinct enough for keeping *microphthalmus* as a separate taxa. The presence of a filamentous prolongation on the upper caudal lobe is another supporting feature, though as a character it is variable.

Mystus montanus (Jerdon)

Bagrus montanus Jerdon, 1849, *Madras J. Lit. Sci.*, 15(2), p. 337 (type locality, Manantoddy, Wynaad).

Macrones montanus var. *dibrugarensis* Chaudhuri, 1913, *Rec. Indian Mus.*, 8, p. 254, pl. 9, figs. 2, 2a, 2b (type locality, Dibrugarh Assam).

Mystus (Mystus) montanus: Jayaram, 1954, *Rec. Indian Mus.*, 51(4), p. 542 (synonymy).

Mystus (Mystus) montanus var. *dibrugarensis*: Jayaram, 1954, *Rec. Indian Mus.*, 51(4), p. 542.

D. I, 7; P. I, 6; V i, 5; A. iii, 9; C. 19.

Diagnostic characters.—A peninsular species with a *bluish shoulder spot and a dark spot at caudal base*. *One or two light bands along sides of body above lateral line may also be present*, fins tipped green in live condition.

Colour.—Silvery superiorly with a tinge of yellow on under surface of head and along abdomen, in preserved specimens.

Distribution.—India: Kerala State, Wynaad range of hills; Madhya Pradesh, Hoshangabad district,

Size.—Maximum size 115 mm. TL.

Fishery value.—Obtained in limited quantities, this species is not extensively fished. It is as such, only of local value, especially in Manantoddy, Kerala.

Type-specimen.—Not known.

Remarks.—*Mystus montanus* var. *dibrugarensis* (Chaudhuri) is synonymised with this species. The differences between the solitary example of *dibrugarensis* and the larger material of *montanus* do not justify the provision of a separate specific or even subspecific status for Chaudhuri's (1913) variant.

***Mystus oculatus* (Valenciennes)**

Bagrus oculatus Valenciennes, 1839, *Hist. Nat. Poiss.*, **14**, p. 424, (type locality, Malabar).

Mystus (Mystus) oculatus: Jayaram, 1954, *Rec. Indian Mus.*, **51**(4), p. 540, text-fig. 6 (see for synonymy).

D. I, 7; P. I, 6; V i, 5; A. iii-iv, 8-9; C. 15.

Diagnostic characters.—Upper lobe of caudal fin longer. A dark spot at the commencement of base of dorsal fin, which is also black tipped. A dark band along middle of dorsal fin. In preserved material body silvery, lighter beneath. Confined to Western Ghats, Kerala.

Colour.—As cited above.

Distribution.—India; Kerala; Tamil Nadu, Coimbatore dist.

Size.—Maximum size 150 mm. TL.

Fishery value.—Being of small size, it is not of much commercial value. Obtained only occasionally.

Type-specimen.—Holotype, 1195, Cote de Malabar, Coll. Belanger, 90 mm. SL. Paris Museum.

***Mystus peguensis* (Boulenger)**

Macrones peguensis Boulenger, 1894, *Ann. Mag. nat. Hist.*, (6) **14**, p. 196 (type locality, Sittang river near Toungoo, Burma).

Mystus (Mystus) peguensis: Jayaram, 1954, *Rec. Indian Mus.*, **51**(4), p. 552 (name only).

D. I, 7; V i, 5; A. 12.

Diagnostic characters.—A series of blackish dotted lines across the lateral line. Maxillary barbels reaching middle of pectoral fin. Similar to *M. planiceps* (Valenciennes).

Colour.—Olive grey above, white beneath, in preserved examples; dorsal and caudal fins dark, adipose fin blackish (after Boulenger, 1894).

Distribution.—Burma: Sittang river near Toungoo.

Size.—Maximum size 20 mm. TL.

Fishery value.—Nil.

Type-specimens.—Syntypes, in BMNH, London, 2 exs., No. 1894.5.21.25.26.

Remarks.—Known only from two specimens on which the original description is based, this species has not been subsequently recorded again. It is closely allied to *M. planiceps* (Valenciennes) of Thailand, Malaya and East Indies.

***Mystus pulcher* (Chaudhuri)**

Macrones pulcher Chaudhuri, 1911, *Rec. Indian Mus.*, **6**, p. 20, (type locality, Bhamo close to Yunnan border).

Mystus (Mystus) pulcher: Jayaram, 1954, *Rec. Indian Mus.*, **51**(4), p. 532 (see for synonymy).

D. I, 7; P. I, 9; V. i, 5; A. ii, 10; C. 17.

Diagnostic characters.—A dark shoulder spot and another at base of caudal. Head length 3.0 to 3.6, body depth 3.8 in standard length. Similar to *M. bleekeri* (Day) but differing in having the two colour spots and a series of minute sensory pores along lateral line.

Colour.—Light brown above with pale whitish brown stripes above and below lateral line, in preserved specimens.

Distribution.—Burma: Bhamo close to Yunnan border; small muddy streams along Kaminng Jade Mines Road, Myitkyana Dist.

Size.—Maximum size 75 mm. TL.

Fishery value.—A small sized species with limited local value.

Type-specimens.—Syntypes, 4 exs., F. 4716/1 to F. 4719/1, in ZSI, Calcutta.

***Mystus punctatus* (Jerdon)**

Bagrus punctatus Jerdon, 1849, *Madras J. Lit. Sci.*, **15**, p. 339 (type locality, Cauvery River, W. Ghats).

Mystus (Mystus) punctatus: Jayaram, 1954, *Rec. Indian Mus.*, **51**(4), p. 547 (see for synonymy).

D. I, 7; P. I, 7–8; V. i, 5; A. iii–iv, 8–9; C. 17.

Diagnostic characters.—About ten black rounded spots along lateral line. Upper surface of head smooth. Snout not flat.

Colour.—Head and back dark greyish olive, becoming yellow on abdomen, in preserved examples; pelvic fins may be yellowish.

Distribution.—India: Bhavani river at base of Nilgiri hills, Karnataka, and Kerala States.

Size.—Maximum size 450 mm. TL.

Fishery value.—Being fairly of a marketable size, this species is of local value. Obtained by the fishermen mostly by rod and line or by hook and line.

Type-specimen.—Not known.

***Mystus rufescens* (Vinciguerra)**

Macrones rufescens Vinciguerra, 1894, *Ann. Mus. Civ. Stor. nat. Genoa*, 9(2), p. 226 (type locality, Meetan, Burma).

Mystus (Mystus) rufescens: Jayaram, 1954, *Rec. Indian Mus.*, 51(4), p. 552 (name only).

D. I, 7; P. I, i, 8; V. i, 5; A. iii, 8; C. 24.

Diagnostic characters.—Similar to *M. armatus* (Day), but differing in the median longitudinal groove reaching base of occipital process and caudal fin with 24 rays.

Colour.—Brown over body, with a black spot on caudal base, in preserved material.

Distribution.—Burma: Meetan.

Size.—Maximum size 75 mm. TL.

Fishery value.—Nil.

Type-specimen.—Holotype, No. 14585, in Museo Civico di Storia Naturale, Genoa.

***Mystus tengara* (Hamilton)**

Pimelodus tengara Hamilton, 1822, *Fish. Ganges*, pp. 183, 377, pl. 23 fig. 60 (type locality, northern parts of Bengal; erroneously written below figure as *Pimelodus batasius*).

Mystus (Mystus) tengara: Jayaram, 1954, *Rec. Indian Mus.*, 51(4), p. 538 (see for synonymy).

D. I, 7; P. I, 8; V. i, 5; A. ii–iii, 9–10; C. 19.

Diagnostic characters.—Median longitudinal groove on head reaching base of occipital process. Dorsal spine serrated anteriorly. Pectoral spine with 8 to 13 antrorse teeth along inner margin. Generally absent from South India.

Colour.—Brilliant yellow, with a black shoulder spot and about five black longitudinal lines (after Day, 1889), in live condition. Snout somewhat whitish in preserved specimens.

Distribution.—India: mainly all through north India, Bangladesh, Pakistan.

Size.—Maximum size 100 mm. TL.

Fishery value.—Commonly obtained in traps, castnets, from rivers, ponds, tanks, pools. Sold in large quantities rather cheaply, in empty kerosene tins.

Type-specimen.—Not known.

Mystus vittatus (Bloch)

Silurus vittatus Bloch, 1797, *Ichthyol. Hist. Nat.*, **11**, p. 40, pl. 371, fig. 2 (type locality, Tranquebar).

Mvstus (Mystus) vittatus: Jayaram, 1954, *Rec. Indian Mus.*, **51**(4), p. 534 (see for synonymy).

D. I, 7; P. I, 9; V i, 5; A. 9–12; C. 17.

Diagnostic characters.—Median longitudinal groove on head short, wide, not reaching base of occipital process. Pectoral spine with 15 to 16 antrorse teeth along inner margin. Teeth on palate in a very narrow band.

Colour.—Much variable, depending upon age. Generally silvery, or golden, with golden hue more prominent; a narrow black band on either side of lateral line; a lighter parallel one below, and two wider ones above; in total about five bands. Fin tips usually dark. A black shoulder spot may also be present (after Day, 1889).

Distribution.—Throughout India, Pakistan, Bangladesh, Burma, Malaya, Thailand, Sri Lanka. A widely distributed species occurring within tidal influence also.

Size.—Maximum 200 mm. TL.

Fishery value.—One of the most common small sized catfish caught in large quantities from ponds, tanks, lakes, rivers and other aquatic resources. Sold in empty kerosene tins at a comparatively cheap rate. Eggs are numerous yellow in colour. Ovigerous females were taken in August in Sri Lanka.

Type-specimen.—Holotype, ZMB 2939, Tranquebar. Coll. probably missionary John, 84.5 mm. SL. Zool. Mus. Berlin.

Remarks.—This fish is called the “fiddler-fish” in Karnataka because of its curious habit of making a noise resembling the buzzing of a bee when irritated.

Genus Aorichthys Wu

Aorichthys Wu, 1939, *Sinensia*, **10**, p. 131 (proposed originally as substitute name for *Aoria* Jordan, 1919 preoccupied in Insecta = *Macrones* Duméril, 1856 preoccupied in Insecta, type species *Pimelodus aor* Hamilton, by subsequent designation, Jayaram, 1971).

Aorichthys: Jayaram, 1971, *Proc. zool. Soc. Calcutta*, **24**, p. 149 (replaces *Osteobagrus* Jayaram elevated to a generic rank).

Description.—Dorsal profile arched. Head large, slightly depressed; snout spatulate or rounded; jaws subequal; lips thin. Mouth subterminal, transverse,

moderately wide. Teeth uniformly villiform on jaws and palate in bands. Eyes moderately large, supralateral. *A distinct interneural shield in between basal bone of dorsal fin and occipital process present.* Four pairs of barbels, one each of maxillary, nasal and two of mandibular. Gill membranes free from each other, overlapping, and also from isthmus. Branchiostegals twelve.

Rayed dorsal fin with seven rays and a spine. Adipose dorsal low, long. Pectoral fins with 9 or 10 rays, and a spine serrated along inner edge with antrorse teeth. Pelvic fins with 6 rays. Anal fin short, with 11 to 13 rays. Caudal fin forked. Lateral line complete, simple.

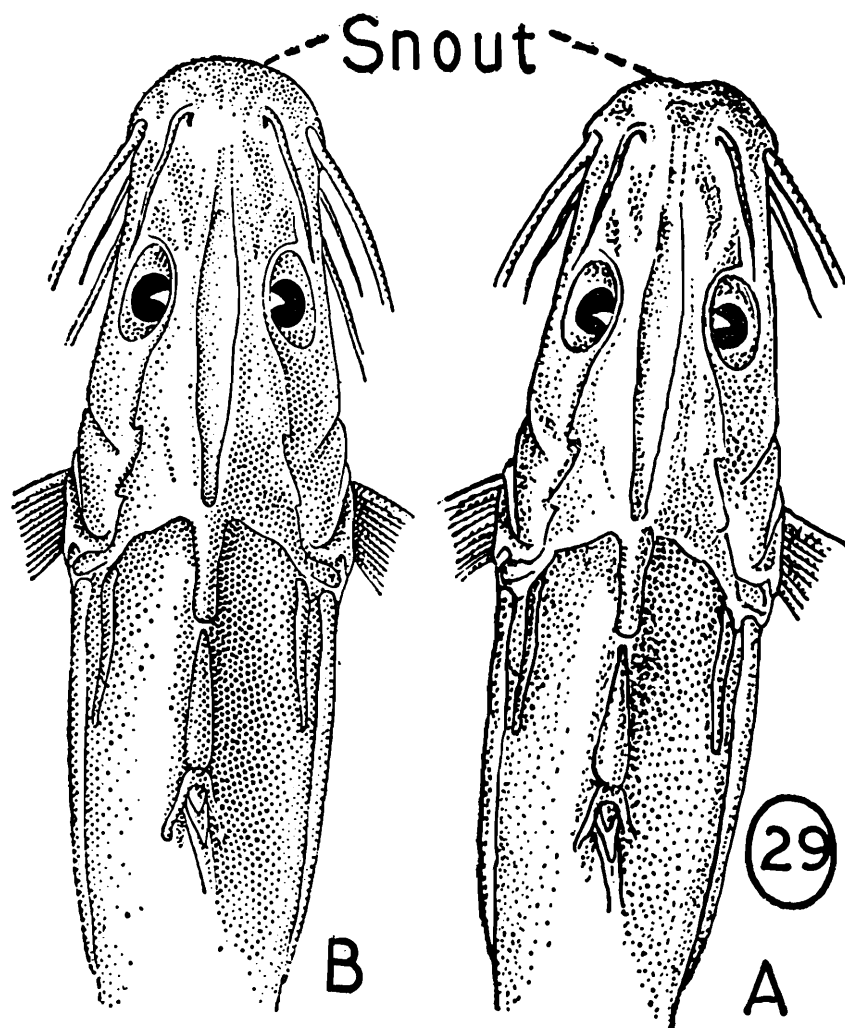
Distribution.—India up to Krishna river system in the south, Pakistan, Burma, China.

Remarks.—Originally proposed (Jayaram, 1955) as a subgenus *Osteobagrus* Jayaram of *Mystus* Scopoli, this has been elevated to a generic rank in view of its osteological characters (Jayaram, 1973). The nomenclature of the genus, the osteology of the rayed dorsal fin and the connected bones are dealt in Jayaram, 1972.

Two species are known.

KEY TO THE SPECIES

Snout spatulate. Width of gape of mouth $\frac{1}{3}$ rd head length. Caudal fin with 19-21 rays	<i>A. seenghala</i> ... (TF 29A)
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Snout rounded. Width of gape of mouth less than $\frac{1}{2}$ head length. Caudal fin with 17 rays	<i>A. aor</i> ... (TF 29B)
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Aorichthys aor (Hamilton)

Pimelodus aor Hamilton, 1822, *Fish. Ganges*, pp. 205, 379, pl. 20, fig. 68 (type locality, Rivers of Bengal and upper parts of Gangetic estuaries).

Mystus (Osteobagrus) aor: Jayaram, 1954, *Rec. Indian Mus.*, 51(4), p. 548, text-fig. 10 (see for synonymy).

Aorichthys aor: Jayaram, 1971, *Proc. zool. Soc. Calcutta*, 24, p. 155 (description).

D. I, 7; P. I, 9–10; V i, 5; A. iii–iv, 8–9; C. 17.

Diagnostic characters.—Snout rounded. Caudal fin with 17 rays. *Maxillary barbels reach caudal fin base or even beyond*.

Colour.—Bluish leaden above becoming white on abdomen. A black tinge on posterior lower end of rayed dorsal fin may be present in preserved specimens.

Distribution.—India up to the Krishna river system in the south. Pakistan. Bangladesh. Burma.

Size.—Maximum size 2 metres TL.

Fishery value.—A common predominant catfish of the heavier and larger variety of considerable value. Mostly riverine, good catches are obtained in the major north Indian rivers and are sold, distributed by road and rail to important cities. Some people seem to prefer the head and other cut-pieces. Breeds before the commencement of the monsoon rains.

This species and its ally *A. seenghala* are known to build nests among pebbles in the bed of the river during April and May. Generally a parent fish with young are found in each nest, but no eggs are seen (Raj, 1940).

Type-specimen.—Not known.

Aorichthys seenghala (Sykes)

Platystoma seenghala Sykes, May 1839, *Trans. zool. Soc. Lond.*, 2, p. 371, pl. 65, fig. 2 (type locality, Mota Mula river, Poona).

Mystus (Osteobagrus) seenghala: Jayaram, 1954, *Rec. Indian Mus.*, 51(4), p. 550 (see for synonymy)

Aorichthys seenghala: Jayaram, 1971, *Proc. zool. Soc. Calcutta*, 24, p. 155 (description).

D. I, 7; P. I, 9; V. i, 5; A. iii, 8–9; C. 19–21.

Diagnostic characters—*Snout spatulate*. Caudal fin with 19 to 21 rays. *Maxillary barbels reach middle or end of rayed dorsal fin*. A round black spot on posterior end of adipose fin.

Colour.—Brownish along back, silvery on sides below lateral line and beneath, in preserved specimens.

Distribution.—Large rivers of India up to Krishna river system in the South. Pakistan, China.

Size.—Maximum size 1.5 metre TL.

Fishery value—Similar to *A. aor*, this is also one of the frequently obtained larger and heavier catfishes of India and Pakistan. Inhabits the larger rivers and is caught extensively, fetching attractive price for the fishermen. Breeds before the commencement of monsoon rains. This species, however is less abundant than *A. aor*.

As in the case of *A. aor*, this species also builds nests among pebbles in the bed of the river during April and May. Nests of this species are larger in size and are in deeper waters (Raj. 1940).

Type-specimen.—Holotype, in British Museum, Natural History, London.

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