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AID TO IDENTIFICATION OF SILUROIDS

by

K. C. JAYARAM

Issued by The Director
Zoological Survey of India. Calcutta

RECORDS

OF THE

ZOOLOGICAL SURVEY OF INDIA

MISCELLANEOUS PUBLICATION

OCCASIONAL PAPER No. 23

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

4. CLARIIDAE, HETEROPNEUSTIDAE, CHACIDAE AND OLYRIDAE

BY

K. C. JAYARAM

Edited by the Director, Zoological Survey of India

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Introduction

This paper is the fourth in the series "Aid to the identification of Siluroids". Part 1 (Jayaram, 1977) contained Keys to the species and genera of the family Bagridae, besides a general key to all the families of Siluriformes. Part 2 (Jayaram, 1977a) dealt with the families, genera and species of Siluridae, Schilbeidae, Pangasiidae, Amblycipitidae and Akysidae. Part 3 (Jayaram, 1979) covered the Sisoridae and all the 18 genera known. The general arrangement is as the same adopted in the earlier three parts. As far as possible important key characters are illustrated. Under descriptions of genera and diagnosis of species, further characters which will help in identification are printed in italics.

Abbreviations

In text-figures.—a.d.=adipose dorsal fin ; adh. app.=adhesive apparatus ; Bl. df.=Basal bone of dorsal fin ; c. pd.=Caudal peduncle ; fng. proc=finger-like processes ; g.m.=gill membrane ; g.o.=gill opening ; m.b.=mandibular barbels ; oc.p.=occipital process ; pc.f.=pectoral fin ; pc. sp.=pectoral spine ; post lab. gr.=post-labial groove ; tblc.=tubercles.

In text.—BM (N. H.)=British Museum (Natural History), London ; GCM (NH)=Govt. College Museum Natural History, Lahore ; TF=Text-figure ; ZMA=Zoological Museum, Amsterdam ; ZSD=Zoological Survey Department, Karachi ; ZSI=Zoological Survey of India, Calcutta.

Acknowledgements

Most of the illustrations were executed by Shri Parimal Biswas, Senior Artist, Zoological Survey of India and a few by Shri D. Pyne of the same department. I am thankful to the Director, Zoological Survey of India, for facilities.

Family Clariidae

Large sized elongate fishes with a compressed body. Teeth on premaxillaries, mandible and prevomer. Nostrils widely separated, anterior tubular, situated near tip of snout, posterior slit-like and with nasal barbel. Barbels eight, well developed. Gill openings wide, extending to above base of pectoral fin. *An accessory respiratory organ, dendritic, attached to second, third and fourth branchial arches above and behind gills in a recess present ; may be reduced as two small bony structures.*

Rayed dorsal fin commencing from near occiput and extending to and separate or continuous with caudal fin, *without any spine. No adipose dorsal fin.* Paired fins inserted horizontally. Pectoral fins with a strong spine, may be serrated ; in some genera fin vestigial. *Anal fin long, not confluent with caudal**. Caudal fin rounded. Lateral line present, complete.

Air-bladder reduced, consisting of two thin-walled sacs united by a transverse tube ; two lateral chambers covered by incomplete bony capsule.

Lateral ethmoid facet for articulation of palatines strictly ventral, seen only from underside of skull. Palatines well developed. Endopterygoid absent. Metapterygoid without any connection with hyomandibular. Pre-vomer large, dentigerous. Post-temporals without inferior limb, connected by sutures to skull. Cranium compactly packed. Meso corocoid in pectoral girdle present.

Vertebrae 60-107.

Distribution.—Freshwaters of Asia, Africa. Well represented in Africa.

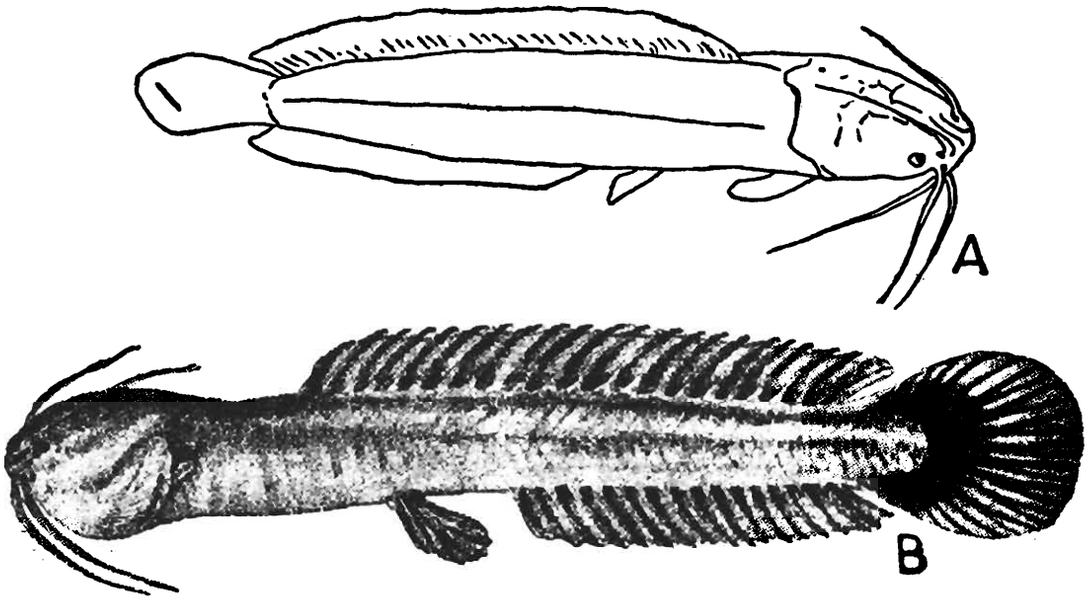

Fig. 1. Lateral view of A. *Clarias batrachus* and B. *Horaglanis krishnai* to show presence or absence of eyes respectively (Fig. B. after A. G. K. Menon, 1951).

Type-genus.—*Clarias* Scopoli.

Remarks.—About eight or nine genera are known, of which two occur in the Indian region.

*Applicable to Indian genera only.

KEY TO THE GENERA

1. **Eyes present. Pectoral fins normal.**	...	*Clarias* Scopoli (Fig. 1A)
Eyes absent. Pectoral fins vestigial.	...	*Horaglanis* Menon (Fig. 1B)

Genus **Clarias** Scopoli

Clarias Scopoli, 1777, *Introductio ad historiam Naturalem* p. 445 (type species, *Clarias orontis* Günther).—Hora, 1936. *Rec. Indian Mus.*, 38, pp. 347-351 (review, key to species).—Silas, 1952, *Proc. nat. Inst. Sci. India*, 18, p. 434 (species composition discussed).—Misra, 1976, *Fauna India*, Ed. 2, 3, p. 124.

Description.—Dorsal profile arched. Head moderate sized, depressed, covered *with osseous plates dorsally and laterally forming a cask covering a diverticulum of the gill cavity* ; snout broadly rounded or pointed ; jaws subequal ; upper jaw longer ; lips fleshy, papillated. Mouth terminal, fairly wide, transverse. Teeth villiform in broad crescentic bands or patches on jaws and palate. Eyes small, dorso-lateral with free orbital margins. Four pairs of barbels, one pair each of maxillary, nasal and two of mandibular. Gill membranes deeply notched, partly united with each other, free from isthmus. *An accessory respiratory dendritic branchial organ attached to second to fourth branchial arches present.*

Rayed dorsal fin long, with 62 to 77 rays and *without any spine*, commencing from near occiput and extending to *but not continuous with caudal fin. Adipose dorsal fin absent.* Pectoral fins with 7 to 11 rays and a strongly serrated spine enveloped in skin. Pelvic fins with six rays. Anal fin long with 45 to 63 rays. Caudal fin almost rounded. Lateral line complete, simple.

Air-bladder reduced, consisting of two thin walled sacs united by a transverse tube, the lateral chambers covered by incomplete horny capsule.

Distribution.—Freshwaters of Africa and South Asia.

A total of 40 species is known from its entire range ; only two present in the Indian region are dealt with here.

Remarks.—A number of species have been proposed under this genus. Hora (1936b) discussed the variations, especially in the dentition and recognised only three species as occurring in India, Sri Lanka and Burma. Smith (1945) did not consider *C. brachysoma* Günther as distinct from *C. teysmanni* Bleeker of Malaya. The great similarity exhibited by the Malayan and Peninsular Indian species has given rise to

this confusion. Silas (1952) discussed the species composition of the genus and grouped the South Indian and Sri Lanka species under one complex, the *dussumieri*-group ; and the Malayan species under a different association the *teysmanni*-group.

The South Indian and Sri Lanka species are thus regrouped as below :

1. *C. dussumieri dussumieri* (Valenciennes)

1. 1. *C. dussumieri dayi* Hora

1. 2. *C. dussumieri brachysoma* Günther

The last is endemic in Sri Lanka, whereas the other two are confined to South India. The second species *C. batrachus* (Linnaeus) is however, widely distributed.

KEY TO THE SPECIES

1. Distance from dorsal fin base to base of occipital process (AB in Fig. 2) contained 4.0 to 5.5 times in head length measured along upper median line, from tip of snout to base of occipital process. ... ... *C. batrachus*

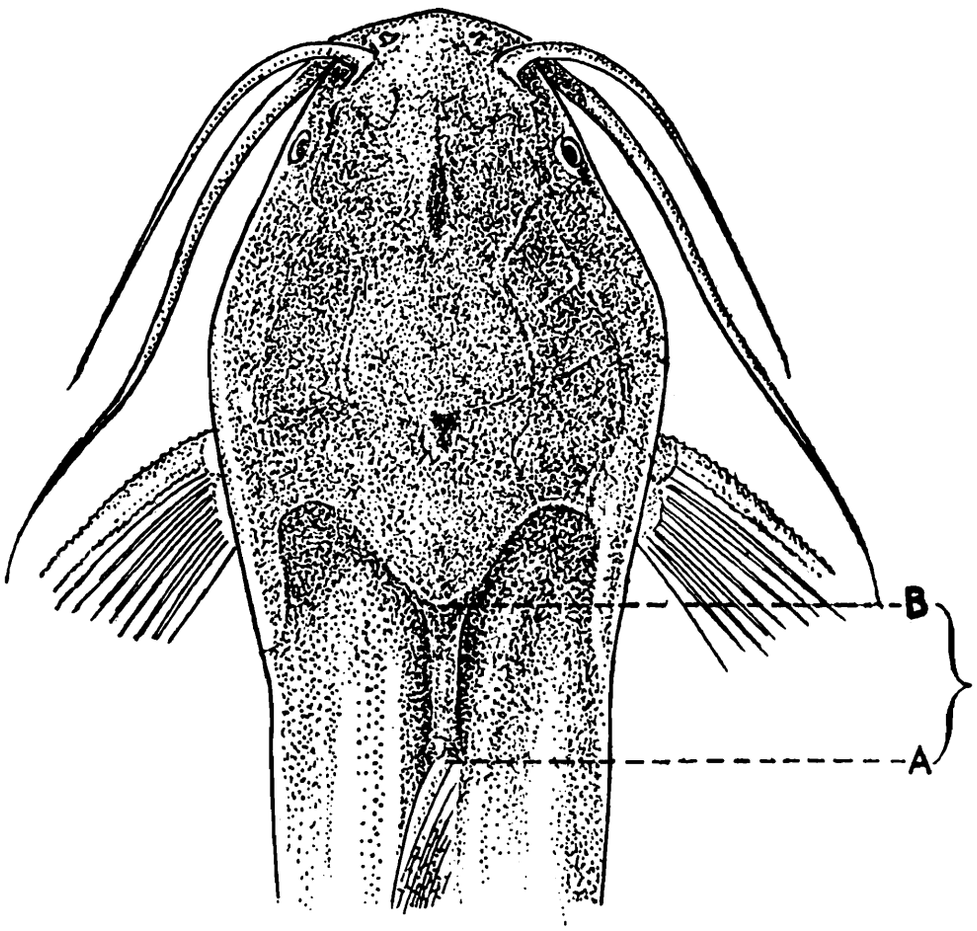

Fig. 2. Dorsal view of head and anterior portion of body of *Clarias batrachus* to show the length of the occipital process.

Distance from dorsal fin base to base of occipital process (AB in Fig. 2) contained less than 4.0 times in head length measured along upper median line from tip of snout to base of occipital process. ... ... *C. dussumieri*

KEY TO SUBSPECIES OF *C. dussumieri*

1. Dorsal fin with 66-70 rays. Pectoral spine strongly serrated externally. ... 2
   Dorsal fin with 70-77 rays. Pectoral spine rough externally (Sri Lanka). ... *C. dussumieri brachysoma* (Fig. 3A)

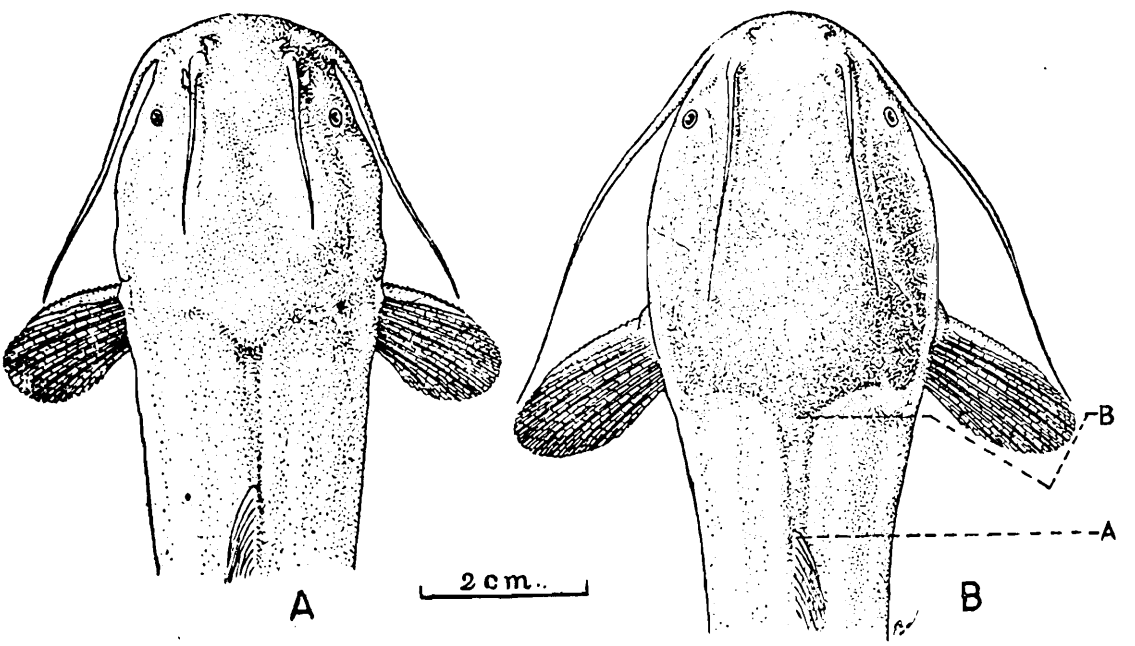

Fig. 3. Dorsal view of head and anterior portion of body of A. *Clarias dussumieri brachysoma* and B. *Clarias dussumieri diussumieri* to show shape of snout and extent of nasal barbels.

2. Snout pointed. Nasal barbel contained more than two times in head length measured from tip of snout to base of occipital process ... ... *C. dussumieri dayi*

   Snout broad. Nasal barbel contained not more than two times in head length measured from tip of snout to base of occipital process. ... ... *C. dussumieri dussumieri* (Fig. 3B)

Clarias batrachus (Linnaeus)

Silurus batrachus Linnaeus 1758, *Syst. Nat.*, Ed. 10, p. 305 (type-locality, Asia, Africa).

Clarias magur Day, 1889, *Fauna Brit. India*, Fish, **1**, p. 115.

Clarias batrachus Misra, 1976, *Fauna India*, Ed. 2, 3, p. 125 (see for synonymy).

D. 62-76 ; P. I, 8-11 ; V. 6 ; A. 45-58 ; C. 15-17.

Diagnostic characters.—Distance from dorsal fin base to base of occipital process contained 4. 0 to 5. 5 times in head length.

Colour.—Dingy green or brown-dorsally, lighter on ventral surface, dorsal and anal fins usually with red margins, sometimes a transverse row or spots along sides of body may be present ; albino specimens not uncommon.

Distribution.—India. Pakistan. Sri Lanka. Bangladesh. Burma. Thailand. Malaya. Malacca. Singapore. Philippines. Java. Bali. Lombok. Sumatra. Borneo.

Size.—Maximum size 457 mm. TL.

Fishery value.—This is one of the most common species of siluroids, highly esteemed for its nourishing properties and considered the best edible fish in Malaya. They are eaten extensively and are sold in live condition in Calcutta and elsewhere, where they fetch a relatively high price. They are brought back to the market the next day if unsold the previous day, because of their sturdy habits. The air-bladder yields a coarse isin glass. They are abundant in ponds and rivers and in the mud they lie concealed for hours. Provided, with an accessory respiratory organ they can live out of water also for some time. Many observers consider that these fishes aestivate in mud, but it seems more probable that they congregate in the one or two deep pools unaffected by the drought and await the advent of the rains, by which time they become ovigerous. This species has a very short and distinct spawning period during July-August and it occurs only once a year (Thakur, 1978).

This is a highly variable species in form. The caudal fin occasionally gets fused with the anal and dorsal fin in some abnormal specimens. *Macropteronotus magur* Hamilton (=*Clarias magur* of Jerdon, 1849) was one such example. The teeth on the palate also undergo considerable changes with growth and exibit many variations. Hora (1936b, p. 350) discussed this problem. Bifurcation of barbels (Thakur and Kohli, 1976) has been reported.

This species is found in close association with *Heteropneustes fossilis* (Bloch) in marshy areas, since the habits, season of occurence etc., are similar to both. The barbels appear to be the chief organs of perception, as experiments in aquarium have proved that this fish is practically blind to objects beyond the reach of its barbels.

Clarias dussumieri brachysoma* Günther

***Clarias** brachysoma* Günther, 1864, *Cat. Fish. Brit. Mus.*, **5**, p. 20 (type-locality, Ceylon). —Misra, 1976, *Fauna India*, Ed. 2, **3**, p. 128.

***Clarias** dussumieri brachysoma* : Silas, 1952, *Proc. nat. Inst. Sci. India*, **18**, p. 435 (systematic position clarified).

D. 70-77 ; P. I, 7-10 ; V. 6 ; A. 53-63. C. 17.

Diagnostic characters.—Pectoral spine rough along outer edge. Dorsal fin with 70-77 *rays.*

Colour.—Uniformly brown.

Distribution.—Sri Lanka.

Size.—Maximum size 305 mm. TL.

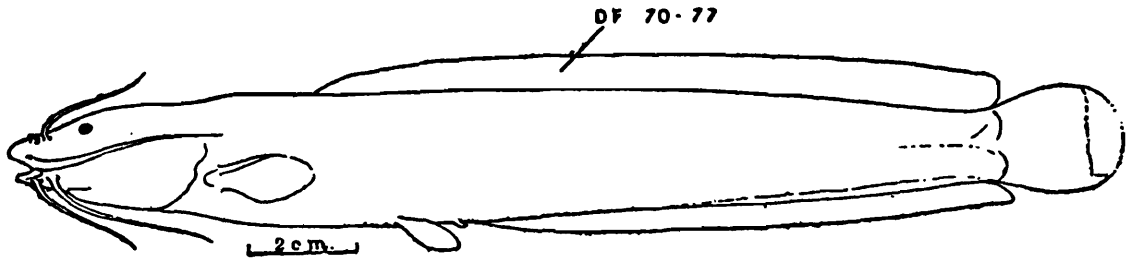

Fig. 4. Outline sketch of lateral view of *Clarias dussumieri brachysoma* to show serrated pectoral spine and extent of dorsal fin.

Fishery value.—Common in muddy streams and ponds of low country and hills. It is well known to come on land during rains or at night. Its flesh is firm, well flavoured, and it is of considerable importance (Dersniyagala, 1932).

Type-specimens.—3 exs. Syntypes, in British Museum Natural History, London, from Sri Lanka presented by Cuming.

Clarias dussumieri dayi Hora

***Clarias** dussumieri* (*nec.* Valenciennes) Day, 1889, *Fauna Brit. India*, Fish, **1**, p. 117 (type-locality, Wynaad, Kerala).—Misra, 1976. *Fauna India*, Ed. 2, **3**, p. 129.

***Clarias** dayi* Hora, 1936, *Rec. Indian Mus.*, **38**, p, 350 (no description).

***Clarias** dussumieri dayi* : Silas, 1952, *Proc. nat. Inst. Sci. India*, **18**, p. 435 (systematic position clarified).

D. 69-70 ; P. I, 8 ; V. 6 ; A. 50-59 ; C. 16.

**Cteysmanni* Bleeker reported by Deraniyagala (1932) from Sri Lanka is *C. d. brachysoma*. Hora (1936b, p. 349) has clearly indicated this and has also stated that *C. teysmanni sensustricto* is found in E. Indies, Thailand, Malaya.

Diagnostic characters.—Pectoral spine strongly serrated along outer edge.

Barbels very short, not reaching beyond eyes. Less number of molariform teeth on palate than in *C. dussumieri dussumieri.*

Colour.—Pale brown uniformly all over body.

Distribution.—India : Wynaad, Malabar, Kerala State, Pondicherry.

Size.—Maximum size 178 mm. TL.

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

Type-specimens.—Holotype, F. 1266, in ZSI, Calcutta in poor state of preservation.

Remarks.—Known by a single specimen, this species was assigned by Day (1889) to *Clarias dussumieri* Valenciennes. Hora (1936b) after comparing material in the British Museum found *C. dussumieri* Valenciennes as distinct and that the specimen collected from Wynaad by Day (1889) and referred by him as *C. dussumieri* is an error. He described the specimen as a new species *C. dayi.*

Clarias dussumieri dussumieri Valenciennes

Clarias dussumieri Valenciennes, 1840, *Hist. Nat. Poiss.*, **15**, p. 382 (type-locality, Malabar and Pondicherry).—Misra, 1976, *Fauna India*, Ed. 2, **3**, p. 130.

Clarias dussumieri : Hora, 1941, *Rec. Indian Mus.*, **43**, p. 113 (systematic position elucidated).

Clarias dussumieri dussumieri : Silas, 1952, *Proc. nat. Inst. Sci. India*, **18**, p. 435 (systematic position clarified).

D. 66-69 ; P. I, 10-11 ; V. 6 ; A. 45-59.

Diagnostic characters.—Pectoral spine strongly serrated along outer edge. Teeth on palate obtuse. Barbels shorter than in *C. brachysoma.*

Colour.—Dark above, lighter below without distinct markings.

Distribution.—India : Malabar coast, Kerala, Pondicherry, Tamil Nadu, Goa, Belgaum, South Canara.

Size.—Maximum size 253. 0 mm. TL.

Fishery value.—It is as valuable as *C. batrachus*, though only to a limited extent.

Type-specimens.—Syntypes, 2 exs., B. 686 Cote de Malabar "Coll. Belanger, 1 ex., 170 mm. SL, B. 687. Mahe, Coll. Dussumier, 1835, 1 ex. 260 mm., Paris Museum.

Genus **Horaglanis** Menon

Horaglanis Menon, 1950, *Rec. Indian Mus.*, **48**, p. 60 (type-species, *Horaglanis krishnai* Menon, by monotypy).

Description.—Dorsal profile slightly arched, ventral profile almost horizontal. Head short, globular ; snout truncated ; jaws subequal ; lips thick, fleshy. Mouth subvertical, fairly wide, crescentic. *Eyes absent.* Teeth villiform, closely set in broad bands or patches in jaws and palate. Four pairs of barbels, one pair each of maxillary, nasal and two of mandibular. Gill membranes united with each other and also with isthmus. Two small bony structures corresponding to the 2nd and 4th arch represent the dendritic apparatus. Branchiostegals 11.

Rayed dorsal fin long, with 23 rays, *commencing in the beginning of the third of the distance between the tip of snout and caudal base, and extending to caudal but free from it.* Adipose dorsal fin absent. *Pectoral fin vestigial, with a central axial ray which bears six small rays distally and nine smaller rays on the sides.* Pelvic fins with six rays. *Anal fin long* with 17 rays, *free from caudal.* Caudal fin rounded. Lateral line faint.

Air-bladder bag-like, laterally broader than long, slightly notched at the anterior end, completely free.

Distribution.—India : Kerala State, Kottayam.

A single species.

Horaglanis krishnai Menon

Horaglanis krishnai Menon, 1950, *Rec. Indian Mus.*, **48**, p. 64 (type-locality, well at Kottayam' Kerala).

D. 23 ; P. 15 ; V. 6 ; A. 17 ; C. 22.

Diagnostic characters.—As in the genus.

Colour.—Uniformly yellowish white all over body and devoid of any pigmentation.

Distribution.—India : Kottayam in Kerala State.

Size.—Maximum size 42 mm. TL.

Fishery value.—Nil.

Type-specimens.—Holotype, F. 313/2, in ZSI, Calcutta.

Family HETEROPNEUSTIDAE

Moderate sized elongate fishes with a compressed body. Teeth on premaxillaries, mandible and prevomer. Nostrils widely separated, anterior produced into short tube, on tip of snout, posterior slit-like

behind base of nasal barbels. Barbels eight, well developed. Gill openings wide, extending to above base of pectoral fins. *An accessory respiratory organ in the form of air-sacs present.*

Rayed dorsal fin inserted somewhat in advance of pelvic fin. Paired fins inserted horizontally. *Adipose dorsal fin absent or represented by a low ridge.* Pectoral fins with a strong spine, serrated. Anal fin long, just reching or united with caudal. Caudal fin almost rounded. Lateral line present, complete.

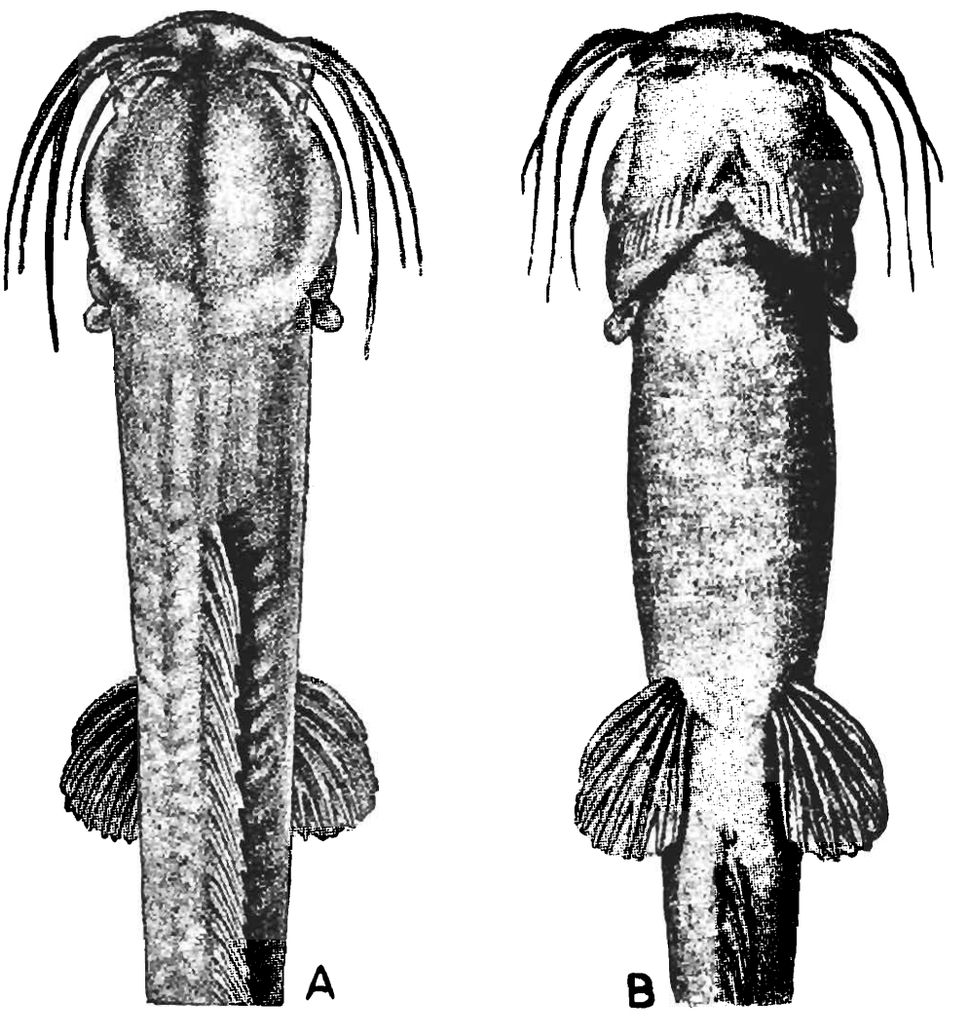

Fig. 5. *Horaglanis krishnai*: A. Dorsal view, B. Ventral view of head and body. (After A. G. K. Menon, 1951).

Air-bladder greatly reduced, consisting of two thin-walled pyriform sacs, enclosed in incomplete bony capsule.

Lateral ethmoid facet for articulation of palatines ventral. Palatines rod-like, slightly swollen at anterior end. Endopterygoid present. Ectopterygoid absent. Metapterygoid without any direct connection with hyomandibular. Prevomer T-shaped, large, dentigerous. Post-temporals suturally connected to skull, without inferior limb.

Distribution.—India. Pakistan. Bangladesh. Sri Lanka. Burma, Thailand and Viet-Nam. Absent from Malaya and East Indies.

Type-genus.—*Heteropneustes* Müller.

Remarks.—The family is represented by a single genus. It was established by Hora (1936). The main characteristics of this group of fishes is the possession of a long hollow cylindrical backward extending air-sacs serving as primitive lungs and thus helping in their aerial respiration.

Genus **Heteropneustes** Müller

Heteropneustes Müller, 1840, *Arch Anat. Physiol.*, p.115 (type-species, *Silurus fossilis* Bloch, by original designation).—Hora, 1936, *Rec. Indian Mus.*, **38**, pp. 208-209 (review).

Description.—Dorsal profile arched. Head moderate sized, greatly depressed, covered with thin skin ; snout flat ; jaws subequal ; lips fleshy, papillated. Mouth terminal, transverse, narrow. Teeth villiform in broad bands on jaws and in two oval patches on palate. Eyes small, lateral. Four pairs of barbels ; one pair each of maxillary, nasal and two of mandibular. Gill mambranes separated by a deep notch, not united with isthmus. *Gill chambers with accessory air-sacs extending backwards into caudal region.* Branchiostegals 7.

Rayed dorsal fin short with six to eight rays and without any spine. Adipose dorsal fin absent or represented by a low adipose ridge, along posterior third of caudal region. Pectoral fins with seven or eight rays and a strong spine serrated along inner edge. Pelvic fins with 6 rays. *Anal fin long with 60* to *79 rays, just reaching or united with caudal fin.* Caudal fin almost rounded. Lateral line complete, simple.

Air-bladder greatly reduced, consisting of two thin walled pyriform sacs enclosed in incomplete bony capsules. Sacs united by a transverse tube which is connected with oesophagus through a slender tube.

Distribution.—India. Pakistan. Bangladesh. Burma. Sri Lanka. Thailand. Two species.

KEY TO THE SPECIES

1.	Anal fin separated from the caudal fin by a deep notch.	*H. fossilis* (Fig. 6A)
	Anal fin confluent with caudal fin.	*H. microps* (Fig. 6B)

Remarks.—For a number of years these fishes were called under the generic name *Saccobranchus* Valenciennes, 1840. *Heteropneustes* Müller, 1839 has priority over Valencienne's name and hence the earlier name has come to stay (see Jayaram, 1961).

The pectoral spines of these fishes are considered very injurious and deadly. These fishes are as such, dreaded by fishermen. Most specimens which are brought to the market for sale, have broken spines.

Heteropneustes fossilis (Bloch)

Silurus fossilis Bloch, 1794, *Naturgesch, ausl. Fische*, **8**, p. 46, pl. 370, fig. 2 (type-locality, Tranquebar).

Heteropneustes fossilis : Hora, 1936, *Rec. Indian Mus.*, **38**, p. 209 (family status provided).

D. 6-7 ; P. I, 7 ; V. 6 ; A. 60-79 ; C. 17-23.

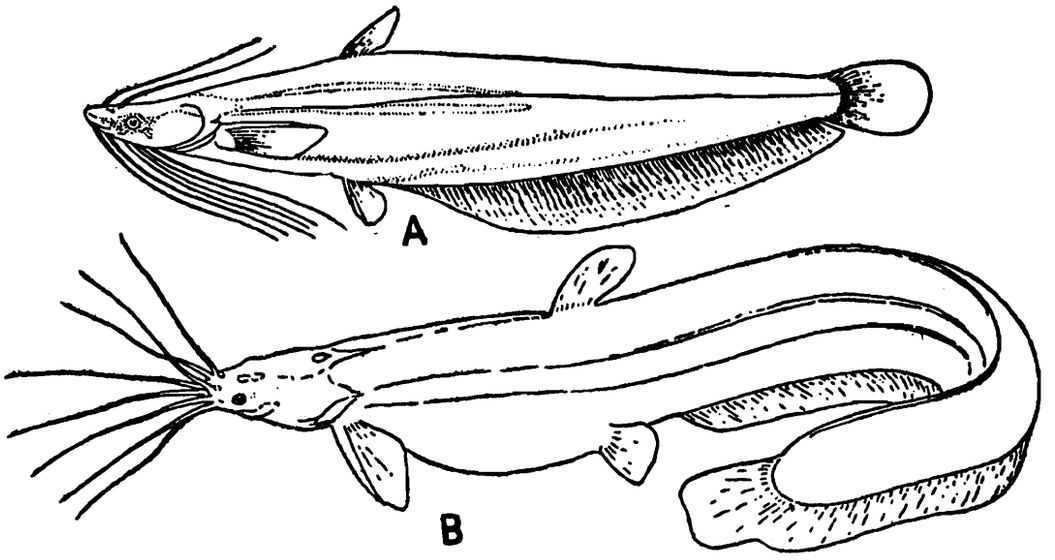

Fig. 6. Lateral view of A. *Heteropneustes fossilis*, B. *Heteropneustes microps* to show fusion of anal fin with caudal or otherwise.

Diagnostic characters.—Anal fin separated from the caudal by a deep notch. Uniformly yellow, occasionally with two longitudinal bands. Occipital process not reaching base of dorsal fin.

Colour.—Uniformly yellow or leaden, occasionally with two longitudinal yellowish bands ; young ones are sometimes reddish.

Distribution.—India. Pakistan. Bangladesh. Sri Lanka. Burma. Thailand.

Size.—Maximum size 300 mm. TL.

Fishery value.—This is one of the more common siluroid fishes, inhabiting confined waters, both fresh and slightly brackish, such as ponds, tanks, lakes, *bheels* and marshes. It comes to the surface for respiration at intervals of 3 to 5 minutes. The frequency of its visit to the surface varies at different times of the day and depends upon metereological conditions to a great extent. Fishermen of Bengal are

aware that during a heavy shower *singi* rises to the surface after much longer intervals, whereas on a hot, calm and sultry day it remains swimming or floating near the surface. It lives in large shoals in suitable localities and is extensively fished on account of the reported invigorating qualities of its flesh. In the Calcutta markets the fish is sold in large quantities and is kept alive. Boat-loads of living fish are brought from the deltaic districts and the Sunderbans. In the hot months of April, May, June about 90% of "Life fish" consists of *Heteropneustes* and *Clarias*. The fish is generally avoided by some from middle February to middle April, as it is believed that it spreads small-pox. The reason may be that during this period the skin is covered with small raised rounded patches. This respite gives the fishery a closed season, and a recovery. Generally during the dry season *singi* live in semi-liquid and semi-dry mud and even when the mud dries up they take their abode at the bottom of fissures and crevices formed by the cracking mud.

This is not a markedly piscivorous species. Insects, ostracods, worms, algal matter, organic debris etc, besides fish form the diet. Cannibalism has been reported in the early stages of the life history of the fish. During monsoon months these fishes breed in confined waters. Sexual maturity is attained when both males and famales are one year old *ca* 85 mm. and 120 mm. respectively (Khan, 1972).

Wounds from the pectoral spine of this fish are much dreaded by fishermen in India as they are reputed to be very poisonous, causing tetanus. Fishermen would rather cut the meshes of their nets and allow a fighting, dreadful *singi* with its pectoral spines poised to escape, than dare to handle it.

Fishermen and fish-merchants stock tanks with *singi* during the rainy season. They fatten well, feed well and can in the reverse become lean and lanky also when starved, the body depth as such is very variable.

Type-specimens.—Syntype, ZMB 3074, Tranquebar, Coll. missionary John, 188 mm. SL. Zool-Mus., Berlin.

Heteropneustes microps (Günther)

Saccobranchus microps Günther, 1864, *Cat. Fish. Brit. Mus.*, **5**, p. 31 (type-locality, Sri Lanka).

Heteropneustes fossilis : Deraniyagala, 1952, *Sri Lanka J. Sci.* (B), **16** (3) p. 282 (Dikkanda, Dambuva estate near Yakvala).

D. 6-8 ; P. I, 6-8 ; V. 6 ; A. 62-70 ; C. 18-23.

Diagnostic characters.—Anal fin confluent with caudal. Reddish to dark brown with two parallel yellow lateral bands on each side. Occipital process reaching base of dorsal fin.

Colour.—Reddish to dark brown with two parallel yellow lateral bands on each side narrower than interspaces ; ventrally lighter.

Distribution.—Sri Lanka : Dikkanda, Dambuva, near Yakvala (U. P.).

Size.—Maximum size 140 mm. TL.

Fishery value.—Found mostly in muddy ponds, the fishery importance is not as much as of *fossilis*.

Type-specimens.—Three syntypes, in British Museum (Natural History), London, No. 1859. 5. 9-11 from Sri Lanka presented by Cuming.

Family CHACIDAE

Robust large sized ugly fishes with head and body ahead of anal fin depressed. Teeth villiform on premaxillaries, mandible ; palate edentate. Nostrils widely separated, anterior pair tubular, situated along front border of snout, posterior pair with or without a short tentacle. Barbels three pairs or six (four pairs or eight if posterior nostrils provided with tentacles), feebly developed. Gill openings mainly lateral, somewhat contracted.

Rayed dorsal fin inserted above middle of pectoral fin with a strong spine and three or four rays. Paired fins horizontally inserted. Pectoral fins with a strong, serrated spine. *Anal fin short with 7-10* rays *not confluent with caudal. Caudal fin rounded with a long procurrent dorsal and a shorter ventral part.* Lateral line complete, marked by a prominent papillated and tuberculated ridge.

Air-bladder large, somewhat cardiform, concave anteriorly, lying across the borders of anterior vertebrae and free.

Osteology not fully known except by Gauba (1970) on the skull. Palatines large, broad, articulating with the strongly projecting lateral ethmoid. Endopterygoid absent. Ectopterygoid small, attached to lower surface of palatines. Post-temporals absent. Mesocoracoid in shoulder girdle present.

Vertebrae 35.

Distribution.—India. Pakistan. Bangladesh. Burma. Malaya. East Indies.

Genus **Chaca** Gray

Chaca Gray, 1831, *Zool. Misc.*, p.9 (type-species, *Platystacus chaca* Hamilton, by monotypy).

Chaca : Jayaram & Majumdar, 1964, *Proc. zool. Soc.*, **17**(2), p. 178 (review).

Description.—Body short, depressed ahead of anal fin, but strongly compressed and sharply tapering behind. *Head very large, strongly depressed.* Jaws subequal, lower jaw prominent ; lips thick, fleshy. *Mouth subterminal, arcuate, very wide.* Teeth small, villiform on jaws ; palate edentate. Eyes small, superior. Barbels three pair (four pairs if posterior nostrils provided with tentacles) ; one pair maxillary, two pairs mandibular. Gill membranes free up to pectoral base and united with isthmus. Branchiostegals six to eight.

Rayed dorsal fin short, with three or four rays and a strong spine. Pectoral fins with four or five rays and a short, strong spine. Pelvic fins with six rays. Anal fin short, with 7 to 10 rays. *Caudal fin rounded with a long procurrent dorsal and a shorter ventral part. Lateral line complete, marked by a prominent papillated and tuberculated ridge.*

Air-bladder rather large, somewhat cardiform in shape, concave anteriorly lying across the bodies of the anterior vertebrae and not enclosed in bone.

Distribution.—North India up to W. Bengal. Bangladesh. Burma. Banka. Borneo. Sumatra.

A single species.

Chaca chaca (Hamilton)

Platystacus chaca Hamilton, 1822, *Fish. Ganges*, pp. 140, 374, pl. xxviii, fig. 43 (type-locality, rivers and ponds of north-eastern parts of Bengal).

Chaca chaca : Jayaram & Majumdar, 1964, *Proc. zool. Soc.*, **17**(2), p. 179 (review).

D. I, 3-4 ; P. I, 4-5 ; V. 6 ; A. 7-10 ; C. 40-48 (28-31, 12-17).

Diagnostic characters.—As in the genus.

Colour.—Brownish, marbled with darker patches especially on fins which may sometimes have a lighter border. Skin provided with arborescent prominent papillae.

Distribution.—India : Bihar, W. Bengal, Assam. Bangladesh. Burma. Banka. Malacca. Borneo. Sumatra. Record from Bombay (Day, 1889, p. 112) doubtful.

Size.—Maximum size 205 mm. TL.

Fishery value.—A horrid looking fish living in freshwater streams, lakes concealed among mud. It is avoided by many because of its

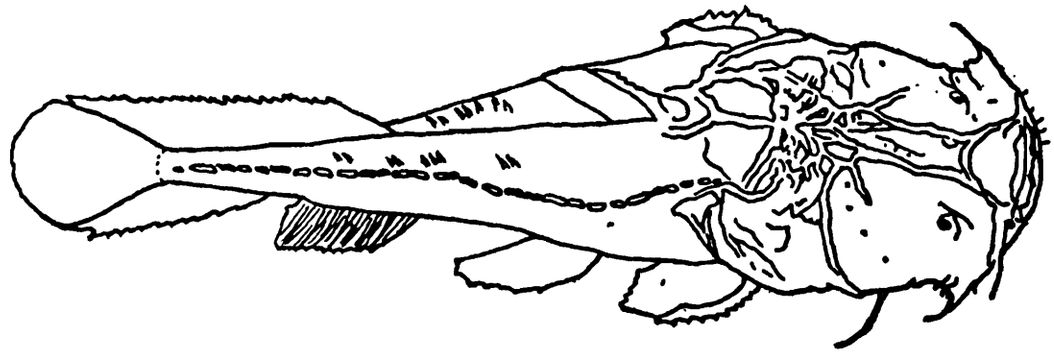

Fig. 7. Lateral view of *Chaca chaca*.

ugly appearance. Its flesh is considered poisonous. Fishermen dread its spines.

Type-specimens.—Not known.

Family OLYRIDAE

Loach-like elongate, small sized fishes with body flattened in front of pelvics and compressed behind. Teeth on premaxillaries, mandible and prevomer. Nostrils widely separated, anterior tubular, nearer snout than eye, posterior with nasal barbel. Barbels eight, generally well developed. *Gill openings very wide, extending to far forwards; functional part greatly restricted by flaps of skin along lower edges.*

Rayed dorsal fin inserted above pelvics. *Adipose dorsal fin long, low,* smooth, not confluent with either rayed dorsal or caudal. Paired fins inserted horizontally. Pectoral fins with a sharp, serrated spine. *Anal fin of moderate length, ensheathed in skin,* not confluent with caudal. Caudal *fin long, lanceolate or forked, filiform, upper part better developed than lower.* Lateral line present, may be indistinct.

Air-bladder moderate sized, more or less free in abdominal cavity, supported dorsally and laterally by bony expansions of transverse processes of anterior vertebrae.

Osteological characters not fully known.

Vertebrae 48 to 53.

Distribution.—India. Burma.

Type-genus.—*Olyra* McClelland,

Genus **Olyra** McClelland

Olyra McClelland, 1842, *Calcutta J. nat. Hist.*, 2, p, 588 (type-species. *Olyra longicaudata* McClellend).

Olyra ; Hora, 1936, *Rec. Indian Mus.*, 38, pp. 202-207 (family status provided, systematic status defined).

Description.—Dorsal profile nearly straight. Head small, compressed ; snout obtusely rounded ; jaws subequal, provided with a number of open pores ; lips thin, continuous, not fleshy. Mouth anterior, narrow, crescentic. Teeth uniformly villiform on jaws and palate in bands.

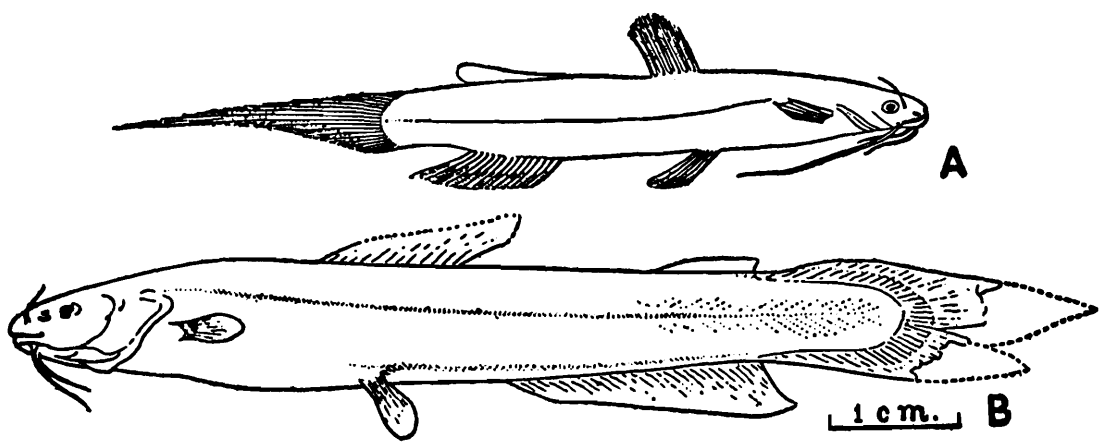

Fig. 8. Lateral view of A. *Olyra burmanica*, B. *Olyra horai* to show shape of caudal fin.

Eyes superior, small. Four pairs of barbels, one each of maxillary, nasal and two of mandibular. *Gill membranes* extensive and *united with each other across isthmus*. Branchiostegals six.

Rayed dorsal fin with six to eight rays and without a spine. Adipose, dorsal fin short, low, posteriorly free. Pectoral fins with four to seven rays and a strong serrated spine. Pelvic fins with six rays. *Anal fin moderately long with 16 to 23 rays, fin rays increasing in length posteriorly. Caudal fin long, lanceolate or forked, filiform, upper part better developed than lower, middle rays prolonged.* Lateral line complete.

Air-bladder fairly extensive, free in abdominal cavity, though surrounded dorsally and laterally by thin wing-like extensions of transverse processess of the complex vertebra.

Distribution.—India : Eastern Himalaya. Burma.

Four species.

KEY TO THE SPECIES

1.	Caudal fin entire.	*O. burmanica* (Fig. 8A) (Fig. 8B)
	Caudal fin forked.	2

2.	Upper lobe of caudal fin not very long than lower lobe.	*O. horai*
	Upper lobe of caudal fin almost twice as long as lower.	3
3.	Body depth 9 to 11 in standard length. Anal fin rays 18 to 23	*O. longicaudata* (Fig. 9A)
	Body depth 11 to 12 in standard length. Anal fin rays 17 to 18.	*O. kempi* (Fig. 9B)

Remarks.—Hora (1936) proposed the family Olyridae to accommodate the genus *Olyra*. Six species have been hitherto described under the genus, of which only four are valid. McClelland (1842) described *O. longicaudata* and *O. laticeps*, the latter being synonymous with *Amblyceps mangois* (Hamilton). The third species was described by Day (1871) as *O. burmanica* which is so far known only by its original description as the type-material is apparently lost. Günther (1883) described the fourth species *O. elongata* from Tenassarim, Burma which Hora (1936) considered as identical with *O. longicaudata*. The fifth species was described by Chaudhuri (1912), *O. kempi* from Assam of which adequate material has been subsequently collected and are available for study. Hora (1933) transferred *Amblycepe horae* Prashad and Mukerji as the sixth species under *Olyra*. *O. horai* known previously by its type-material has now been recorded from Damra, near Darugiri forest, Garo hills, Meghalaya by Pillai and Yazdani (1971).

Olyra is distinguishable from *Amblyceps* to which it is closely allied, by the position of the rayed dorsal fin, which is above pelvics in *Olyra* (between base of pectoral and pelvics in *Amblyceps*), nature of pectoral spine (broad, flexible in *Amblyceps*) and by the presence of teeth on palate in *Olyra* (absent in *Amblyceps*).

Olyra burmanica Day

Olyra burmanica Day, 1871, *Proc. zool. Soc. London*, p. 711 (type-locality, Pegu Yomas, Burma).

Olyra burmanica : Hora, 1936, *Rec. Indian Mus.*, **38**, p. 207 (name only).

D. 8 ; P. I, 4 ; V. 6* ; A. iii. 13 ; C. 17.

Diagnostic characters.—*Caudal fin entire.* Body depth 7.5 in standard length. Anal fin with 16 rays. Teeth on palate in a horse-shoe shaped band.

Colour.—Dark brown.

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* Pelvic fins stated to have 7 rays by Day (1871), probably in error.

Distribution.—Burma : Pegu Yomas.

Size.—Not known.

Type-specimens.—One ex. Australian Museum, Sydney No. B. 7560. Now designated as Lectotype.

Fishery value.—Nil.

Remarks.—According to Hora (1936, p. 207) no specimen of *burmanica* is available. The above description is drawn from Day (1889) and his figures.

Olyra horai (Prashad & Mukerji)

Amblyceps horae Prashad & Mukerji, 1929, *Rec. Indian Mus.*, **31**, p. 173, p. 7, fig. 1, text-fig. 1 (type-locality, Indawgyi Lake, Myitkyina dist., Burma).

Olyra horai : Hora, 1933, *Rec. Indian Mus.*, **35**, p. 609 (generic position changed). —Hora, 1936, *Rec. Indian Mus.*, **38**, p. 207 (name only).—Pillai & Yazdani, 1971, *J. zool. Soc. India*, **23** (2), p. 135 (record from Meghalaya).

D. 8 ; P. I, 7 ; V. 6 ; A. 21 ; C. 38-40.

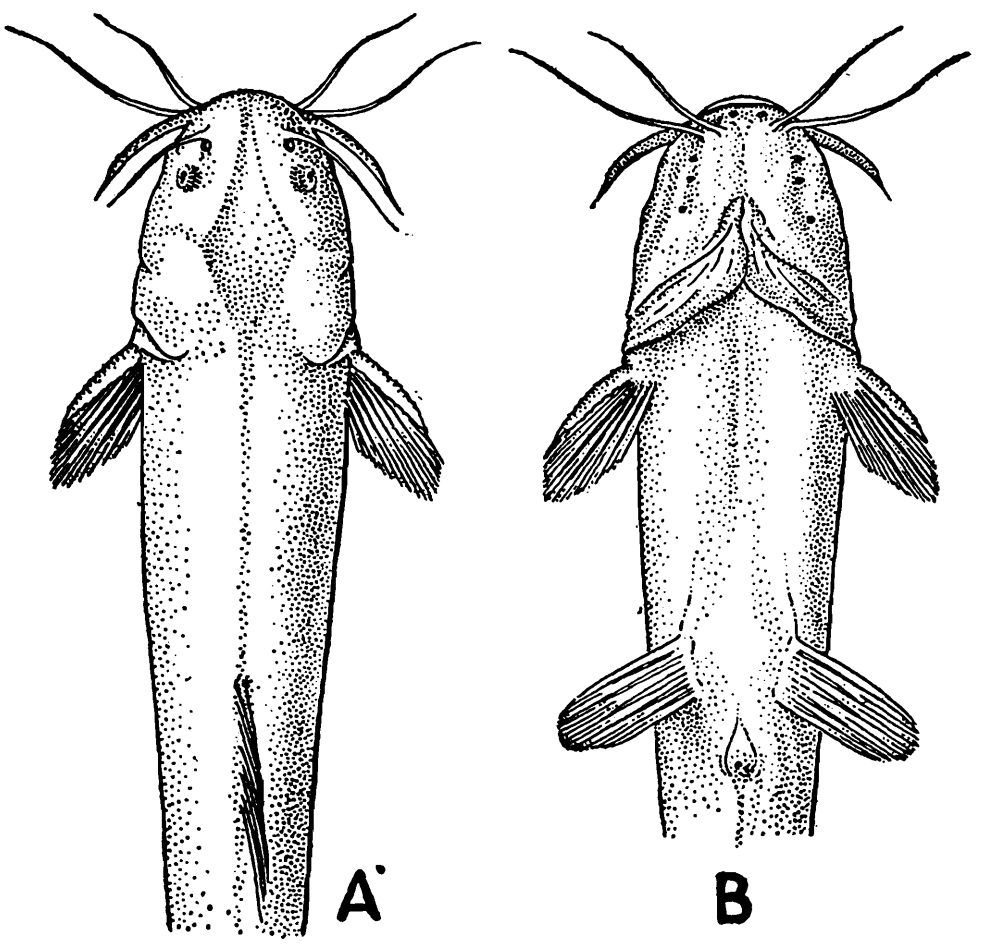

Fig. 9. *Olyra horai* : A. Dorsal view, B. Ventral view of head and body. (After Prashad & Mukherji, 1929).

Diagnostic characters.—Caudal fin forked. Lateral line distinct and complete. Body depth 8.7 in standard length. Anal fin with 21 rays.

Colour.—Dark brownish above, paler below, *body with minute blackish spots thickly scattered all over surface.* Fins dirty white, except caudal which is more or less blackish.

Distribution.—India : Meghalaya. Burma : Indawgyi Lake, Myitkyina district.

Size.—Maximum size 70 mm SL.

Fishery value.—A rare species with no value.

Type-specimens.—Holotype, F. 10854/1, in ZSI, Calcutta.

Olyra kempi Chaudhuri

Olyra kempi Chaudhuri, 1912, *Rec. Indian Mus.*, **7**, p. 443, pl. 41, fig. 4 (type-locality, Mangaldai, Assam).—Hora, 1936, *Rec. Indian Mus.*, **38**, p. 207 (name only).

D. 7 ; P. I, 4-6 ; V. 6 ; A. 18-23 ; C. 15-16.

Diagnostic characters.—Caudal fin deeply lobed. Body depth 11 to 13 in standard length. Anal fin with 18-23 rays.

Colour.—Boby brown, abdomen and pectoral, pelvic and dorsal fins dull white, adipose deep brown. *Two longitudinal pale brown bands on each side of lateral line present, lateral line itself marked by a dark brown band.* Head and thorax marked by pores.

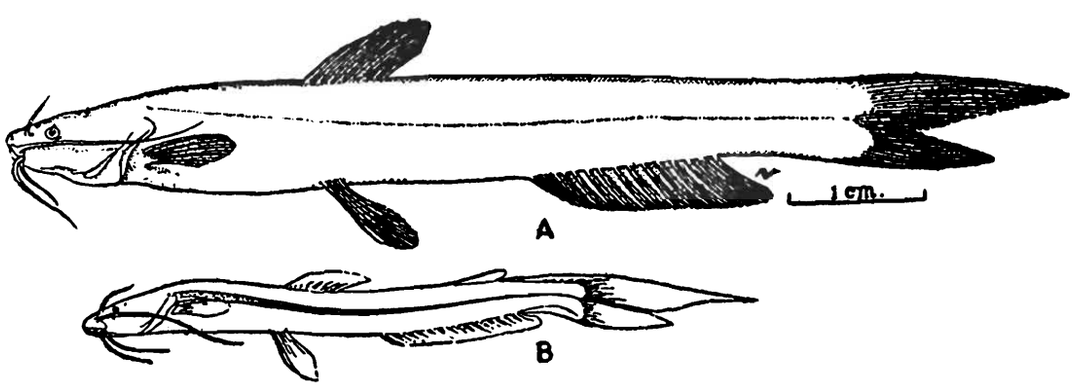

Fig. 10. Lateral view of A. *Olyra longicaudata*, B. *Olyra kempi* to show relative body depth and extent of anal fin.

Distribution.—India : Mangaldai, Assam.

Size.—Maximum size 104 mm. SL.

Fishery value.—Nil.

Type-specimen.—Syntype, one ex., F. 5387/1, in ZSI, Calcutta.

Olyra longicaudata McClelland

Olyra longicaudata McClelland, 1842, *Calcutta J. nat. Hist.*, 2, p. 588, pl. 21, fig. 1 (type-locality, Khasi hills, As am'.—Hora, 1936, *Rec. Indian Mus.*, **38**, p. 205 (alimentary canal, air-bladder illustrated).

D. 8 ; P. i, 4-6 ; A. 18-23 ; C. 14-16.

Diagnostic characters.—Caudal fin forked. Body depth 9 to 11 in standard length. Anal fin with 18 to 23 rays. Lateral line more marked near to commencement.

Colour.—Olivaceous brown, darker above, lighter below.

Distribution.—India : base of Darjeeling Himalaya, Assam. Burma : Tenasserim.

Size.—Maximun size 110 mm. TL.

Fishery value.—This species is generally found in small rocky streams at base of hills, in association with *Amblyceps mangois* (Hamilton). It feeds on insect larvae. Its economic use is limited.

Type-specimens.—Not known.

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