

## SILUROID FISHES OF INDIA, BURMA AND CEYLON.

### XIII. FISHES OF THE GENERA *Erethistes* MÜLLER & TROSCHEL, *Hara* BLYTH AND OF TWO NEW ALLIED GENERA.

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(PLATES I, II.)

An examination of the material in the collection of the Zoological Survey of India referred to the genus *Erethistes* Müll. & Trosch. has revealed that, as recognised at present, it is a composite genus in which several allied forms have been lumped together. Confusion has also been observed with regard to the precise specific limits of the various species so far described in this genus. It is proposed to elucidate here the systematic position of the Indian forms.

#### Genus *Erethistes* Müller & Troschel.

1845. *Erethistes*, Müller & Troschel, *Horae Ichthyol.* III, p. 12, pl. i, fig 3.  
1864. *Erethistes*, Günther, *Cat. Fish. Brit. Mus.* V, p. 263.  
1870. *Hara* (in part), Day, *J. Asiat. Soc. Bengal* XXXIX, p. 40.  
1872. *Erethistes* (in part), Day, *Proc. Asiat. Soc. Bengal*, p. 122.  
1877. *Erethistes* (in part), Day, *Fish. India*, p. 452.  
1883. *Erethistes* Günther, *Ann. Mag. Nat. Hist.* (5), XI, p. 139.  
1889. *Erethistes* (in part), Day, *Faun. Brit. India*, Fish. I, p. 209.  
1911. *Erethistes*, Regan, *Ann. Mag. Nat. Hist.* (8), VIII, p. 564.

The genus *Erethistes* was established by Müller and Troschel in 1845 to accommodate a small species of Cat-fishes from Assam. They characterized the genus as follows<sup>1</sup> :—

Gill-openings narrow. Head large, broad, roughened and anteriorly pointed. Besides occipital process, similar cubital processes, one on each side. Pectoral girdle provided with long bony process both above and below the pectoral fin. Snout small. Spike-shaped teeth in both jaws. Palate edentulous. Dorsal and pectoral spines strong and serrated. Dorsal fin situated over pelvic fins. Anal fin small.<sup>2</sup>

Without examining any specimen, but evidently relying on the original descriptions and figures (Plate XII, figs. 5, 6), Günther in 1864 elaborated the description and added, "Body with minute tubercles arranged in longitudinal series. Eyes small. Mouth small, inferior, with small teeth in both jaws; palate toothless. Apparently a small barbel to each maxillary; no other barbels"

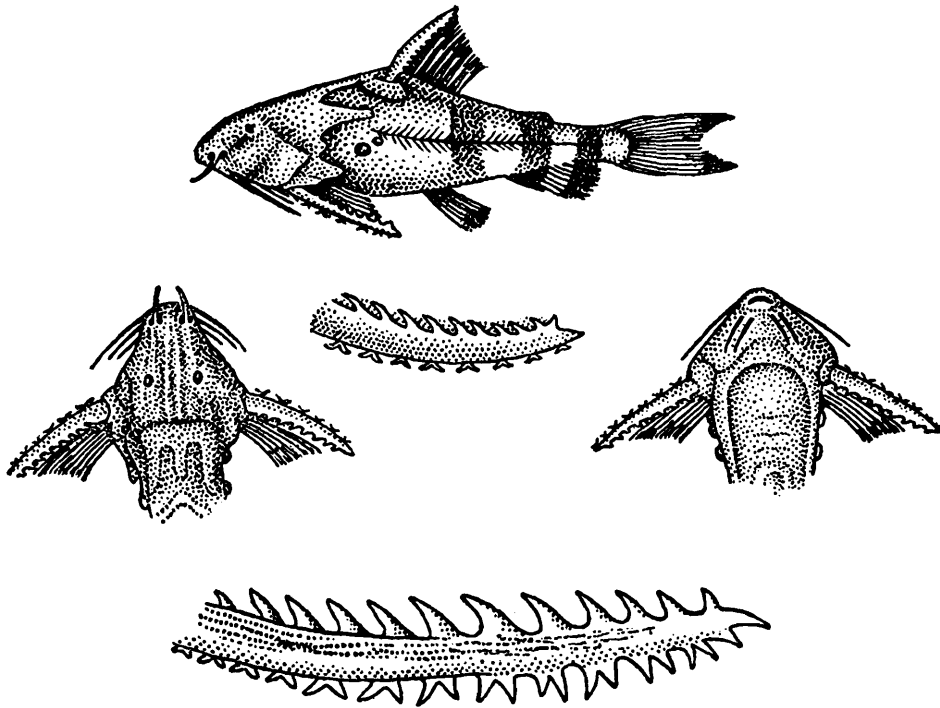
In 1872, Day referred to this genus and stated :

"Having a few months since obtained a copy of 'Horae ichthyoiologicae' from Berlin, I found that the figure of *Erethistes* (excepting in the absence of barbels) corresponded with specimens of *Pimelodus hara*, H. B., not only in the long processes about the nape and in the humeral region, but also in the pectoral spine and the number of fin rays".

<sup>1</sup> I am indebted to Dr. Trewavas of the British Museum for supplying me with copies of the original descriptions and figures of the genus *Erethistes* and of the species *E. pusillus* Müll. & Trosch.

<sup>2</sup> This is a free translation of the German description.

*Hara buchanani* (= *Pimelodus hara*) of Day's conception had pairs of divergent denticles along the outer edge of the pectoral spine, a feature very characteristic of *Erethistes pussilus*. It will be shown below (*vide infra*, p. 199) that in Hamilton's *Pimelodus hara* all the denticles on the outer edge of the pectoral spine are directed backwards. However, Day caused great confusion regarding the specific limits of these two species, as is evident from the figures of *Erethistes hara* published by

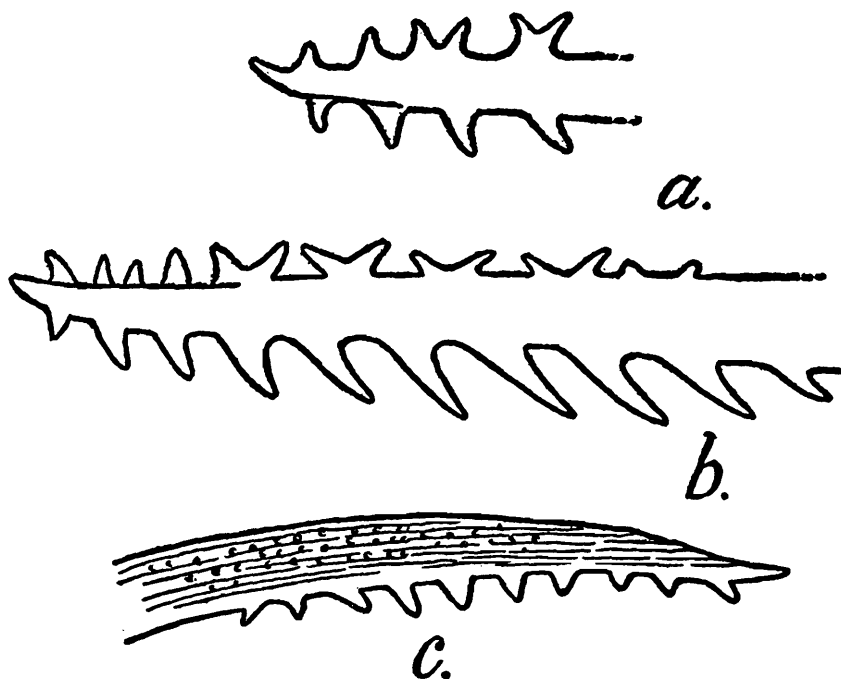


TEXT-FIG. 1.—Day's four drawings (upper) of a specimen wrongly identified as *Erethistes hara* (Ham.), with  $4\frac{1}{2}$  times enlarged drawing (lower) of the pectoral spine of specimen No. Cat. 585 to indicate that Day may have used this specimen for his drawings.

him in his *Fishes of India* (pl. cii, figs. 1 & 2). His larger figure based on a specimen from Suddya in Assam shows *Pimelodus hara* whereas his smaller figure of a "half grown" specimen shows *Erethistes pussilus*. The original of the latter figure is probably Cat. No. 585 from Tenasserim collected by Major Berdmore. It is a ripe female and not a half grown specimen.

In 1883, Günther gave a fresh description of the genus *Erethistes* and stated that "These characters are taken from specimens of *Erethistes hara*" Dr. Trewavas has very kindly informed me that there are two specimens (81.4.29. 1-2) from N. Bengal in the British Museum stated to have been "presented by A. Günther" These were first labelled as *Hara buchanani* and then *Erethistes hara*. One of the specimens (81.4.29.1) is 46+4 mm. in length with the caudal incomplete and the second is 45 mm. in standard length. In both of them, the outer margin of the pectoral spine is provided with divergent denticles characteristic of *Erethistes pussilus*. Dr. Trewavas very kindly sent me figures of the dorsal and pectoral spines of these specimens which are reproduced here for future reference.

In 1911, Regan gave the osteological characteristics of the genus. Dr. Trewavas informs me that there is no prepared skeleton of *Erethistes* but the specimen No. 81.4.29.1 has been dissected and is evidently the one used by Regan. It will thus be seen that both Günther and Regan were referring to the true *Erethistes* in their characterisation of the genus though both had confused *Erethistes* and *Hara* as one and the same genus.



TEXT-FIG. 2.—Pectoral and dorsal spines of specimens of *Erethistes pussilus* Müll. & Trosch. in the collection of the British Museum, London.

a. End portion of pectoral spine of specimen No. 81.4.29.2 ; b. Left pectoral spine of specimen No. 81.4.29.1 ; c. Dorsal spine of specimen No. 81.4.29.1.

In view of the above discussion, I propose to restrict the generic name *Erethistes* to the forms in which the denticles on the outer edge of the pectoral spine are divergent. The genus may, therefore, be redefined as follows:—

The genus *Erethistes* comprises small, ugly-looking, spider-like fishes in which the superficial bones of the head are granulated and form a strong armature. The dorsal and lateral surfaces of the body are also granulated, while the ventral surface is covered with short spines directed backwards. The occipital, cubital and scapular processes are well developed ; in continuation of the scapular processes there are two bony nodules on each side ; the humeral processes are elongate and protect the abdomen on each side. The ventral surface of the head and body is flat and horizontal. There are two dorsal fins ; the anterior with a strong spine and the posterior adipose, rather short and placed above the anal. The pelvic fins are six-rayed and are inserted below the dorsal. The pectoral fins are more or less horizontal ; the pectoral spines are strongly indented along both margins, *the indentations along the outer edge being arranged in the form of divergent spines.* The mouth is small and is situated on the ventral surface a short distance behind the tip of the conical snout. There are minute teeth in both jaws while the palate is edentulous. The teeth in the upper jaw are arranged in 3 or 4 series, those of the inner series are elongated and lie flat on the

jaw with their bases ensheathed in muscular pads. The teeth in the lower jaw are minute and scattered. There are eight barbels; the nasal barbels are small and are attached to the flap covering the posterior nostrils; the maxillary barbels are of moderate size and are provided with short, basal flaps; the bases of the two pairs of mandibular barbels are placed in a more or less horizontal line. All the barbels are annulated with black rings. The two nostrils on each side are close together. The eyes are small and devoid of free orbital margins. The gill-membranes are confluent with the isthmus opposite the roots of the humeral processes. The air-bladder (Plate I, fig. 4) is divided into two globular, lateral lobes which are connected by a median, transverse tube; the two lobes come in contact with the skin externally and are protected by the cubital and scapular processes.

*Distribution.*—*Erethistes* is a monotypic genus so far. It was originally described from Assam but the material in the collection of the Zoological Survey of India and of the British Museum shows that it occurs in Burma, N. Bengal and Bihar also. Day described a similar form from Orissa but the specimens from Orissa examined by me are not referable to *Erethistes* as restricted here. The extension of the range of the genus to Orissa, though probable, needs confirmation.

### ***Erethistes pussilus* Müller & Troschel.**

(Plate I, figs. 1-6.)

1845. *Erethistes pussilus*, Müller & Troschel, *Horae Ichthyol.* III, p. 12, pl. i, fig. 3 (Assam: one specimen not quite 2 inches long).  
 1864. *Erethistes pusillus*, Günther, *Fish. Cat. Brit. Mus.* V, p. 264.  
 1869. *Hara buchanani*, Day<sup>1</sup> (*nec* Blyth), *Proc. Zool. Soc. London*, p. 369 (Orissa).  
 1870. *Hara buchanani*, Day<sup>2</sup> (*nec* Blyth), *J. Asiat. Soc. Bengal* XXXIX, p. 40.  
 1877. *Erethistes hara*, Day<sup>3</sup> in part (*nec* Hamilton), *Fish. India*, p. 452, pl. cii figs. 1 and 2.  
 1889. *Erethistes hara*, Day in part (*nec* Hamilton), *Faun. Brit. Ind. Fish.* I, p. 209.

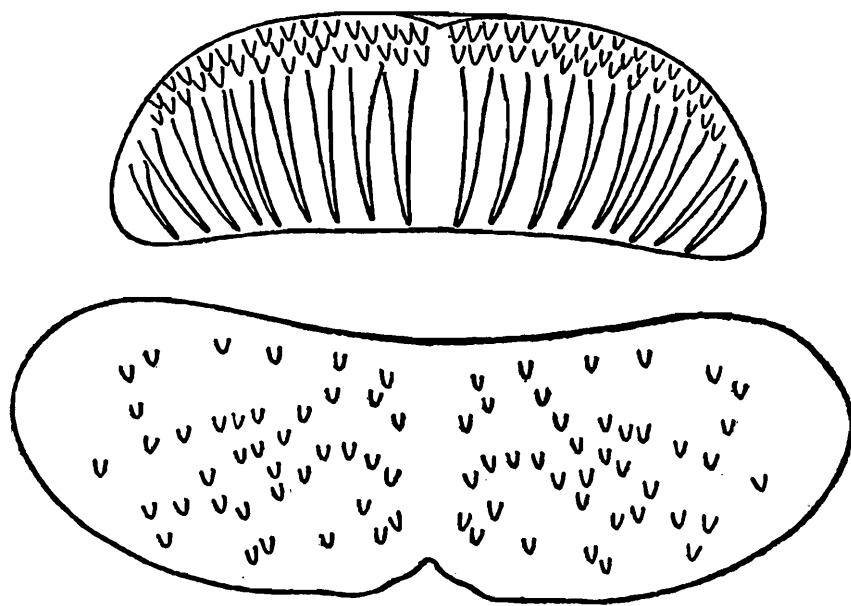
*Erethistes pussilus* comprises small fishes rarely exceeding two inches in length; the ventral surface of the head and body is flattened but the dorsal profile rises sharply to the base of the dorsal fin and thereafter slopes down to the base of the caudal. The head is sharply pointed anteriorly; its length is contained from 3.6 to 4.3 times in the standard length. The head is almost as wide as long. The depth of the body is almost equal to or slightly greater than the length of the head. It may be mentioned that Müller and Troschel also found "Head as broad as long, its length being equal to the height of the body, and one-third

<sup>1</sup> Day described pectoral spine as "serrated internally, and with finer serrations externally but arranged in a very peculiar manner, each alternate tooth being directed anteriorly or posteriorly". There is a small specimen, 29 mm. in standard length, in the Asiatic Society of Bengal's collection (A. S. B. Cat. 583) from Orissa presented by Day in which the serrations on the outer edge of the pectoral spine are directed in one direction only. In fresh specimens from Orissa, the pectoral spine is not of the type so characteristic of *Erethistes*. This reference has, therefore, been included in the synonymy to invite attention to Day's description. It is likely, however, that the specimen in the Calcutta Museum with which he compared his Orissa specimens had the spine of the *Erethistes* type.

<sup>2</sup> In characterising *Hara buchanani*, Day stated that the external serrations of the pectoral spine are "alternately directed forwards and backwards".

<sup>3</sup> As explained above, the two figures published by Day clearly show that he had confused the two types characterised by the nature of the pectoral spine. He also noted that divergent denticles are present "in many, especially small specimens".

of the total" in the type-specimen (*vide* Günther, *loc. cit.*, p. 264). The snout is almost as long as the postorbital part of the head. The interorbital distance is one-third the width of the head. The maxillary barbels are generally shorter than the head. The gape of the mouth is about one-fourth of the width of the head. Both the dorsal and the pectoral fins are longer than the head; their spines are well developed and strong. The base of the adipose dorsal is considerably shorter than the length of the snout. The caudal peduncle is 3 times as long as its least height.



TEXT-FIG. 3.—Dentition of *Erethistes pussilus* Müll. and Trosch.  $\times 40$ .

The drawing was made from specimen No. F. 862 from the Jharahi River, Siripur, Saran District, Bihar.

The commencement of the dorsal fin is distinctly nearer the tip of the snout than the base of the caudal fin. The distance between the vent and the base of caudal is two-thirds of the distance between the vent and the tip of the snout. The alimentary canal is short with one loop only.

The other characters are as given in the generic description. Owing to the inaccessibility of the original description of *Erethistes pussilus*, particularly for Indian students, I give below a free English translation<sup>1</sup> of it for convenience of reference in future :

The head is triangular and is as broad as long; its length is contained more than three times in the total length. The height of the body is equal to the length of the head. The eyes are small and are situated in the middle of the length of the head; they are three diameters apart and four diameters from the end of the snout. The head is very coarsely roughened and uneven and the ridge on it ends in a point over the snout. There is a shallow groove from behind the tip of the snout and between the eyes; posterior to this are two median fontanels one behind the other, the last being situated at the base of the occipital process. The occipital process is narrow with parallel margins and is three times as long as broad; it extends to the basal bone of the dorsal spine which is semicircular and roughened. The cubital processes run parallel to the occipital process and are longer than it. The crested scapular processes are also roughened. The mouth is narrow and pointed and is provided with narrow bands of velvet-like teeth in the upper and lower jaws. The gill-openings are narrow and are

<sup>1</sup> I am obliged to Dr. A. K. Mitra of the Anthropological Survey of India for the English translation of the German descriptions of the genus and of the species *Erethistes pussilus* Müll. & Trosch.

separated from each other by a distance which is greater than the distance between the mouth and the gill-openings. There are six branchiostegal rays. Filiform maxillary barbels appear to have been present, but others cannot be recognised. Below the tip of the snout, the lower jaw forms two sharp, posteriorly directed, hook-shaped processes. The pectoral girdle is roughened, and the pointed pectoral process has in the middle of its lower margin a strong indentation. Behind this process, there are two bony, roughened tubercles in the skin which are formed by the ends of the transverse processes of the compound vertebra. The humeral processes are longer than the pectoral ones; they are narrow and extend as far as two-thirds of the pectoral fins. Posterior to these processes, the broad body becomes narrow. The dorsal fin is situated above the pectoral fin and is provided with a spine characteristic of Cat fishes; the dorsal spine is roughened anteriorly and laterally but is denticulated posteriorly. There are six rays in the dorsal fin besides the spine. The adipose dorsal is low and as long as the anal fin above which it is situated. The caudal fin is truncate. The anal fin has 11 rays. The pectoral fins are provided with strong spines; the denticulations along their anterior margin consists of teeth alternately directed forwards and backwards, only the last on the tip is directed backwards; the denticulations along the inner border are still more pronounced and directed forwards. The pectoral fin extends to the pelvic fin which is provided with 6 rays. The body is covered with four to five rows of tubercles which appear to be similar to those found in Bloch's *Platystacus verrucosus*, which is now not to be found in Bloch's collection. It has a large air-bladder.

B. 6; D. 1/6; A. 11; v. 6.

Colour.—Brown.

Size.—1 inch 10 lines.

Locality.—Assam. In the Zool. Museum of Berlin. Presented by Walker.

*Erethistes pussilus* is represented in the collection of the Zoological Survey of India from the following localities:—

Reg. No.	Locality.	Donor.	Remarks.
Cat. 585	Tenasserim.	Major Berdm re.	Mixed up with 5 other specimens of <i>Hara filamentosa</i> Blyth. Probably the original of Day's figure in the <i>Fishes of India</i> .
Cat. 584	?	?	Of the 3 specimens under this number, two belong to <i>E. pussilus</i> .
F 6982-6989 1	Bijli Hill, Kamrup Dist., Assam.	L. W. Middleton.	
F 86/2	Jharahi River, Siripur, Saran Dist., Bihar.	M. M. Mackenzie.	
F 816/2	Lakhmidi River near S i t a m a r i Rly. Station, Bihar.	P. N. Mitter.	

*Distribution*.—Burma, Assam, Bihar and ? Orissa.

*Measurements in millimetres.*

	Tena- sserim.	Assam.			Bihar.		Locality ?	
Standard length	39.8	26.0	42.4	36.2	37.0	37.1	40.0	40.9
Length of head ..	11.0	6.0	11.1	9.1	9.3	8.9	10.6	10.8
Width of head ..	10.0	6.0	10.9	9.1	9.0	8.7	10.6	10.0
Height of head ..	9.4	5.2	9.0	8.2	8.3	8.3	9.0	9.0
Depth of body ..	11.8	6.4	10.1	9.8	9.6	9.1	10.0	10.8
Length of snout	5.5	3.0	5.0	4.7	4.6	4.5	5.0	5.3
Interorbital width	4.0	2.0	4.0	3.0	3.0	2.9	3.8	4.0
Length of maxillary barbels.	D.*	6.2	11.1	8.8	8.4	7.6	7.5	9.0
Gape of mouth ..	D.*	1.6	2.6	2.3	2.5	2.1	2.4	2.5
Length of dorsal fin	D.*	8.0	11.1	9.7	10.2	9.0	D.*	11.8
Length of dorsal spine	12.2	5.5	9.0	8.1	8.1	6.7	12.0	10.0
Length of pelvic fin ..	D.*	5.0	7.0	6.1	6.3	6.5	6.3	6.0
Length of base of adipose dorsal.	D.*	2.7	3.6	4.5	4.0	3.6	4.0	3.0
Length of pectoral fin	D.*	8.5	1.0	11.1	13.5	11.5	D.*	10.0
Length of pectoral spine.	13.3	7.3	11.6	12.5	11.5	10.4	14.4	12.0
Length of caudal peduncle	6.6	4.8	7.8	6.8	7.1	7.0	7.2	7.2
Least height of caudal peduncle.	2.2	1.7	2.6	2.3	2.5	2.3	2.5	2.6
Distance between com- mencement of dorsal and tip of snout.	18.6	10.5	18.0	15.7	16.0	15.0	17.0	18.2
Distance between com- mencement of dorsal and base of caudal.	21.2	15.5	24.2	20.5	21.0	22.1	23.0	22.7
Distance between vent and tip of snout.	27.2	14.9	26.6	22.5	23.3	22.1	24.2	24.1
Distance between vent and base of caudal.	12.6	11.1	15.8	13.7	13.7	14.9	15.8	16.

\*D. = Damaged.

*Ecology.*—No observations have yet been recorded on the bionomics of *Erethistes pussilus* and an attempt made to study them in the living condition at Siripur (Jharahi River), Saran District, Bihar, has not been fruitful. It is known, however, that *E. pussilus* and *Hara hara* live together in the same habitat. Day<sup>1</sup> referred to their habitat in Orissa

<sup>1</sup> Day, F., *Proc. Zool. Soc. London*, p. 370 (1869).

and Mr. M. M. Mackenzie collected specimens of both the species from the Jharahi River at Siripur.

According to the District Gazetteer of the Saran District (pp. 5, 7 ; Calcutta : 1908), Jharahi River takes its rise from a large swamp and acts as an overflow channel to relieve the lowlands of surplus water in the rains. In the dry season it used to dry up leaving stagnant pools or marshes in the deeper portions of its bed. Though it passed Husepur, the former home of the Hathwa Rajas and Mairwa, it conveyed little or no traffic. Mr. M. A. S. Menon, who was sent to study the ecology of *E. pussilus*, has reported that in October-November (27th October to 1st November) the Jharahi River near the Agricultural Farm at Siripur is 2 to 4 feet deep and the bed consists of soft mud with the marginal area of 40 to 60 feet covered with tall grasses and weeds. The water was clear and the current slow with plenty of floating vegetation. Though no boats were noticed during this visit, the party was authentically informed that when Mr. Mackenzie was Superintendent of the Agricultural Farm, the stream was about 10 to 12 feet deep and navigable throughout the year.

The local people recognised the fish *E. pussilus* as "Tengra" and stated that this variety was found when the river was not so shallow. Day also found in Orissa that *Erethistes* "lives amongst weeds or in very muddy parts of rivers"

It would thus appear that *Erethistes* inhabit sluggish deep waters overgrown with vegetation. In such habitats, their spider-like appearance and strongly pectinated spines presumably provide them with anchorage to the vegetation, among which they live fairly well protected from their enemies.

*Relationships.*—Müller and Troschel compared *E. pussilus* with *Platystacus verrucosus* Bloch in certain respects, while Günther in his *Catalogue* considered it allied to *Sisor* Hamilton. After examining the specimens of the species in 1883, he regarded *Erethistes* as a "genus most closely allied to *Callomystax*" Regan in 1911, on the basis of osteological characters, referred the genus to the family Sisoridae, which comprises specialised Bagrid fishes in which the pterygoid and post-temporal bones are absent, the head of the hyomandibular is contracted and articulates with the sphenotic only and the air-bladder is divided into two lateral lobes. According to Regan's synopsis of the genera of the Sisoridae, *Erethistes* is closely allied to *Nangra* Day<sup>1</sup> and *Gagata* Bleeker from which it differs in having "Mesopterygoid large, extending to hyomandibular above the reduced metapterygoid; pelvics below the dorsal".

### **Erethistoides, gen. nov.**

The genus *Erethistoides* is proposed for a small species of torrent-inhabiting cat-fishes in which the head and body are greatly depressed and flattened, and the paired fins are horizontally placed. The mouth is distinctly inferior and considerably behind the tip of the snout, the teeth in the upper jaw are visible externally. *The denticles along the*

<sup>1</sup> *Nangra* Day is synonymous with *Gagata* Bleeker, vide Hora, S. L., *Rec. Ind. Mus.* XLIII, p. 9 (1941).



*outer margin of the pectoral spine are directed towards the base in the proximal half of the spine while along the distal half they are directed towards the tip.*

As there are only three examples of the new genus, I have not dissected any specimen. Owing to the small uncovered area between the cubital and scapular processes and thick and tuberculated skin in this area, it would appear that the air-bladder is greatly reduced and possibly enclosed in bony capsules, partially or completely.

The genus is allied to *Erethistes* Müll. & Trosch. in most respects and the main points of differences are noted above. Detailed characteristics are given in the description of the species.

*Genotype* :—*Erethistoides montana*, gen. et sp. nov. (*Loc.*—Tangla, Darrang District, Assam).

***Erethistoides montana*, gen. et sp. nov.**

(Plate I, figs. 10-12.)

D. 1/5 ; A. 9 ; P. 1/6 V-6 ; C. 13.

In *Erethistes montana* the head and body are greatly depressed and the ventral surface is flattened and horizontal ; the dorsal profile rises only very gently from the tip of the snout to the base of the dorsal fin. The depth of the body is contained from 6.1 to 6.3 times in the standard length. The tail is long and narrow ; the least height of the caudal peduncle being contained 3.4 to 3.7 times in its length. The skin and bones all along the dorsal and lateral surfaces are covered with denticles while the whole of the ventral surface is covered with small backwardly directed spines. The head is broadly pointed in front ; its length is contained from 3.2 to 3.3 times in the standard length ; the width of the head is contained from 1.1 to 1.2 times and its height from 2.1 to 2.2 times in its length. The eyes are small, dorso-lateral in position and situated in the posterior half of the head. The interorbital width is less than one-third the length of the head. The mouth is of moderate width, distinctly inferior, and more or less transverse ; its gape is contained from 2.2 to 2.3 times in the width of the head. The snout projects like a broad hood in front of the mouth. The lips are thin but the surrounding portions of skin are papillated. The nasal barbels are longer than the eye ; the maxillary are longer than the head and are provided with broad bases ; the inner mandibular barbels are almost as long as the gape of the mouth while the outer are considerably longer. The gill-openings extend to the ventral surface for about a quarter of the distance before the gill-membranes become united with the skin of the isthmus ; the portion of the gill-opening in front and somewhat inner to the base of the pectoral spine is modified into a spout-like structure for the passage of the expiratory current.

The head and the anterior part of the body are provided with strong armature of bones, all of which are thick, strong and markedly denticulate. The median groove on the head extends from between the posterior nostrils to the base of the occipital process where there is a median fontanel. Just behind the orbital region there is a transverse ridge in the groove. The occipital bone is long and narrow but just

misses the basal bone of the dorsal fin. The basal bone of the dorsal fin is expanded on the sides into wing-like extensions. The cubital processes are almost as long as the occipital process. The scapular process is short and stumpy and is followed by two bony tubercles between it and the basal bone of the dorsal fin. The humeral processes are long and curved, and are separated from the pelvic bones by a short distance. There are two raised muscular pads inner to and behind the pelvic fins and a median pad in front of the anal opening.

The dorsal fin is situated opposite the pelvis; its commencement is distinctly nearer to the tip of the snout than the base of the caudal fin. The dorsal fin is longer than the depth of the body below it but is considerably shorter than the length of the head. The dorsal spine is strong; it is finely serrated externally and pectinated internally. The adipose dorsal is short and low; its base is almost equal to the interorbital width. The pectoral fins are long and horizontal; they are almost as long as, slightly shorter or longer than the head, and extend considerably beyond the bases of the pelvic fins. The pectoral spine is broad and strong; the skin of its distal end is produced into a filiform process along with similar structures of some of the other outer rays; the outer border is finely serrated and the inner is strongly pectinated. The pelvic fins extend beyond the vent which is situated nearer to the base of the caudal fin than to the tip of the snout, but do not reach the base of the anal fin. The anal fin is short and does not extend to the caudal fin. The rays of the lower portion of the caudal fin are greatly produced but are not filiform.

The general colour is dusky above and dirty white below. The head at the nape is provided with a dark band and the body with three similar bands, one below the first dorsal, one below the adipose dorsal and one in front of the caudal fin. The middle portion of the upper surface of the pectoral fins is infuscated with black. The two dorsals and the caudal are provided with bands near their distal portions.

*Locality*.—Streamlets round about Tangla, Darrang District, Assam. Two specimens were collected by me on 14th November, 1939.

*Type-specimen*.—F 314/2, Zoological Survey of India, Calcutta.

*Remarks*.—*Erethistoides montana* can be readily distinguished by the position of its mouth, long maxillary barbels and the form of the caudal fin. Its *Balitora*-like facies recalls its mode of life in very swift currents.

*Measurements in millimetres.*

Standard length ]	..	..	..	37.8	33.0
Length of head				11.3	10.2
Width of head	..			10.1	8.1
Height of head	..		..	5.1	4.9
Depth of body				6.0	5.4
Length of snout	..		..	6.0	5.0
Interorbital width				3.2	3.1

Length of maxillary barbels	..	..	..	12.4	11.8
Gape of mouth	..	..	..	4.5	3.5
Length of dorsal fin	..	..	..	8.5	6.0
Length of dorsal spine	..	..	..	8.0	5.8
Length of pectoral fin	..	..	..	12.2	9.5
Length of pectoral spine	..	..	..	10.5	9.0
Length of pelvic fin	..	..	..	6.8	5.9
Length of base of adipose fin	..	..	..	3.8	3.0
Length of caudal peduncle	..	..	..	7.9	7.1
Least height of caudal peduncle		..	..	2.3	1.9
Distance between dorsal and tip of snout	..		..	16.9	14.0
Distance between commencement of dorsal and base of caudal.				20.9	19.0
Distance between tip of snout		..	..	22.0	18.9
Distance between vent and base of caudal	..		..	15.8	14.1

***Erethistoides montana pipri*, gen. et sp. et subsp. nov.**

(Plate I, figs. 7-9.)

The subspecies *pipri* is represented in the collection by a single specimen obtained by Dr. K. S. Misra from the Rihand River at Pipri. Though it is sufficiently distinct from *Erethistoides montana* from Assam, I have considered it expedient to keep them linked together, firstly because both forms are known from three specimens altogether and secondly to bring out the significance of their occurrence in such widely separated localities. Remarks on the zoogeographical importance of these forms have already been made elsewhere<sup>1</sup>.

The form is less depressed and the body is not so densely tuberculated as in *E. montana*. The dorsal surface behind the dorsal fin and the ventral surface behind the pelvic fins are smooth along the middle. All the fins are somewhat more elongated and the caudal fin is quite different in shape from that of *E. montana*. In the subspecies *pipri*, the caudal fin is emarginate with the lower caudal lobe slightly longer than the upper. The form, lengths and tuberculation of the occipital and cubital processes as well as of the basal bone of the dorsal fin are also different in the two forms. Differences in proportions and other characters can be made out by referring to the drawings and the table of measurements given below:—

*Measurements in millimetres.*

Standard length	..	..	..	30.8
Length of head	..	..	..	9.4
Width of head	..	..	..	9.4

<sup>1</sup>Hora, S. L., *J. Zool. Soc India* I, pp. 1-7 (1949).

Height of head	..	..	..	5.4
Depth of body ..	..		..	6.0
Length of snout	..	..	..	5.0
Interorbital width	..	..	..	3.0
Length of maxillary barbel ..	..	..	..	7.5
Gape of mouth ..	..	..	..	4.0
Length of dorsal fin	..	..	..	6.6
Length of dorsal spine	..		..	5.4
Length of pectoral fin	..		..	11.0
Length of pectoral spine ..	..	..	..	9.5
Length of pelvic fin	..	..	..	6.0
Length of base of adipose fin			..	3.6
Length of caudal peduncle ..	..		..	6.8
Least height of caudal peduncle	..	..	..	2.3
Distance between dorsal and tip of snout		..		15.5
Distance between commencement of dorsal and caudal fin				15.3
Distance between vent and tip of snout		..	..	19.0
Distance between vent and caudal fin ..	..	..	..	11.8

*Locality*.—Pipri, Rihand River, Mirzapur District, U. P.

*Type-specimen*.—F 315/2, Zoological Survey of India, Calcutta.

### **Conta<sup>1</sup>, gen. nov.**

1871. *Hara* (in part), Day, *Proc. Zool. Soc. London*, p. 407.

1877. *Erethistes* (in part), Day, *Fish. India*, p. 452.

1889. *Erethistes* (in part), Day, *Faun. Brit. India*, Fish. I, p. 209.

The genus *Conta* is proposed for *Pimelodus conta* Hamilton originally described from North-eastern Bengal (Mahananda River). It differs from the genera *Erethistes* Müller and Troschel, and *Hara* Blyth in the following characters :

1. The form is elongated and subcylindrical and not much depressed and flattened.
2. The humeral processes supporting the edges of the abdomen are short and do not extend beyond the bases of the pectoral fins.
3. The rounded abdominal surface is plaited in the middle forming an adhesive pad similar to that found in the fishes of the genus *Glyptothorax* Blyth.

<sup>1</sup> I am aware of the use of the generic name *Contia* Baird and Girard among Reptilia Ophidia and of the name *Contra* proposed by Boulenger (*Zool. Rec.* XLII, p. 1905) for the same. The name *Conta* proposed here differs from both in spellings and is tautonymous and, therefore, a very appropriate generic name for this species.

4. The dorsal spine is strongly pectinated along both edges and not only along the inner edge as in other genera of the *Erethistes*-group.

It differs from *Glyptothorax* in having a broad isthmus separating the two gill-openings.

Day caused considerable confusion with regard to the specific limits of Hamilton's *Pimelodus conta* and it is, therefore, necessary to fix up its position with reference to its original description and figures. The following are its salient features as taken from Hamilton's description :—

- (i) The head is small, oval and sharpish.
- (ii) The mouth is small.
- (iii) The maxillary barbels are shorter than the head.
- (iv) The back slopes very little towards the head.
- (v) The lateral line is straight and high on the sides.
- (vi) The vent is nearly in the middle.
- (vii) D. 5. The dorsal spine is serrated on both sides.
- (viii) The pectoral spine is indented on both sides.
- (ix) The caudal fin is divided into two unequal lobes ; the upper terminating in a long, slender point.

Keeping in mind the above characters of Hamilton's *Pimelodus conta*, if one studies the species of *Erethistes* recognised by Day in his *Fishes of India*, one will at once come to the conclusion that Day's *E. elongatus* is synonymous with *P. conta*. Further, a large number of specimens collected from the hill-streams of North-east Bengal, including the Mahananda River (Type-locality) near Siliguri, and Assam leave no doubt that these two species are conspecific. Day's *E. conta* is Hamilton's *Pimelodus hara* and his *E. hara* is in part *P. conta* and in part *E. pussilus*. The details concerning the systematics of these forms are discussed under each species.

*Genotype*.—*Pimelodus conta* Hamilton (Loc.—Mahananda River, North-east Bengal).

*Distribution*.—Assam and North-east Bengal.

### **Conta conta** (Hamilton).

(Plate II, figs. 4-6.)

1822. *Pimelodus conta*, Hamilton, *Gangetic Fishes*, p. 191. (Mahananda River, North-east Bengal).  
 1860. *Hara conta*, Blyth, *J. Asiat. Soc. Bengal* XXIX, p. 152.  
 1864. *Hara conta*, Günther, *Cat. Fish. Brit. Mus.* V, p. 189.  
 1871. *Hara elongata*, Day, *Proc. Zool. Soc. London*, p. 704 (Garo Hills, Assam. One specimen 2.25 inches long).  
 1877. *Erethistes elongata*, Day, *Fish. India*, p. 453, pl. cii., fig. 5.  
 1889. *Erethistes elongata*, Day, *Faun. Brit. Ind. Fish.* I, p. 207.  
 1921. *Erethistes elongata*, Hora, *Rec. Ind. Mus.* XXII, p. 738.  
 1922. *Erethistes elongata*, Hora, *ibid.*, XXIV, p. 45 (Ventral surface figured).  
 1929. *Pimelodus conta*, Hora, *Mem. Ind. Mus.* IX, pl. xxi, fig. 8 (MS drawing reproduced).  
 1937. *Erethistes elongatus*, Shaw & Shebbeare, *J. Roy. Asiat. Soc. Bengal, Science*, III, p. 98, fig. 99.

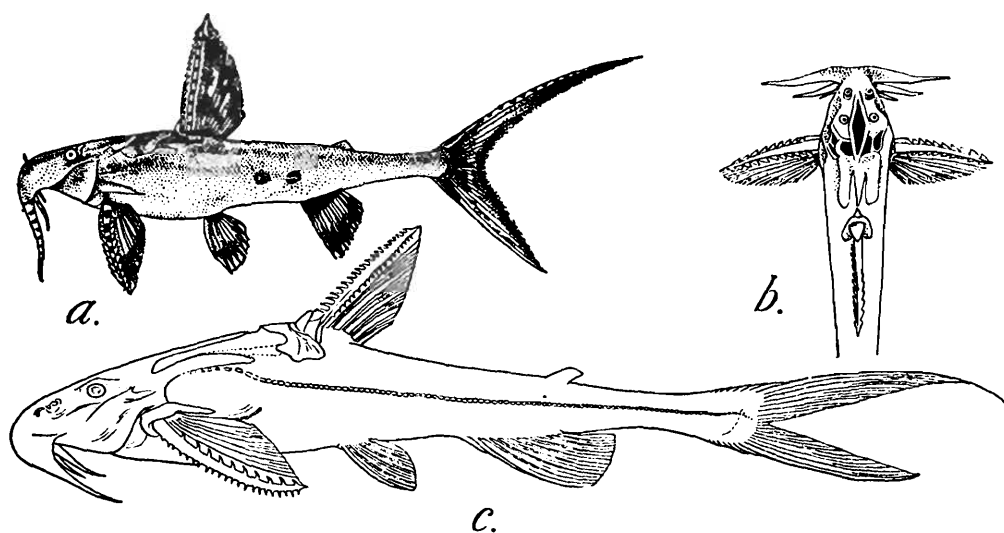
*Conta conta* is a slender, elongated, subcylindrical, small fish, in which the dorsal profile is but gently arched. The ventral profile is horizontal upto the pelvic fins and thereafter rises to the base of the caudal fin. The head is small, oval and sharpish ; its length is contained from 4.5 to 5.5 times in the standard length. The width of the head is contained

from 1.1 to 1.4 times in the length of the head. The height of the head is greater than its length in one very young specimen otherwise it is equal to or considerably shorter than the length of the head, upto 1.5 times in the length of the head. The eyes are small, dorsolateral in position and situated in the posterior half of the head. The interorbital space is contained from 3.1 to 4.6 times in the length of the head. The nostrils are nearer the tip of the snout than the eye. The nasal barbels are small. The maxillary barbels are generally considerably shorter than the head and extend as far as the gill-openings; they are provided with broad cutaneous flaps at their bases. The mandibular barbels are considerably shorter and fleshy. The mouth is small and is situated on the ventral surface behind the tip of the snout; it is bordered by thick fleshy lips which are papillated and continuous at the angles of the mouth. The anterior lip is interrupted in the middle though the skin in that region is papillated for some distance in the mouth also. It seems probable that the inhaled current enters the mouth through this gap. The gape of the mouth is one-fourth to one-fifth the width of the head. The gill-openings are lateral, extending to the ventral surface only for a short distance; they are provided with spout-like structures in front of the bases of the pectoral spines, these probably serving as exhalent passages for the respiratory current. The groove on the head extends from the nostrils to the base of the occipital process. The occipital process is long and narrow and almost reaches the basal bone of the dorsal fin. The cubital process is somewhat curved, slender and almost as long as the occipital process. The scapular process is short but is followed by another slender bone which is longer than the scapular process. Sometimes this last bone is represented by an ossicle or a chain of ossicles. The humeral process along the lateral abdominal edge is very short and is almost as long as the base of the pectoral fin.

The head and body are tuberculated with the exception of the middle abdominal region which is covered with longitudinal plaits of skin probably performing adhesive function. The depth of the body is contained from 5.3 to 6.5 times in the standard length. The caudal peduncle is long and narrow; its least height is contained from 5 to 8 times in its length. The vent is situated almost in the middle of the distance between the tip of the snout and the base of the caudal fin. There is a small anal papilla.

The dorsal fin is situated somewhat in advance of the pelvics and considerably nearer the tip of the snout than the base of the caudal; it is provided with one spine and five branched rays; it is considerably higher than the depth of the body below it. The dorsal spine is strongly indented along both edges. The adipose dorsal is small and is situated above the base of the anal fin. The pectoral fins are horizontally placed slightly above the ventral profile; they are longer than the head and extend to the bases of the pelvic fins. The pectoral spine is serrated along both edges; the serrations along the outer edge are directed backwards while those along the inner edge are directed forwards. Each fin is provided with one spine and six branched rays. The pelvic fins are six-rayed and are horizontally placed; they extend beyond the vent but are separated from the anal fin by a considerable distance.

The anal fin is short and is provided with 9 to 10 rays. The caudal fin is deeply furcate with both the lobes greatly produced; it contains about 17 rays besides smaller ones at the sides.



TEXT-FIG. 4.—*Conta conta* (Ham.).

a. Copy of Hamilton's drawing of *Pimelodus conta*, lateral view; b. Same as above, a portion of the dorsal view showing nature of pectoral and dorsal spines; c. Outline sketch of a specimen from the Mahananda River, N. Bengal  $\times 1\frac{1}{2}$ .

The alimentary canal possesses a single loop. The air bladder (Plate II, fig. 6) is divided into two lateral portions which are covered by bony plates posteriorly and are connected anteriorly by a horizontal tube. The lateral line is marked with a series of prominent tubercles.

The colour in the preserved specimens is chocolate dusky all over with the exception of the ventral surface which is dirty white. The barbels are annulated with dark bands. The fins are dark with light patches or bands. The outer rays of the caudal fin are lightly coloured and form a whitish border to the fin.

*Conta conta* has hitherto been collected from the rocky streams at the bases of the hills and in its general facies, habits and habitat seems very much like the other loach-like cat-fishes of the genera *Olyra* and *Amblyceps*. In fact, fishes of all the three genera have been collected together from the same stream.

*Conta conta* is represented in the collections of the Zoological Survey of India from the following localities:—

Registered No.	Locality.	Donor.	Remarks.
436	Garro Hills, Assam.	F. Day.	Type of <i>Erethistes elongatus</i> Day.
F 10077/1	Mahananda R., below Darjeeling.	G. E. Shaw & E. O. Shebbeare.	Topotype.
F 82/2	Mahananda R., near Siliguri.	D. D. Mukerji.	(Figured as Plate II, figs. 4, 5, 6).
F 83/2	Laska R., 8 miles from Siliguri.	D. D. Mukerji.	
F 84/2	Eastern Himalayan streams.	Darjeeling Museum.	(Text-figure 4c).
F 85/2	Bhareli River, above Lokra, Balipara Frontier Tract, Assam.	S. L. Hora.	

*Distribution.*—Assam Hills and Darjeeling Himalayas.

Measurements in millimetres.

	F 82/2	F 84/2				F 85/2					F 10077/1	436	F 83/2				
	Siliguri.	Eastern Himalayas.				Balipara Frontier Tract, Assam.					Darjeeling.	Garo Hills Assam.	Laska R. near Siliguri.				
Standard length .. ..	47.5	39.5	49.1	44.6	46.2	28.5	33.6	35.0	35.1	42.9	49.9	45.0	43.9	45.9	46.3	49.0	44.9
Length of head .. ..	9.3	8.0	9.6	9.0	8.8	5.6	6.2	7.1	6.9	8.6	9.0	9.3	8.5	8.2	9.0	9.9	8.1
Width of head .. ..	7.8	6.0	7.2	6.1	7.0	4.8	5.1	6.0	6.0	6.6	7.2	6.5	6.3	6.9	6.8	7.8	6.1
Height of head .. ..	6.3	6.0	6.2	6.0	7.9	5.9	5.0	5.5	5.5	6.0	7.0	6.2	7.0	7.6	7.1	8.0	7.6
Depth of body .. ..	7.7	6.8	7.0	7.8	7.4	5.0	5.8	5.9	6.0	8.1	8.0	6.9	7.8	7.1	7.1	8.1	7.3
Length of snout .. ..	5.0	4.0	5.0	4.5	5.0	3.1	3.5	4.0	3.3	5.1	5.0	5.0	4.9	4.2	4.2	5.1	4.9
Interorbital width ..	3.0	1.9	2.7	2.2	2.1	1.6	1.9	1.9	1.8	2.7	2.6	2.0	2.0	20.4	2.0	2.5	2.0
Length of maxillary barbel ..	7.2	5.8	6.7	5.0	6.3	4.0	5.7	4.0	6.1	10.6	6.0	6.0	7.0	7.9	7.5	6.3	7.8
Gape of mouth .. ..	1.8	1.4	1.4	1.3	1.8	1.0	1.0	1.0	1.1	1.3	1.3	1.5	1.0	1.5	1.1	1.6	1.3
Length of dorsal fin .. ..	12.0	8.9	12.0	11.6	12.1	7.8	8.9	D.	9.3	12.0	14.5	12.0	11.6	12.0	10.4	12.5	11.1
Length of dorsal spine .. ..	11.0	7.4	10.0	10.5	11.0	6.0	7.8	7.4	8.3	9.9	13.0	10.6	9.5	10.3	9.2	11.0	9.4
Length of pectoral fin .. ..	13.0	11.0	13.2	12.8	13.0	7.3	10.1	11.0	11.0	12.3	14.3	11.7	10.9	11.3	11.1	13.0	12.9
Length of pectoral spine .. ..	10.8	9.0	11.4	11.3	11.4	6.5	8.4	9.9	9.1	11.2	12.6	11.0	9.9	10.1	10.4	11.8	11.0
Length of pelvic fin .. ..	7.3	5.3	7.0	7.0	6.8	4.8	4.9	5.0	5.3	8.0	7.0	6.9	6.4	6.2	7.0	7.4	6.7
Base of adipose fin .. ..	2.0	1.4	1.4	1.9	1.9	1.0	1.7	1.6	1.5	2.7	2.0	1.5	1.5	1.5	1.8	2.0	2.0
Length of caudal peduncle .. ..	11.1	9.0	12.0	11.5	11.8	8.6	8.7	8.6	9.5	10.3	12.2	10.2	10.9	11.2	11.0	12.0	11.0
Least height of caudal peduncle ..	2.2	1.9	2.0	2.0	2.0	1.1	1.2	1.1	1.2	1.8	2.0	2.0	1.9	2.0	2.0	2.0	2.1
Distance between base of dorsal and tip of snout.	18.2	14.8	18.1	16.3	16.8	10.6	14.0	14.9	12.9	17.4	18.0	16.9	16.5	16.3	16.6	18.9	16
Distance between base of dorsal and base of caudal.	29.3	24.7	31.0	28.3	29.4	17.9	19.5	22.9	22.2	25.5	31.9	28.1	27.4	29.6	29.7	30.1	28.1
Distance between vent and tip of snout	26.0	18.0	25.0	22.9	24.0	14.1	16.8	18.0	18.5	23.9	26.5	23.2	24.0	24.2	24.8	26.7	25.6
Distance between vent and base of caudal	21.5	21.5	24.1	21.7	22.2	14.4	16.8	18.0	16.6	19.0	23.4	21.8	9.9	21.7	21.5	22.3	19.3



*Ecology.*—Reference has already been made to the general similarity in habits and habitats of *Conta conta* to *Amblyceps mangois* (Ham.)<sup>1</sup> and *Olyra longicaudata* McClell.<sup>2</sup> Whereas *Amblyceps* and *Olyra* live among pebbles and shingle at the bottom of small submountainous streams liable to be cut up into pools and puddles during the dry season and to floods during the rainy season, *Conta*, by virtue of an adhesive apparatus on the thoracic and abdominal regions, probably adheres to rocks in waters flowing through boulders. In such crevices, its strongly pectinated dorsal and pectoral spines probably serve as organs of attachment. They can indeed be very useful in crawling about among stones and boulders which are generally very slippery. The denticulations on the spines are so arranged as to contend both forward and backward thrusts, which are the usual features of turbulent waters.

#### GENUS *Hara* (Blyth).

1860. *Hara*, Blyth, *J. Asiat. Soc. Bengal* XXIX, p. 151.  
 1864. *Hara*, Günther, *Cat. Fish. Brit. Mus.* V, p. 189.  
 1870. *Hara* (in part), Day, *J. Asiat. Soc. Bengal* XXXIX, p. 37.  
 1872. *Erethistes* (in part), Day, *Proc. Asiat. Soc. Bengal*, p. 122.  
 1877. *Erethistes* (in part), Day, *Fish. India*, p. 452.  
 1883. *Erethistes*, Günther, *Ann. Mag. Nat. Hist.* (5), XI, p. 139.  
 1889. *Erethistes* (in part), Day, *Faun. Brit. India*, Fish. I, p. 209.  
 1911. *Erethistes*, Regan, *Ann. Mag. Nat. Hist.* (8), VIII, p. 564.

In 1860, Blyth characterised the genus *Hara* as follows:—

“ With broad maxillary cirri, soft throughout, and annulated with two colours: the pectoral spines short, flat, and pectinated on both edges; the dorsal spine less stout, serrated on both edges or behind only: mouth small, terminal, but opening below: head flattish, with small eyes placed high: a band of card-like palatal teeth. Colouring dark and minutely mottled ”.

“ Type. *H. buchanani*, nobis; *Pimelodus hara*, H. B. ”

The above description appears to have been based on the original description and figure of *Pimelodus hara* Hamilton<sup>3</sup>, to which Blyth had access in the library of the Asiatic Society of Bengal. Though Hamilton stated that the pectoral spine is “ indented behind ”, Blyth corrected it from the figure and stated “ pectinated on both edges ”. In characterising the dorsal spine as “ serrated on both edges or behind only ”, evidently Blyth had both *P. hara* and *P. conta* under consideration. It is not clear how Blyth came to note “ a band of card-like palatal teeth ”, for in *P. hara*, Hamilton noted “ The only teeth consist in a roughness on each jaw ”, while in *P. conta* the jaws are stated to have “ no perceptible teeth ”. Evidently he took this character from the specimens of *Hara filamentosa*. His diagnosis of the genus *Hara* is, therefore, of a composite nature. The fixing of the characters of this genus should be restricted entirely to the diagnostic features of *Pimelodus hara*.

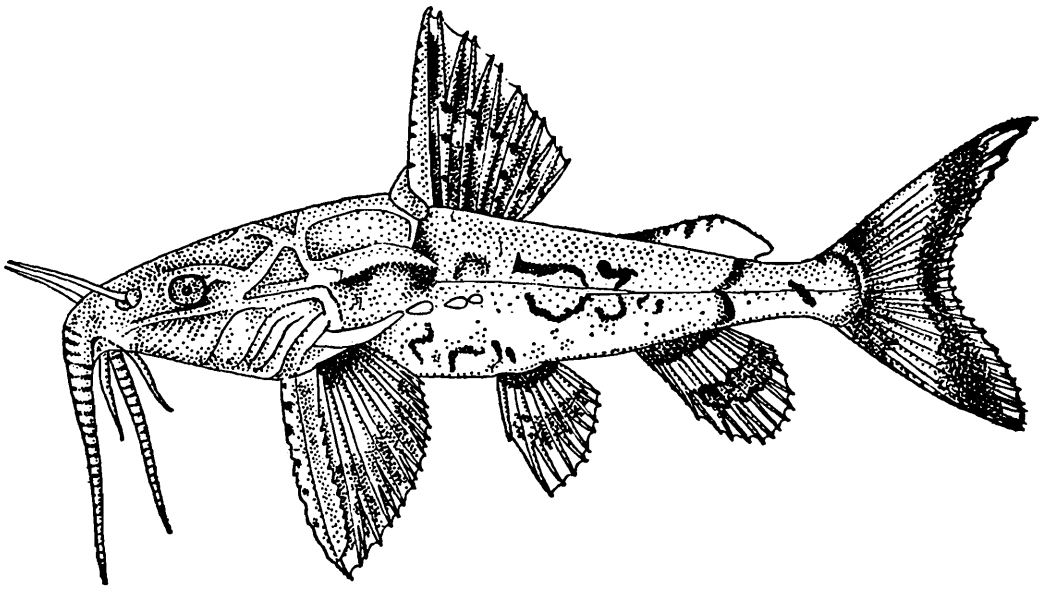
In 1929, I remarked on the controversy regarding Buchanan's (afterwards Hamilton) Zoological Collections and the importance of his fish drawings and concluded that “ *In the absence of any authentic preserved material these drawings are of special interest, for they are the only indications we possess of the different species described by Buchanan* ”. I

<sup>1</sup> Hora, S. L., *Rec. Ind. Mus.* XXXV, pp. 607-621 (1933).

<sup>2</sup> Hora, S. L., *Rec. Ind. Mus.* XXXVIII, pp. 202-207 (1936).

<sup>3</sup> Hamilton, F., *Gangetic Fishes*, p. 190 (Edinburgh: 1822).

wish, therefore, to invite attention to the fact that in the original drawing of *Pimelodus hara*, the indentations along the outer margin of the



TEXT-FIG. 5.—Copy of Hamilton's drawing of *Pimelodus hara* showing the nature of the dorsal and pectoral spines.

pectoral spines are not arranged as pairs of divergent denticles, characteristic of the genus *Erethistes*, but all are pointed in one direction (backwards). Day had caused considerable confusion in mixing up the two types of very characteristic forms readily distinguishable on this character. As both types may sometimes occur together in the same locality and are similar in appearance and colouration, it is all the more necessary to pay particular attention to the nature of the pectoral spine in the two cases.

The genus *Hara* is closely allied to the genus *Erethistes* from which it is principally distinguished by the nature of the pectoral spine as discussed above.

*Genotype*.—*Pimelodus hara* Hamilton (*Loc.*—Kosi River).

*Distribution*.—Burma, Assam, Bengal, Bihar, U. P. and Orissa.

### **Hara hara** (Hamilton).

(Plate II, figs. 1-3).

- 1822. *Pimelodus hara*, Hamilton, *Gangetic Fishes*, p. 190 (Kosi River).
- 1860. *Hara buchanani*, Blyth, *J. Asiat. Soc. Bengal* XXIX, p. 151.
- 1860. *Hara filamentosa*, Blyth, *ibid.*, p. 151 (Tenasserim).
- 1864. *Hara buchanani*, Günther, *Cat. Fish Brit. Mus.* V, p. 189.
- 1869. *Hara buchanani*, Day, *Proc. Zool. Soc. London*, p. 369 (Orissa).
- 1877. *Erethistes hara*, Day (in part), *Fish. India*, p. 452, pl. cii, fig. 1.
- 1877. *Erethistes conta*, Day (nec Hamilton), *Fish India*, p. 453, pl. cii, fig. 4.
- 1889. *Erethistes hara*, Day (in part), *Faun. Brit. Ind. Fish.* I, p. 204, fig. 74.
- 1889. *Erethistes conta*, Day (nec Hamilton), *ibid.*, p. 205.
- 1889. *Erethistes conta*, Vinciguerra (nec Hamilton), *Ann. Mus. Civ. Stor. Nat. Genova* (2), IX, p. 122.
- 1929. *Erethistes conta*, Prashad & Mukherji (nec Hamilton), *Rec. Ind. Mus.* XXXI, p. 186.
- 1929. *Pimelodus hara*, Hora, *Mem. Ind. Mus.* pl. xxi, fig. 5 (Hamilton's MS drawing reproduced).

I have referred above (*vide supra*, p. 195) to the salient features of *Pimelodus conta* and concluded that Day's *Erethistes conta* cannot

represent Hamilton's *P. conta*. Under *E. pussilus*, I have shown that Day's *E. hara* must in part be assigned to that species. The above synonymy of *E. hara* shows that Day's classification of the species of this genus was responsible for wrong identifications in the case of later workers.

In describing *Hara filamentosa*, Blyth himself pointed out its great likeness to *H. buchhanani* but attached specific importance to the filamentous prolongation of the upper lobe of the caudal fin. It is significant that in several species common to India and Burma, the caudal fin is more markedly bifurcate and the colouration is more gaudy as we go from west to east. In the case of *Amblyceps mangois* (Ham.)<sup>1</sup>, it was shown that the form of the caudal fin is very variable. In the case of Siamese specimens of *A. mangois*, the upper lobe of the caudal fin is produced into long filamentous processes exactly similar to the condition described by Blyth in his *Hara filamentosa*. Günther rightly attached no importance to this character but Day in distinguishing his *E. hara* and *E. conta* did take it into consideration.

Of the lot of 6 specimens of *Hara filamentosa* now in the collection of the Indian Museum, one is referable to *Erethistes pussilus*. In these old specimens, the caudal fin is damaged and the colouration has completely faded away so the characteristic features noted by Blyth cannot be made out now. It appears from measurements that Day's figures of *E. conta* in his *Fishes of India* (pl. cii, figs. 4, 4a, 4b and 4c) were made from one of these specimens.

The specimens from Meetan, Tenasserim and Bassein have a smooth ventral surface. The bases of the fins in the Meetan specimens are dark, whereas in the Bassein specimens the pectoral spine is proportionately long. In the examples from Terai and Duars in northern Bengal, the ventral surface is greatly flattened though the body is considerably elevated. It would thus appear that in the material before me, there are probably several races and subspecies, but both in quantity and quality the material is not sufficient for such intraspecific studies.

The species is represented in the collection of the Indian Museum from the following localities :—

Registered No.	Locality.	Donor.	No. of specimens.
Cat. 583	Orissa.	F. Day.	1
	Kudal Darh, Patna State, Orissa.	B. S. Chauhan	3
F7046/1	Lucknow, U. P.	M. M. Khan	1
F11390/1	Terai & Duars, N. Bengal.	G. E. Shaw & E. O. Shebbeare.	2
1454	Sadiya, Assam.	F. Day.	1
1453	Bassien, Burma.	F. Day.	1
Cat 585	Tenasserim, Burma.	Major Berdmore.	5
Cat. 582	Mandalay, Burma.	F. Day.	1
F11049/1	Meetan, Burma.	Genova Museum.	2
F10878/1	Indawgyi Lake, Burma.	B. N. Chopra.	1

<sup>1</sup> Hora, S. L., *Rec. Ind. Mus.* XXXV, p. 618, fig. 5 & p. 620, fig. 6 (1933).

**Hara jerdoni** (Day)

(Plate II, figs. 7-9.)

1870. *Hara jerdoni*, Day, *J. Asiat. Soc. Bengal* XXXIX, p. 39.1877. *Erethistes jerdoni*, Day, *Fish. India*, p. 453, pl. cii, fig. 3.1889. *Erethistes jerdoni*, Day, *Faun. Brit. India*, Fish. I, p. 206.

Since Day described *Hara jerdoni* from Sylhet, no other worker seems to have recorded this fish from any other locality. Day examined only 3 specimens, the largest being 1.5 inches. In the collection of the Indian Museum, the species is represented by the following specimens :—

Registered No.	Locality.	Donor.	No. of specimens.
Cat. 586	Sylhet, Assam.	Capt. R. Beavan.	1
431	Sylhet, Assam.	Purchased from Day.	1
13873-13902	Jessor Bheels, E. Bengal.	Woodmason & Alcock.	30
F 7150-7153/1	Kowpati, Mangaldai (Assam).	S. W. Kemp.	29
F 317/2	Siripur, Saran (Bihar).	M. M. Mackenzie.	10
F 318/2	Tista River, Jalpaiguri.	N. Annandale & S. W. Kemp.	1

The Asiatic Society of Bengal's specimen (Cat. 586) is registered as *Hara jerdoni* and may have been examined and determined by Day. The specimen No. 431 is undoubtedly one of the three that formed the type-series. The specimens from the Jessore Bheels had been registered as *Erethistes conta*, but there can be no doubt about their specific identity as *H. jerdoni*. This is the only species of the genus in which the skin is smooth and the length of pectoral spine is almost one and a half times as long as the length of the head.

The air-bladder is divided into two lateral circular lobes which are lodged in deep pits and are partially enclosed by bone. They are free on the ventral surface and dorso-laterally they come in contact with portions of translucent skin enclosed by the cubital processes above and scapular processes below. Bony tubercles, two or three in number, enclose the area between the processes mentioned above, thus forming a circular bony rings round the air-bladder. It would appear that air-bladder is a functional organ and receives stimulus from its contact with external factors through the translucent areas of the skin.

*Distribution.*—From the material listed above in the collection of the Zoological Survey of India, it will be seen that the species is widely distributed from Bihar, north and east Bengal to Assam.