SILUROID FISHES OF INDIA, BURMA AND CEYLON

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XI. FISHES OF THE SCHILBEID GENERA *SILONOPANGASIUS* HORA, *PSEUDEUTROPIUS* BLEEKER, *PROEUTROPIICHTHYS* HORA, AND *AILIA* GRAY.

As the family Schilbeidae is represented by several genera in the Ethiopian and Oriental zoogeographical regions, it was my[1] intention to give a comprehensive account of the classification, distribution, ecology and evolution of these fishes, but considerable difficulty was experienced in carrying out this plan, partly owing to the great confusion that prevailed in the taxonomy of the Indian genera and species of this family, and partly because of the absence of African material in the collection of the Indian Museum for comparison with the Indian forms. Accordingly, the Indian genera have now been revised one by one and the generic limits of *Eutropiichthys* Bleeker[2] [*E. goongwaree* (Sykes), *E. vacha* (Hamilton) and *E. murius* (Hamilton)], *Clupisoma* Swainson[3] [*C. garua* (Hamilton), *C. prateri* Hora and *C. montana* Hora], *Silonia* Swainson[4] [*S. silondia* (Hamilton)], *Pangasius* Cuvier and Valenciennes[5] [*Pangasius pangasius* (Ham.)]; *Helicophagus* Bleeker[6] and *Platytropius* Hora[7] have already been elucidated. The taxonomy of the Indian species included in these genera has also been dealt with. This article deals with a systematic account of the remaining Indian genera of the Schilbeidae.

Key to the Indian genera of Schilbeidae.

I. Two barbels (maxillary); teeth caniniform; air-bladder[8] greatly reduced	*Silonia* Swainson.
II. Four or eight barbels.	
A. Four barbels; one pair maxillary, one pair mandibular.	
1. Caniniform teeth in jaws; air-bladder greatly reduced, without any caecum at the posterior end	*Silonopangasius* Hora.
2. Small, villiform teeth in jaws; air-bladder[9] large or of moderate size, usually with a caecum at the posterior end	*Pangasius* Cuv. & Val.

[1] Hora, S. L., *Cur. Sci.* V, pp. 352, 353 (1937).
[2] Hora, S. L., *Journ. Bombay Nat. Hist. Soc.* XXXIX, pp. 431-446 (1937).
[3] Hora, S. L., *ibid.* XXXIX, pp. 659-678 (1937).
[4] Hora, S. L., *ibid.* XL, pp. 137-147 (1938).
[5] Hora, S. L., *ibid.* XL, pp. 355-366 (1938).
[6] Hora, S. L., *Rec. Ind. Mus.* XXXIX, pp. 235-240 (1937).
[7] Hora, S. L., *Journ. Siam. Soc. Nat. Hist.* Suppl. XI, pp. 39-46 (1937).
[8] Nair, K. K., *Rec. Ind. Mus.* XL, pp. 5-11 (1938.)
[9] Nair, K. K., *ibid.* XXXIX, pp. 117-124 (1937).

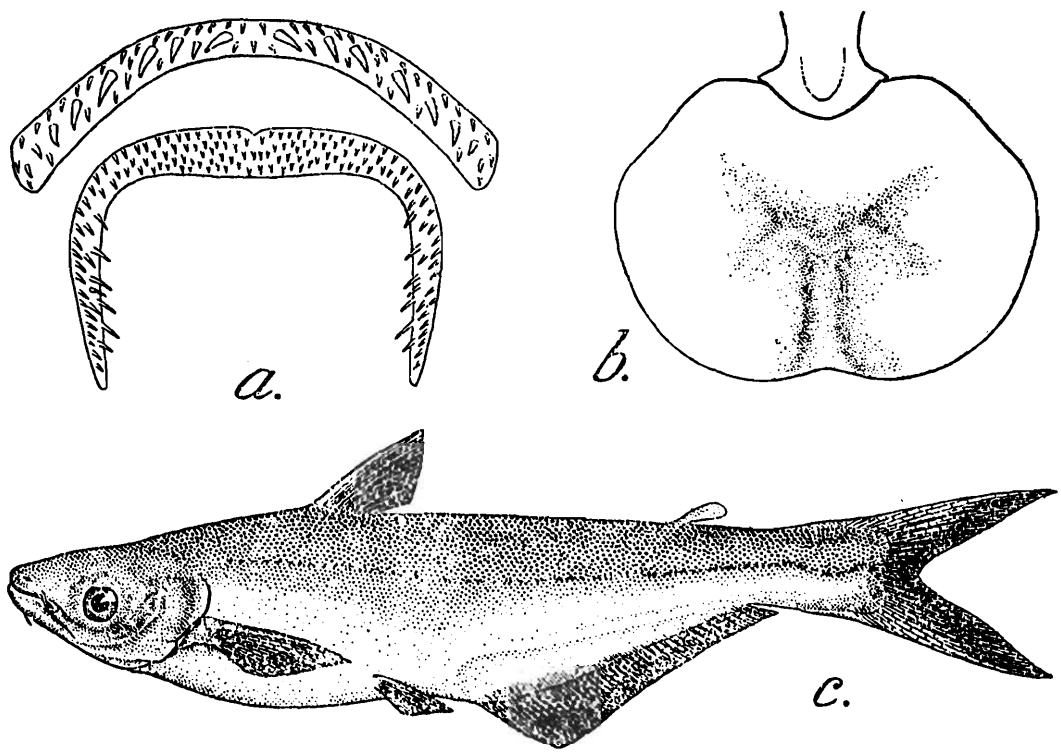
B. Eight barbels ; one pair maxillary, two pairs mandibular, one pair nasal.

1. Teeth on palate in two small widely separated patches, sometimes connected by a linear series.
   - *a.* Rayed dorsal present ; air-bladder large, forming blister-like areas above pectorals. *Pseudeutropius* Blkr.
   - *b.* Rayed dorsal present ; air-bladder[1] greatly reduced, tubular, partly covered by bone .. .. *Ailia* Gray.
2. Teeth on palate in four distinct contiguous patches or in a broad band sometimes interrupted in the middle.
   - *a.* Teeth on palate in four distinct patches ; air-bladder of moderate size .. .. *Proeutropiichthys* Hora.
   - *b.* Teeth on palate in two extensive patches separated in the middle or in a continuous horse-shoe-shaped band.
     - i. Maxillary and palatine teeth greatly produced backwards at the sides ; air-bladder[2] greatly reduced, tubular .. . *Eutropiichthys* Blkr.
     - ii. Maxillary and palatine teeth not produced backwards ; air-bladder[3] greatly reduced, but not tubular .. .. .. *Clupisoma* Swainson.

Silonopangasius Hora.

1937. *Silonopangasius*, Hora, *Cur. Sci.* V, p. 352.

The genus *Silonopangasius* was proposed for *Ageneiosus childreni* Sykes.[4] This species, as I understand it, possesses caniniform teeth in the jaws and a pointed lower jaw, as in *Silonia*, and four barbels—one



Text-fig. 1.—*Silonopangasius childreni* (Sykes).

a. Dentition : × 3 ; *b.* Air-bladder : × 3 ; Lateral view of a specimen from the Bhavani River : × $\frac{2}{3}$.

[1] Nair, K. K., *Rec. Ind. Mus.* XL, pp. 185, 186 (1938).
[2] Nair, K. K., *ibid.* XL, pp. 183-185 (1938).
[3] Nair, K. K., *ibid.* XL, pp. 186, 187 (1938).
[4] Sykes, W. H., *Trans. Zool. Soc. London* II, p. 375 (1841).

pair maxillary and one pair mandibular—as in *Pangasius*. The air-bladder, though small and somewhat thick-walled, is considerably larger than that of *Silonia* ; it is oval in outline with the longer axis transversely disposed. On account of the structure of the air-bladder and the presence of a pair of mandibular barbels this species cannot be referred to *Silonia* or to *Pangasius* and has accordingly been placed in a separate genus.

Ageneiosus childreni was characterised by Sykes as follows :

" An *Ageneiosus*, without *cirri* ; with the first ray of the dorsal and pectoral fins serrated on the anterior edge only : with eight rays in the dorsal and 42 in the anal fin ; with two sharp lobes to the tail, the upper being somewhat the smallest."

Sykes mentioned the length of his specimen as 18 inches and remarked " flesh sweet and juicy, but not firm " As regards the affinities of his spicees he stated.

" A comparison of my drawing with the description of *Ageneiosus mino* of Dr. Hamilton's 'Fishes of the Ganges', will show how many features there are in common between it and the *Parree* ; but its height and compressed body, and the extent of the anal fin, at once fix the latter as a distinct species. Found in the Mota Mola river, at Poona. *Pimelodus silorida* (*sic*) of Buchanan Hamilton (Tab. VII, fig. 50) is also an *Ageneiosus*."

The serrations along the anterior borders of the dorsal and the pectoral fins are obviously incorrectly shown in the figure of the species which most probably served for Sykes' description. Serrations are invariably present in Siluroid fishes along the inner borders of the spines, and the outer border may be smooth or serrated.

Jerdon,[1] who included this species in his list of fishes of Southern India, referred it to the genus *Silundia* and remarked :

" I have very little doubt that this is a true *Silundia*, and perhaps the *S. Gangetica* though Sykes says there are no cirri, for it appears that the two small cirri which are present in that fish are made out sometimes with difficulty."

Günther[2] included Sykes' species in the synonymy of *Silondia gangetica* without any comments ; while Day[3], when describing *Silundia sykesii*, made the following observations regarding this species :

" Sykes states that this fish is termed *Purree* Mahr. and *Sillun* in the Deccan, that it is *without cirri*, and also that the first bony ray is ' serrated ' on the anterior edge ", such being also shown in the figure. This last observation leads me to believe that he described from the drawing, which seems to have maxillary barbels indistinctly marked.

" The long maxillary barbels of this species [*S. sykesii*] at once serve to distinguish it from the *S. gangetica*, C. V."

The air-bladder of *S. sykesii* is described as " transverse, not enclosed in bone."

Day also referred to the presence of the mandibular barbels in *S. sykesii* and their absence in *S. gangetica* and came to the conclusion that no generic importance should be attached to this character. The generic distinction between the two species, however, rests mainly on the character of the air-bladder.

I have examined several examples of *Silonopangasius childreni* (Sykes). Three specimens (Nos. 1230, 1285, 8903) were purchased from Day and two out of these are labelled in Day's handwriting as *Silundia sykesii* ; these are 123 mm., 180 mm., and 200 mm. in standard length

[1] Jerdon, T. C., *Madras Journ. Litt. & Sci.* XV, p. 340 (1849).
[2] Günther, A., *Cat. Fish. Brit. Mus.* V, p. 65 (1864).
[3] Day, F., *Journ. Linn. Soc. Zool.* XII, p. 569 (1876).

respectively. Recently 3 adult specimens were received from the Mota Mola river, the type-locality, and in 1918 the late Dr. N. Annandale had collected a large number of young specimens from the edge of the Godavari river at Rajahmundry in the Madras Presidency. So far as is known at present, the species is found in Deccan only.

As a result of the examination of the above noted material I am fully convinced that Day's *Silundia sykesii* is synonymous with Sykes's *Ageneiosus childreni*. The following table of measurements gives some idea of the range in variation of proportions, etc.

Measurements in millimetres.

	Bhavani R.		Godavari R.	Madras.		Deccan.		Poona.		
Total length	256·0	165·0	81·0	..	220·0	332·0	..	338·0	323·0	300·0
Standard length	199·0	133·0	61·5	197·0	179·0	271·5	123·5	271·5	255·0	235·0
Length of head	50·0	31·0	16·0	45·0	42·0	63·0	28·8	64·0	57·0	55·0
Width of head	31·0	18·0	11·0	25·0	23·0	40·0	15·0	35·3	31·0	29·0
Width of body	26·0	14·0	7·5	20·0	17·0	30·0	11·0	38·0	30·0	25·0
Height of body	49·0	30·0	13·5	40·0	37·0	57·0	21·5	62·0	57·0	55·0
Diameter of eye	13·2	9·5	5·5	13·0	12·5	17·0	9·0	17·0	16·0	14·8
Interorbital width	21·0	10·0	5·5	15·5	13·0	21·0	10·0	21·6	19·0	18·0
Length of snout	17·0	12·0	5·5	15·0	14·5	21·0	9·0	23·0	20·0	19·0
Length of maxillary barbel ..	12·0	11·0	12·0	16·0	15·5	28·0	15·5	31·0	26·0	25·0
Length of mandibular barbel ..	1·0	1·2	5·5	4·0	5·0	6·0	5·0	9·0	7·0	6·5
Length of dorsal spine ..	32·0	20·0	9·0	D.	D.	38·0	19·0	38·0	D.	D.
Length of pectoral spine ..	36·0	22·0	11·0	35·0	33·0	49·0	21·0	52·0	48·0	45·0
Least height of caudal peduncle.	18·0	11·0	5·0	16·0	15·5	20·0	10·5	25·0	20·0	20·0

Pseudeutropius Bleeker.

The genus *Pseudeutropius* was proposed by Bleeker[1] in the group Pangasii to accommodate *Eutropius brachypopterus* Blkr. and was characterised as follows :

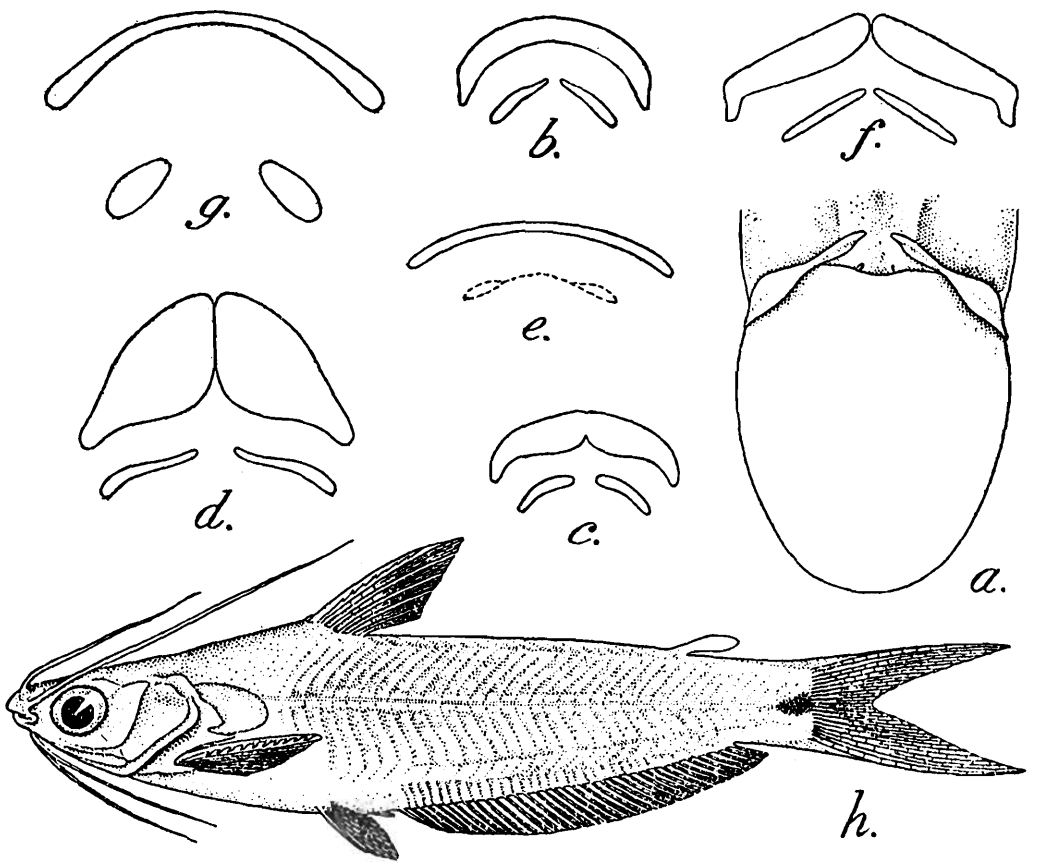
"Cirri 8, nasales 2, supramaxillares 2, inframaxillares 4. Dentes maxillis pluriseriati. Dentes vomerini in vittam transversam dispositi, palatini distincti nulli. Cirri inframaxillares omnes margini maxillae anteriori valde approximati. B. 10."

A year later Bleeker[2] revised this definition and stated "Dentes vomero-palatini in vittam transversam indivisam dispositi."

The chief points of differences between *Eutropius* and *Pseudeutropius* are : (i) The mandibular barbels are situated at a considerable distance from the anterior margin of the lower jaw in *Eutropius* and close to the margin in *Pseudeutropius*. (ii) In *Eutropius* the mandibular barbels are placed one pair behind the other, whereas in *Pseudeutropius* both the pairs are in a more or less straight line. (iii) The vomerine and palatine patches of teeth are distinct, though contiguous, in *Eutropius* ; while in *Pseudeutropius* the vomero-palatine patches are transversely disposed and the vomerine teeth are indistinguishable from the palatine teeth.

[1] Bleeker, P., *Versl. Akad. Amsterdam* XIV, p. 398 (1862).
[2] Bleeker, P., *Ned. Tijdschr. Dierk.* I, p. 106 (1863).

A study of the descriptions of the species included by Günther[1] and Day[2] under *Pseudeutropius* shows that they paid little attention to the limits proposed by Bleeker for this genus with regard to the dentition of its members. For instance, in the six species referred by Günther to this genus the vomerine teeth are stated to " form a very narrow band, which is angularly bent, and continuous with the palatine teeth " in *P. brachypopterus*, the type of the genus and of which Günther had a typical specimen from Bleeker's collection ; while the dentition of *P. atherinoides*, *P. mitchelli* and *P. goongwaree* is not described. In



Text-fig. 2.—*Pseudeutropius* Bleeker.

a. Air-bladder of *P. atherinoides* (Bloch), from a specimen 53 mm. in standard length : $\times 4\frac{2}{3}$; *b*., *c*. and *d*. Dentition of three specimens of *P. atherinoides* (Bloch), 57 mm., 74 mm. and 100 mm. in standard length respectively : *b* : $\times 6$; *c* : and *d* : $\times 4$; *e*. Dentition of type-specimen of *P. brachypopterus* (Bleeker) after a sketch by Mr. J. R. Norman ; *f*. Dentition of *P. mitchelli* Günther after a sketch by Mr. J. R. Norman ; *g*. Dentition of a specimen (No. 430) of *P. mitchelli* Günther, 96 mm. in standard length ; *h*. Lateral view of a specimen (Cat. No. 502) of *P. atherinoides* (Bloch).

P. megalops, the teeth of the vomer form two quadrangular patches, which are separated from each other by a linear groove ; the palatine teeth form a cuneiform band which is subcontinuous with the vomerine teeth." In *P. longimanus*, " the vomerine band is interrupted in the middle, each half being subcontinuous with the palatine band." Taking into consideration the character of dentition it is clear that whereas there is considerable similarity between *P. megalops* and *P. longimanus*, both of these differ from *P. brachypopterus*, and should not be included under *Pseudeutropius (sensu stricto)*.

[1] Günther, A., *Cat. Fish. Brit. Mus.* V, pp. 58-61 (1864).
[2] Day, F., *Fish. India*, pp. 470-474 (1877).

Day in his " Fishes of India " included seven species under *Pseudeutropius* ; of all of these I have examined specimens determined by him. Though there are inaccuracies in his descriptions and figures of the dentition of the various species, I shall, for the point under discussion, refer to the account as given by him. In *P. goongwaree*, the teeth are " in a wide pyriform band wider than those in the jaws, the vomerine and palatine groups touching, but the two vomerine patches having a short interspace between them." In *P. taakree*, the vomerine and palatine teeth are in distinct patches. In *P. acutirostris*, the teeth are " in two minute patches on the vomer, and of the same character on the palatines, which are not continuous with those on the vomer." In *P. murius*, the teeth " on the vomer and palate form an almost uninterrupted semilunar band." The teeth on the palate of *P. sykesi* are " in two distinct patches." In *P. atherinoides*, there is " a narrow, uninterrupted, crescentic band across the palate," while in *P. garua* the teeth are " in a semilunar band across the palate, those of the vomer contiguous to those of the palatines, and each patch being semicircular internally : sometimes the two vomerine patches have an interspace between them." The great variation in the dentition of these species clearly shows that *Pseudeutropius*, as recongnised by Day, is a composite genus.

It is also clear from the above that dentition alone is not sufficient for the proper differentiation of the genus *Pseudeutropius*. I have, however, found that if this feature is coupled with the nature of air-bladder, it is possible to differentiate and define more precisely this and the allied Schilbeid genera occurring in India.

For determining the precise limits of the genus *Pseudeutropius*, I requested Mr. J. R. Norman to examine the type-specimen of *Pseudeutropius brachypopterus*, the type of the genus. He sent me a sketch of its dentition (Text-fig. 2*e*), and remarked that the specimen is in a poor condition and, in consequence, he had great difficulty in making out the outlines of the tooth-bands. According to Weber and de Beaufort[1] the dentition of *P. brachypopterus* consists of " Minute teeth in narrow bands on the jaws ; on the vomer in two small patches connected by an angular line of teeth " Unfortunately no account has so far been published of the air-bladder in this species, but it seems probable that it is a large, thin-walled structure which laterally comes in contact with the skin and forms translucent, blister-like areas above the pectoral fins. Weber and de Beaufort (*op. cit.*) described another species of *Pseudeutropius—P. moolenburghae*—from Sumatra in which they found " Teeth minute, in the jaws in a narrow band, on the vomer in two widely separate elliptic patches." Its figure shows the translucent area above the pectoral fin, though there is no reference to the nature of the air-bladder in the description.

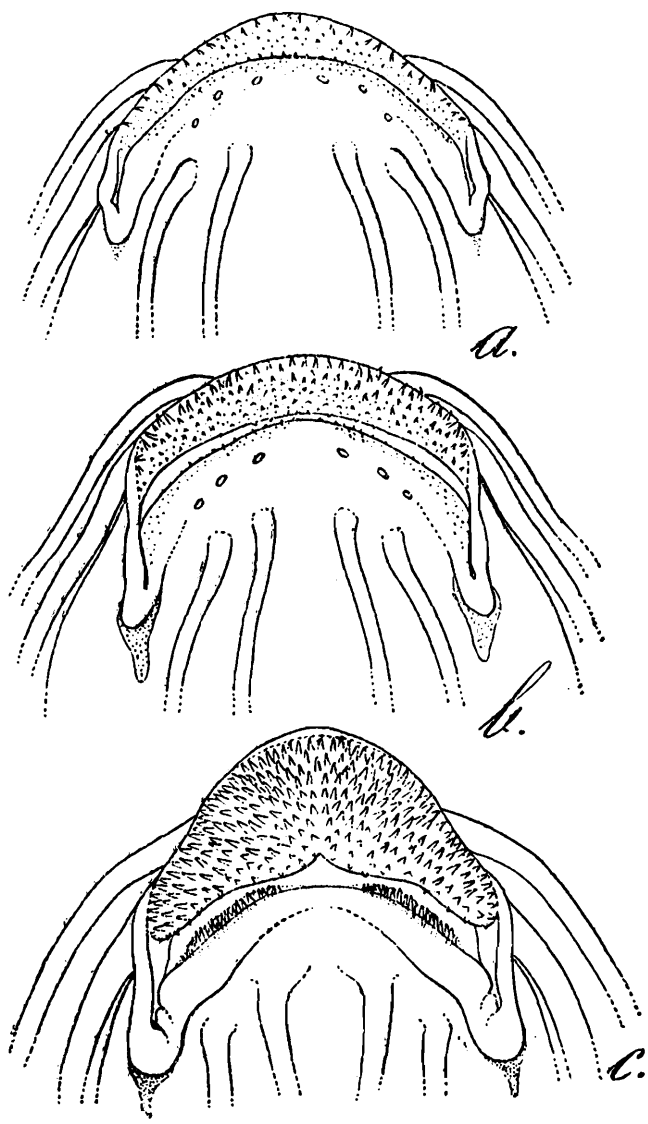
As judged from the material in the collection of the Indian Museum, it seems that *Pseudeutropius* is represented in the Indian waters by *P. atherinoides* (Bloch)[2] and *P. mitchelli* Günther[3] ; both the species possess vomerine teeth in two distinct patches which may be small or

[1] Weber M. and Beaufort, L. F. de, *Fish. Indo-Austral. Archipel* II, p. 249 (1913).
[2] Bloch, M. E., *Naturges. Ausland. Fische* VIII, p. 48 (1794).
[3] Günther, A., *Cat. Fish. Brit. Mus.* V, p. 59 (1864).

extensive but are always narrow, and a large air-bladder free in the abdominal cavity (Text-fig. 2*a*). As there appears to be a considerable confusion regarding the specific limits of the two species I give below their brief history and chief taxonomic features.

Pseudeutropius atherinoides (Bloch.)

P. atherinoides was described from Tranquebar, but later Hamilton[1] described two species from Bengal—*Pimelodus urua* and *P. angius* —which have rightly been regarded as synonymous with Bloch's species. Hamilton himself pointed out the close affinity between *P. urua* and *P. atherinoides*. *P. angius*, with brilliant colour markings, is only a colour form of *P. atherinoides*. Valenciennes's[2] *Bagrus exodon* is undoubtedly the same as Day's *Pseudeutropius acutirostris*.[3] The former was



Text-fig. 3.—Ventral surface of the anterior part of head of three specimens of *Pseudeutropius atherinoides* (Bloch), showing stages in the prolongation of the upper jaw and the development of teeth.

a. Standard length of specimen 59 mm.: × 10; *b*. Standard length of specimen 64 mm.: × 8; *c*. Standard length of specimen 100 mm.: × 5½.

[1] Hamilton, F., *Fish. Ganges*, pp. 177, 180, 377 (1822).

[2] Valenciennes, A., in *Belanger Voyage Ind. Orient. Zool.*, p. 385 (1834).

[3] Day, F., *Proc. Zool. Soc. London*, p. 618 (1869).

described from Bengal whereas the latter is stated to be common in the Irrawaddy and other large Burmese rivers. The differences in dentition and colouration noticed among individuals of this species seem to indicate sexual dimorphism but the material is insufficient for a proper elucidation of this problem. In the collection of the Indian Museum there are specimens showing various stages in the elongation of the upper jaw and in one example from the Sunderbans typical *acutirostris*-condition of the snout is present. Though the figure of *Bagrus exodon* is rather poor for the determination of the species, the description of the dentition leaves no doubt about its identity. It runs as :

" Nous lui donnous cette épithéte d'*Exodon*, qui veut dire hors dents, parce qú elle caractérise notablement les dents inter-maxillaires adhérentes à de larges plaques au bout du museau, de manière à dépasser entièrement la mâchoire inférieure."

Chaudhuri[1] described a new variety of *P. atherinoides* from young specimens with the characteristic colour bands. " A narrow spiral corrugation on chest " in the variety *walkeri* is an artifact due to the action of the preservative used. The eyes are never subcutaneous in this species, and Chaudhuri's description is inaccurate on this point also.

Pseudeutropius mitchelli Günther.

Pseudeutropius mitchelli was described by Günther[2] from two young specimens, " Three and a half inches long ", collected in the Madras Presidency. Unfortunately no specific locality is mentioned. In 1865, Day[3] regarded it as a synonym of *P. sykesi* (Jerdon) and remarked :

" By no means rare in the rivers of Malabar. In two specimens the adipose fin was absent, perhaps lost by some accident ; probably from some such deformed specimen Dr. Jerdon described the *Schilbe sykesii*."

In his *Fishes of Malabar*, he reaffirmed this view and stated that the species grows to above eight inches in length. Günther in the *Zoological Record* for the same year (p. 199) made the following observation under *Pseudeutropius mitchelli* :

" Although Mr. Day states (*Fish. Malabar*, p. 192) that he has no doubt Mr. Jerdon described his *Schilbe sykesii* from an example without adipose fin, it must, even in that case, appear doubtful whether the fish is identical with *P. mitchelli*. If he cannot verify his assertion by the examination of the typical specimen, he has no right to exchange the name of a well-determined species for that of a doubtful one. "

Day's reply to the above is contained in a footnote on p. 423 of his *Fishes of India* where after referring to Günther's observations he remarks : " Jerdon had described the species fifteen years before Dr. Günther, and sufficiently well for my recognizing it at a locality where he found it"

Jerdon's description[4] of *Schilbe sykesii* is of a generalised nature and insufficient for the determination of the species. Jerdon's examples,

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[1] Chaudhuri, B. L., *Rec. Ind. Mus.* VII, p. 444 (1912).

[2] Günther, A., *Cat. Fish. Brit. Mus.* V, p. 59 (1864).

[3] Day, F., *Proc. Zool. Soc. London*, p. 289 (1865).

[4] Jerdon's description of *Schilbe sykesii* (*Madras Journ. Litt. Sci.* XV, p. 335, 1849) is as follows :

" Head one-fifth of whole length of body ; much compressed, its width being about half its length ; eye large, being $3\frac{1}{2}$ times in the head ; maxillary cirri reach the ventral fin, all the other (6) cirri longer than the head ; dorsal and pectoral spines serrated ; the latter strongly so ; anal fin about one-third of length of body—D. 1-6 ; A. 36—colour greenish above, silvery on the sides and beneath."

about 6 inches in length, were obtained from the Cauvery. Recently I have got a large collection of fish from the same river made by Prof. C. R. Narayan Rao. There is a specimen in this collection which I refer to Jerdon's species. A thorough examination of this specimen and its comparison with others have shown that it undoubtedly belongs to *P. sykesi* which has proved to be identical with Sykes' *Hypophthalmus taakree*[1]. Of the latter I have received a large number of fresh specimens from the Western Ghats, so there can be no doubt about its true identity.

The three specimens in the collection of the Indian Museum referred by Day to *P. sykesi* are about 5 inches in length without the caudal fin. The vomerine teeth in these specimens are in two distinct patches and the air-bladder is moderately extensive and lies free in the abdominal cavity; it also forms blister-like translucent areas above the pectoral fins. Mr. Norman very kindly examined the types of *P. mitchelli* and sent me a sketch of its upper dentition. He also observed that the " blister-like translucent area above the pectoral fin is indicated in the types of this species." The difference in the extent of the vomerine teeth of *P. mitchelli* and *P. sykesi* (Day *nec* Jerdon), as figured above, is probably due to the relative age of the specimens. I have noticed this in the case of *P. atherinoides* also; in the young the bands on the palate are more extensive and become somewhat reduced as the fish grows in size. From the above it is clear that Day was right in regarding *P. mitchelli* as identical with his *P. sykesi*, but unfortunately his *P. sykesi* is not the same as *P. sykesi* (Jerdon) which has now to be regarded as a synonym of *P. taakree* (Sykes). Thus *P. mitchelli* stands as a valid species.

Superficially *P. mitchelli* and *P. atherinoides* are very similar, but Mr. Norman informs me that the former has a smaller head, with the nape distinctly less elevated. These differences are also present in the specimens before me. In the adult specimens of *P. atherinoides* the snout is usually produced and bears teeth on the ventral surface.

Günther states that in his *P. mitchelli* the pectoral spine does not extend backwards to the vertical from the dorsal spine. This is not so in three specimens I refer to this species wherein the pectoral spine extends beyond the base of the dorsal spine.

Proeutropiichthys Hora.

1937. *Proeutropiichthys*, Hora, *Cur. Sci.* V, p. 353.

The genus *Proeutropiichthys* was proposed for such species of *Pseudeutropius*-like fishes in which the vomerine and palatine teeth form four distinct patches; these may be contiguous, slightly separated or widely apart from one another. The air-bladder is not extensive and thin-walled as in *Pseudeutropius*, but is of moderate size and lies free in the abdominal cavity.

Eutropius macrophthalmus Blyth was designated as the genotype of *Proeutropiichthys*, but an examination of fresh material from various

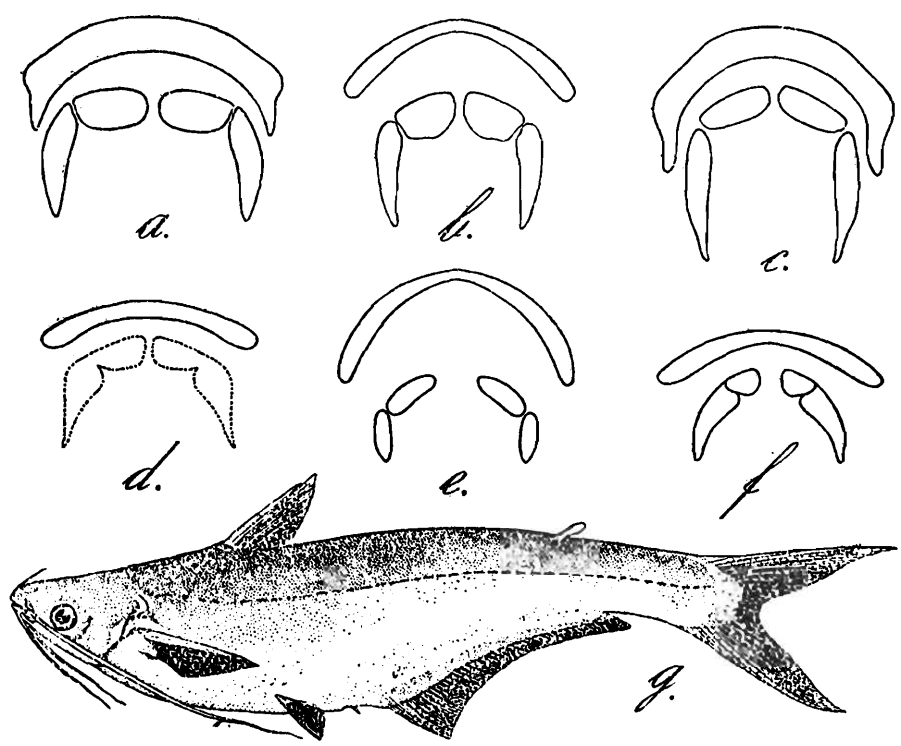
[1] Sykes, W. H., *Trans. Zool. Soc. London* II, p. 369 (1841).

localities in Peninsular India has shown that it is synonymous with *Hypophthalmus taakree* Sykes. As indicated below, this genus seems to be monotypic.

Proeutropiichthys taakree (Sykes).

1841. *Hypophthalmus taakree*, Sykes, *Trans. Zool. Soc. London* II, p. 369, pl. lxiv, fig. 4.
1849. *Schilbe Sykesii*, Jerdon, *Madras Journ. Litt. Sci.* XV, p. 335.
1849. *Bagrus taakree*, Jerdon, *ibid.*, p. 336.
1853. *Bagrus taakree*, Bleeker, *Verh. Bat. Gen.* XXV, p. 56.
1860. *Eutropius macrophthalmus*, Blyth, *Journ. As. Soc. Bengal* XXIX, p. 156.
1864. *Pseudeutropius megalops*, Günther, *Cat. Fish. Brit. Mus.* V, p. 60.
1864. *Pseudeutropius longimanus*, Günther, *ibid.*, p. 60.
1867. *Eutropius taakree*, Day, *Proc. Zool. Soc. London*, p. 564.
1869. *Pseudeutropius taakree*, Day, *ibid.*, p. 617.
1877. *Pseudeutropius taakree*, Day, *Fish. India*, p. 471, pl. cix, fig. 4.
1889. *Pseudeutropius taakree*, Day, *Faun. Brit. Ind.* Fish. I, p. 138.
1890. *Pseudeutropius taakree*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 205.
1929. *Pseudeutropius taakree*, Prashad and Mukerji, *Rec. Ind. Mus.* XXXI, p. 178.

In view of the great taxonomic confusion that prevails regarding the specific limits of the various species included in the synonymy of *P. taakree*, I give below a short history of each and my reasons for making the nomenclatorial changes indicated above.



Text-fig. 4.—*Proeutropiichthys taakree* (Sykes).

a. Upper dentition of a specimen from Burma, 126 mm. in total length : × 2¾ ; *b*. Upper dentition of a specimen from the Godaveri River, 136 mm. in total length : × 3½ ; *c*. Upper dentition of a specimen without history, 119 mm. in standard length : × 3 ; *d*. Upper dentition of type-specimen of *Pseudeutropius longimanus* Günther. After a sketch by Mr. J. R. Norman ; *e*. Upper dentition of a specimen from Poona, 102 mm. in standard length : × 4½ ; *f*. Upper dentition of type-specimen of *Pseudeutropius megalops* Günther. After a sketch by Mr. J. R. Norman ; *g*. Lateral view of a specimen (No. F. 12131/1) from Poona : × ⅜.

Sykes described his *Hypophthalmus taakree* from specimens collected in the " Beema river, near Pairgaon ", and characterised it as follows :

" An *Hypophthalmus*, with 8 cirri, 2 of which reach to the ventral fins ; 2 very minute *cirri* near the nostrils, and 4 on the chin, nearly as long as the head ; with the first dorsal and pectoral rays serrated on the posterior edges, and with 8 rays in the dorsal and 50 in the anal fin."

From a perusal of the full description and figure of the species attention may be directed to the following other salient features of the fish :

(i) " Eyes so much on the edge or side of the head as to be seen in half their diameter from below."

(ii) " Tail being bent downwards from the end of the second dorsal and anal fins."[1]

(iii) " Snout nearly on a line with the level of the back, which is very slightly raised : belly more arched than the back "

Though as judged by modern standards, this species is insufficiently characterised, it is so common in the Deccan that there can be no doubt about its identity. I have examined large series of specimens of this species from Poona, Deolali, Hyderabad-Deccan, Godaveri, etc. There are, no doubt, marked variations in the number of rays in the anal fin and also in the development of dentition, but these are hardly of any specific value, especially when they intergrade. Being a variable species, it seems to have been described by later workers under several names.

Jerdon included this species in his list of the freshwater fishes of Southern India but gave a wrong diagnosis of the fish mentioning " Adipose fin long, anal fin short." In fact, the reverse of this was described by Sykes. *Schilbe sykesii* of Jerdon also appears to be synonymous with *P. taakree* as indicated above under *Pseudeutropius mitchelli* Günther (*vide supra*, p. 105).

Bleeker also recognised *P. taakree* as a valid species, but both Jerdon and Bleeker included it under *Bagrus*.

Blyth described *Eutropius macrophthalmus* from Tenasserim and characterised it as follows :

" Of the usual form of this genus, but with remarkably large eyes, that occupy more than half of the height of the head. Longer maxillary cirri reaching to the vent, the four inferior cirri to base of pectorals ; spines slender, the pectoral less so, and all minutely pectinated behind ; the dorsal also jagged in front for its basal half."

" D. 1-7.-A. 47 to 54."

" Colour bright silvery infuscated along the back, with a golden lustre on the gill covers. Soft rays of the dorsal and pectoral infuscated except at base ; also the median portion of the deeply forked caudal, while several outer rays of the caudal above and below are white throughout. Ventrals and anal white ; the slender adipose fin having minute dusky spots. Longest specimen 6½ in."

Günther[2] regarded this species as a doubtful form of *Pseudeutropius*, while Day[3] considered it as a synonym of *P. goongwaree*[4]. I[5] have already shown the precise specific limits of Sykes' *goongwaree* and its position in the genus *Eutropiichthys*. Though Blyth's description of

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[1] This is an artifact. I have examined a specimen from Poona in which the back is arched as described by Sykes ; it is figured here as text-fig. 4*g*.

[2] Günther, A., *Cat. Fish. Brit. Mus.* V, p. 58 (1864).

[3] Day, F., *Fish. India*, p. 471 (1877).

[4] Sykes, W. H., *Trans. Zool. Soc. London* II, p. 369 (1841).

[5] Hora, S. L., *Journ. Bombay Nat. Hist. Soc.* XXXIX, p. 435 (1937).

the species, especially on account of the absence of any reference to dentition of the fish, is insufficient for its precise determination I am convinced that this ' large-eyed *Eutropius* ' could not be anything else except the form described by Day as *P. taakree* from Burma. Under *P. taakree* Day observed : " I have obtained in Burmah, as high as Mandalay, specimens which I am unable to separate from this species, except that in some the pectoral spine is slightly shorter, in other the adipose fin is almost or quite absent " I have examined specimens from Pegu and Mandalay referred by Day to *P. taakree* and also fresh specimens collected by Dr. B. N. Chopra in the Myitkyina District, Upper Burma. The latter specimens were reported upon by Prashad and Mukerji who remarked :

" The samples before us from Kamaing differ from Day's description mainly in their head being broader, the maxillary barbels shorter ; the dorsal as well as the pectoral spines besides being denticulated posteriorly, are finely serrated anterirorly. Day 'obtained in Burma, as high as Mandalay', specimens apparently belonging to this species but with a shorter pectoral spine. It is quite possible that the Burmese specimens of *P. taakree* are distinct from the Indian."

The differences noted above are probably due to the large size of the Burmese examples in the collection studied by Prashad and Mukerji, for in larger specimens from Deccan the pectoral and dorsal spines are granulated along the anterior border. In smaller individuals these serations are very fine and the outer border of the spine may appear as smooth. It is quite possible, however, that the Burmese race of the species may prove to be distinct but at the present the material from Burma is not sufficient to make such a detailed study.

Though Günther[1] doubtfully referred *Hypophthalmus taakree* Sykes to *Eutropius*, he described two species under *Pseudeutropius*, *P. megalops* and *P. longimanus*, which appear to be synonymous with Sykes' species. *P. megalops* was described from a single specimen " Six inches long. Godaveri at Mahadespur, Orissa. From the Collection of Messrs. V Schlagintweit." Day[2] included this species, with a query, under the synonymy of *P. murius*, and no other author appears to have commented on the specific limits of this species. In order to verify Day's contention I sent a sketch of the dentition of ' *P. murius* ' (I[3] have included *murius* in the genus *Eutropiichthys*.) to Mr. J. R. Norman of the British Museum and requested him to compare it with the dentition of the type-specimen of *P. megalops*. He informed me that " The type of this species [*P. megalops*] has a dentition quite different to that shown in your sketch, so that I have given a rough sketch of this (Text-fig. 4 *f*). A second specimen in the British Museum identified as *P. megalops* (120 mm.) has a dentition agreeing exactly with your sketch." On further enquiry I learnt that the second specimen of *P. megalops* came from North East Bengal and formed part of the collection made by Jerdon.

The above information definitely clears up two points : (i) that *P. megalops* and ' *P. murius* ' are two distinct species and (ii) that Day may have been misled in his conclusion on account of the wrong identification of Jerdon's specimen in the British Museum.

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[1] Günther, A., *Cat. Fish. Brit. Mus.* V, p. 52 (1864).
[2] Day, F., *Fish. India*, p. 472 (1877).
[3] Hora, S. L., *Journ. Bombay Nat. Hist. Soc.* XXXIX, p. 435 (1937).

To bring out the differences between *P. megalops* and " *P. murius* " I requested Mr. Norman to compare the two specimens of *P. megalops* in the British Museum. He very kindly sent me the following note on this point.

" With regard to the two specimens of *Pseudeutropius megalops* of which the dentition is different these are certainly not of the same species and there is little doubt that Jerdon's specimen has been incorrectly named. In the type of *P. megalops* the depth of the body is $5\frac{1}{4}$ in the length without the caudal fin and the head 5, whereas in Jerdon's specimen the depth is 4 and the head $4\frac{3}{4}$. Further the maxillary barbel extends beyond the origin of the anal fin in the type and the caudal peduncle is longer than deep, whereas in Jerdon's specimen the barbel only reaches the first quarter of the pectoral spine and the caudal peduncle is about as deep as long. There are other minor differences but these are the more important."

In the collection of the Zoological Survey of India, there are 4 specimens from the Godaveri River collected by Dr. N. Annandale at Rajahmundry which agree fairly closely with Günther's description of *P. megalops*, especially in the form of the dentition (Text-fig. 4 *b*). The proportions, length of barbels, etc. differ to a certain extent, but these differences cannot be regarded as specific. The number of anal rays varies from 42 to 49. I give below a table of measurements of these examples, which seem to me to belong to *P. taakree.*

Measurements in millimetres.

Standard length	108·5	103·0	65·0	55·0
Length of head ..	24·0	21·5	14·5	11·8
Width of head ..	13·5	12·0	7·8	6·0
Height of head at occiput ..	15·5	14·5	10·0	8·5
Length of mouth	5·0	4·0	3·0	2·5
Width of mouth	6·4	5·5	4·1	3·3
Diameter of eye	7·0	7·0	6·0	5·1
Length of snout	8·0	8·0	4·9	4·0
Interorbital width	7·5	7·2	4·5	4·0
Width of body ..	11·0	11·0	7·0	5·0
Height of body ..	20·0	18·0	12·5	9·0
Length of pectoral spine	20·4	19·0	11·0	D.
Length of dorsal spine	17·5	16·0	8·8	7·0
Length of nasal barbel[1]	10·5	10·0	7·0	4·5
Length of maxillary barbel[2]	50·0	46·5	29·0	25·2
Length of outer mandibular barbel	25·0	24·0	12·0	10·0
Length of inner mandibular barbel	25·5	25·4	13·0	12·0
Length of caudal peduncle ..	16·0	14·0	7·5	6·5
Least height of caudal peduncle	9·0	8·5	5·0	4·0
Commencement of dorsal from tip of snout	34·0	31·5	20·5	16·5

P. longimanus was described from a " Skin : 6 inches long : not good state. India. From the Collection of the Zoological Society." The main difference from *P. megalops* seems to consist in the number of rays in the dorsal and anal fins (D. 1/6 ; A. 41 for *P. megalops* and D. 1/8 ; A. *ca* 54 for *P. longimanus*). I have referred above to the variation in the number of anal rays of *P. taakree* and after having examined large series of specimens it is not possible for me to recognise

[1] Reaching to the middle of the eye-diameter.

[2] The length of maxillary barbels is very variable ; usually they extend to the end of the pelvic fins but they may be shorter or longer.

the above differences as of any specific value. Accordingly, I agree with Day[1] that *P. longimanus* is synonymous with *P. taakree*. Day[2] was of the opinion that the type-specimen of *P. longimanus* was from the collection of Col. Sykes and may have been the original of his *P. taakree*.

At my request, Mr. J. R. Norman sent to me a sketch of the dentition of *P. longimanus* (Text-fig. 4 *d*) and it also shows that the species is identical with *P. taakree*. There are two old, poorly preserved specimens in the Indian Museum (Cat. No. 509) without any locality label or name of donor in which the number of fin-rays and dentition (Text-fig. 4 *c*) correspond with Günther's description of *P. longimanus*.

As noted in the case of several other Indian species, the distribution of *P. taakree* is also of zoogeographical interest ; it is found in Deccan on the one hand and Burma on the other, and has not yet been recorded from the intermediate regions. There is one lot of 6 old specimens in the collection of the Indian Museum (No. Cat. 507) which is labelled to have been collected at Calcutta. This record seems to be rather doubtful.

Ailia Gray.

The generic name *Ailia* was proposed by Gray as a subgenus of *Malapterus* (*sic*) to accommodate his species ' *Malapterus* (*Ailia*) *Bengalensis* ' figured in the *Illustrations of Indian Zoology*. This figure is a copy of Hamilton's original drawing of *Malapterurus coila*. The definition of the genus is, however, given in the *Zoological Miscellany* (p. 8, 1831) and is as follows :

" Body compressed ; fins all spineless ; fat-fin very short and small over the end of the very long anal fin ; ventral fins all nearly under the pectoral ; tail forked. Most allied to *Melapterus* of Geoffroy."

At the same time Gray described the genus *Acanthonotus* for *A. hardwickii* which is also figured in the *Illustrations*. Both the figure and the description appear to be based on a badly preserved specimen of *Ailia coila* (Ham.) in which the neural spines projected beyond the dorsal profile giving the false appearance of " a series of small spines " before the spineless dorsal. Though the latter generic name has line priority over *Ailia*, it is not accepted here owing to its diagnosis being very defective.

The genus *Ailia* is remarkable in several respects and Bleeker[3] constituted a separate group Ailianini in the sub-family Ailichthyoidei for its reception. Günther[4], however, included it in his composite group Silurina, but Regan[5] in his classification of the Siluroid fishes accommodated it in a separate subfamily—Ailiinae—of the Schilbeidae. The most salient features of *Ailia* are : (i) tubular, horse-shoe-shaped air-bladder, (ii) absence of rayed dorsal ; (iii) presence of a small adipose dorsal, (iv) long anal fin ; (v) eight well-developed barbels ; (vi) forked caudal and (vii) fairly well marked dentition. Of these, great import-

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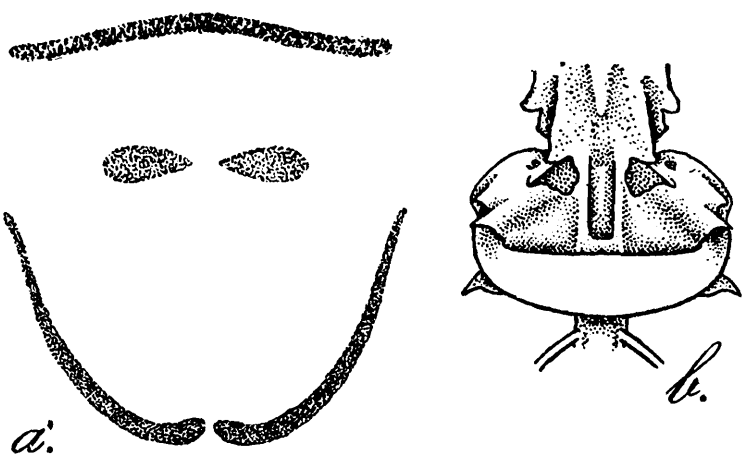
[1] Day, F., *Proc. Zool. Soc. London*, p. 617 (1869).
[2] Day, F., *Fish. India*, pp. iv (under Sykes), 471 (1877).
[3] Bleeker, P., *Ichth. Arch. Ind. Prodr.* 1, Siluri, pp. ix, 248 (1858).
[4] Günther, A., *Cat. Fish. Brit. Mus.* V, p. 55 (1864).
[5] Regan, C. T., *Ann. Mag. Nat. Hist.* (8) VIII, p. 567 (1911).

ance has been attached to the structure of the air-bladder which has been described by Day[1], Bridge and Haddon[2] and Nair[3].



Text-fig. 5.—Dentition and air-bladder of *Ailia coila* (Hamilton).
a. Dentition: × 8; *b*. Air-bladder: × 5.

In 1871, Day (*loc. cit.*) established the genus *Ailiichthys* for *A. punctata* found in " The Jumna, and southern rivers in the Punjab that are tributaries of the Indus, but not those on the hills, " and characterised it as : " Differing from *Ailia* in that the ventral fins are entirely absent." In several cases I have previously referred to the absence of pelvic fins in fishes and shown that no reliance can be placed on this character for taxonomic purposes. In *Ailia*, for instance, the body is greatly compressed and almost leaf-like. The pelvic fins are very small and lie below the pectorals. In these circumstances their function is taken over by the pectorals, which are somewhat more elongated than usual, and in consequence the pelvics may be regarded as mere vestigeal organs. It is no wonder, therefore, if under certain circumstances they do not make their appearance altogether. Similar cases of abnormality have been observed by a number of workers. Günther[4] explained the absence of pelvics on the assumption that " The chief function of these fins is to balance the body of the fish whilst swimming ; and it is evident that, in fishes moving during a great part of their life over swampy ground, or through more or less consistent mud, this function of the ventral fins ceases, and that nature can readily dispense with these organs altogether." This is probably true in the case of such genera as *Channallabes*, *Apua*, *Channa*, etc. which live in mud or vegetable débris, but *Ailia* is certainly not a bottom fish as is evident from its form and colouration. In the case of *Ailia* it seems probable that owing to the extension of the tail region and the compression of the head and body there remains very little space for the attachment of the pelvic fins. Moreover, the elongation of the pectorals as far back as the anal fin rendered the presence of pelvics as useless. In the economy of nature,

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[1] Day, F., *Proc. Zool. Soc. London*, p. 712 (1871).
[2] Bridge, T. W. and Haddon, A. C., *Phil. Trans. Roy. Soc. London* (B) CLXXXIX, p. 208 (1894).
[3] Nair, K. K., *Rec. Ind. Mus.* XL, pp. 185, 186 (1938).
[4] Günther, A., *Ann. Mag. Nat. Hist.* (4) XII, p. 143 (1873).

therefore, these organs may sometime be totally absent. In view of what is stated above, I do not consider *Ailiichthys* as a separate genus from *Ailia*. In fact, my examination of the material in the collection of the Indian Museum shows that *Ailiichthys punctatus* Day is synonymous with *Ailia coila* (Ham.). Thus I am able to recognise only one species in this geneus.

XII. A FURTHER NOTE ON FISHES OF THE GENUS *Clarias* GRONOVIUS.

In 1936, I[1] discussed the systematic position of the various forms of *Clarias* described from India, Burma and Ceylon, and concluded that only three species can be recognised from these regions, *viz.*, *C. batrachus* (Linn.) (Ceylon, India, Burma, the Malay Archipelago and further east), *C. brachysoma* Günther (Ceylon) and *C. dayi* Hora (Wynaad Hills). Since then I have examined the Siluroid material preserved in the collections of the Bombay Natural History Society and the Government Museum, Madras, and among them found specimens (2 from Karkala, South Canara District and 7 from Goa), which, though closely allied to *C. brachysoma*, differ in certain respects from all the three species enumerated above. A similar specimen was also found in a collection of fishes sent by Prof. P. W. Gideon for determination ; it was collected in a *nullah* near Belgaum. A close study of these specimens and literature has shown that they are referable to *C. dussumieri* Cuv. & Val.,[2] which was described from Malabar and Pondicherry from specimens 7 to 8 inches in length, and distinguished from *C. batrachus* (=*C. magur*) by the following characters :—

" avec la tête lisse et large de la deuxième [*C. magur*], a les épines pectorales plus sensiblement dentées, et les dents de l'arc vomérien approachent plus de la forme de petits pavés que de celle de dents en velours ras."

Though *C. dussumieri* was found by Jerdon[3] " in tanks and ditches in Malabar ", Günther[4] regarded it only as a *species inquirendum*. At the time of writing ' The Fishes of Malabar ', Day[5] had not examined any specimen of the species but later he[6] found one example, 7 inches long, from the Wynaad which he assigned to *C. dussumieri*. This specimen, which is now preserved in the collection of the Indian Museum and is in a very poor state of preservation, was found by me (*loc. cit.*) to be abundantly distinct from all the known species of the genus and was accordingly made the type of a new species *C. dayi* Hora. In my previous note I regarded *C. dussumieri* as a synonym of the widely distributed Indian species, *C. batrachus*, but fresh material from the Malabar zone has convinced me that it is worthy of recognition as a distinct species. It is distinguished from *C. batrachus*, among other characters, by its greater distance between the occipital process and

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[1] Hora, S. L., *Rec. Ind. Mus.* XXXVIII, pp. 347-351, text-figs. 1-5 (1936).
[2] Cuvier, G., and Valenciennes, A., *Hist. Nat. Poiss.* XV, p. 582 (1840).
[3] Jerdon, T. C., *Madras Journ. Litt. & Sci.* XVI, p. 342 (1849).
[4] Günther, A., *Cat. Fish. Brit. Mus.* V, p. 17 (1864).
[5] Day, F., *Fishes of Malabar*, p. 197 (1865).
[6] Day, F., *Fish. India*, p. 484 (1877).

commencement of the dorsal fin ; from *C. brachysoma* in having a more coarsely serrated pectoral spine, somewhat shorter barbels and more obtuse teeth on the palate and from *C. dayi* in having much longer nasal brabels, less molariform teeth and less strongly serrated pectoral spine. It is thus in several respects an intermediate form between *C. brachysoma* and *C. dayi.*

Specimens of *C. brachysoma* from Ceylon have usually been referred to *C. teysmanni* Bleeker (Java, Sumatra, Borneo and Malacca), but after an examination of the type material of both the species in the collection of the British Museum of Natural History, Mr. J. R. Norman (*vide* Hora, *loc. cit.*, p. 349) showed that the two forms are distinct. Generally speaking, there is no doubt regarding the very close similarity between the species typical of the Malabar zone and Ceylon on the one hand and of the Malay Archipelago on the other. Attention may here be directed to an error in my previous article on *Clarias* in the explanation of text-figure 2, *viz.*, text-figure 2*a* represents, after Norman, the vomerine tooth band of *C. brachysoma* and text-figure 2*b* that of *C. teysmanni* and not *vice versä* as was then described.

For facility of reference in future I give below full descriptions of *C. dussumieri* Cuv. & Val. For a detailed account of *C. dayi* Hora reference may be made to Day's descriptions of *C. dussumieri* both in the *Fishes of India* and in the *Fauna.*

Clarias dussumieri Cuvier and Valenciennes.

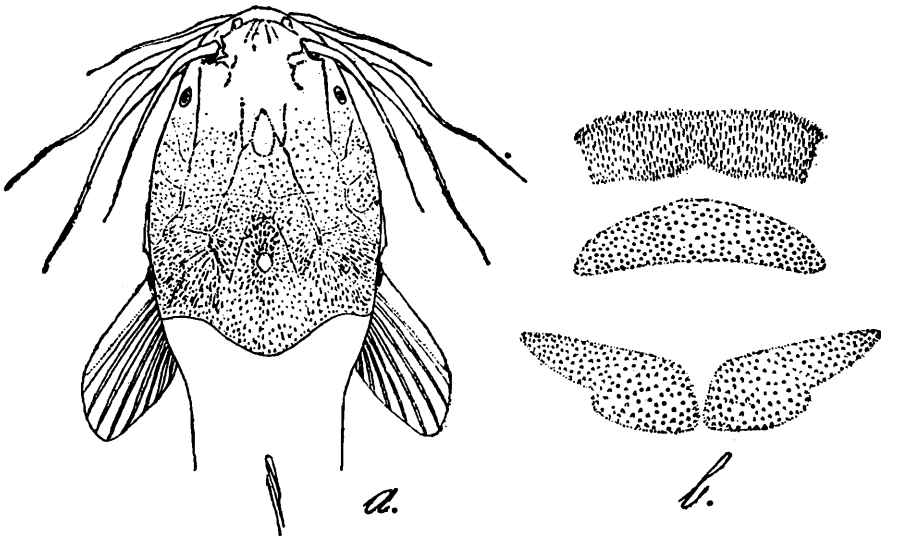
1840. *Clarias Dussumieri,* Cuvier and Valenciennes, *Hist. Nat. Poiss.* XV, p. 382.

D. 66-69 ; A. 45-59 ; P. 1/10-11 ; V 6.

Clarias dussumieri is an elongated fish in which the depth of the body is contained from 8·4 to 9·4 times, the length of head to end of gill-cover 6 times and to end of occipital process 4·5 times in the total length. The height of head is contained from 1·5 to 1·7 times in its length. The head is almost as broad as long. The diameter of the eye is contained from 8 to 10 times, the length of snout from 2·7 to 3·2 times and the interorbital width 1·8 times in the length of the head. The occipital process is broadly rounded ; its height is considerably less than half the length of its base. The distance between the origin of dorsal and occipital process is contained about 3 times in the length of the head to the end of the occipital process.

The dorsal surface of the head is roughened with ridges. The frontal fontanel is almost twice as long as broad and extends as far as the front border of the eye, while the occipital fontanel is oval and much shorter. The interorbital distance is greater than the width of the mouth and is almost equal to the postorbital part of the head. The nasal barbels extend as far as the occipital fontanel ; the maxillary barbels extend beyond the bases of the pectorals ; the outer mandibulars reach the bases of the pectorals while the inner mandibulars are shorter. There are villiform teeth in the jaws ; those in the upper jaw are in the

form of a continuous band one-fifth as broad as long ; those in the lower jaw are grouped in two contiguous patches which are produced back-



Text-fig. 6.—*Clarias dussumieri* Cuvier and Valenciennes.

a. Dorsal surface of head and anterior part of body up to commencement of dorsal fin : × ⅔ ; *b*. Dentition : × 2½.

wards at the sides. The vomerine teeth are conspicuously obtuse and are situated in a broad crescentic band.

The dorsal fin commences almost above the termination of the pectorals and is separated from the caudal by a distinct notch. The caudal fin is longer than the head and is roundly pointed at the end ; it is not confluent with the anal and the dorsal fins. The pectoral fin is considerably shorter than the head ; its spine is strong and conspicuously serrated along the outer border ; along the inner border it is provided with a few small teeth in the middle. The pelvic fins extend beyond the commencement of the anal fin.

In the preserved specimens there are no distinct markings ; the general colour is somewhat darker above and lighter below.

Variations.—The above description is based on two fine examples from Karkala in South Canara District. The seven specimens from Goa are in a poor state of preservation but generally agree in almost all particulars with the Karkala examples. The specimen from Belgaum is, however, stumpy and stout with the body considerably deeper, head somewhat broader and the paired fins shorter. The pectoral spine is relatively much shorter.

Distribution.—Along the Malabar Coast generally ; it has been recorded from Pondicherry, Goa, South Canara and Belgaum.

Remarks.—Except for the differences in the nature of the pectoral spine and vomerine teeth, and the length of barbels *C. dussumieri* is closely related to *C. brachysoma* of Ceylon and *C. dayi* of the Wynaad. In the following Table I give measurements of 3 specimens of *C. áussumieri* and of 3 specimens of *C. brachysoma* for purposes of comparison.

Measurements in millimeters.

	C. dussumieri			*C. brachysoma*		
	Karkala.		Belgaum.	Ceylon.		
Total length	253·0	227·0	178·8[1]	252·2[2]	236·0	206·0
Length of caudal	34·0	33·0	22·5	33·0	34·0	28·2
Depth of body	30·0	24·0	26·0	35·0	29·2	30·5
Length of head to end of opercle	41·2	38·0	34·2	44·0	40·0	33·0
Length of head to end of occipital process	54·3	49·6	43·4	54·2	50·5	44·5
Height of head	27·8	22·0	22·3	29·8	25·2	25·0
Width of head ..	38·0	34·5	33·0	39·5	37·5	31·8
Length of snout	14·3	13·8	10·5	15·2	14·0	10·5
Diameter of eye	5·0	3·9	3·0	4·2	4·2	3·5
Interorbital width ..	22·6	21·0	19·0	24·0	23·2	19·0
Length of pectoral spine ..	22·0	18·2	13·8	19·5	19·0	15·2
Length of pectoral ..	30·2	25·6	20·7	28·6	28·0	21·8
Length of pelvic	19·8	18·8	14·0	17·8	15·6	15·0
Length of nasal barbel ..	32·0	31·0	25·0	35·6	36·2	28·5
Distance between occipital process and dorsal fin	17·4	16·3	14·7	20·5	18·0	16·4

[1] The caudal fin is partly damaged in this specimen.
[2] This is a mature female full of eggs.