ON A COLLECTION OF FISH FROM THE HAZARIBAGH DISTRICT, BIHAR.

By K. N. Das, *M.Sc., Assistant, Zoological Survey of India, Calcutta.*

Hora[1] in the introduction to his account of the fishes of the Rajmahal Hills explained the zoogeographical importance of studying the fish-fauna of the series of hills which once comprised the Satpura trend of mountains stretching between the Assam Himalayas on the east to Gujrat on the west. The occurrence in the Rajmahal Hills of such forms as *Laguvia*, *Amblyceps*, *Garra gotyla* and *Botia dario* has already lent considerable support to the continuity of the fauna of these hills with that of the hills of Assam. With a view to studying the extension of the range of the Assamese fauna westwards two parties of the Zoological Survey of India made collections during 1938 in the western part of the Santal Parganas and in the district of Hazaribagh respectively. In this article I give an account of an extensive collection of fishes made by Dr. H. S. Rao in the Hazaribagh District during September-October 1938. The area investigated extends 25 miles north, 32 miles south and 12 miles east of the town of Hazaribagh. The collections were made from hill-streams of various types, all of which finally drain into the Damodar River, a tributary of the Hooghly.

The collection under report (*vide* list given below) comprises 26 species, which are distributed among 18 genera and 9 families. As is to be expected, 17 species belong to the order Cyprinoidea, Cyprinidae (12) and Cobitidae (5); and 4 to the Siluroidea, Clariidae (1), Amblycepidae (1) and Sisoridae (2); while the remaining 5 species represent the families Mastacembelidae (1), Nandidae (1), Gobiidae (1) and Ophicephalidae (2). Most of the species are widely distributed in India and do not call for any special comments. The occurrence of *Barbus pinnauratus* and *Amblyceps mangois* in the Hazaribagh District is, however, of special significance from a zoogeographical point of view. *B. pinnauratus*, a form hitherto believed to be confined to Peninsular India, was recently recorded by Hora[2] from the Chindwin Drainage, and the Bailadila Range in Central Provinces, and its present record from an intermediate region clearly shows the route of migration followed by the north-eastern fishes to the peninsula of India. *Amblyceps mangois*, a small loach-like Siluroid fish confined to rocky streams at the bases of hills, is of special importance for zoogeographical studies; the extension of its range westwards along the old Satpura trend is significant. Dr. Hora informs me that he has recently obtained specimens of this species from Perak which extend its range to as far as the Malay Peninsula. The examination of the Hazaribagh material has also enabled me to define the specific limits of Hamilton's little-known Minnow, *Cyprinus guganio*.

I am grateful to Dr. B. Prashad, Director, Zoological Survey of India, for allowing me to work out the collection and for going through the

[1] Hora, S. L., *Rec. Ind. Mus.* XL, pp. 169-171 (1938).

[2] Hora, S. L., *Rec. Ind. Mus.* XXXIX, pp. 336, 337 (1937); *ibid.* XL, pp. 239-240 (1938).

manuscript. I express my great indebtedness to Rai Bahadur Dr. S. L. Hora for critically examining my identifications and for constant help and guidance. Babu A. K. Mondul and Babu B. N. Bagchi have executed the figures for the text under my supervision and for this my thanks are due to them.

LIST OF SPECIES.

Family MASTACEMBELIDAE.

1. *Mastacembelus armatus* (Lacép.).

Family CYPRINIDAE.

2. *Barilius bendelisis* Ham.
3. *Danio (Brachydanio) rerio* (Ham.).
4. *Laubuca laubuca* (Ham.).
5. *Esomus danricus* (Ham.).
6. *Rasbora daniconius* (Ham.).
7. *Barbus pinnauratus* (Day).
8. *Barbus tetrarupagus* (Ham.).
9. *Barbus ticto* (Ham.).
10. *Barbus sophore* (Ham.).
11. *Barbus guganio* (Ham.).
12. *Garra mullya* (Sykes).
13. *Crossochilus latius* (Ham.).

Family COBITIDAE.

14. *Lepidocephalichthys guntea* (Ham.).
15. *Nemachilus denisonii* Day.
16. *Nemachilus zonatus* (McClell.).
17. *Nemachilus botia* (Ham.).
18. *Nemachilus dayi* Hora.

Family CLARIIDAE.

19. *Clarius batrachus* (Linn.).

Family AMBLYCEPIDAE.

20. *Amblyceps mangois* (Ham.).

Family SISORIDAE.

21. *Glyptothorax botia* (Ham.).
22. *Gagata cenia* (Ham.).

Family NANDIDAE.

23. *Nandus nandus* (Ham.).

Family GOBIIDAE.

24. *Glossogobius giuris* (Ham.).

Family OPHICEPHALIDAE.

25. *Ophicephalus gachua* Ham.
26. *Ophicephalus punctatus* Bloch.

SYSTEMATIC ACCOUNT.

Family MASTACEMBELIDAE.

Mastacembelus armatus (Lacépède).

1938. *Mastacembelus armatus*, Hora, *Rec. Ind. Mus.* XL, p. 172.

A tributary stream of the Barakar River, south of Surjpura on the Barhi Road, about 16 miles from Hazaribagh. 4.x.1938.—6 specimens.

Damodar River near Ramgarh town, 32 miles from Hazaribagh on the Ranchi Road. 8.x.1938.—1 specimen.

A stream north of Canary Hill, Hazaribagh, 25.ix.1938.—1 specimen.

Mastacembelus armatus is distributed throughout India, Burma and Ceylon.

Family CYPRINIDAE.

Barilius bendelisis Hamilton.

1938. *Barilius bendelisis*, Hora, *Rec. Ind. Mus.* XL, p. 173.

Siwane River, 4 miles north-west of Hazaribagh on the Barhi Road. 24.ix.1938.—6 specimens.

A stream north of Canary Hill, Hazaribagh. 25.ix.1938.—5 specimens.

Barakar River about 2 miles from Barhi on G. T. Road. 15.x.1938.—1 specimen.

A tributary of the Barakar River south of Surjpura on the Barhi Road, about 16 miles from Hazaribagh. 4.x.1938.—25 young.

Siwane River, east of Hazaribagh Barhi Road. 14.x.1938.—5 specimens.

Barilius bendelisis is a widely distributed species, and is represented in the collection by a large number of specimens.

Danio (Brachydanio) rerio (Hamilton).

1938. *Brachydanio rerio,* Hora, *Rec. Ind. Mus.* XL, p. 173.

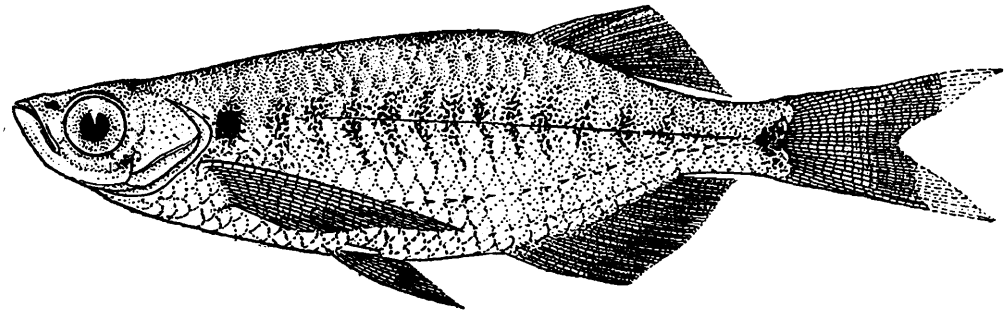
Brachydanio rerio is represented by a large number of examples collected from almost all the localities visited by the party. It is widely distributed throughout India and Burma.

Laubuca laubuca (Hamilton).

1878. *Perilampus laubuca,* Day, *Fish. India* II, pp. 598, 599.

Barakar River, about 3 miles from Barhi on the G. T. Road, Hazaribagh District. 15.x.1938.—12 specimens.

Laubuca laubuca is represented in the collection by 12 examples ranging from 18 mm. to 33 mm. in standard length. The cutting edge of the abdomen starts from below the pelvics and extends to the anal, the abdomen below the pectoral in Hazaribagh examples is rather rounded. Two black spots, one at the root of the caudal and another above the base of the pectoral, are very prominent. There



Text-fig. 1.—Lateral view of *Laubuca laubuca* (Ham.): $\times 2\frac{2}{5}$.

are 8 to 10 irregular blotches on the body along the middle line, in the youngest example these blotches are, however, very indistinct.

Day (*loc. cit.*) gives the distribution of the species as " Ganjam, Orissa, Bengal, Central India, Assam and Burma "

Esomus danricus (Hamilton).

1938. *Esomus danricus,* Hora, *Rec. Ind. Mus.* XL, p. 173.

Esomus danricus is represented in the collection by a very large number of examples collected from different localities.

E. danricus is one of the most widely distributed Indian species. It is very common in Bengal, Bihar, United Provinces, Punjab, Sind and South India. It grows to a length of 4 to 5 inches.

Rasbora daniconius (Hamilton).

1938. *Rasbora daniconius,* Hora, *Rec. Ind. Mus.* XL, p. 173.

Bokharo River, about 2 miles east of Hazaribagh-Ranchi Road, at mile $14\frac{1}{2}$. 2.x.1938.—2 specimens.

Junction of Dudhi and Bokharo Rivers about half a mile east of bridge at mile $15\frac{1}{2}$ on Hazaribagh-Ranchi Road. 28.ix.1938.—2 specimens.

Upad stream, a tributary of the Bokharo River, near the mica mines 2 miles from 5th milestone of Ranchi Road. 13.x.1938—4 specimens

Siwane River, 4 miles north-west of Hazaribagh on the Barhi Road. 24.ix.1938.—2 specimens.
Barakar River about 3 miles from Barhi on the G. T. Road, Hazaribagh District. 15.x.1938.—1 specimen.
Bokharo falls and river about 12 miles from Hazaribagh. 5.x.1938.—4 specimens.
A hot spring, a few yards west of the bank of the Bokharo River, 2 miles east of Hazaribagh-Ranchi Road. 2.x.1938.—2 specimens.

There are 17 examples, mostly young, of the species in the collection; the largest example measures 46 mm. in length without the caudal. *Rasbora daniconius* is found throughout India, Burma and Ceylon.

Barbus pinnauratus (Day).

1937. *Barbus pinnauratus*, Hora, *Rec. Ind. Mus.* XXXIX, p. 336.
1938. *Barbus pinnauratus*, Hora, *Rec. Ind. Mus.* XL, pp. 239, 240.

Tributary of the Barakar River, south of Surajpura on the Barhi Road, about 16 miles from Hazaribagh. 4.x.1938.—1 specimen.
Siwane River, 4 miles north-west of Hazaribagh on the Barhi Road. 24.ix.1938.—1 specimen.
Barakar River, about 3 miles from Barhi on the G. T. Road, Hazaribagh District. 15.x.1938.—1 specimen.
Bokharo falls and river, about 12 miles from Hazaribagh. 5.x.1938.—1 specimen.

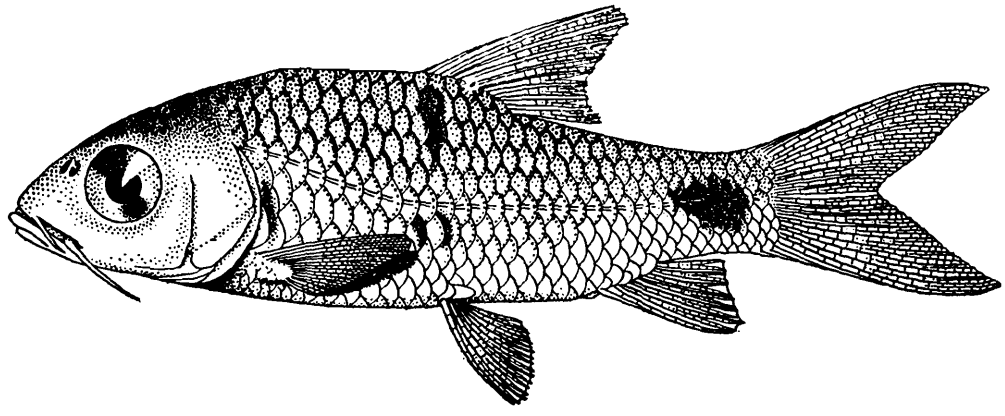
Barbus pinnauratus is represented in the collection by 4 young examples, the largest measures 57 mm. in length without the caudal. In the youngest example, about 25 mm. in the standard length, the characteristic markings on the body, *viz.* the black spots at the bases of scales, a vertical blotch below the commencement of the dorsal fin and a dark band just behind the gill-opening, are rather well developed. The dorsal spine is very weak and a few scattered serrations are only observed under high magnification.

In working out a small collection of fish from the Chindwin Drainage, Hora (*loc. cit.*, 1937) came across a few examples of *Barbus*, which he assigned to *B. pinnauratus*, a form that had hitherto been known from "fresh waters at Coconada down the east coast of India to Ceylon, and inland as far as Neilgherries, also along the Western Ghats and rivers at their bases"[1]. In 1938, Hora (*loc. cit.*) recorded one specimen of *pinnauratus* from a stream at the foot of the Bailadila Range, Bastar State, Central Provinces. Its occurrence in an intermediate region like Hazaribagh is of special interest and lends support to Hora's views regarding the route of migration of the north-eastern fishes towards Peninsular India.

Dr. Hora has very kindly directed my attention to a specimen of *Barbus* recently received by the Zoological Survey of India from Prof. M. A. Moghe of Nagpur for identification. The specimen (text-fig. 2) is young, measuring 22·8 mm. in standard length, and agrees in all essential characters with the smallest example of *B. pinnauratus* described above. The vertical blotch below the commencement of the dorsal fin runs down further and there is indication on one side that it extends to below the lateral line. The dorsal spine seems to be un-

[1] Day, F., *Fish. India*, p. 562 (1878).

serrated. The presence of bright large blotches on either side of the tail and the unserrated ray of the dorsal fin are undoubtedly juvenile charac-



Text-fig. 2.—Lateral view of *Barbus pinnauratus* (Day) from Nagpur: ×3¼.

ters. However, should the unserrated condition of the dorsal spine prove to be a specific character in the adult, the two specimens regarded here as the young *B. pinnauratus* will have to be given a specific status.

Barbus tetrarupagus (McClelland).

1878. *Barbus tetrarupagus*, Day, *Fish. India*, p. 572, pl. cxlii, fig. 6.

Siwane River, east of Hazaribagh-Barhi Road, at mile 19½. 14.x.1938.—1 specimen.

Among weeds in rice fields and lotus tank near Hearngunge, Hazaribagh Extension. 11.x.1938.—1 specimen.

The precaudal spot near the base of the caudal covers the 21st to the 23rd scales on the lateral line. The black spot on the lateral line just behind the opercle, as mentioned by Day, is not very clear in the younger example measuring 27 mm. in standard length, but is represented by a number of black dots; the spot in the larger example is very characteristic. The dorsal and anal fins are tipped with black bands; the one on the dorsal runs posteriorly at a distance of about a third from base.

B. tetrarupagus is very closely related to *B. sophore* (Ham.) with regard to the body proportion and colouration and may be confused with it. The former can, however, be readily distinguished by the possession of a pair of barbels and a black spot on the lateral line just behind the gill-opening.

Barbus ticto (Hamilton).

1938. *Barbus ticto*, Hora, *Rec. Ind. Mus.* XL, p. 175.

1939. *Barbus ticto*, Hora, Misra & Malik, *Rec. Ind. Mus.* XLI, pp. 263-279.

Siwane River, east of Hazaribagh-Barhi Road, at 19th milestone. 14.x.1938.—2 specimens.

A tributary of Barakar River, south of Surjpura on the Barhi Road. 4.x.1938.—2 specimens.

Barakar River, about 3 miles from Barhi on the G. T. Road, Hazaribagh District. 15.x.1938.—Numerous specimens.

Tributary stream of the Konar River about 1 mile from Hazaribagh. 27.ix.1938.—3 specimens.

Rice field and lotus tank near Hearngunge, Hazaribagh. 11.x.1938.—3 specimens.

Siwane River, 4 miles north-west of Hazaribagh on the Barhi Road. 24.ix.1938.—1 specimen.
Siwane River, east of Hazaribagh-Barhi Road at 19th milestone. 14.x.1938.—Numerous young specimens.
Ricefield and connected channel near Hearngunge, Hazaribagh. 9.x.1938. —1 specimen.
Damodar River near Ramgarh town. 8.x.1938.—1 specimen.

The collection contains a very large number of specimens, mostly, young, from different localities; all of them agree well with the recently published account of Hora, Misra and Malik[1] of *Barbus ticto*. The incomplete lateral line never extends beyond 8 scales in the Hazaribagh specimens and the black spots on the body are comparatively larger.

Barbus ticto has a very wide range of distribution in India, Burma, Ceylon and Siam.

Barbus sophore (Hamilton).

1878. *Barbus stigma*, Day, *Fish. India*, p. 579, pl. cxli, fig. 5.
1916. *Barbus sophore*, Chaudhuri, *Mem. Ind. Mus.* V, p. 436.
1938. *Barbus sophore*, Misra, *Rec. Ind. Mus.* XL, p. 260.

Siwane River, 4 miles north-west of Hazaribagh on the Barhi Road. 24.ix.1938.—4 specimens.
Tributary on the Barakar River, south of Surjpura on the Barhi Road, about 16 miles from Hazaribagh. 4.x.1938.—3 specimens.
A stream north of Canary Hill, Hazaribagh. 25.ix.1938.—1 specimen.
Damodar River near Ramgarh town. 8.x.1938.—1 specimen.
Barakar River, about 3 miles from Barhi on the G. T. Road, Hazaribagh District. 15.x.1938.—9 specimens.
Siwane River, east of Hazaribagh-Barhi Road. 14.x.1938.—4 specimens.
A tributary stream of the Konar River about 1 mile from Hazaribagh. 27.ix.1938.—2 specimens.
Konar River about 2 miles from Hazaribagh on the Barhi Road. 23.ix. 1938.—2 specimens.

Hora[2] directed the attention of ichthyologists to the unpublished manuscript of Dr. Francis Buchanan (afterwards Francis Hamilton) prepared by him while stationed at Baruipur, Lower Bengal, from 1794 to 1798. Among the 78 species described in the manuscript, *Cyprinus crysopareius* (No. 71) is reported to be known as " Sophori " in Sanskrit and " Punti " in Bengali; this is undoubtedly the same fish which Hamilton later on designated as *Cyprinus sophore*[3] " a beautiful little fish very common in ponds " of Bengal.

Barbus sophore is represented by 26 examples in the collection; they are mostly young, the largest measuring about 40 mm. in length without caudal. It is a widely distributed species throughout India and Burma.

Barbus guganio (Hamilton).

1822. *Cyprinus (Cabdio) guganio*, Hamilton, *Fish. Ganges*, pp. 338, 392, (MS. drawing No. 101).
1878. *Barbus ambassis*, Day, *Fish. India*, p. 576, pl. cxlv, fig. 1.
1878. *Barbus guganio*, Day, *Fish. India*, p. 579, fig.

Barakar River, about 2 miles from Barhi on the G. T. Road, Hazaribagh District. 15.x.1938.—9 specimens.

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[1] Hora, S. L., Misra, K. S. and Malik, G. M., *Rec. Ind. Mus.* XLI, pp. 263-279 (1939).
[2] Hora, S. L., *Journ. Asiat. Soc. Bengal* XXVII, pp. 123-135 (1931).
[3] Hamilton, F., *Fish. Ganges*, p. 310, pl. xix, fig. 86 (1822).

Though, according to Hamilton, " The *Guganio* (Gugani) is probably found in most of the rivers and ponds of the Gangetic provinces," its systematic position has hitherto been in doubt. Day (*loc. cit.*) based his brief description of the species on Hamilton's account and published his manuscript drawing, but noted that " This species is evidently allied to *Barbus ambassis* " Recently Hora[1] stated that " *B. guganio* is known only from Hamilton's original description and figure and so far as I am aware no specimen of the species is at present available in any museum collection " The material from Hazaribagh, as also a few specimens collected by Dr. S. L. Hora at Maltipur on the Hooghly River and provisionally referred by him to *B. ambassis*, have made it possible now to elucidate the precise specific limits of this species.

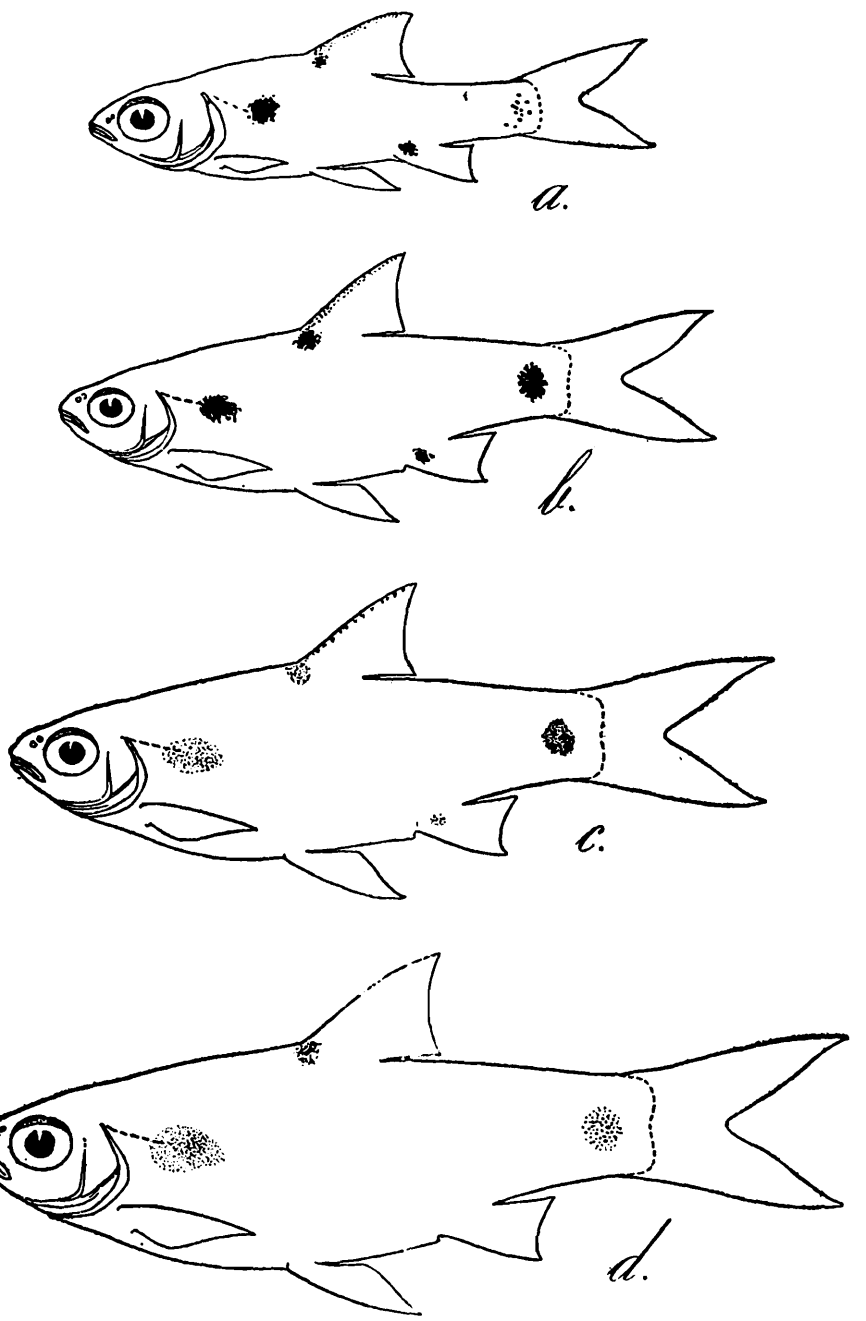
Hamilton described *guganio* in his eighth division of the genus *Cyprinus* which he termed *Cabdio*. The fishes of this division are characterised by small size, absence of spots, stripes, or other remarkable distinction of colour, considerably compressed form and absence of barbels. The most salient features of *guganio*, as given in Hamilton's description, are :—

(i) The second dorsal ray is " strong, and undivided, and indented behind "
(ii) " The *lateral line*, if any exists, is very faint "
(iii) " The *scales* are large in proportion, and adhere firmly "
(iv) " The *dorsal* fin is near the middle " and the " vent is behind the middle "
(v) The fore part of the dorsal and the back are dotted, while the rest of the body is silvery.
(vi) The fish " scarcely exceeds an inch and a half in length ", and has considerable superficial resemblance to *Amblypharyngodon mola* (Ham.).

Though Hamilton's descriptions are, as a rule, meagre and inadequate, the above noted features of the species, as reported by him, make it easy to distinguish this form. In the specimens before me there are a few which agree very closely with Hamilton's description, while there are some others which in their general facies, proportions and colouration agree with Day's description of *B. ambassis*. Day noted that his *B. ambassis* grows to a size of about 3 inches and described the colouration as " light greenish, with a silvery band along the sides. A small black spot at the base of the anterior dorsal rays, and a black blotch at the side of the tail " In very young specimens the dorsal spine is black throughout its length and a black spot is also present at the base of the anterior rays of the anal fin. The ventral surface between the anal and the caudal fins is also streaked with black. In the accompanying figure (text-fig. 3) a few stages in the growth of the species are figured to show the changes undergone in colouration during development to the adult size. Hora[2] showed similar colour changes in the case of *Barbus* (*Puntius*) *dorsalis* (Jerdon) and *Oreichthys cosuatis*

[1] Hora, S. L., *Rec. Ind. Mus.* XXXIX, p. 321 (1937).
[2] Hora, S. L., *Rec. Ind. Mus.* XXXVIII, pp. 2-5, text-figs. 1, 2 (1936) ; *Rec. Ind. Mus.* XXXIX, pp. 321-323, text-fig. 1 (1937).

(Ham.). From the above it would seem that both Hamilton and Day had half-grown or adult specimens of the species.



TEXT-FIG. 3.—Outline drawings of *Barbus guganio* (Ham.) showing changes in colour spots during growth.

a. Specimen from Hazaribagh, 14 mm. in length without caudal; *b*. Specimen from Hazaribagh, 18·5 mm. in length without caudal; *c*. Specimen from Maltipur, 23 mm. in length without caudal; *d*. Specimen from Maltipur, 32 mm. in length without caudal.

Hamilton found the species common in the districts between the Brahmaputra and the Jumna Rivers, while Day recorded his *B. ambassis* from " Madras, Orissa, Bengal, and Assam at least as high as Suddya ".

Garra mullya (Sykes).

1921. *Garra mullya*, Hora, *Rec. Ind. Mus.* XXII, pp. 658-660.

Upad stream, a tributary of the Bokharo River near the mica mines 2 miles from the 5th milestone on Ranchi Road. 13.x.1938.—10 specimens.

Chota River on Hazaribagh-Ranchi Road at mile 22. 12.x.1938.—2 specimens.
Bokharo falls and river about 12 miles from Hazaribagh. 5.x.1938.—15 specimens.
A tributary of the Barakar River, south of Surjpura on the Barhi Road, about 16 miles from Hazaribagh. 4.x.1938.—2 specimens.
A tributary stream of the Ketwa River about 1½ miles north-west of Khutra village in the Ichak sub-division. 21.ix.1938.—2 specimens.
A tributary stream of the Siwane River flowing through Sal jungle south of Kanary Hill, Hazaribagh. 7.x.1938.—2 specimens.
Junction of the Dudhi and Bokharo rivers about half a mile east of the bridge at mile 15½ on the Hazaribagh-Ranchi Road. 28.ix.1938.—1 specimen.
A stream north of Canary Hill, Hazaribagh. 25.ix.1938.—2 specimens.
A tributary stream of the Siwane River, south of Canary Hill, Hazaribagh. 1.x.1938.—1 specimen.

In the large number of young specimens, ranging from 18·5 mm. to 64 mm. in total length, there is a prominent lateral black band, which in very young specimens, terminates in a black precaudal spot.

Garra mullya is the most widely distributed species of the genus; it is known from the whole length of the Western Ghats, the hills of the Central Provinces, Orissa and Chhota Nagpur.

Crossochilus latius (Hamilton).

1934. *Crossochilus latius*, Mukerji, *Journ. Bombay Nat. Hist. Soc.* XXXVII, p. 50.
1938. *Crossochilus latius*, Hora and Misra, *Journ. Bombay Nat. Hist. Soc.* XL, pp. 31, 32, pl. ii, figs. 2, 3 and 5.

Siwane River, east of Hazaribagh-Barhi Road. 14.x.1938.—1 specimen.

Recent works of Mukerji (*loc. cit.*) and Hora[1] have shown that *Crossochilus latius* of authors is composed of three distinct species, *viz. Crossochilus latius* (Ham.), *C. punjabensis* Mukerji and *C. burmanicus* Hora. Hora and Misra (*loc. cit.*) assigned the specimens from Deolali to this species and remarked that South Indian forms " are of a considerably smaller size than those found in north India, but morphologically they seem to represent the typical *C. latius*. In the Deccan specimens, however, the eyes are relatively smaller and in this respect they agree with the Burmese examples " It is of interest to note that the specimen found at Hazaribagh is closely allied to the typical form found in the Brahmaputra and Ganges systems.

Crossochilus latius is represented in the collection by a single example, 57 mm. in length without caudal. It is distributed in Penninsular India, and in the rivers and tributaries of the Ganges and Brahmaputra.

Family Cobitidae.

Lepidocephalichthys guntea (Hamilton).

1938. *Lepidocephalichthys guntea*, Hora, *Rec. Ind. Mus.* XL, p. 177.

A tributary stream of the Barakar River, south of Surjpura on the Barhi Road about 16 miles from Hazaribagh. 4.x.1938.—33 specimens.
Junction of Dudhi and Bokharo Rivers about half a mile east of the bridge at mile 15½ on the Hazaribagh-Ranchi Road. 28.ix.1938.—21 specimens.
Siwane River west of Hazaribagh-Barhi Road about 4 miles from Hazaribagh town. 14.x.1938.—1 specimen.

[1] Hora, S. L., *Rec. Ind. Mus.* XXXVIII, p. 319 (1936).

A small tributary stream of the Konar River joining it on its left bank about a mile from the camp. 27.ix.1938.—4 specimens.
Konar River under bridge on Ranchi Road at mile 2½. 23.ix.1938.—6 specimens.
Upad stream, a tributary of the Bokharo River, about 2 miles west of Hazaribagh-Ranchi Road at mile 5. 13.x.1938.—9 specimens.
Rice fields and connected channels near Hearngunge, Hazaribagh Extension. 9.x.1938.—5 specimens.
Barakar River, about 3 miles from Barhi on the G. T. Road, Hazaribagh District. 15.x.1938.—11 specimens.
A tributary stream of the Siwane River flowing through the Sal jungle, south of the Canary Hill, Hazaribagh. 7.x.1938.—31 specimens.
Chotta River at mile 22 on the Hazaribagh-Ranchi Road. 12.x.1938.—1 specimen.
A tributary stream of the Konar River joining it on its right bank. 26.ix.1938.—2 specimens.
Siwane River, east of Hazaribagh-Barhi Road at mile 19. 14.x.1938.—23 specimens.
Damodar River near Ramgarh town, 32 miles from Hazaribagh on the Ranchi Road. 8.x.1938.—3 specimens.
A tributary stream of the Siwane River, south of the Canary Hill, Hazaribagh. 1.x.1938.—21 specimens.
Konar River, about 2 miles from Hazaribagh on the Ranchi Road. 3.x.1938.—14 specimens.
A stream north of Canary Hill, Hazaribagh and the scrub jungle near the hill. 25.ix.1938.—12 specimens.
Bokharo River, about 2 miles east of Hazaribagh-Ranchi Road at mile 14½. 2.x.1938.—24 specimens.

In the large number of specimens of *Lepidocephalichthys guntea* under report the colouration, as pointed out by several previous workers, is very variable. The constant feature in the colouration of the species is the lateral band on each side of the fish, the ocellus on the tail and bands on the caudal fin. The mottled colour on the body is sometimes entirely lacking.

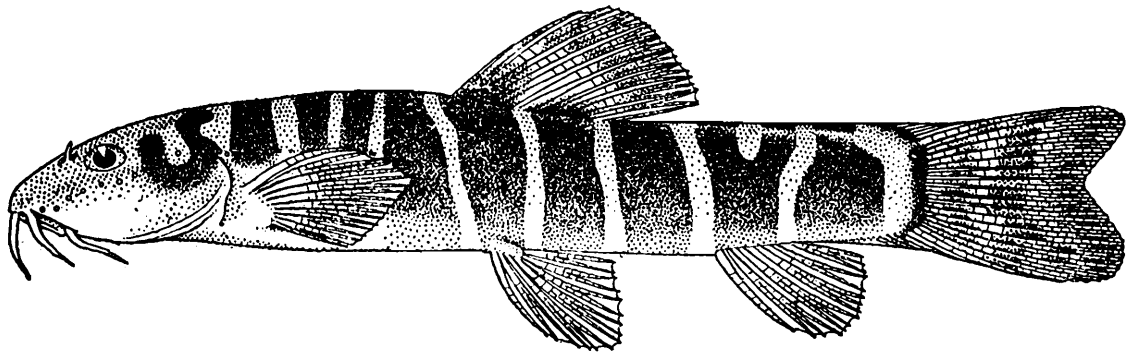
L. guntea is distributed throughout India, except the Malabar Coast and the regions to the south of the Kistna River.

Nemachilus ? denisonii Day.

1878. *Nemacheilus Denisonii*, Day, *Fish. India*, p. 617, pl. cliii, fig. 5.

Stream near Keke Basaudi in the Mandu Thana, Hazaribagh District. 28.ix.1938.—3 specimens.
Bokharo falls and river about 12 miles from Hazaribagh. 5.x.1938.—28 specimens.

It is with considerable hesitation that I refer a large number of young, half-grown and adult specimens to *Nemachilus denisonii*, which has so



TEXT-FIG. 4.—Lateral view of *Nemachilus ? denisonii* (Ham.): × *ca.* 2½.

far been known from "Neilgherry and Coorg hills, and rivers at their bases; Mysore and the Deccan" This species seems to replace *N. rupi-*

cola of the Himalayan streams in the streams of Southern India. The specimens exhibit considerable variation in colour. In very young specimens the body colour is brownish with 10 to 11 irregular interrupted bands; the dorsal fin is without any colour bands. The lateral line in the Hazaribagh specimens is incomplete and extends as far back as the commencement of the dorsal fin.

Nemachilus zonatus (McClelland).

1938. *Nemachilus zonatus*, Hora, *Rec. Ind. Mus.* XL, p. 178.

Barakar River, about 3 miles from Barhi on the G. T. Road, Hazaribagh District. 15.x.1938.—1 specimen.

The single specimen in the collection, 27·5 mm. in standard length, agrees closely with Day's[1] description and figure. *N. zonatus* is distributed in Birbhum, Assam, Orissa and rivers and tributaries of the Ganges and the Jumna.

Nemachilus botia (Hamilton).

1878. *Nemachilus botia*, Day, *Fish. India*, pp. 614, 615, pl. clvi, fig. 5.

Barakar River, about 3 miles from Barhi on the G. T. Road, Hazaribagh District. 15.x.1938.—8 specimens.

The collection contains 8 young examples ranging from 19 mm. to 28 mm. in length without the caudal. The base of the dorsal fin is considerably shorter than the length of the head. The lateral line is complete in the larger examples.

N. botia is distributed throughout India, except the Malabar Coast and to the south of the Kistna River.

Nemachilus dayi Hora.

1878. *Nemacheilus savona*, Day (*nec* Hamilton), *Fish. India*, p. 619, pl. clv, fig. 8.

1935. *Nemachilus dayi*, Hora, *Rec. Ind. Mus.* XXXVII, p. 57.

Upad stream, a tributary of the Bokharo River near the mica mines, 2 miles from 5th milestone on the Ranchi Road. 13.x.1938.—1 specimen.

Hora in the paper referred to above, showed that Hamilton's[2] *Cobitis savona* is not conspecific with Day's *Nemacheilus savona* and, therefore, proposed a new name for the latter form. Day's *savona* was stated by him to occur in "Bengal and N. W. Provinces" Day specially mentioned that he received specimens of *N. savona* from the hills near Ranigunj. In the collection of the Indian Museum the species is represented from the Western Ghats, the Central Provinces and Chhota Nagpur.

Family Clariidae.

Clarius batrachus (Linnaeus).

1936. *Clarius batrachus*, Hora, *Rec. Ind. Mus.* XXXVIII, pp. 347-351.

A small stream near the camp, Hazaribagh town. 5.x.1938.—9 specimens.

Clarius batrachus is a widely distributed species of the Oriental Region.

[1] Day, F., *Fish. India*, p. 618, pl. clvi, fig. 2 (1878).

[2] Hamilton, F., *Fish. Ganges*, p. 357 (1822).

Family AMBLYCEPIDAE.

Amblyceps mangois (Hamilton).

1933. *Amblyceps mangois*, Hora, *Rec. Ind. Mus.* XXXV, pp. 607-621.
1938. *Amblyceps mangois*, Hora, *Rec. Ind. Mus.* XL, pp. 178, 179.

Tributary of the Barakar River, south of Surjpura on the Barhi Road, about 16 miles from Hazaribagh. 4.x.1938.—3 specimens.
Siwane River, east of Hazaribagh-Barhi Road. 14.x.1938.—2 specimens.

Hora (*loc. cit.*, 1938, p. 179) in extending the range of the species up to the Santal Parganas stated that " its occurrence in the Rajmahal Hills to the west of the Ganges is of special interest as it shows that the Assam Hills and the Rajmahal Hills must have been continuous at not a very remote period of earth's history " The occurrence of *A. mangois* in the Hazaribagh District lends further support to Hora's observation and extends the range of the species further westwards. In all the 5 examples in the collection, ranging from 16·5 mm. to 34 mm. in length without the caudal, the adipose dorsal is distinct and not continuous with the caudal[1]; the caudal fin is also furcate and is contained from 4·1 to 5 times in the total length.

Amblyceps mangois is a hill-stream fish and is widely distributed in northern India, northern Burma and Siam. Dr. Hora informs me that he has recently received examples of this species from Perak in the Federated Malay States.

Family SISORIDAE.

Glyptothorax botia (Hamilton).

1877. *Glyptosternum botia*, Day, *Fish. India*, p. 497, pl. cxiii, fig. 4.
1923. *Glyptothorax botia*, Hora, *Rec. Ind. Mus.* XXV, p. 27.

Damodar River near Ramgarh town. 8.x.1938.—4 specimens.

In the four young specimens, ranging in total length from 42 mm. to 55 mm., assigned to *Glyptothorax botia* the head and body are covered all over with well defined spinous tubercles. The colour is dark above and greyish below. The base and a few anterior rays of the dorsal and the anterior part of the adipose dorsal are stained with black. The body is intensely black at the base of the caudal fin and fairly broad longitudinal dark markings are continued along the outer edges of its two lobes.

G. botia, as recognised by Day, has so far been known from Delhi and Bara-Banki in Northern India; its record from the Hazaribagh District is of considerable interest.

Gagata cenia (Hamilton).

1938. *Gagata cenia*, Hora, *Rec. Ind. Mus.* XL, p. 180.

Damodar River near Ramgarh town. 8.x.1938.—1 specimen.

Gagata cenia is distributed in the rivers and tributaries of the Indus, Jumna, Ganges, Damodar and Irrawadi.

[1] Hora, S. L., *Rec. Ind. Mus.* XXXV, pp. 618, 619 (1933).

Family Nandidae.

Nandus nandus (Hamilton).

1938. *Nandus nandus*, Hora, *Rec. Ind. Mus.* XL, p. 181.

Barakar River, about 2 miles from Barhi on the G. T. Road, Hazaribagh District. 15.x.1938.—1 specimen.

Nandus nandus is represented in the collection by one example, 48 mm. in length without the caudal. The species is found in fresh and slightly brackish waters throughout India and Burma.

Family Gobiidae.

Glossogobius giuris (Hamilton).

1938. *Glossogobius giuris*, Hora, *Rec. Ind. Mus.* XL, p. 181.

A small tributary stream of the Konar River, about a mile from Hazaribagh. 27.ix.1938.—1 specimen.

Siwane River, east of Hazaribagh Road. 14.x.1938.—1 specimen.

Glossogobius giuris is represented in the collection by 2 young examples. It is widely distributed in India and occurs in fresh and brackish waters.

Family Ophicephalidae.

Ophicephalus gachua Hamilton.

1922. *Ophiocephalus gachua*, Weber & de Beaufort, *Fish. Indo-Austral. Archipel.* IV, p. 321.

1938. *Ophicephalus gachua*, Hora, *Rec. Ind. Mus.* XL, p. 180.

Rice fields and connected channels near Hearngunge, Hazaribagh District. 9.x.1938.—2 specimens.

Dudhi River, east of the bridge at mile 15½ on the Hazaribagh-Ranchi Road, 28.ix.1938.—4 specimens.

Siwane River, 4 miles north-west of Hazaribagh on the Barhi Road. 24.ix.1938.—6 specimens.

Siwane River, east of Hazaribagh-Barhi Road. 14.x.1938.—3 specimens.

Junction of Dudhi and Bokharo Rivers, about half a mile east of the bridge at mile 15½ on the Hazaribagh-Ranchi Road. 28.ix.1938.—4 specimens.

Damodar River near Ramgarh town. 8.x.1938.—2 specimens.

A tributary of the Bokharo River, south of Surjpura on the Barhi Road about 16 miles from Hazaribagh. 4.x.1938.—9 specimens.

Barakar River, about 3 miles from Barhi on the G. T. Road, Hazaribagh District. 15.x.1938.—1 specimen.

A stream north of Canary Hill, Hazaribagh. 25.ix.1938.—1 specimen.

Chotta River on Hazaribagh-Ranchi Road at mile 22. 12.x.1938.—1 specimen.

Ophicephalus gachua has a very wide range of distribution in the whole of the Oriental Region.

Ophicephalus punctatus Bloch.

1917. *Ophiocephalus punctatus*, Chaudhuri, *Mem Ind. Mus.* V, pp. 504, 505.

Rice fields and connected channels near Hearngunge, Hazaribagh District. 9.x.1938.—2 specimens.

Dudhi River east of the bridge at mile 15½ on the Hazaribagh-Ranchi Road. 28.ix.1938.—2 specimens.

Siwane River, 4 miles north-west of Hazaribagh on the Barhi Road. 24.xi.1938.—1 specimen.

Siwane River, east of Hazaribagh-Barhi Road. 14.x.1938.—1 specimen.
Barakar River, about 3 miles from Barhi on the G. T. Road, Hazaribagh District. 15.x.1938.—1 specimen.
Konar River among grass near the bank. 20.ix.1938.—1 specimen.
Among weeds in rice fields and lotus tank near Hearngunge. 11.x.1938.—8 specimens.

Chaudhuri (*loc. cit.*) gives the distribution of *O. punctatus* as " Fresh waters of the East Indian continent and of Ceylon. Yunnan ". Weber and de Beaufort[1] doubtfully included the species in the list of Indo-Australian fishes.

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[1] Weber and de Beaufort, *Fish. Indo-Austral. Archipel.* IV, p. 330 (1922).

MGIPC—M—III-8-10—19-12-39—370.