THE FISH OF THE INDAWGYI LAKE AND THE STREAMS OF THE MYITKYINA DISTRICT (UPPER BURMA).

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(Plates VII—X.)

INTRODUCTION.

The following report on the fishes of the Indawgyi Lake and the streams of the Myitkyina District, Upper Burma, is based on a large collection made by a party of the Zoological Survey of India under the leadership of Dr. B. N. Chopra during October to December, 1926. One of the species of the genus *Danio*, subgenus *Brachydanio*, out of this collection has already been described by Dr. S. L. Hora,[1] while the collection of the various species of the genus *Nemachilus* is being studied by him and a report on it will be published separately in his revision of the Indian species of the genus.

We have to record here our great indebtedness to our colleague Dr. B. N. Chopra for the great care he took in making the collection and for the excellent preservation of the material obtained. He also collected detailed information about the local names of the fish and made careful records of their natural colouration in the field-book. We have drawn largely on his notes about the physical characters of the lake, etc., and have also to thank him for other information ungrudgingly given at all times. The illustrations accompanying this paper were executed under our supervision by Babu A. C. Chowdhury and Babu D. N. Bagchi, two of the talented artists of the Zoological Survey, and we are indebted to them for the excellent delineations of the species figured.

In addition to the Indawgyi Lake the collections of fish under report were made from (1) several small pools and sluggish muddy streams, all of which are directly or indirectly connected with the lake, (2) large rivers or *chaungs*[2] also directly or indirectly connected with the lake, (3) pools and streams in the Myitkyina District not connected with the lake, and (4) rocky and hill-streams in the same district. We give below the lists of species collected from these areas :—

I. Indawgyi Lake.

Amphipnous cuchia (Ham. Buch.).
Clarias batrachus (Linn.).
Silurus cochinchinensis Cuv. & Val.
Amblyceps horae, sp. nov.
Saccobranchus fossilis (Bloch).
Wallago attu (Bloch).
Barbus chola (Ham. Buch.).
Barbus phutunio (Ham. Buch.).
Barbus sophore (Ham. Buch.).
Rasbora daniconius (Ham. Buch.).
Rasbora rasbora (Ham. Buch.).
Rohtee feae (Vincig.).

[1] Hora, S. L., *Rec. Ind. Mus.*, XXX, p. 39, fig. 2 (1928).
[2] *Chaung* is the Burmese name for a big stream or river,

Eutropiichthys vacha (Ham. Buch.).
Callichrous pabo (Ham. Buch.).
Aoria aor (Ham. Buch.).
Aoria gulio (Ham. Buch.).
Aoria cavasius (Ham. Buch.).
Aoria (*Macronoides*) *dayi* (Vincig.).
Akysis variegatus subsp. *variegatus*, nov.
Erethistes conta (Ham. Buch.).
Lepidocephalichthys berdmorei (Blyth).
Labeo calbasu (Ham. Buch.).
Labeo gonius (Ham. Buch.).
Labeo rohita (Ham. Buch.).
Catla catla (Ham. Buch.).
Barbus sewelli, sp. nov.
Barbus myitkyinae, sp. nov.
Barbus sarana caudimarginatus Blyth.
Rohtee alfrediana (Cuv. & Val.).
Rohtee belangeri (Cuv. & Val.).
Laubuca (*Laubuca*) *laubuca* (Ham. Buch.).
Notopterus notopterus (Pallas).
Ambassis ranga (Ham. Buch.).
Ambassis baculis (Ham. Buch.).
Mastacembelus armatus (Lacép.).
Ophicephalus marulius Ham. Buch.
Ophicephalus striatus Bloch.
Ophicephalus gachua Ham. Buch.
Ophicephalus punctatus Bloch.
Anabas testudineus (Bloch).
Trichogaster fasciatus Bl. Schn.
Indostomus paradoxus, gen. et sp. nov.
Tetraodon cutcutia Ham. Buch.

II. Small pools and sluggish muddy streams directly or indirectly connected with the Indawgyi Lake.

Amphipnous cuchia (Ham. Buch.).
Clarias batrachus (Linn.).
Lepidocephalichthys guntea (Ham. Buch.).
Lepidocephalichthys berdmorei (Blyth).
Barbus chola (Ham. Buch.).
Barbus phutunio (Ham. Buch.).
Rasbora daniconius (Ham. Buch.).
Gudusia variegata (Day).
Xenentodon cancila (Ham. Buch.).
Ambassis ranga (Ham. Buch.).
Ambassis baculis (Ham. Buch.).
Badis badis (Ham. Buch.).
Badis dario (Ham. Buch.).
Ophicephalus gachua Ham. Buch.
Ophicephalus punctatus Bloch.
Anabas testudineus (Bloch).
Tetraodon cutcutia Ham. Buch.

The 17 species from the small pools and sluggish streams, with the exception of *Lepidocephalichthys guntea*, *Gudusia variegata*, *Xenentodon cancila*, *Badis badis* and *Badis dario*, were also found in the lake. *G. variegata* and *X. cancila* probably visit the lake from time to time, while the two perches of the genus *Badis* appear to be mostly confined to muddy and hill streams.

III. Large rivers and Chaungs directly or indirectly connected with the Indawgyi Lake.

Monopterus albus (Zuiew).
Saccobranchus fossilis (Bloch).
Eutropiichthys vacha (Ham. Buch.).
Callichrous pabo (Ham. Buch.).
Callichrous pabda (Ham. Buch.).
Amblypharyngodon atkinsonii (Blyth).
Barbus chagunio (Ham. Buch.).
Barbus hexastichus McClell.
Barbus chola (Ham. Buch.).

Pseudeutropius taakree (Sykes).
Aoria leucophasis (Blyth).
Bagarius bagarius (Ham. Buch.).
Labeo rohita (Ham. Buch.).
Labeo angra (Ham. Buch.).
Labeo boga (Ham. Buch.).
Gudusia variegata (Day).
Notopterus notopterus (Pallas).
Xenentodon cancila (Ham. Buch.).
Mastacembelus armatus (Lacép.).
Chaudhuria caudata Annand.
Cirrhina mrigala (Ham. Buch.).
Barbus phutunio (Ham. Buch.).
Esomus altus (Blyth).
Rasbora daniconius (Ham. Buch.).
Rohtee feae (Vincig.).
Barilius guttatus Day.
Chela sladeni Day.
Ophicephalus marulius Ham. Buch.
Ophicephalus striatus Bloch.
Ophicephalus gachua Ham. Buch.
Doryichthys dünckeri, sp. nov.
Tetraodon cutcutia Ham. Buch.

Of the 32 species enumerated above, *Monopterus albus*, *Callichrous pabda*, *Pseudeutropius taakree*, *Aoria leucophasis*, *Bagarius bagarius*, *Labeo angra*, *Labeo boga*, *Cirrhina mrigala*, *Amblypharyngodon atkinsonii*, *Barbus chagunio*, *Barbus hexastichus*, *Esomus altus*, *Barilius guttatus*, *Chela sladeni*, *Gudusia variegata*, *Xenentodon cancila*, *Chaudhuria caudata*, *Doryichthys dünckeri*, were not found in the lake. The occurrence of *Chaudhuria caudata*, which was known so far only from the Inlé Lake, S. Shan States, in this area is of special interest, but with only a single specimen. which we provisionally assign to this species, it would not be right to dilate on the discontinuous distribution of this peculiar form in the S. Shan States on the one hand and in Upper Burma on the other. The other species, with the exception of *Doryichthys dünckeri*, are all widely distributed in the rivers of India or Burma, and do not call for any special remarks. The occurrence of a species of the genus *Doryichthys* in inland waters so far away from the sea and above the zone of tidal influence is of special interest.

IV Small pools and streams not connected with the Indawgyi Lake.

Silurus cochinchinensis Cuv. & Val.
Aoria cavasius (Ham. Buch.).
Aoria pulcher (Chaudhuri).
Lepidocephalichthys guntea (Ham. Buch.).
Lepidocephalichthys berdmorei (Blyth).
Chopraia rupicola, gen. et sp. nov.
Barbus hexastichus McClell.
Barbus phutunio (Ham. Buch.).
Barbus sophore (Ham. Buch.).
Danio aequipinnatus (McClell.).
Danio (Bachydanio) rerio (Ham. Buch.).
Badis badis (Ham. Buch.).
Badis dario (Ham. Buch.).
Ophicephalus gachua Ham. Buch.
Parasphaerichthys ocellatus, gen. et sp. nov.
Trichogaster fasciatus Bl. Schn.

Of the 16 species from the small pools and streams not connected with the Indawgyi Lake, *Chopraia rupicola* and *Parasphaerichthys ocellatus* are both new rupicolous forms and are apparently endemic in the area ; the former of these was also collected from the hill-streams in the same district. The new genus of the family Anabantidae, which

we have described as *Parasphaerichthys*, is of special interest. It is, as the name indicates, closely allied to the genus *Sphaerichthys* Canestrini[1] which occurs in the Malay Peninsula and the Dutch Indies.

V Rocky and hill-streams of the Myitkyina District.

Aoria (*Macronoides*) *dayi* (Vincig.).
Akysis variegatus subsp. *variegatus*, nov.
Glyptothorax tuberculatus, sp. nov.
Glyptothorax burmanicus, sp. nov.
Balitora brucei Gray.
Chopraia rupicola, gen. et sp. nov.
Garra lamta (Ham. Buch.).
Barbus phutunio (Ham. Buch.).
Barbus burmanicus Day.
Rasbora daniconius (Ham. Buch.).
Rasbora rasbora (Ham. Buch.).
Lepidocephalichthys berdmorei (Blyth).
Acanthopthalmus pangia (Ham. Buch.).
Danio aequipinnatus (McClell.).
Danio (*Brachydanio*) *rerio* (Ham. Buch.).
Danio (*Brachydanio*) *choprae* Hora.
Ambassis ranga (Ham. Buch.).
Badis badis (Ham. Buch.).
Badis dario (Ham. Buch.).
Ophicephalus gachua Ham. Buch.

Of these 20 species the Homalopterid *Chopraia rupicola* has been referred to above and the only two forms to which attention may be drawn are the two new species of the genus *Glyptothorax*. The hill-streams of this district are not very rapid, and none of the fishes of these streams are highly specialised.

In the following table we give a complete list of all the species which were found in the waters of the Myitkyina District including the Indawgyi Lake. In the same table we give the local Burmese names of the fish so far as these could be found out by Dr. Chopra and the Survey party by enquiry from the fishermen.

	Local names.
Family SYMBRANCHIDAE.	
1. *Amphipnous cuchia* (Ham. Buch.)	*Nga-sin.*
2. *Monopterus albus* (Zuiew)	
Family SILURIDAE.	
3. *Clarias batrachus* (Linn.)	*Nga-khu.*
4. *Silurus cochinchinensis* Cuv. & Val.	*Taung-nga-nu-than.*
5. *Amblyceps horae*, sp. nov.	
6. *Saccobranchus fossilis* (Bloch)	*Nga-khu* or *Nga-gyi.*
7. *Wallago attu* (Bl. Schn.)	
8. *Eutropiichthys vacha* (Ham. Buch.)	*Nga-glaung.*
9. *Callichrous pabda* (Ham. Buch.)	*Nga-nudan.*
10. *Callichrous pabo* (Ham. Buch.)	
11. *Pseudeutropius taakree* (Sykes)	*Nga-myin-ok-pha.*
12. *Aoria aor* (Ham. Buch.)	*Nga-gyaung.*
13. *Aoria gulio* (Ham. Buch.)	
14. *Aoria cavasius* (Ham. Buch.)	*Nga-zin-yaing.*
15. *Aoria leucophasis* (Blyth)	*Nga-nouk-twa.*
16. *Aoria pulcher* (Chaudhuri)	
17. *Aoria* (*Macronoides*) *dayi* (Vincig.)	
18. *Akysis variegatus* subsp. *variegatus* nov.	
19 *Bagarius bagarius* (Ham. Buch.)	*Nga-maun-ma.*

[1] Canestrini, J., *Verh. Zool.-bot. Gesellsch. Wien.* X, p. 707 (1860).

20. *Glyptothorax tuberculatus*, sp. nov. .. ..
21. *Glyptothorax burmanicus*, sp. nov. .. ..
22. *Erethistes conta* (Ham. Buch.) .. .. .. *Ta-nga-ngo.*

Family HOMALOPTERIDAE.

23. *Chopraia rupicola*, gen. et sp. nov. .. ..
24. *Balitora brucei* Gray .. .. ..

Family COBITIDAE.

25. *Lepidocephalichthys guntea* (Ham. Buch.) .. ..
26. *Lepidocephalichthys berdmorei* (Blyth) ..
27. *Acanthopthalmus pangia* (Ham. Buch.) .. ..

Family CYPRINIDAE.

28. *Garra lamta* (Ham. Buch.) .. .. ..
29. *Labeo calbasu* (Ham. Buch.) .. .. .. *Nga-net pya.*
30. *Labeo gonius* (Ham. Buch.) .. .. .. *Nga-dain.*
31. *Labeo rohita* (Ham. Buch.) .. .. .. *Nga-myitchin.*
32. *Labeo angra* (Ham. Buch.) .. .. *Kyauk-nga-lu.*
33. *Labeo boga* (Ham. Buch.) .. .. .. *Nga-lu.*
34. *Cirrhina mrigala* (Ham. Buch.) .. .. *Nga-gyin.*
35. *Catla catla* (Ham. Buch.) .. .. .. *Nga-thine.*
36. *Amblypharyngodon atkinsonii* (Blyth) .. .. *Nga-byet.*
37. *Barbus chagunio* (Ham. Buch.) .. .. *Nga-balon.*
38. *Barbus sewelli*, sp. nov. .. .. .. *Nga-khon-ma-mee-nee*
39. *Barbus myitkyinae*, sp. nov. .. .. .. *Nga-gyee-gyan.*
40. *Barbus sarana caudimarginatus* Blyth .. .. *Nga-khon-ma.*
41. *Barbus hexastichus* McClell. .. .. ..
42. *Barbus chola* (Ham. Buch.) .. .. .. *Nga-khon-ma.*
43. *Barbus burmanicus* Day .. .. ..
44. *Barbus phutunio* (Ham. Buch.) .. ..
45. *Barbus sophore* (Ham. Buch.) .. .. *Nga-khon-ma-mi-kuet*
46. *Esomus altus* (Blyth) .. .. ..
47. *Rasbora daniconius* (Ham. Buch.) .. .. *Nga-na-gyaung.*
48. *Rasbora rasbora* (Ham. Buch.) .. .. ..
49. *Rohtee alfrediana* (Cuv. & Val.) .. .. *Nga-salam-bya.*
50. *Rohtee belangeri* (Cuv. & Val.) .. .. .. *Nga-phe-aung.*
51. *Rohtee feae* (Vincig.) .. .. .. *Nga-hpa-mu.*
52. *Barilius guttatus* Day .. .. *Nga-lawa.*
53. *Danio aequipinnatus* (McClell.) .. ..
54. *Danio* (*Brachydanio*) *rerio* (Ham. Buch.) .. ..
55. *Danio* (*Brachydanio*) *choprae* Hora .. ..
56. *Laubuca* (*Laubuca*) *laubuca* (Ham. Buch.) ..
57. *Chela sladeni* Day .. .. .. *Nga-yin-bounza.*

Family CLUPEIDAE.

58. *Gudusia variegata* Day .. .. *Nga-la-bi.*

Family NOTOPTERIDAE.

59. *Notopterus notopterus* (Pallas) .. .. .. *Nga-phe.*

Family BELONIDAE.

60. *Xenentodon cancila* (Ham. Buch.) .. .. *Nga-hpaung-yo.*

Family PERCIDAE.

61. *Ambassis ranga* (Ham. Buch.) .. .. *Nga-zin-zat.*
62. *Ambassis baculis* (Ham. Buch.) .. .. *Nga-zin-zat.*

Family NANDIDAE.

63. *Badis badis* (Ham. Buch.) .. .. ..
64. *Badis dario* (Ham. Buch.) .. .. ..

Family MASTACEMBELIDAE.

65. *Mastacembelus armatus* (Lacép.) .. .. *Nga-mwe-do* or *Nga-la-mwe.*

Family CHAUDHURIIDAE.

66. *Chaudhuria caudata* Annand. .. .. ..

Family OPHICEPHALIDAE.

67. *Ophicephalus marulius* Ham. Buch. .. .. *Nga-yan-dain.*
68. *Ophicephalus striatus* Bloch .. .. .. *Nga-yan-ou.*
69. *Ophicephalus gachua* Ham. Buch. .. .. *Nga-yan-putet.*
70. *Ophicephalus punctatus* Bloch .. .. *Nga-yan.*

Family ANABANTIDAE.

71. *Anabas testudineus* (Bloch) .. .. .. *Nga-byema.*
72. *Trichogaster fasciatus* Bl. Schn. .. ..
73. *Parasphaerichthys ocellatus*, gen. et sp. nov. ..

Family INDOSTOMIDAE, nov.

74. *Indostomus paradoxus*, gen. et sp. nov. .. ..

Family SYNGNATHIDAE.

75. *Doryichthys dünckeri*, sp. nov. .. ..

Family TETRAODONTIDAE.

76. *Tetraodon cutcutia* Ham. Buch. .. .. *Nga-zibu.*

For a proper understanding of the fish fauna of the lake it is necessary to preface our remarks with an account of the physical characteristics of the area.

The Indawgyi[1] Lake, the largest freshwater lake of Burma, is situated in the Myitkyina District in Upper Burma, between 25° 5′ and 25° 20′ North Latitude and 96° 18′ and 96° 23′ East Longitude at an altitude of about 550 feet above sea-level. It is formed by a depression hemmed in by low ranges of hills on its south, west, and east.[2] It is somewhat ovoidal in shape, and in the dry season is about 16 miles long, while its maximum breadth, which lies in the southern area near the base, is well over 6 miles. During and after the rains the area of the lake is much more extensive owing to its water spreading over the surrounding country. The northern area of the lake is shallow ; the depth at the time of the visit of Dr. B. N. Chopra in 1926 in this region nowhere exceeded 12 feet. The remainder of the lake is fairly deep ; in some parts near the south end the depth is at least 40 feet, while according to common belief in places it is as much as 100 feet deep. The lake is fed by several streams, the most important of which, the Nanyinkhan and the Namsanda, open into it on the western shore near the southern and northern corners respectively. A number of small streams also flow into it on the eastern side, while a few of the streams along this side and a few along the southern shore disappear just before reaching the lake ; the waters of these streams probably flow into the lake by underground channels. The most important outlet from the lake is along the Indaw River which arises from near the north-eastern corner. The Indaw River runs in a north-easterly direction along a deep but narrow and winding channel

[1] *Indawgyi* literally means "the large Royal Lake" (*in*=lake, *daw*=royal and *gyi*=large), but according to local tradition the name is derived from that of the patron saint *Indawshingyi nat* (*nat*=god-dragon).

[2] Hortz, W. A., *Burma Gazetteer, Myitkyina District*, p. 13 (Rangoon, 1912).

to Kamaing where it joins with the Namkawng, which river hereafter is known as the Mogaung *Chaung*. Before joining the Namkawng the Indaw receives a hill-stream, the Namtein, from the hills to the east of the Jade Mines. The Mogaung runs in a south-easterly to due south direction to open into the Irrawadi River at Hahkan not very far from Bhamo ; during its course the Mogaung is also fed by several hill-streams.

For the greater part the shores of the lake, except in the rainy season, are more or less definitely marked. During the rainy season and for some time afterwards the lake, as noted above, overflows its banks and at this time a part of the surrounding country also forms a part of it. In the northern area there are no definite shores as the surrounding country consists of marsh land rich with submerged vegetation growing on it. Large masses of aquatic weeds agglutinated together are often found floating in this part of the lake. These masses are not solid enough to support any weight, and differ in this respect from the floating islands of the Inlé Lake in the Southern Shan States. They, however, support a very rich flora and are particularly common near the mouth of the Indaw River.

The bottom of the lake consists of soft blackish clay near the shores, while in the deeper regions there is a large amount of sand mixed with the clay.

The water of the lake is mostly clear, but the large masses of microscopic floating algae, which form the greater part of its planktonic life, give it a distinct greenish tinge. A strong breeze often blows along the surface of the lake in a north to south direction and the waters as a result are often turbid.

The Indawgyi Lake, therefore, may be classed as a eutrophous type[1] of lake. It is a large expanse of water with an extensive shore area but with more or less definite banks ; its water is of a greenish colour, except when it is rendered turbid by the prevailing strong breeze, with a rich planktonic fauna and submerged aquatic vegetation mostly confined to the shallow marginal zone. The fish fauna is fairly rich, but the chief characteristic is the large number of individuals of different species which are found in the lake, and several of which grow to a very large size.

Within recent years the Zoological Survey of India has investigated the fauna of two other lakes, *viz.*, the Inlé Lake in the S. Shan States, Burma, and the Loktak Lake in Manipur, Assam. The Indawgyi Lake lies between these two lakes, and it is, therefore, possible to compare the fish fauna of these three areas. Before doing so, it is necessary to briefly compare the physical characteristics of these three lakes. All the three lakes are situated in open valleys surrounded by ranges of hills running almost due north and south. The altitudes of the lakes are different, the Inlé and the Loktak lakes are situated at an altitude of about 3,000 feet above sea-level, while the altitude of the Indawgyi is only 550 feet. The Inlé and the Loktak lakes are both rather shallow, the water in neither being more than 10-12 feet deep, and they are both remarkable for the great abundance of submerged aquatic vegetation. They are,

[1] See Hentschel, E., *Grundzüge der Hydrobiologie*, p. 188 (Jena, 1923), and Hesse, R., *Tiergeographie auf Oecologischen Grundlage*, p. 355 (Jena, 1924).

further, comparatively smaller areas of water and the shores in neither of them are very definite. The Indawgyi Lake, however, is very large and its depth in several places exceeds 40 feet. Its shores are more definite and the phanerogamic aquatic vegetation, which is confined to the marginal zone, is not so abundant as in the other two lakes, while the greenish water of the Indawgyi Lake is not so clear as that of the Inlé Lake.

We give below a table showing the distribution of the different species of fish in the three lakes.

	Indawgyi Lake.	Loktak Lake.	Inlé Lake.
Amphipnous cuchia (Ham. Buch.).	+	—	+
Monopterus albus (Zuiew)	—	+	+
Clarias batrachus (Linn.)	+	+	+
Silurus cochinchinensis Cuv. & Val.	+	—	—
Amblyceps horae, sp. nov.	+	—	—
Saccobranchus fossilis (Bloch).	+	—	—
Wallago attu (Bl. Schn.)	+	—	—
Eutropiichthys vacha (Ham. Buch.).	+	—	—
Callichrous pabo (Ham. Buch.).	+	—	—
Callichrous bimaculatus (Bloch).	—	+	—
Aoria aor (Ham. Buch.)	+	—	—
Aoria gulio (Ham. Buch.)	+	—	—
Aoria cavasius (Ham. Buch.)	+	—	—
Aoria bleekeri Day	—	+	—
Aoria (Macronoides) dayi (Vincig.).	+	—	—
Akysis variegatus subsp. *variegatus*, nov.	+	—	—
Erethistes conta (Ham. Buch.)	+	—	—
Lepidocephalichthys berdmorei (Blyth).	+	—	+
Lepidocephalichthys irrorata Hora.	—	+	—
Garra gravelyi (Annand.)	—	—	+
Labeo calbasu (Ham. Buch.)	+	+	—
Labeo gonius (Ham. Buch.)	+	—	—
Labeo rohita (Ham. Buch.)	+	—	—
Labeo pangusia (Ham. Buch.)	—	+	—
Cirrhina latia (Ham. Buch.)	—	—	+
Catla catla (Ham. Buch.)	+	—	—
Barbus sewelli, sp. nov.	+	—	—
Barbus myitkyinae, sp. nov.	+	—	—
Barbus sarana caudimarginatus Blyth.	+	+	+
Barbus dukai Day	—	—	+
Barbus tor (Ham. Buch.)	—	—	+
Barbus schanicus Blgr.	—	—	+
Barbus stedmanensis Blgr.	—	—	+
Barbus nigrovittatus Blgr.	—	—	+
Barbus chola (Ham. Buch.)	+	—	—
Barbus conchonius (Ham. Buch.).	—	+	—
Barbus ticto (Ham. Buch.)	—	+	—
Barbus stoliczkanus Day	—	—	+
Barbus phutunio (Ham. Buch.)	+	—	—
Barbus sophore (Ham. Buch.)	+	—	—
Cyprinus carpio intha Annand.	—	—	+
Sawbwa resplendens Annand.	—	—	+

	Indawgyi Lake.	Loktak Lake.	Inlé Lake.
Rasbora daniconius (Ham. Buch.).	+	—	—
Rasbora rasbora (Ham. Buch.)	+	—	—
Microrasbora rubescens Annand.	—	—	+
Microrasbora erythromicron Annand.	—	—	+
Rohtee feae (Vincig.)	+	—	—
Rohtee alfrediana (Cuv. & Val.)	+	—	—
Rohtee belangeri (Cuv. & Val.)	+	+	—
Barilius ornatus Sauvage	—	—	+
Barilius auropurpureus Annand.	—	—	+
Danio aequipinnatus (McClell.)	—	—	+
Laubuca (Laubuca) laubuca (Ham. Buch.).	+	—	—
Notopterus notopterus (Pall.)	+	—	+
Ambassis ranga (Ham. Buch.)	+	+	—
Ambassis baculis (Ham. Buch.)	+	—	—
Mastacembelus armatus (Lacép.).	+	—	—
Mastacembelus caudiocellatus Blgr.	—	—	+
Mastacembelus oatesii Blgr.	—	—	+
Chaudhuria caudata Annand.	—	—	+
Ophicephalus marulius Ham. Buch.	+	—	—
Ophicephalus striatus Bloch	+	—	+
Ophicephalus gachua Ham. Buch.	+	—	+
Ophicephalus harcourtbutleri Annand.	—	+	+
Ophicephalus punctatus Bloch.	+	—	—
Ophicephalus siamensis Günther.	—	—	+
Anabas testudineus (Bloch)	+	—	—
Trichogaster fasciatus Bl. Schn.	+	—	—
Indostomus paradoxus, gen. et sp. nov.	+	—	—
Tetraodon cutcutia Ham. Buch.	+	—	—

It will be seen from this table that the fish fauna of the Indawgyi Lake, consisting of 43 species, is the richest of the three lakes. In the Loktak Lake only 13 species were found, while the Inlé Lake has 28. Two species only ,*viz.*, *Clarias batrachus* and *Barbus sarana caudimarginatus*, are found in all the three lakes ; a large number of species, which are found in the Indawgyi Lake, are absent in both the Loktak and the Inlé lakes, while a few of the Indawgyi fishes are found in either of the other two lakes. The main characteristic of the fish fauna of the Inlé Lake is the evolution of Cyprinids like *Sawbwa resplendens*, species of the genus *Microrasbora*, the Mastacembelus-like genus *Chaudhuria* and several endemic forms which are only found in this lake. The fauna of the Loktak Lake is in no way peculiar, and has no endemic species. In the Indawgyi Lake, the endemic element consists of two species of the genus *Barbus*, *viz.*, *B. sewelli* and *B. myitkyinae*, and *Indostomus paradoxus*, the only known species of the new family Indostomidae of the order Solenichthyes. The fish fauna of these three lakes consists of the usual Indo-Burmese genera of freshwater fish. The fishes of the Indawgyi, except for the marine relict type *Indostomus paradoxus*, which is

found in the lake and probably in its connected waters, do not consist of any very peculiar forms. From the occurrence of only a single marine relict species in an inland water-basin such as the Indawgyi Lake, and which at the present day is only indirectly connected with the nearest marine area, the Bay of Bengal, through the long and circuitous channels of the Irrawadi River system, it would not be right to dogmatize about the age of the Indawgyi Lake, but its importance cannot be ignored, and there can be little doubt that it points to a direct connection of the lake with the Bay of Bengal in a past geological age. Unfortunately we are so far not fully acquainted with the geology of the Myitkyina District, but Pilgrim[1] in his map of the probable distribution of land and water in Eocene times shows this area as forming a part of the Bay of Bengal, and even during Miocene times a part of it was still covered by the sea. Murray Stuart's [2] geological work was confined to the north-eastern part of the Myitkyina District, but during his traverses he found tertiary rocks to the east of the Indawgyi Lake, and we are informed by Mr. E. L. G. Clegg of the Geological Survey of India that recent work in the Jade Mines area has confirmed these findings. It may, therefore, be assumed that in the early Tertiaries, at any rate, the Indawgyi area formed a part of the extension of the Bay of Bengal, and that *Indostomus paradoxus* probably represents a descendant of some marine type which was left in this region after it was cut off from the sea, and became transformed into a freshwater lake.

In the systematic account we have often given detailed descriptions of the different species of fish found in the Myitkyina District. This was found necessary as our specimens did not agree in all details with the published descriptions of the species. In most cases we had to examine the large collections in the Indian Museum from different parts of India, and notes on some of the specimens from other areas are also included. In addition to the figures of the new forms we have also thought it desirable to publish figures of some of the old species of which no good figures were available.

SYSTEMATIC DESCRIPTION.

Family SYMBRANCHIDAE.

Amphipnous cuchia (Ham. Buch.).

1822. *Unibranchapertura Cuchia,* Hamilton Buchanan, *Fish. Ganges,* pp. 16, 363, pl. xvi, fig. 4.
1878. *Amphipnous cuchia,* Day, *Fish. India,* p. 656, pl. clxviii, fig. 1.
1889. *Amphipnous cuchia,* Day, *Faun. Brit. Ind., Fish.* I, p. 69, fig. 27.
1889. *Amphipnous cuchia,* Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 356.
1918. *Amphipnous cuchia,* Annandale, *Rec. Ind. Mus.,* XIV, p. 43.

This species is represented by two specimens which, according to the field notes of Dr. B. N. Chopra, were " dug out with earthworms from near the south end of the Indawgyi Lake " in the Myitkyina District.

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[1] Pilgrim, G. E., *Journ. Asiat. Soc. Bengal* (n. s.) XIX, pl. i (1920).

[2] Murray Stuart, *Rec. Geol. Surv. Ind.,* LIV, pp. 398-411, pl. xx (1923). We have to thank Mr. E. L. G. Clegg of the Geological Survey of India for reference to this paper and other information about the geology of the district.

The living specimens according to Dr. Chopra were "reddish in colour with darker longitudinal bands."

The species is recognised as a fish by the Burmese but is apparently not commonly eaten.

Monopterus albus (Zuiew).

1793. *Mureana alba*, Zuiew, *Nov. Act. Soc. Petropol.*, VII, p. 299.
1800. *Monopterus javanensis*, Lacépède, *Hist. Nat. Poisson.*, II, p. 139.
1870. *Monopterus javanensis*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 14.
1878. *Monopterus javanensis*, Day, *Fish. India*, p. 656, pl. clxix, fig. 1.
1889. *Monopterus javanensis*, Day, *Faun. Brit. Ind., Fish.* I, p. 70, fig. 28.
1901. *Monopterus albus*, Jordon & Snyder, *Proc. U. S. Nat. Mus.*, XXIII, p. 838.
1916. *Monopterus albus*, Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, III, pp. 413, 414, figs. 210, 211.
1918. *Monopterus albus*, Annandale, *Rec. Ind. Mus.*, XIV, p. 42.
1921. *Monopterus albus*, Hora, *Rec. Ind. Mus.*, XXII, p. 177.

This species is represented by a single specimen which was obtained from Kamaing in the Myitkyina District. It is 115 mm. long.

It is not a common species in the area round Indawgyi Lake and the Burmese do not apparently distinguish it from *Amphipnous cuchia*.

Family SILURIDAE.

Clarias batrachus (Linn.).

1758. *Silurus batrachus*, Linnaeus, *Syst. Naturae* (ed. 10th), p. 305.
1822. *Macropteronotus Magur*, Hamilton Buchanan, *Fish. Ganges*, pp. 146, 374, pl. xxvi, fig. 45.
1862. *Clarias batrachus*, Bleeker, *Atl. Ichth.*, II, p. 103.
1864. *Clarias magur*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 17.
1877. *Clarias magur*, Day, *Fish. India*, p. 485, pl. cxii, figs. 5, 5a.
1889. *Clarias magur*, Day, *Faun. Brit. Ind., Fish.* I, p. 115, figs. 48, 49.
1889. *Clarias magur*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 191.
1913. *Clarias batrachus*, Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, II, p. 190, fig. 74.
1918. *Clarias batrachus*, Annandale, *Rec. Ind. Mus.*, XIV, p. 43.
1921. *Clarias batrachus*, Hora, *Rec. Ind. Mus.*, XXII, p. 178.
1923. *Clarias batrachus*, Hora, *Journ. Nat. Hist. Soc. Siam*, VI (2), p. 165.

The ground colour of the specimens is somewhat dusky rather than black, while there are numerous white spots scattered all over the body. Three slightly arched vertical bands of a lighter colour are present on the caudal fin. The pectoral spine is finely serrated along both its outer and inner surfaces.

C. batrachus is fairly common in and about the marginal zones of the Indawgyi Lake. The largest specimen in the collection is 135 mm. long.

Silurus cochinchinensis Cuv. & Val.

1839. *Silurus Cochinchinensis*, Cuvier & Valenciennes, *Hist. Nat. Poisson.*, XIV, p. 352.
1860. *Silurichthys Berdmorei*, Blyth, *Journ. Asiat. Soc. Bengal*, XXIX, p. 156.
1877. *Silurus Cochinchinensis*, Day, *Fish. India*, p. 481, pl. cxiii, fig. 2.
1889. *Silurus cochinchinensis*, Day, *Faun. Brit. Ind., Fish.* I, p. 120.

The lower jaw is slightly shorter than the upper and there is a row of large open pores arranged in a line parallel to the margin of the lower

jaw. These pores, as was confirmed by an examination of Day's specimens of the species from Akyab, are present in this species generally, but Day does not mention them in his description.

The pectoral spine, though slender, is fairly strong and about half as long as the pectoral rays. The anal fin is inserted just behind the ventral. The maxillary barbels are dusky-grey while the mandibulars are pale white.

S. cochinchinensis is fairly common in the lake and in some of the streams opening into it. In the collection there are three specimens from the north end of the lake near Nyaungbin, and two from Sattan *chaung* running near and inside the Paudawmu cave about 8 miles from Kamaing, in the Myitkyina District. The specimens vary from 85-120 mm. in length.

Amblyceps Blyth.

Blyth[1] established the genus *Amblyceps* in 1858, and defined it as " affined to *Olyra*, McClelland, but the head much broader and flatter, with minute eyes, placed near the hind aperture of the nostrils; two pairs of cirri above and below, the inner above situate between the fore and hind apertures of the nostrils; pectoral and dorsal spines short and concealed, but comparatively robust; the second or adipose dorsal short and low; and the ventrals and anal also short; tail large and moderately furcate; a band of card-like teeth above and below, but no palatal band discernible in the specimens; body subcylindrical, compressed, becoming more so to the tail." Günther[2] in reviewing Blyth's definition defined the genus as follows :

" Adipose fin short and low; a short dorsal fin with a concealed pungent spine and with six soft rays; anal fin short. Barbels eight. Teeth villiform; palate edentulous. Head covered with soft skin above; eyes very small. Lateral line none? Caudal forked; no thoracic adhesive apparatus; ventrals with six rays, inserted behind the end of the dorsal fin."

Day[3] followed Blyth and Günther, and did not make any remarks about the presence or absence of the lateral line in the genus. In his *Report on the Freshwater Fish and Fisheries of India and Burma* (1873) he, however, stated that the lateral line is absent.

Chaudhuri,[4] in view of the description of *A. marginatus* Günther[5] and of his new species, *A. murray-stuarti* Chaudhuri, pointed out the necessity of modifying the definition of the genus *Amblyceps*. In both these species the caudal fin is " square cut " and not furcate. In *A. murray-stuarti* further " there appear to be about thirteen loose folds of skin over the posterior part of the chest continued to the anterior portion of the abdominal region which are likely to possess some adhesive function." A new species of the genus from the Indawgyi Lake, which we associate with the name of Dr. S. L. Hora, shows several new characters.

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[1] Blyth, E., *Proc. Asiat. Soc. Bengal*, XXVII, p. 281 (1858).
[2] Gunther, A., *Cat. Fish. Brit. Mus.*, V, p. 190.
[3] Day, F., *Fish. India*, p. 490.
[4] Chaudhuri, B. L., *Rec. Ind. Mus.*, XVI, p. 273 (1919).
[5] Günther, A., In Pratt's *To the Snows of Tibet through China*, p. 245, pl. ii, fig. 4 (1892).

It is, therefore, necessary to give an emended definition of the genus *Amblyceps*. It is as follows :—

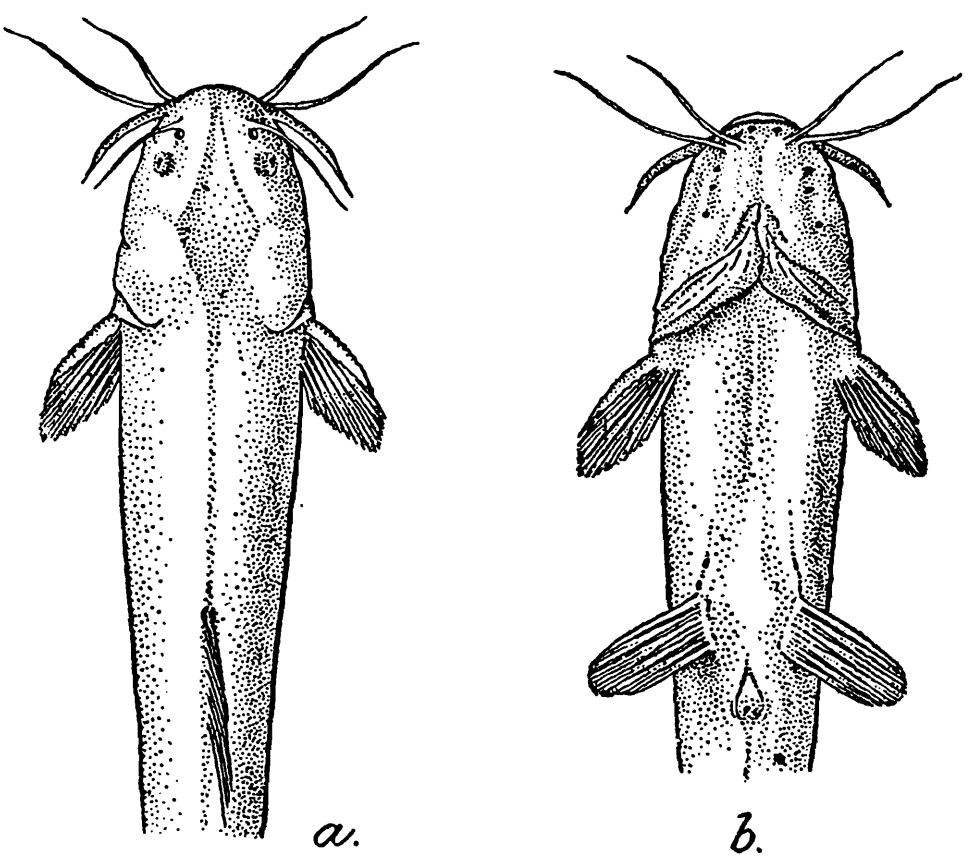
A thoracic adhesive area may be well developed, rudimentary or absent. The gape of the mouth may be moderate or extensive. The dorsal fin consists of one spine and six or seven rays. The ventral fin is situated immediately below or far behind the dorsal fin. The caudal may be forked, subtruncate or truncate. The lateral line may be present or absent.

Amblyceps horae, sp. nov.

(Plate VII, fig. 1.)

D. 1/7, A. 10/11, P. 1/7, V 6, C. 38-40.

The length of the head is contained about 6 times and the depth of the body about 8·7 times in the total length of the body without the caudal. The diameter of the eye is contained 9·2 times in the length of



TEXT-FIG. 1.—*Amblyceps horae,* sp. nov.
(*a*) Dorsal view of anterior portion of body of type-specimen, × 2.
(*b*) Ventral view of anterior portion of body of the same, × 2.

the head, which is 1·5 times wider than deep. The length of the snout is equal to the interorbital width. The jaws are nearly equal, and the lips more or less fleshy. There is a row of fairly large open pores along the margin of the lower jaw and a few scattered ones laterally along the cheeks.

The dorsal fin is situated above the ventral. The pectoral, which originates immediately behind the gill opening, is as long as the head

behind the middle of the eye. The pectoral spine is slightly longer and stronger than that of the dorsal; it is flattened dorso-ventrally and serrated along both its anterior and posterior edges. The ventral, which is situated midway between the gill openings and the commencement of the anal, is longer than the pectoral. The anal is long and moderately high. The caudal is longer than the head, and deeply emarginate. The adipose dorsal is inserted above the middle of the anal and is continuous with the caudal fin. The vent is situated slightly posterior to the ventral and is provided with a distinct papilla. All the fin rays are concealed in the thick skin.

There are 8 barbels, a pair each of nasals and maxillaries and two pairs of mandibulars. The nasal barbels are slender and when straightened out reach the posterior end of the preoperculum. The maxillary barbels are more or less damaged. The outer mandibular pair are longer than the inner. The lateral line is complete and distinct.

The colour of the specimen preserved in spirit is dark brownish above and paler below, with minute blackish spots thickly scattered all over the surface. The fins are dirty white, except for the caudal which is more or less blackish.

We have a single specimen of *A. horae* which was collected from the shallow parts of the Indawgyi Lake along its western shore near Loimon village, in the Myitkyina District.

Type-specimen.—No. F 10854/1 in the collection of the Zoological Survey of India (*Ind. Mus.*), Calcutta.

Remarks.—*A. horae* is a very characteristic species and is easily distinguished from the other species of the genus by the dorsal fin being situated far back, the serrated pectoral spine, and the presence of a distinct and complete lateral line.

Measurements in millimetres.

Total length without caudal	70·0
Length of head	11·5
Height of body	8·0
Length of snout	4·0
Diameter of eye	1·25
Interorbital width	4·0
Length of caudal peduncle	11·0
Least height of caudal peduncle	8·0
Length of pectoral fin	7·0
Length of ventral fin	8·0

Saccobranchus fossilis (Bloch).

1794. *Silurus fossilis*, Bloch, *Nat. Ausl. Fische*, VIII, p. 46, pl. ccclii, fig. 2.
1822. *Silurus Singio*, Hamilton Buchanan, *Fish. Ganges*, pp. 147, 374, pl. xxxvii, fig. 46.
1840. *Saccobranchus singio*, Cuvier & Valenciennes, *Hist. Nat. Poisson.*, XV, p. 400, pl. ccccxlviii.
1864. *Saccobranchus fossilis*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 31.
1877. *Saccobranchus fossilis*, Day, *Fish. India*, p. 486, pl. cxiv, fig. 1.
1889. *Saccobranchus fossilis*, Day, *Faun. Brit. Ind., Fish.* I, p. 125, fig. 53.
1913. *Saccobranchus fossilis*, Chaudhuri, *Rec. Ind. Mus.*, VII, p. 255.
1916. *Saccobranchus fossilis*, Sundara Raj, *Rec. Ind. Mus.*, XII, p. 262.

The fish is blackish above and much lighter below. As Day[1] has already remarked " in the Burmese specimens, as a rule, there are two

[1] Day, F., *Proc. Zool. Soc. London*, p. 612 (1869).

longitudinal yellowish-white bands", which, however, are seldom present in the Indian specimens.

S. fossilis does not appear to be very common in the lake. Only a single specimen was collected from its south end. It is 74 mm. long. There is also in the collection under report another specimen, 155 mm. long, from the Namkawng stream at Kamaing, in the Myitkyina District.

Wallago attu (Bl. Schn.).

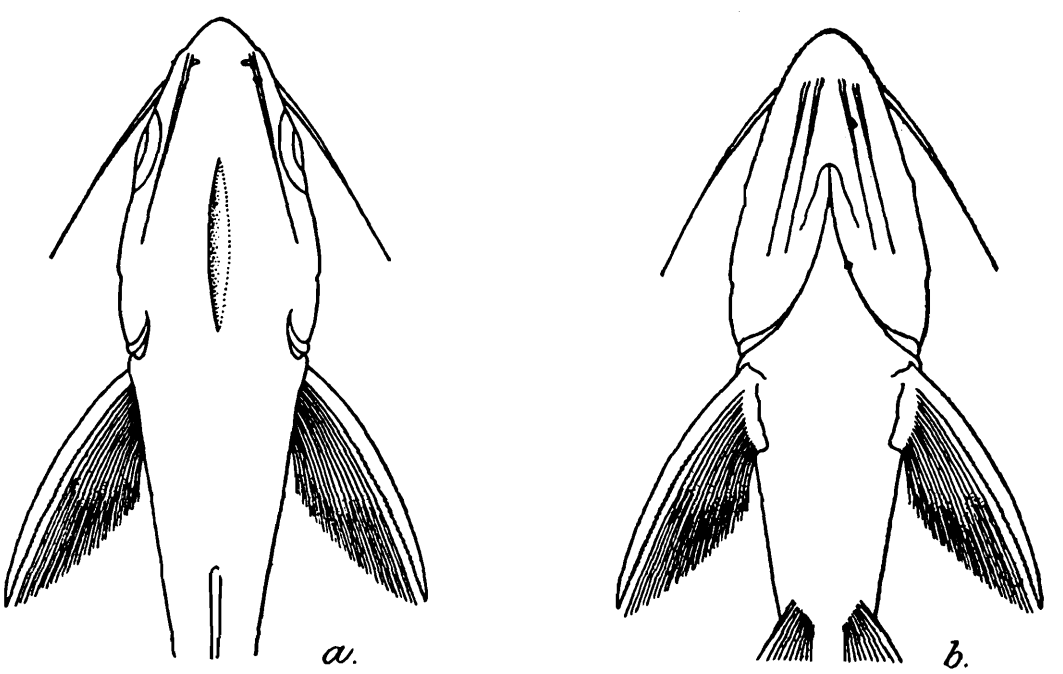
1801. *Silurus attu*, Bloch & Schneider, *Syst. Ichth.*, p. 378.
1852. *Wallago Mutteri*, Bleeker, *Nat. Tijdschr. Ned. Ind.*, III, p. 585.
1862. *Wallago attu*, Bleeker, *Atl. Ichth.*, II, p. 79.
1864. *Wallago attu*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 36.
1877. *Wallago attu*, Day, *Fish. India*, p. 479, pl. cxi, fig. 4.
1889. *Wallago attu*, Day, *Faun. Brit. Ind., Fish.* I, p. 126, fig. 54.
1889. *Wallago attu*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 199.
1913. *Wallago attu*, Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, II, p. 201.
1923. *Wallago attu*, Hora, *Journ. Nat. Hist. Soc. Siam*, VI (2), p. 165.

The eyes in the specimens before us are situated at a distance about 3 times the diameter of the eye from the tip of the snout and not " 2 diameters " as described by Day.

W attu is fairly common in the lake and grows to a large size ; one specimen from the shallower parts of the lake on the western side is 45 cm. long.

Eutropiichthys vacha (Ham. Buch.).

1822. *Pimelodus Vacha*, Hamilton Buchanan, *Fish. Ganges*, pp. 196, 378, pl. xix, fig. 64.
1863. *Eutropiichthys vacha*, Bleeker, *Ned. Tijd. Dierk.*, p. 107.
1864. *Eutropiichthys vacha*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 38.
1877. *Eutropiichthys vacha*, Day, *Fish. India*, p. 490, pl. cxiv, fig. 6.
1889. *Eutropiichthys vacha*, Day, *Faun. Brit. Ind., Fish.* I, p. 128, fig. 55.
1889. *Eutropiichthys vacha*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 199.



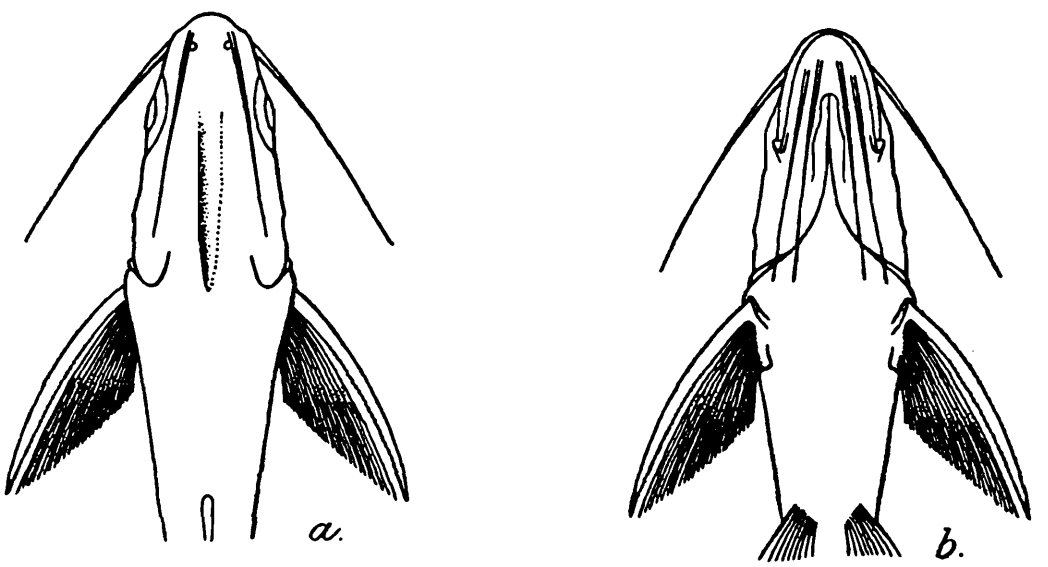
TEXT-FIG. 2.—*Eutropiichthys vacha* (Ham. Buch.) with pointed snout from Myitkyina District.

(*a*) Dorsal view of anterior portion of body.
(*b*) Ventral view of anterior portion of body.

The specimens which are assigned to *E. vacha* differ considerably from Day's description of the species. According to Day the diameter of the eye is " $3\frac{1}{2}$ to $3\frac{1}{4}$ in the length of the head, 1 diameter from the end of the snout and 1 to $1\frac{1}{4}$ apart," but in the specimens before us the corresponding proportions are $4\frac{1}{2}$ to 5, $1\frac{1}{2}$ and 2 to $2\frac{1}{2}$. The angle of the mouth is situated just below the posterior margin of the orbit and not as noted by Day, " under the middle or hind third of the eyes." The length of the barbels is somewhat variable. In specimens of moderate size, *viz.*, about 200—300 mm. in length, the nasal barbels generally reach the posterior margin of the head, but in older specimens they are much shorter and do not extend beyond the posterior margin of the orbit. The maxillary barbels reach up to the middle or the end of the preoperculum, while the mandibular pairs are considerably shorter.

According to Day the pectoral spine is as long as that of the dorsal, but in the Indawgyi specimens, as also in several others from Day's collection in the Indian Museum, the pectoral spine is much stronger and considerably longer than the dorsal. Day described the ventral fins as " situated under the posterior dorsal rays," but in all the specimens examined by us this fin is inserted immediately below the commencement of the dorsal.

Day (*op. cit.*) distinguished a Burmese variety which he had originally designated as *E. burmanicus*. We have not seen this variety, but the specimens before us differ from Day's description of the Burmese form in the barbels being much shorter and the pectoral spine not reaching the anal.



TEXT-FIG. 3.—*Eutropiichthys vacha* (Ham. Buch.) with blunt snout from the Punjab.
(*a*) Dorsal view of anterior portion of body.
(*b*) Ventral view of anterior portion of body.

It may also be noted that in addition to Day's *E. burmanicus* there are two more or less distinct forms of *E. vacha* and which can be easily distinguished by their different facies. In the first form (fig. 2) the snout is very sharp and pointed and the barbels are short, while in the second form (fig. 3) the snout is blunt and more or less rounded and the barbels, though shorter than those of *E. burmanicus*, are considerably longer. The specimens from the lake have a pointed snout.

In the collections of the Indian Museum *E. vacha* is not represented from different parts of India and we are, therefore, unable at present to define the distribution, etc., of the two forms mentioned above. The difference in the shape of the snout does not appear to be anything more than a local variation, but it is interesting to note that the form with a pointed snout, such as the one found in the Indawgyi Lake and the rivers in Upper Burma, is also represented in the Indian Museum collection by specimens from the River Beas in the Punjab.

E. vacha is fairly common in the lake and the Indaw and Nam Ting rivers. It is said to inhabit the deeper parts and to grow to a weight of about 30 lbs.

Four specimens of this species were collected; one from the western part of the lake and three from the river waters at Chaungwa, in the Myitkyina District. The specimen from the lake is 325 mm. long.

Callichrous pabda (Ham. Buch.).

1822. *Silurus pabda*, Hamilton Buchanan, *Fish. Ganges*, pp. 150, 374, pl. xxv, fig. 47.
1839. *Callichrous vittatus*, Swainson, *Nat. Hist. Fish.* II, p. 306.
1864. *Callichrous pabda*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 47.
1877. *Callichrous pabda*, Day, *Fish. India*, p. 479, pl. cxl, figs. 2, 3.
1889. *Callichrous pabda*, Day, *Faun. Brit. Ind., Fish.* I, p. 133.
1914. *Callichrous pabda*, Regan, *Ann. Mag. Nat. Hist.* (8) XIII, p. 261.
1921. *Callichrous pabda*, Hora, *Rec. Ind. Mus.*, XXII, p. 743.

The lower jaw is very prominent and more or less elevated at the symphysis. The ventral fin is inserted below the dorsal and just reaches the anal which is separated from the caudal by a notch. The general colour of the body in spirit is silvery with a golden sheen. There is a darker shoulder spot and many minute dark-brown spots and irregular blotches distributed all over the body. The maxillary barbels are dusky. There is a single row of large open pores widely separated from one another and lying parallel to the margin of the lower jaw. The pectoral spine is smooth and very sharp at the tip.

C. pabda has so far not been recorded from Burma. In the collection before us it is represented by three specimens, two from the shallower parts of the western area of the lake and one from Namkawng stream at Kamaing, in the Myitkyina District. These specimens range from 75-115 mm. in length.

Callichrous pab (Ham. Buch.).

1822. *Silurus pabo*, Hamilton Buchanan, *Fish. Ganges*, pp. 153, 375, pl. xxii, fig. 48.
1864. *Callichrous pabo*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 48.
1877. *Callichrous pabo*, Day, *Fish. India*, p. 477, pl. cx, fig. 6.
1889. *Callichrous pabo*, Day, *Faun. Brit. Ind., Fish.* I, p. 132.

The diameter of the eye is 5-5½ in the length of the head and about 2¼ diameter from the tip of the snout; the interorbital distance is 3-3½ diameters of the eye. The greatest width of the head equals its length from the tip of the snout to the angle of the mouth. The lower jaw is prominent and has a distinct central knob-like projection on the symphysis. The width of the mouth is longer than half the length of the head. The maxillary barbels extend a little beyond the hind edge of the

orbit. The mandibular barbels are slender and about twice the diameter of the eye.

The pectoral fins are slightly shorter than the head excluding the snout.

Day found in Burma a variety of this fish " clouded all over with fine dark spots." This is the case with the specimens under report. Further, he observed that the pectoral spine is entire in Burmese specimens, but this does not seem to be generally the case, as distinct serrations are present on the pectoral spines of the specimens under report, as also in some specimens from Pegu in the Indian Museum from Day's collection.

No specimens of *C. pabo* were obtained from the lake. In the collection before us the species is, however, represented by two specimens from Namkawng *chaung* at Kamaing, in the Myitkyina District. They are 210 mm. long.

Pseudeutropius taakree (Sykes).

1841. *Hypophthalmus Taakree*, Sykes, *Trans. Zool. Soc. London*, II, p. 369, pl. lxiv, fig. 4.
1864. *Pseudeutropius longimanus*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 60.
1867. *Eutropius taakree*, Day, *Proc. Zool. Soc. London*, p. 564.
1869. *Pseudeutropius taakree*, Day, *Proc. Zool. Soc. London*, 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.
1889. *Pseudeutropius taakree*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 205.

The specimens of this species from different localities appear to vary considerably. The samples before us from Kamaing differ from Day's description mainly in their head being broader, the maxillary barbels shorter, the mandibulars longer and the pectoral spines shorter ; the dorsal as well as the pectoral spines besides being denticulated posteriorly, are finely serrated anteriorly. 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.

P. taakree was not found in the Indawgyi Lake. It is common in the rivers and *chaungs* in the Myitkyina District.

Three specimens were collected by Dr. Chopra at Kamaing. The largest one is 330 mm. long.

Aoria[1] **aor** (Ham. Buch.).

1822. *Pimelodus aor*, Hamilton Buchanan, *Fish. Ganges*, pp. 205, 379, pl. xx, fig. 68.
1864. *Macrones aor*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 78.
1877. *Macrones aor*, Day, *Fish. India*, p. 444.
1889. *Macrones aor*, Day, *Faun. Brit. Ind., Fish.* I, p. 149.
1889. *Macrones aor*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 217.

It is of interest to note that the dorsal spine is serrated only in about $\frac{1}{2}$—$\frac{2}{3}$ of the upper posterior margin.

A. aor occurs in the Indawgyi Lake in great abundance and grows to a very large size. This fish is caught in large quantities throughout the year and is one of the commonest edible fish in Upper Burma.

[1] Jordan, D.S.—*Genera of Fishes*, IV, p. 567 (1919).

In the collection *A. aor* is represented by five specimens from different parts of the lake ; the largest of these is 40 cm. long.

Aoria gulio (Ham. Buch.).

1822. *Pimelodus gulio*, Hamilton Buchanan, *Fish. Ganges*, pp. 201, 379, pl. xxii, fig. 66.
1864. *Macrones gulio*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 79.
1877 *Macrones gulio*, Day, *Fish. India*, p. 445, pl. xcix, fig. 2.
1889. *Macrones gulio*, Day, *Faun. Brit. Ind., Fish.* I, p. 151, fig. 64.
1889. *Macrones gulio*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 229.
1913. *Macrones gulio*, Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, II, p. 344.
1923. *Macrones gulio*, Hora, *Journ. Nat. Hist. Soc. Siam*, VI (2), p. 171.
1927. *Aoria gulio*, Mukerji, *Rec. Ind. Mus.*, XXIX, pp. 249-251.

The nasal barbels extend to about the middle of the orbit, the maxillaries to the middle of the ventrals, the mandibulars as far as the base of the pectorals and the mentals are about $\frac{1}{2}$ the length of the mandibulars. The pectoral spine is almost as long as the dorsal spine, but much stronger and is ridged longitudinally ; the dorsal spine is granulated.

A. gulio is represented in the collection by a single specimen collected from the western part of the lake which appears to have migrated from the rivers through some stream opening into the lake. The specimen is 300 mm. long.

Aoria cavasius (Ham. Buch.).

1822. *Pimelodus cavasius*, Hamilton Buchanan, *Fish. Ganges*, pp. 203, 379, pl. xi, fig. 67.
1864. *Macrones cavasius*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 76.
1877. *Macrones cavasius*, Day, *Fish. India*, p. 447, pl. c, fig. 1.
1889. *Macrones cavasius*, Day, *Faun. Brit. Ind., Fish.* I, p. 155.
1889. *Macrones cavasius*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 218.
1916. *Macrones cavasius*, Sundara Raj, *Rec. Ind. Mus.*, XII, p. 264.

The nasal barbels are shorter than the head ; the maxillary barbels in the majority of specimens do not extend beyond the end of the anal fin ; the outer mandibular barbels extend almost to the tip of the pectoral spine. The maxillary and the nasal barbels are blackish. The dorsal spine is shorter than the head excluding the snout.

A. cavasius is common in the northern area of the Indawgyi Lake and in the muddy streams at Kamaing in the Myitkyina District. Two specimens from the lake and 4 from the muddy streams were obtained. They vary in length from 60-72 mm.

Aoria leucophasis (Blyth).

1860. *Bagrus leucophasis*, Blyth, *Proc. Asiat. Soc. Bengal*, XXIX, p. 148.
1864. *Macrones leucophasis*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 78.
1877. *Macrones leucophasis*, Day, *Fish. India*, p. 449, pl. c, fig. 2.
1889. *Macrones leucophasis*, Day, *Faun. Brit. Ind., Fish.* I, p. 158.
1889. *Macrones leucophasis*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 220.

The dorsal and the pectoral spines bear longitudinal striations. The axillary process which is more or less triangular is strong and granulated.

In some specimens the maxillary barbels extend to about the base of the caudal fin. Only $\frac{3}{4}$ of the distal part of the pectoral spine is denticulated. The adipose dorsal fin commences behind the rayed

dorsal at a distance equalling almost $\frac{3}{4}$ the length of the base of the latter and not " just behind " it as noted by Day. The length of the base of the second dorsal in the specimens before us is at the most $1\frac{1}{2}$ times the length of the first dorsal and not " twice to two and a half times."

A. leucophasis is very common in the Indaw and the Nam Ting rivers, but is rarely found in the lake.

Nineteen specimens were collected at Chaungwa, a large fishing village at the junction of the Indaw and the Nam Ting rivers, in the Myitkyina District. The largest specimen is 250 mm. long.

Aoria pulcher (Chaudhuri).

1911. *Macrones pulcher*, Chaudhuri, *Rec. Ind. Mus.*, VI, pp. 20-22, pl. i, fig. 4.

We have examined the type-series of *A. pulcher* preserved in the Indian Museum collection and find that the specimens under report from the Myitkyina District are similar to the types of the species from the Bhamo District.

A. pulcher is not known to occur in the lake. Eight specimens were procured from small muddy streams along the Kamaing Jade Mines Road, in the Myitkyina District.

Chaudhuri's largest specimen is 67 mm. long, while the largest one in the collection before us is 75 mm. in length.

Aoria (Macronoides) dayi (Vincig.).

1889. *Macrones Dayi*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, pp. 230-235, pl. vii, fig. 3.

1921. *Macrones (Macronoides) dayi*, Hora, *Rec. Ind. Mus.*, XXII, pp. 179, 737.

Hora has separated this species along with *Aoria affinis* (Blyth) and *Aoria merianiensis* (Chaudhuri) into a distinct subgenus *Macronoides*. " The fishes of this subgenus are readily distinguished by their short barbels which do not exceed the length of the head, by possession of pores on the undersurface of the head and by the fact that the mandibular pairs of barbels are placed in an almost horizontal line."

We have compared our specimens with one out of Vinciguerra's type-series recently presented by him to the Zoological Survey of India at the request of Dr. Hora. They agree in every detail with the typical form.

A. (Macronoides) dayi occurs in the lake, as also in the rocky streams at Kamaing, in the Myitkyina District.

In the collection there are two specimens from the rocky streams at Kamaing and a single one from the north end of the Indawgyi Lake. They vary from 39-47 mm. in length.

Akysis variegatus subsp. **variegatus,** nov.

(Plate VIII, figs. 1, 2.)

This new subspecies, for which we propose the name *variegatus*, is closely allied to both *Akysis variegatus* Bleeker[1] and *Akysis pictus* Günther[2]

[1] Bleeker, P.—*Ichth. Arch. Ind. Prodr. l. Siluri.*, p. 235 (1858). For a recent description of the species see Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, II, p. 372, fig. 150.

[2] Günther, A.—*Ann. Mag. Nat. Hist.* (5) XI, p. 138 (1883).

reported from Java and Tenasserim respectively, but differs from either species chiefly in the composition of the pectoral and the anal fins. In the pectoral fins of *A. variegatus* and *A. pictus*, there are " 5-6 " and " 7 " branched rays respectively, while in the specimens before us there are 8. Likewise, the anal fins of the two known species are composed of " 8-9 " and " 9 " rays respectively, while in the specimens under report there are 11. From Günther's species the new form further differs in its longer nasal, shorter maxillary and longer outer mandibular barbels ; its dorsal fin is also more anteriorly situated. In colouration and general facies it bears a closer resemblance to *A. variegatus* than to *A. pictus*.

In the absence of any specimens of the two species referred to above for comparison, it is difficult to be definite about the specific position of this apparently new form, but we consider it to be a variety of *A. variegatus*.

This new variety is represented in the collection by three specimens, one from the shallower parts of the Indawgyi Lake along the southwestern shore and 2 from small rocky streams roundabout Kamaing in the Myitkyina District.

Type-specimen.—No. F 10873/1 in the collection of the Zoological Survey of India (*Ind. Mus.*), Calcutta.

Measurements in millimetres.

Total length without caudal	40·0	23·0
Length of head	9·0	6·0
Depth of head	6·0	3·0
Width of head	11·0	6·5
Height of body	9·0	4·0
Length of snout	3·5	3·0
Diameter of eye	7·5	·5
Interorbital width	3·5	2·0
Length of caudal peduncle	8·0	4 5
Least height of caudal peduncle	4·0	2·0

Bagarius bagarius (Ham. Buch.).

1822. *Pimelodus bagarius*, Hamilton Buchanan, *Fish. Ganges*, pp. 186, 378, pl. vii, fig. 62.
1841. *Bagrus Yarrelli*, Sykes, *Trans. Zool. Soc. London*, II, p. 370, pl. lxv, fig. 1.
1853. *Bagarius Buchanani*, Bleeker, *Atl. Icth.* II, p. 61, pl. 81, fig. 33.
1864. *Bagarius yarrellii*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 183.
1877. *Bagarius Yarrellii*, Day, *Fish. India*, p. 495, pl. cxv, fig. 3.
1889. *Bagarius yarrellii*, Day, *Faun. Brit. Ind., Fish.* I, p. 194, fig. 71.
1889. *Bagarius Yarrellii*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 243.
1912. *Bagarius bagarius*, Weber & Beaufort, in Maass " *Durch Zentral-Sumatra*," Bd. II, Fische, p. 16.
1913. *Bagarius bagarius*, Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, II, p 270, fig. 105.

The maxillary barbels are shorter than the head and extend as far back as the first quarter of the pectoral fin. The dorsal spine is rugose anteriorly and almost smooth posteriorly.

No specimens of *B. bagarius* were found in the Indawgyi Lake, and the only specimen in the collection was taken at Kamaing, in the Myitkyina District. It is 205 mm. long.

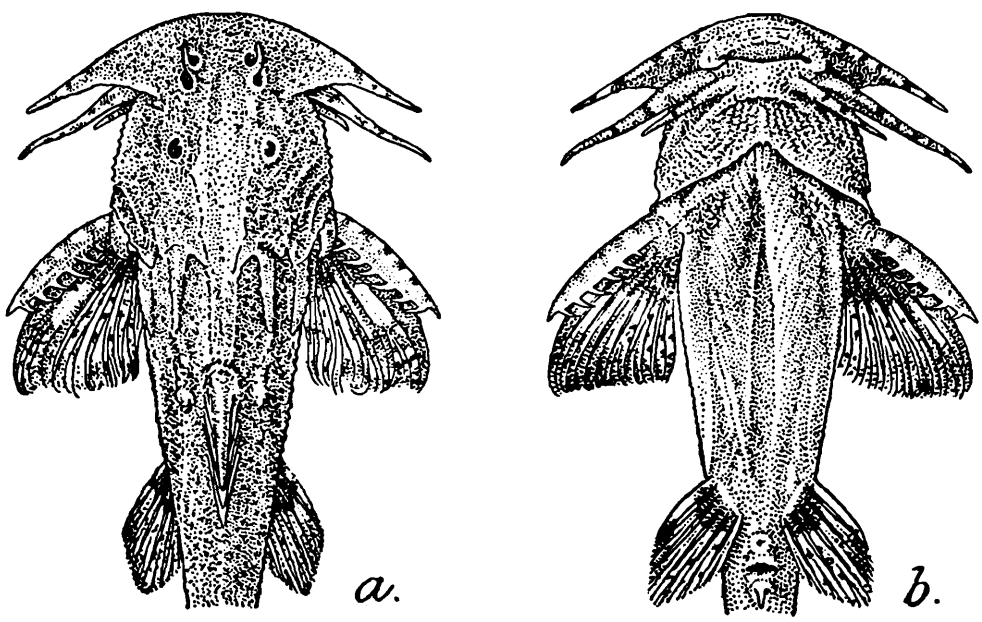
Glyptothorax tuberculatus, sp. nov.

(Plate VII, fig. 2.)

D. 1/6, A. 2/8, P. 1/7, V. 1/5, C. 20.

The head is slightly longer than broad and much broader than deep. Its length is contained about 3·3 times and the depth of the body nearly 4·3 times in the total length of the body excluding the caudal. The snout is broadly rounded anteriorly and is longer than the postorbital part of the head. The eyes, which are situated in the posterior half of the head, are small. The interorbital width is equal to the distance between the anterior margin of the orbit and the base of the nasal barbels.

There are four pairs of barbels. The nasals are about $1\frac{1}{2}$ times as long as the diameter of the eye. The maxillary barbels, which are very much flattened at their bases, are stout and do not extend very much beyond the posterior end of the eye. The outer pair of mandibular barbels are nearly as long as the maxillary and extend to the free margin of the opercular flap, while the inner pair are about $\frac{2}{3}$ of the length of the outer.



TEXT-FIG. 4.—*Glyptothorax tuberculatus*, sp. nov.

(*a*) Dorsal view of anterior portion of body of type-specimen, × $2\frac{1}{2}$.
(*b*) Ventral view of anterior portion of body of the same, × $2\frac{1}{2}$.

The upper jaw is longer than the lower. The gape of the mouth is moderate and the lips, especially the upper, are fleshy. The adhesive apparatus on the thorax is well developed. It is considerably longer than broad and has an elongated slight depression in its middle (fig. 4*b*). The anus is situated midway between the bases of the ventrals and the anal.

The dorsal fin is inserted above the posterior third of the pectorals ; its spine is very strong and is almost equal to the length of the head excluding the snout. The longest dorsal ray is shorter than the depth of the body and is equal to the length of the head behind the posterior nostrils. The pectorals are as long as the dorsal ; the spine is flat, strong and internally denticulated, and does not bear any adhesive apparatus

on its ventral surface. The ventrals, which originate immediately below the end of the base of the dorsal, are shorter than the pectorals. The anal, which commences below the middle of the adipose dorsal, is as long as the rayed dorsal. The adipose dorsal starts as a low ridge just behind the first dorsal and extends to about the termination of the anal, where it is a little better developed. The caudal is slightly shorter than the head. It is deeply furcate, both its lobes being almost of the same size.

The median longitudinal groove on the head is shallow but fairly prominent and extends to the base of the occipital process which latter is about three times as long as wide at the base. The humero-cubital process is roughened and has an elongated osseous projection posteriorly. In between the occipital and the humero-cubital processes, there is a scapular projection above the lateral line. The skin is rough and the whole body is thickly covered with minute tubercles.

The colour of the type-specimen in spirit is dark-brown variegated with irregular blackish patches. The fins are blackish with broad whitish vertical bands. The chest and the lower part of the head are dirty yellow. The maxillary and the mandibular barbels are annulated with black.

G. tuberculatus is represented in the collection by a single well preserved specimen. It is a mature female with eggs. The specimen was collected from Sankha, a large hill-stream, midway between Kamaing and Mogaung, in the Myitkyina District.

Type-specimen.—No. F.10876/1 in the collection of the Zoological Survey of India (*Ind. Mus.*), Calcutta.

Remarks.—The presence of humero-cubital and scapular processes is not a common feature in the genus *Glyptothorax*. In this respect *G. tuberculatus* resembles species of the genera *Erethistes* and *Laguvia*.[1]

Measurements in millimetres.

Total length without caudal	30·0
Length of head	9·0
Depth of head	4·5
Width of head	8·0
Height of body	7·0
Length of snout	5·0
Diameter of eye	1·0
Interorbital width	2·5
Length of caudal peduncle	5·5
Least height of caudal peduncle	3·0
Longest ray of dorsal fin	6·0
Length of pectoral fin	5·5
Length of ventral fin	4·0
Length of caudal fin	8·0

[1] Hora, S. L., *Rec. Ind. Mus.*, XXII, p. 739 (1921).

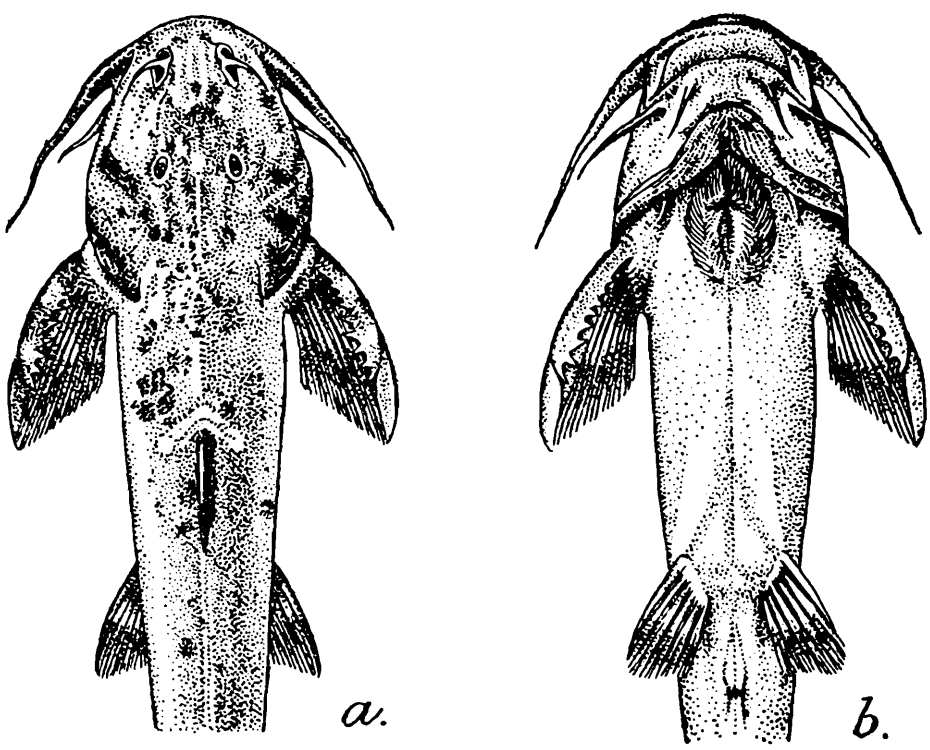
Glyptothorax burmanicus, sp. nov.

(Plate VII, fig. 3.)

D. 1/6, A. 2/9, P. 1/8, V. 1/5, C. 21.

The dorsal profile to the origin of the dorsal fin is moderately curved and almost straight behind it. The ventral profile is more or less straight up to the insertion of the anal fin. The head is longer than broad and about twice as broad as deep ; its length is contained about 3·5 times and the depth of the body about 5·5 times in the length of the body without the caudal. The snout is broadly rounded anteriorly and is slightly longer than the postorbital part of the head. The eyes are small, superior, and situated in the posterior half of the head ; their diameter is contained 14 times in the length of the head. The interorbital width is equal to the distance between the anterior margin of the orbit and the openings of the posterior nostrils.

There are four pairs of barbels. The nasals are about as long as the distance between their bases. The maxillary barbels are broad at their bases and extend to the base of the pectoral spine. The outer mandibular pair are half as long as the maxillary, while the inner pair are much shorter.



TEXT-FIG. 5.—*Glyptothorax burmanicus*, sp. nov.

(*a*) Dorsal view of anterior portion of body of type-specimen, nat. size.

(*b*) Ventral view of anterior portion of body of the same, nat size.

The upper jaw is considerably longer than the lower. The mouth is inferior, and the width of the gape is equal to the length of the snout. The teeth are minute and sharp, and are arranged in a broad patch in the upper jaw. In the lower jaw they are placed on a crescentic band which

is divided in the middle by a narrow fleshy projection of the skin. The anterior lip is papillated, while the posterior is more or less smooth. The adhesive apparatus on the thorax is well-developed, more or less rhomboidal in shape and longer than broad and has a deep depression in the centre (fig. 5*b*). The anus is situated nearer to the base of the anal fin than to that of the ventrals, and is provided with a papilla behind it.

The dorsal fin is inserted just above the middle of the distance between the points of origins of the pectorals and the ventrals. The dorsal spine is fairly strong and is as long as the postorbital part of the head, while the longest dorsal ray is shorter than the depth of the body. The pectorals are as long as the head from behind the opening of the posterior nostril. The pectoral spine is flat, strongly denticulated behind, and is devoid of any adhesive apparatus on its ventral surface. The ventrals are nearly $\frac{2}{3}$ the length of the pectoral and extend beyond the anal opening. They are situated about in the middle of the distance between the first dorsal ray and the commencement of the adipose dorsal. The anal fin, which commences slightly behind the insertion of the adipose dorsal, is nearly as long as the pectorals. The adipose dorsal is about 4 times as long as high and its base is nearly $1\frac{1}{2}$ times longer than that of the anal. The caudal fin is slightly longer than the pectorals; it is deeply emarginate, both the lobes being equal and pointed.

The colour of the type-specimen in spirit is dusky brown above with many blackish spots irregularly scattered over the body. The lower surface is dirty yellowish. The fins are banded.

Only a single specimen of this new species was collected from Sankha, a large hill-stream, midway between Kamaing and Mogaung, in the Myitkyina District.

Type-specimen.—No. F.10877/1 in the collection of the Zoological Survey of India (*Ind. Mus.*), Calcutta.

Remarks.—In his revision of the genus *Glyptothorax*, Hora[1] has discussed in detail the specific positions of the different species of the genus and has given a key to the Indian forms. According to this key all the species in which the pectoral spine and the ventral rays are not plaited below, and in which the longest ray of the dorsal fin is as long as or shorter than the depth of the body, can be grouped into two main divisions, *viz.*:

"A. Pectorals *as long as or slightly longer than length of head;* thoracic adhesive apparatus slightly longer than broad and *provided with a depression* in its centre"; and "B. Pectorals *shorter than length of head;* thoracic adhesive apparatus considerably longer than broad and *devoid of a depression* in its centre." (Italics are ours). *Glyptothorax burmanicus* is a very characteristic species and cannot be placed in either the first or the second division for it differs from the former in its shorter pectorals and from the latter in its having a deep depression in the centre of the thoracic adhesive apparatus. Its main distinguishing

[1] Hora, S. L.—*Rec. Ind. Mus.*, XXV, pp. 8-30 (1923).

features are the short pectorals, *i.e.*, *shorter than length of head* and a *deep depression* in the middle of the thoracic adhesive apparatus.

Measurements in millimetres.

Total length without caudal	104·0
Length of head	28·0
Depth of head	12·0
Width of head	23·0
Height of body	19·0
Length of snout	15·0
Diameter of eye	2·0
Interorbital width	6·0
Length of caudal peduncle	20·0
Least height of caudal peduncle	8·0
Longest ray of dorsal fin	15·0
Length of pectoral fin	20·0
Length of ventral fin	14·0
Length of caudal fin	21·5

Erethistes conta (Ham. Buch.).

1822. *Pimelodus conta*, Hamilton Buchanan, *Fish. Ganges*, pp. 191, 378.
1860. *Hara filamentosa*, Blyth, *Journ. Asiat. Soc. Bengal*, XXIX, p 152.
1864. *Hara conta*, Günther, *Cat. Fish. Brit. Mus.*, V, p. 189.
1877. *Erethistes conta*, Day, *Fish. India*, p. 453, pl. cii, fig. 4.
1889. *Erethistes conta*, Day, *Faun. Brit. Ind., Fish.* I, p. 205.
1889. *Erethistes conta*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 250.

Day's description of the pectoral spine of this species as " rather shorter than the head " is incorrect. We have very carefully measured specimens of *E. conta* from Tenasserim sent by Major Berdmore, Day's specimens from Bassein in the Indian Museum collection and the present specimen from the Indawgyi Lake, and find that the dorso-ventrally flattened pectoral spine, which is denticulated internally and serrated externally, is slightly curved backwards and is considerably longer than the head or the dorsal spine.

Further, according to Day, the " colouration of *E. conta* is similar to that of *E. hara*, except that the mandibular barbels do not appear ever to be annulated with black and sometimes even the maxillary pair are destitute of colour." But, as was stated by Hamilton Buchanan in the original description of the species and shown in his unpublished figure of *Pimelodus khongta*, No. 17, both the maxillary and the mandibular barbels of *E. conta* are distinctly annulated with black.

Only a single specimen of *E. conta* was collected from the south end of the Indawgyi Lake. It is 59 mm. long.

Family HOMALOPTERIDAE.

In discussing the Indian members of the family Homalopteridae, Hora[1] recognized three genera : *Homaloptera* van Hasselt with *Helgia* Vinciguerra as a synonym, *Balitora* Gray and Hardwicke and *Bhavania*[2]

[1] Hora, S. L.—*Rec. Ind. Mus.*, XIX, pp. 195-207 (1920).

[2] Hora's selection of the name *Bhavania* is rather unfortunate owing to a very similar name having been used by Schmarda for a Polychaete *Bhawania* in *Neue Wirbellose Thiere*, I, ii, p. 164 (1861). The different spellings of the two names, however, allow of their being retained.

Hora. The two latter of these three genera are endemic in India only, while *Homaloptera* has a wide range in the south-eastern parts of the Asiatic continent and in the Indo-Australian Archipelago.

The first point to be considered is the validity of the generic name *Balitora* and the author or authors to whom it should be assigned. Hora in the paper cited above assigns the genus to Gray and Hardwicke, but the " Illustrations of Indian Zoology,"[1] in which the name was first used in a scientific sense, was edited by Gray alone. It was based on the collections of Natural History specimens and drawings of Major-General Hardwicke, but was not the joint work of Gray and Hardwicke. This is clearly proved by Gray being cited as the editor of the work, and, further, by all the new species in the ' Directions for arranging the Plates ' at the end of the work being referred to as Gray's species ; on the plates only the names of the fishes are given and the authors of the various species are not cited. No descriptions of the plates or of the new genera and species illustrated were ever published by Gray, and this in many cases has resulted in confusion as to their author. Confining ourselves to the fishes under question, we find that the first confusion was started by Swainson in 1838.[2] He published poor copies of Gray's figures of *Balitora brucei* (misspelt *Bricei* by Swainson) and added the following short description : " its living in mountain streams, joined to its single dorsal fin, small scales, and general habit, sanctions the idea that it enters within the confines of the family *Cobitidæ*, of which it forms the platyrostral or cartilagenous type." Incomplete, inaccurate and altogether inadequate as this description is for the identification of the genus and Gray's species, it may with the figures, for the purpose of the Rules of Zoological Nomenclature, be accepted as the first description of the genus *Balitora*, and *B. brucei*, the only species mentioned, be taken as its genotype. McClelland[3] rightly assigned the genus and the species to Gray, but changed the generic name to *Platycara* as " for independently of the species being different from any of those described by Buchanan, and supposed by him to be the *Balitora* of natives, Mr. Gray's genus is peculiar to mountain torrents, the beds of which are rocky rather than sandy ; for this reason as well as from the fact of the *Balitora* of Gray forming a new type distinguished by a flat head and other remarkable characters, I propose for it the generic name *Platycara.*" McClelland gave a fairly complete description of the genus, but included in it *Platycara nasuta*, which, as we know now, is a species of the genus *Garra.*

Günther[4] in including *Balitora* in the synonomy of the genus *Homaloptera* added that the generic name *Balitora* of Gray was " not characterized." Though assigning the generic name to Gray, Günther curiously assigned the two Indian species of the genus to Gray and Hardwicke ; his references to the plate in Gray's work are also inaccurate. Day[5] followed Günther in reference to the authors of the genus and the species.

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[1] For dates of publication see Sherborn " *Index Animalium,*" p. lxii.

[2] Swainson, W.—*Nat. Hist. Class. Fishes, Amphibia, Reptiles in Lardner's Cabinet Cyclopedia*, I, pp. 366, 367 (London, 1838).

[3] McClelland, J.—*Asiat. Researches*, XIX, pp. 245, 246, 299, 427, 428 (1839).

[4] Günther, A.— *Cat. Fish. Brit. Mus.*, VII, p. 340 (1868).

[5] Day, F.—*Fishes of India*, pp. 525, 526 (1878), and *Faun. Brit. Ind., Fishes*, I. pp. 243, 244 (1889).

Hora in the paper cited already revived the generic name *Balitora*, and assigned both the genus and its two species to Gray and Hardwicke.

In accordance with the International Rules of Zoological Nomenclature Gray's name *Balitora* has no status (*vide* Opinion 1 (B) in connection with the meaning of the word *Indication* in Art. 25*a* as applied to generic names). Swainson, however, in spite of his incomplete description, may be accepted as the author of the genus *Balitora*, and in view of Hora's detailed description and revival of the genus, the authors of the genus may be designated as : *Balitora* Swainson *emend.* Hora.

Genus **Chopraia**, nov.

This new genus of the family Homalopteridae, which we associate with the name of Dr. B. N. Chopra, is represented by a large series of specimens. It may be described as follows :

Fish of small size with the head of moderate size, broad, not greatly depressed ; eyes large, situated about the middle of the head and dorso-lateral in position ; mouth large, semicircular, provided with thick fleshy lips, without tubercles ; 6 barbels, 4 in front of the mouth and 2 at the lateral angles. Pectorals and ventrals of normal size, the former with a well developed fleshy peduncle ; pectorals with 14—16 (4—5/10—12) rays and ventrals with 8 (2/6) rays. Branchial openings narrow, extending as far as the anterior margin of the pectoral fin on the ventral surface.

Genotype.—Chopraia rupicola, sp. nov. collected from the rocky streams roundabout Kamaing, in the Myitkyina District.

Remarks.—The genus differs from the other genera of the family in the general form, the shape of the head, the situation and better development of the eyes, the branchial openings and the fins. It is very closely allied to *Homaloptera.*

Chopraia rupicola, sp. nov.

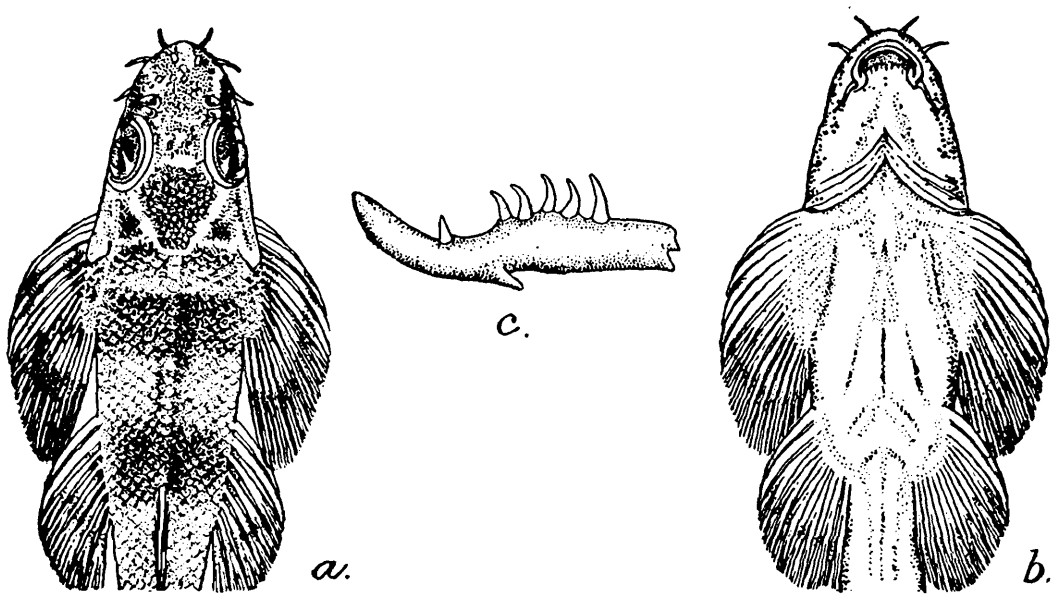
(Plate VIII, fig. 3.)

D. 2/7, A. 2/5, P. 5/11, V. 2/6, C. 27-28, L. 1. 42-45, L. tr. 12.

We have examined a large number of specimens of this species from various rocky streams in the Myitkyina District and can find no differences in the specimens from different streams. The largest specimen before us is 27 mm. long excluding the caudal fin and the species does not seem to grow beyond this size.

The dorsal profile of the fish is moderately arched, the maximum depth being near the origin of the dorsal ; from here the outline slopes gradually to the eyes and then almost abruptly and rapidly to the snout. Behind the dorsal fin the curve is not so marked and the back appears almost straight. The head is almost $\frac{1}{4}$ of the total length of the body excluding the caudal, and its maximum depth is about $\frac{1}{2}$ of its length. The snout is narrowly rounded and is less than $\frac{1}{2}$ the length of the head. The eyes are large, dorso-lateral in position, slightly smaller than the interorbital width and are contained about 4 times

in the length of the head. The mouth is semi-circular, provided with thick fleshy lips ; the upper being better developed and partly over-



TEXT-FIG. 6.—*Chopraia rupicola*, gen. et sp. nov.

(*a*) Dorsal view of anterior portion of body of type-specimen, ×5½.
(*b*) Ventral view of anterior portion of body of the same, ×5½.
(*c*) Pharyngeal bone with teeth.

hanging the lower. There are no tubercles either on the lips or the area behind the mouth. Of the six barbels, the anterior four are arranged in an arc just outside the upper lip ; the other two arise at the angles of the semi-circular mouth. The pectoral fins are provided with a distinct fleshy peduncle, and almost reach the ventrals. The ventrals are short, about half as long as the pectorals. The caudal fin is only slightly emarginate with the lower lobe slightly longer than the upper. The lateral line is distinct, deeply curved upwards above the pectoral fin, then running almost straight to the base of the caudal fin.

The ground colour is light yellow, with a large number of minute dots of a chocolate to black colour arranged in the form of five vertical bands along the sides. All the fins have 1-2 vertical black bands. In some specimens the bands run into one another, except in the mid-dorsal line, where the light and the dark bands alternate. In spirit specimens the sides of the fish appear of a dark chocolate colour and the abdominal portion is whitish to yellowish.

Distribution.—*C. rupicola* is fairly common in the various rocky and hilly streams of the Myitkyina District. In the collection before us the species is represented from the following streams in the Myitkyina District :—Small rocky streams roundabout Kamaing ; Sankha, a large hill-stream, midway between Kamaing and Mogaung ; Sattan *chaung*, a stream flowing inside and near the Paudawmu cave about 8 miles from Kamaing ; and small muddy streams along Kamaing Jade Mines Road, in the Myitkyina District.

Type-specimen.—No. F. 10379/1 in the collection of the Zoological Survey of India (Ind. Mus.), Calcutta, from small rocky streams roundabout Kamaing.

Measurements in millimetres.

Total length without caudal ..	27·0	25·0	25·0	25·0	24·0
Height of body	5·0	4·5	4·5	4·5	4·0
Length of head	7·0	6·5	6·75	6·75	6·5
Height of head	3·5	3·25	3·5	3·25	3·25
Width of head ..	4·75	4·75	4·75	4·75	4·5
Length of snout ..	3·0	3·0	3·0	2·75	2·75
Diameter of eye	1·75	1·75	1·75	1·75	1·75
Interorbital width	2·0	2·0	2·0	2·0	2·0
Height of dorsal fin	5·25	5·0	5·25	5·25	5·0
Length of pectoral fin ..	8·0	7·0	7·0	7·0	7·0
Length of ventral fin ..	3·75	3·25	3·5	3·75	3·25

Balitora Swainson emend. Hora.

1838. *Balitora*, Swainson, *Nat. Hist. Class., Fish. etc.*, I, p. 366.
1920. *Balitora*, Hora, *Rec. Ind. Mus.*, XIX, p. 196.

In the general account of the family we have discussed in detail our reasons for referring the genus *Balitora* to Swainson and Hora rather than to Gray who first suggested the name for the two Indian species.

In the collection from the Indawgyi area there is a single specimen of this genus which we refer to *Balitora brucei* Gray.

Balitora brucei Gray.

1832. *Balitora Brucei*, Gray, *Illustr. Ind. Zoology*, I, pl. lxxxviii, fig. 1.
1920. *Balitora brucei*, Hora, *Rec. Ind. Mus.*, XIX, p. 197.

Hora described this species in detail from old specimens from Cherrapunji and Lower Burma, and so was unable to make any remarks on the natural colouration of the species.

We have examined a fair number of fresh specimens from Tang-Siang stream, Cherrapunji, Assam, collected by Dr. S. L. Hora and a single specimen collected by Dr. B. N. Chopra from Sankha, a large hill-stream midway between Kamaing and Mogaung in the Myitkyina District.

The species is chocolate brown along the sides becoming much lighter on the back. On the dorsum there are a number of circular spots of a brown colour on a lighter background. In some cases these circles run into one another and appear as bands. The fins are light brown with a light yellowish margin. The caudal has two vertical dark bands on a dusky yellow background. The ventral surface is much lighter, being yellowish to white in colour. The lateral line, which is very prominent, appears much lighter in colour than the surrounding area.

The snout is covered by a large number of minute tubercles which extend on the upper surface of the head and on the operculum and even on the fleshy peduncles of the pectoral fins. There is also a prominent semi-circular row of such tubercles above the eye on each side. The tubercles are also present along the fin rays on the upper surface of the pectoral and ventral fins ; those on the former being better developed.

In the specimens examined by us there are 3 unbranched rays followed by 8 branched ones in the ventral fins. The number of scales along the lateral line is very variable. In the Burmese specimen there are about 78 scales, while in the Assamese the number does not usually exceed 70.

The only specimen of the species was, as noted above, collected from Sankha hill-stream. It is 36 mm. long.

Family COBITIDAE.

Lepidocephalichthys guntea (Ham. Buch.).

1822. *Cobitis guntea*, Hamilton Buchanan, *Fish. Ganges*, pp. 353, 394.
1868. *Lepidocephalichthys balgara*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 365.
1878. *Lepidocephalichthys guntea*, Day, *Fish. India*, p. 609, pl. clv, fig. 4.
1889. *Lepidocephalichthys guntea*, Day, *Faun. Brit. Ind., Fish.* I, p. 220, fig. 80.
1889. *Lepidocephalichthys guntea*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 339.
1913. *Lepidocephalichthys guntea*, Chaudhuri, *Rec. Ind. Mus.*, VIII, p. 247.
1921. *Lepidocephalichthys guntea*, Hora, *Rec. Ind. Mus.*, XXII, p. 196.

The species is very scarce in the streams and pools in the district under report and was not found in the Indawgyi Lake.

Only four specimens were collected, two each from a small muddy stream along the Kamaing Jade Mines Road, and small rocky streams roundabout Kamaing, in the Myitkyina District. They are 35 mm. long.

Lepidocephalichthys berdmorei (Blyth).

1860. *Acanthopsis Berdmorei*, Blyth, *Proc. Asiat. Soc. Bengal*, XXIX, p. 168.
1869. *Cobitis Berdmorei*, Day, *Proc. Zool. Soc., London*, p. 550.
1878. *Lepidocephalichthys Berdmorei*, Day, *Fish. India*, p. 610, pl. cliii, fig. 3.
1889. *Lepidocephalichthys berdmorei*, Day, *Faun. Brit. Ind., Fish.* I, p. 221.
1889. *Lepidocephalichthys Berdmorei*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 341.
1918. *Lepidocephalichthys berdmorei*, Annandale, *Rec. Ind. Mus.*, XIV, p. 43.
1921. *Lepidocephalichthys berdmorei*, Hora, *Rec. Ind. Mus.*, XXII, p. 196.

This is the commonest loach in all the muddy and rocky streams and pools in the district under report. It occurs also in the Indawgyi Lake.

Quite a large series of this species was collected from various streams and pools and a few specimens were also found in the lake. The stream and the lake forms are quite similar and do not differ in any particular. The largest specimen from the lake is 75 mm. long.

There appears to be a marked difference in the outlines of the body of *L. guntea* and *L. berdmorei*. In the former species the dorsal outline is more or less straight, while in the latter it is distinctly convex.

Acanthopthalmus pangia (Ham. Buch.).

(Plate VII, fig. 4.)

1822. *Cobitis pangia*, Hamilton Buchanan, *Fish. Ganges*, pp. 355, 394.
1823. *Acanthopthalmus javanicus*, van Hasselt, *Alg. Konst-en Letterbode*, II, p. 133 (no description).
1868. *Acanthopthalmus pangia*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 370.
1878. *Acanthopthalmus pangia*, Day, *Fish. India*, p. 610, pl. clv, fig. 5.
1889. *Acanthopthalmus pangia*, Day, *Faun. Brit. Ind., Fish.* I, p. 222.
1889. *Acanthopthalmus pangia*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 347.
1916. *Acanthopthalmus pangia*, Weber & Beaufort, *Fishes, Indo-Austral-Archipel.* III, p. 31.
1921. *Acanthopthalmus pangia*, Hora, *Rec. Ind. Mus.*, XXII, p. 197.

The colour of the specimens of this species is reddish-brown above and whitish below. The darker area is mottled with fine dots, and there

are about 20 dark brown vertical bands on the back alternating with lighter ones. At the base of the caudal fin there is generally a blackish vertical band ; another blackish bar runs transversely along the middle from the base to the tip of the caudal fin and a third slightly broader vertical band is present about its middle. The rays of the dorsal fin are all blackish but the other fins are diaphanous.

The largest specimen before us is 35 mm. long. On opening the abdomen egg-masses were found in some of the specimens, which shows that they are adults. Hamilton Buchanan states that his original specimens from East Bengal are " from three to four inches " long. According to Weber and Beaufort *A. pangia* grows to a size of " about 80 mm.", while Hora's largest adult female from Manipur, Assam, is 60 mm. in length.

A. pangia does not occur in the Indawgyi Lake. Quite a large number of specimens were, however, collected from Sankha, a large hill-stream, in the Myitkyina District.

Family CYPRINIDAE.

Garra lamta (Ham. Buch.).

1822. *Cyprinus (Garra) lamta,* Hamilton Buchanan, *Fish. Ganges,* pp. 343, 393.
1921. *Garra lamta,* Hora, *Rec. Ind. Mus.,* XXII, pp. 660-662, pl. xxiv, figs. 2, 2*a*.

In a recent revision of the species of the genus *Garra*, Hora (*op. cit.*) observed that *Garra lamta* " instead of having a wide range, as stated by a number of authors, is restricted to the eastern part of the Vindhya Range and the Nepal Terai. Buchanan procured some specimens from the Gorakhpur District, probably from the hill-streams." We have to record here its occurrence in Upper Burma also.

The colouration of the Burmese specimen agrees with Hora's description, except that it is slightly darker. Dr. Chopra, in the field notes, observes that in the living specimen " all the fins are tipped with light orange red."

Garra lamta is represented by a single specimen about 45 mm. long, which was collected from Sankha hill-stream in the Myitkyina District.

Labeo calbasu (Ham. Buch.).

1822. *Cyprinus calbasu,* Hamilton Buchanan, *Fish. Ganges,* pp. 297, 307, pl. ii, fig. 83.
1868. *Labeo calbasu,* Günther, *Cat. Fish. Brit. Mus.,* VII, p. 54.
1878. *Labeo calbasu,* Day, *Fish. India,* p. 536, pl. cxxvi, fig. 4.
1889. *Labeo calbasu,* Day, *Faun. Brit. Ind., Fish.* I, p. 259, fig. 93.
1889. *Labeo calbasu,* Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 265.
1911. *Labeo calbasu,* Chaudhuri, *Rec. Ind. Mus.,* VI, p. 23.
1921. *Labeo calbasu,* Hora, *Rec. Ind. Mus.,* XXII, p. 182.

The pectoral fin is almost of the same size as the ventral which does not reach the base of the anal ; the latter extends beyond the base of the caudal.

The living specimens, according to Dr. Chopra's field notes, had " back and sides dark slate grey tinged with greenish ; scales edged with a darker shade of the same. Belly dirty whitish. Lips light orange."

Two specimens of *L. calbasu* were collected from the western parts of the lake ; the larger of these is 260 mm. long.

Labeo gonius (Ham. Buch.).

1822. *Cyprinus gonius*, Hamilton Buchanan, *Fish. Ganges*, pp. 292, 387, pl. iv. fig. 82.
1842. *Rohita gonius*, Cuvier & Valenciennes, *Hist. Nat. Poisson*, XVI, p. 361.
1869. *Labeo gonius*, Day, *Proc. Zool. Soc. London*, p. 372.
1877. *Labeo gonius*, Day, *Fish. India*, p. 537, pl. cxxvii, fig. 1.
1889. *Labeo gonius*, Day, *Faun. Brit. Ind., Fish.* I, p. 261.
1889. *Labeo gonius*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 268.
1913. *Labeo gonius*, Chaudhuri, *Rec. Ind. Mus.*, VIII, p. 244.

The interorbital width appears to vary according to the size of the fish. In specimens from 100 to 108 mm. long it is about twice the diameter of the eye, but in larger specimens, say 300 to 400 mm. long, it is nearly $2\frac{1}{2}$ times. The length of the head is contained about 4 times and the depth of the body 3-$3\frac{1}{2}$ times in the total length of the body without the caudal. The lips, specially the upper one, are fringed.

The dorsal fin has 3 unbranched and 15 branched rays. In full-grown specimens the length of the pectoral is equal to that of the head behind the opening of the anterior nostrils, but in younger specimens it is shorter and does not exceed the length of the head behind the snout.

The scales are of a moderate size and arranged in 56-62 rows along the lateral line and 17 rows in a transverse series. Between the lateral line and the base of the ventral there are $7\frac{1}{2}$ scales.

The size, number and arrangement of scales in *L. gonius* seem to be very variable in different localities. Both Day and Vinciguerra have discussed this point at some length, but the question is far from settled and needs a thorough investigation in reference to all the species of the genus.

The living specimens, according to Dr. Chopra's field notes, had " back and head dark green. Longitudinal stripes of the same colour on the sides growing fainter ventrally. About 13 rows of stripes. Belly white. Fins infuscate."

L. gonius is fairly common in the lake. Four specimens were collected from the western parts of the lake, the largest of which is about 350 mm. long. It probably grows to a much larger size and is one of the chief edible fish in the Myitkyina District.

Labeo rohita (Ham. Buch.).

1822. *Cyprinus rohita*, Hamilton Buchanan, *Fish. Ganges*, pp. 301, 388, pl. xxxvi, fig. 85.
1842. *Labeo Dussumieri* & *L. fimbriatus*, Cuvier & Valenciennes, *Hist. Nat. Poisson*, XVI, pp. 350, 353.
1868. *Labeo rohita*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 55.
1877. *Labeo rohita*, Day, *Fish. India*, p. 538, pl. cxxvii, fig. 4.
1889. *Labeo rohita*, Day, *Faun. Brit. Ind., Fish.* I, p. 262.

The dorsal fin is situated nearer the tip of the snout than the base of the caudal fin. The pectoral is as long as the head behind the opening of the posterior nostrils. The ventral is slightly longer than the pectoral. The anal extends beyond the base of the caudal fin.

According to Dr. Chopra's field notes the living specimens of *L. rohita* had the " dorsal surface greyish black, sides silvery greyish.

Five or six rows of orange red spots on the sides. Belly white. Eyes blackish grey encircled with bright red. Fins dark greyish. The orange spots on the sides are very conspicuous."

L. rohita is fairly common in the lake and the rivers and is said to grow to a weight of about 25 to 30 lbs.

Two specimens were collected, one from the lake and the other from the rivers flowing into it. The lake example is about 300 mm. long and does not differ in any way from the river form.

Labeo angra (Ham. Buch.).

1822. *Cyprinus angra*, Hamilton Buchanan, *Fish. Ganges*, pp. 331, 391.
1868. *Labeo morala*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 56.
1877. *Labeo angra*, Day, *Fish. India*, p. 541, pl. cxxviii, fig. 2.
1889. *Labeo angra*, Day, *Faun. Brit. Ind., Fish.* I, p. 267.
1889. *Labeo angra*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 273.
1913. *Labeo angra*, Chaudhuri, *Rec. Ind. Mus.*, VIII, p. 249.
1921. *Labeo angra*, Hora, *Rec. Ind. Mus.*, XXII, p. 183.

The specimens from Myitkyina District agree with the typical Burmese examples of *L. angra*.

Two specimens were collected from the Namkawng *chaung* at Kamaing in the Myitkyina District, where it is very common. The specimens vary from 210 to 250 mm. in length.

According to Dr. Chopra's field notes the bottom of the stream from which the specimens were collected " is partly muddy and partly sandy, and the water is quite clear. The flow is not rapid."

Labeo boga (Ham. Buch.).

1822. *Cyprinus boga*, Hamilton Buchanan, *Fish. Ganges*, pp. 286, 386, pl. xxviii, fig. 80.
1877. *Labeo boga*, Day, *Fish. India*, p. 543, pl. cxxviii, fig. 3 & pl. cxxxi, fig. 4.
1889. *Labeo boga*, Day, *Faun. Brit. Ind., Fish.* I, p. 269.
1889. *Labeo boga*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 274.

The specimens of this species in the collection before us agree in all respects with the Burmese examples in the Indian Museum collection. There are large open pores on the snout. The scaly appendage of the ventral fin is long and well developed. A dark spot is present above the middle of the pectoral fin.

No specimens of *L. boga* were collected from the lake itself, but two were procured from the Namkawng *chaung* at Kamaing, in the Myitkyina District. The larger of the two is 200 mm. long.

Cirrhina mrigala (Ham. Buch.).

1822. *Cyprinus mrigala*, Hamilton Buchanan, *Fish. Ganges*, pp. 279, 386, pl. vi, fig. 79.
1842. *Cirrhina rubripinnis*, Cuvier & Valenciennes, *Nat. Hist. Poisson*, XVI, p. 288, pl. cccclviii.
1842. *Cirrhina mrigala*, Cuvier & Valenciennes, *Nat. Hist. Poisson*, XVI, p. 294.
1868. *Cirrhina mrigala*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 35.
1871. *Cirrhina mrigala*, Day, *Journ. Asiat. Soc. Bengal*, p.135, pl. ix, figs. 6*a*, 6*b*.
1877. *Cirrhina mrigala*, Day, *Fish. India*, p. 547, pl. cxxix, fig. 4.
1889. *Cirrhina mrigala*, Day, *Faun. Brit. Ind., Fish.* I, p. 278.
1889. *Cirrhina mrigala*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 261.
1910. *Cirrhina mrigala*, Jenkins, *Rec. Ind. Mus.*, V, p. 138.
1911. *Cirrhina mrigala*, Chaudhuri, *Rec. Ind. Mus.*, VI, p. 24.

Small pores are present on the snout. The pectoral fin is nearly as long as the head including the snout. The ventral is as long as the pec-

toral. A pair of rostral barbels is present; they are about half the width of the orbit. These barbels, which were noticed by Hamilton Buchanan, are not mentioned in Day's description of the species but are shown in his figure.

C. mrigala seems to be rare in the lake itself, but is very common in the Indaw River and Namkawng *chaung* at Kamaing in the Myitkyina District. It is said to grow to a weight of about 20 lbs.

One specimen 250 mm. in length was obtained from the Namkawng *chaung*.

Catla catla (Ham. Buch.).

1822. *Cyprinus catla*, Hamilton Buchanan, *Fish. Ganges*, pp. 287, 318, pl. xiii, fig. 81.
1844. *Catla Buchanani*, Cuvier & Valenciennes, *Nat. Hist. Poisson*, XVII, p. 411, pl. 515.
1868. *Catla Buchanani*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 14.
1878. *Catla Buchanani*, Day, *Fish. India*, p. 553, pl. cxxxiv, fig. 5.
1889. *Catla buchanani*, Day, *Faun. Brit. Ind., Fish.* I, p. 287, fig. 99.
1889. *Catla Buchanani*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 260.
1916. *Catla catla*, Sundara Raj, *Rec. Ind. Mus.*, XII, p. 254.
1923. *Catla catla*, Hora, *Journ. Nat. Hist. Soc. Siam*, VI (2), p. 158.

The pectoral fin does not reach the base of the ventral, nor does the ventral extend to the anal. All the fins are darkish.

C. catla is a very common fish in the northern area of the lake, and grows to about 15 to 20 lbs. in weight. The local fishermen consider it to be the " best " of all the edible fishes of the lake.

One specimen 265 mm. long was obtained from the lake.

Amblypharyngodon atkinsonii (Blyth).

1860. *Mola Atkinsonii*, Blyth, *Journ. Asiat. Soc. Bengal*, XXIX, p. 164.
1878. *Amblypharyngodon Atkinsonii*, Day, *Fish. India*, p. 555, pl. cxxxiv, fig. 4.
1889. *Amblypharyngodon atkinsonii*, Day, *Faun. Brit. Ind., Fish.* I, p. 290.
1889. *Amblypharyngodon Atkinsonii*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 302.

The lower jaw has a slightly elevated, knob-like structure in the middle, and there is a corresponding emargination in the upper jaw for this projection of the lower jaw.

The opercular bones are silvery; dorsal, caudal and anal fins are tipped with black; and generally a greyish transverse band is present on the sides of the body.

A. atkinsonii was not found in the lake. It is represented in the collection by six specimens which were collected from the Namkawng *chaung* at Kamaing, in the Myitkyina District. They are all about 100 mm. long.

Barbus chagunio (Ham. Buch.).

1822. *Cyprinus chagunio*, Hamilton Buchanan, *Fish. Ganges*, pp. 295, 387.
1839. *Barbus chagunio*, McClelland, *Asiat. Research.* XIX (2), pp. 272, 341, pl. ix, fig. 4.
1868. *Barbus spilopholis* & *B. Beavani*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 96.
1878. *Barbus chagunio*, Day, *Fish. India*, p. 559, pl. cxxxvi, fig. 1 & pl. cxl, fig. 2.
1889. *Barbus chagunio*, Day, *Faun. Brit. Ind., Fish.* I, p. 299.
1913. *Barbus chagunio*, Hora, *Rec. Ind. Mus.*, VII, pp. 250, 251.
1928. *Barbus chagunio*, Hora, *Journ. Asiat. Soc. Bengal*, XXIII, pp, 415-417.

As none of the published description of *B. chagunio* are complete we give below a short description. Besides the two well preserved speci-

mens from Upper Burma we have examined a large series of this species preserved in the collections of the Indian Museum.

D. 5/8, A. 3/5, P. 15, V. 2/8, C. 19, L. 1.46-47, L. tr. 14.

The head is considerably compressed, its width in the middle being equal to half its own length. The eyes are situated almost in the middle of the head and their diameter is about 4 times in the length of the head. They are situated 1½-2 diameters from the tip of the snout and the inter-orbital distance is slightly longer than their diameter.

The dorsal fin is inserted slightly in advance of the ventral and is nearer the tip of the snout than the base of the caudal. The pectoral is as long as the length of the head behind the opening of the nostrils or is slightly longer, and is separated from the base of the ventral by a distance which equals almost half its own length. The ventral is considerably shorter than the pectoral, and its first unbranched ray is very small and firmly attached to the second one. The anal fin originates midway between the ventrals and the base of the caudal. Its longest branched ray is as long as the head, excluding the snout. The vertical fins are scaly at their bases and the ventrals have well developed scaly appendants.

The maxillary and the rostral barbels are almost equal in length ; only the latter are more slender.

The colouration of the specimens in spirit is silvery glossed with gold and, as Day observes, the scales towards the back are " darkest at their bases." The distal portion of the dorsal fin is black. There is a blackish band just behind the operculum which passes from the base of the pectoral to the nape.

Distribution.—B. chagunio has been recorded from " Orissa, throughout Bengal, Assam, Bihar and the N. W. Provinces to the Punjab," but has not so far been found in " Sind, the Deccan, Western Coast, Mysore, Madras or Burma."

This species is fairly common in the Namkawng *chaung* at Kamaing in the Myitkyina District, though only two specimens were brought back by Dr. Chopra.

Remarks.—In his recent note Hora has discussed at length the Günther-Day controversy about the specific validity of Hamilton Buchanan's *Cyprinus chagunio* and concludes that in Hamilton Buchanan's manuscript notes the number of rays in the dorsal fin is given as " D. 11 " and this should be the distinguishing factor in the identity of his species *B. chagunio.*

We have carefully examined a large series of specimens from various areas and prepared the skeleton of the dorsal fin of one specimen, and find that the number of dorsal fin rays is not 11, as stated by Hamilton Buchanan, but that there are 13 definite rays, of which 5 are spinous and 8 branched. The first two spinous rays are very small and embedded in the skin and are, therefore, likely to be overlooked when the fish is not carefully examined.

Measurements in millimetres.

Total length without caudal ..	210·0	195·0
Length of head	48·0	45·0
Height of body	65·0	60·0
Length of snout..	18·0	17·0
Diameter of eye..	12·0	11·0
Interorbital width	13·0	13·0
Length of caudal peduncle ..	35·0	35·0
Least height of caudal peduncle	24·0	22·0
Length of pectoral fin	38·0	35·0
Length of ventral fin	30·0	29·0

Barbus sewelli, sp. nov.

(Plate IX, figs. 1, 1*a*, 1*b*).

D. 4/8, A. 3/6, P. 16, V. 9, C. 24-26, L. l. 32-36, L. tr. 10 ($5\frac{1}{2}+4\frac{1}{2}$).

The length of the head is contained from 3·4 to 3·7 times and the depth of the body from 2·3 to 2·5 times in the total length of the body without the caudal. The diameter of the eye is contained from 3·4 to 3·8 times in the length of the head. The snout is slightly longer than the diameter of the eye and is contained about 1·3 times in the interorbital width.

The dorsal fin commences midway between the tip of the snout and the base of the caudal fin. The last dorsal spine is fairly strong and is denticulated in its distal posterior half. The pectorals are slightly longer than the ventrals and are separated from the base of the latter by a distance equalling $\frac{1}{3}$ of their length. The ventrals are inserted just below the origin of the dorsal ; they do not extend to the base of the anal. The caudal fin is deeply emarginate. The dorsal, anal and the caudal fins have scales at their bases.

The scales are large. There are 10 or 11 predorsal scales. The lateral line is complete.

There are two pairs of barbels. The maxillary barbels are situated at the angles of the mouth and are almost equal to or slightly longer than the diameter of the eye. The rostrals originate midway between the angles of the mouth and the tip of the snout. They are nearly $\frac{2}{3}$ of the length of the maxillary barbels, and for the greater part of their length are covered up by the fleshy labial fold. The occipital region is more or less flat and the snout is moderately pointed.

In the field notes, the colour of fresh specimens was noted as " back and head olivaceous green colour extending to sides. Belly and sides silvery white. 8 longitudinal rows of black spots, from back of the operculum to the base of the caudal. A large black blotch at the posterior end of the operculum. Orbit gold on sides, black above. An olive coloured streak in front of the orange spot on the operculum. All fins are tipped with organge red, the coloured area in the case of caudal and anal being considerably more than half of the fin."

In the spirit specimens the upper half of the body is pinkish-blue in colour and the ventral half is yellowish-white. There are 8 rows of prominent black spots on the sides, each spot being situated at the free portion of the successive scales. These spots are regularly arranged

in longitudinal series which run more or less parallel to one another from behind the operculum to the base of the caudal fin. There is a deep black band just behind the operculum from its upper angle to the base of the pectoral fins. An indistinct blackish blotch is also present in the middle of the caudal peduncle. The dorsal and the pectoral fins are dusky, and the ventrals and the anal are yellowish-white. The outer marginal rays of the caudal are more or less blackish.

B. sewelli is fairly common in the Indawgyi Lake, especially in the south-western area. It is said to grow to a moderate size, usually not exceeding 8-9 inches.

Seven specimens were collected from the southern area of the lake and along its western shore near Lonton village and two from the northern end near Nyaungbin village, in the Myitkyina District. The largest example is 110 mm. long excluding the caudal.

Type-specimen.—No. F.10910/1 in the collection of the Zoological Survey of India (*Ind. Mus.*), Calcutta.

Measurements in Millimetres.

Total length without caudal	108·0	99·0	90·0
Length of head	29·0	27·0	24·0
Height of body	42·5	42·0	35·0
Length of snout	9·0	8·0	7·5
Diameter of eye	8·0	7·0	7·0
Interorbital width	12·0	11·0	10·0
Length of caudal peduncle	22·0	21·0	18·0
Least height of caudal peduncle ..	21·0	19·0	16·0
Length of pectoral fin	22·0	20·0	18·3
Length of ventral fin	15·0	14·0	13·0

Barbus myitkyinae, sp. nov.

(Plate IX, figs. 2, 2*a*, 2*b*.)

D. 4/8, A. 3/6, P. 15, V. 9, C. 26-28, L. l. 32-34, L. tr. 9 ($5\frac{1}{2}+3\frac{1}{2}$).

The length of the head is contained from 4·1 to 4·5 times and the depth of the body from 2·7 to 3·1 times in the total length of the body without the caudal. The diameter of the eye is almost equal to the length of the snout and is contained from 3·2 to 3·8 times in the length of the head. The length of the snout is equal to or slightly longer than the interorbital width.

The dorsal fin is inserted midway between the tip of the snout and the base of the caudal fin and is emarginate at the free margin. The last undivided dorsal ray is very strong and denticulated internally ; it is as long as the head up to or slightly beyond the opening of the nostrils. The pectorals are almost as long as the ventrals and do not extend to the base of the latter. The ventrals commence just below the dorsal and are separated from the base of the anal by a distance equalling about half their own length. The anal fin is rather short. The caudal is deeply forked. The dorsal, the anal and the caudal are enclosed at their bases in scaly sheaths.

The scales are large. There are 11 or 12 scales before the dorsal fin. The lateral line is complete.

There are two pairs of barbels. The maxillary barbels are shorter than the diameter of the eye, while the rostrals are about half as long. The interorbital portion is flat and the snout is obtusely pointed.

In spirit specimens, the body in the upper half is greenish-black, while the portion below the lateral line and the opercular region are silvery. There is a black vertical band just behind the gill-opening. The free margins of the scales are bordered with minute blackish dots. All the fins are dirty whitish.

B. myitkyinae is quite common in the Indawgyi Lake and in streams in the adjacent area. In the lake it is said to grow to about 4 lbs. in weight.

A large series of specimens of this fish was collected from different parts of the lake. The largest example from the western area of the lake is 270 mm. in length excluding the caudal.

Type-specimen.—No. F. 10912/1 in the collection of the Zoological Survey of India (*Ind. Mus.*), Calcutta.

Remarks.—*B. myitkyinae* is characterised by the number of transverse rows of scales of which there are $5\frac{1}{2}$ above the lateral line, by its deep and somewhat compressed body, and a comparatively small head and big eyes for a fish of this size. Of the known species of the genus *Barbus* from Burma it appears to be closely allied to *B. oatesii* Boulenger[1], but the points mentioned above distinguish it without any difficulty.

Measurements in millimetres.

Total length without caudal	270·0	135·0	127·0
Length of head	60·0	32·5	30·0
Height of body	85·0	49·0	46·0
Length of snout ..	16·0	10·0	9·0
Diameter of eye	15·5	10·0	9·0
Interorbital width	15·5	10·0	8·5
Length of caudal peduncle ..	42·0	26·0	25·0
Least height of caudal peduncle	31·0	18·0	16·0
Length of pectoral fin	47·0	28·0	26·0
Length of ventral fin	48·0	28·0	25·5

Barbus sarana caudimarginatus Blyth.

1860. *Barbus caudimarginatus*, Blyth, *Journ. Asiat. Soc. Bengal*, XXIX, p. 157.
1918. *Barbus sarana caudimarginatus*, Annandale, *Rec. Ind. Mus.*, XIV, p. 46, pl. iii, fig. 3.
1921. *Barbus sarana caudimarginatus*, Hora, *Rec. Ind. Mus.*, XXII, p. 183.

Annandale has rightly remarked that " this form is no more than a Burmese race of the common Indian *B. sarana* (Ham. Buch.) differing only in colouration and in possessing more variable number of lateral scales."

In *B. sarana caudimarginatus* there are from 28 to 30 scales along the lateral line, whereas in the typical *B. sarana* the number is generally 32 to 34. The number of scales between the lateral line and the base of the ventral fin is always $3\frac{1}{2}$ to $4\frac{1}{2}$ in the typical Indian form.

[1] Boulenger, G. A.,—*Ann. Mag. Nat. Hist.* (6) XII, p. 201 (1893).

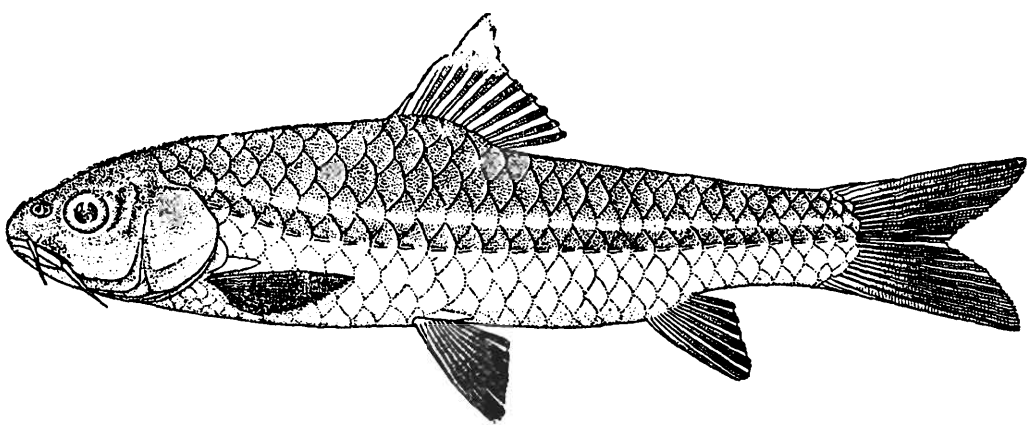
B. sarana caudimarginatus is fairly common in the Indawgyi Lake, especially in the shallow waters in the southern and western areas. It is said to grow to about one foot in length.

A large number of specimens of this species were collected by Dr. Chopra and his party from the areas mentioned above. The largest of these specimens is 130 mm. long.

Barbus hexastichus McClelland.

1839. *Barbus hexastichus*, McClelland, *Asiat. Research.*, XIX (2), pp. 269, 333, pl. xxxix, fig. 2.
1868. *Barbus hexastichus*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 129.
1878. *Barbus hexastichus*, Day, *Fish. India*, p. 565, pl. cxxxvi, fig. 4.
1889 *Barbus hexastichus*, Day, *Faun. Brit. Ind., Fish.* I, p. 308.
1889. *Barbus hexastichus*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 293.
1913. *Barbus hexastichus*, Chaudhuri, *Rec. Ind. Mus.*, VII, p. 249.
1921. *Barbus hexastichus*, Hora, *Rec. Ind. Mus.*, XXII, p. 186.
1924. *Barbus hexastichus*, Hora, *Rec. Ind. Mus.*, XXVI, p. 27.

The maxillary barbels are longer than the rostrals and are about $1\frac{1}{2}$ times the diameter of the eyes. The lips are well developed and more



Text-fig. 7.—Lateral view of *Barbus hexastichus* McClell. from Myitkyina District, $\times \frac{2}{5}$

or less fleshy. The interorbital width is about twice the diameter of the eye in full-grown specimens. The breadth of the head is almost equal to its length behind the middle of the orbit. The depth of the body is equal to the length of the head or even slightly more.

The dorsal fin is inserted just above the ventrals in full-grown specimens, but in younger individuals it is situated slightly in front ; it consists of 4 spines and 9 branched rays. The pectoral fin is as long as the head behind the opening of the nostrils or even slightly longer ; it does not extend up to the ventrals.

The scales for a fish of this size are particularly large. There are 25 scales in a longitudinal row, 6 in each transverse row and $2\frac{1}{2}$ rows between the lateral line and the base of the ventrals. There are 9 to 10 predorsal scales. The caudal peduncle is nearly $1\frac{1}{2}$ times longer than high.

The colour of the specimens in spirit is blackish in the upper half of the body, while the lower half is silvery white. The rostral barbels and the fins are dusky.

According to Dr. Chopra's field notes, *B. hexastichus* is " very common in deep pools in front of the cave mouth (Paudawmu cave) and just inside the entrance. Lower half light pinkish when living. Scales in the upper

half dull grey with prominent patches of yellowish red ; in lower half silvery white edged with light pink. Lips reddish. Anal fin pinkish, others, especially the pelvic and the caudal, edged with pink. Eyes sky bluish. Grows to about 25 to 30 lbs. in weight. Much commoner in the rivers than in the lake."

In the collection there are three specimens, two large ones from Kamaing and a medium sized one from the Sattan *chaung* inside and near Paudawmu cave, about 8 miles from Kamaing in the Myitkyina District. The largest specimen is 400 mm. long.

Barbus chola (Ham. Buch.).

1822. *Cyprinus chola,* Hamilton Buchanan, *Fish. Ganges,* pp. 312, 389.
1868. *Barbus chola,* Günther, *Cat. Fish. Brit. Mus.,* VII, p.143.
1878 *Barbus chola,* Day, *Fish. India,* p. 571, pl. cxlii, fig. 4.
1889. *Barbus chola,* Day, *Faun. Brit. Ind., Fish.* I, p. 317.
1889. *Barbus chola,* Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 294.
1907. *Barbus chola,* Annandale, *Rec. Ind. Mus.,* I, p. 41.
1911. *Barbus chola,* Chaudhuri, *Rec. Ind. Mus.,* VI, p. 15.
1913. *Barbus chola,* Chaudhuri, *Rec. Ind. Mus.,* VIII, p. 249.

The deep black precaudal spot and the black mark behind the gill-opening, which were considered by Day to be characteristics of individuals of the species from Bengal and Assam only, are present in all the specimens before us. In specimens of moderate size there is generally a narrow blackish band across the middle of the dorsal fin, but in the younger specimens it is represented by only a black blotch in the anterior part of the fin. There are 25-26 scales in a longitudinal row.

B. chola occurs in the lake in very large numbers and appears to be the commonest of all the lake-dwelling species of the genus *Barbus.*

A large series of specimens of the species were collected by Dr. Chopra and his party from different parts of the lake and various streams in that part of the country.

Barbus burmanicus Day.

1878. *Barbus burmanicus,* Day, *Fish. India,* p. 572, pl. cxli, fig. 4.
1889. *Barbus burmanicus,* Day, *Faun. Brit. Ind., Fish.* I, p. 318.
1889. *Barbus burmanicus,* Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 295.

Only a single young specimen of *B. burmanicus* was obtained from a shallow and sluggish hill-stream at Hopin, in the Myitkyina District. It is 40 mm. long.

Barbus phutunio (Ham. Buch.).

1822. *Cyprinus phutunio,* Hamilton Buchanan, *Fish. Ganges,* pp. 319, 390.
1868. *Barbus phutunio,* Günther, *Cat. Fish. Brit. Mus.,* VII, p. 154.
1869. *Barbus phutunio,* Day, *Proc. Zool. Soc. London,* p. 375.
1878. *Barbus phutunio,* Day, *Fish. India,* p. 578, pl. cxlv, fig. 4.
1889. *Barbus phutunio,* Day, *Faun. Brit. Ind., Fish.* I, p. 327.
1912. *Barbus phutunio,* Sewell & Chaudhuri, *Ind. Fish of Prov. Util. etc.,* p. 15, fig. 8.
1921. *Barbus phutunio,* Hora, *Rec. Ind. Mus.,* XXII, p. 186.

The species occurs in great abundance in the lake and in various small muddy and rocky streams in the Myitkyina District.

A large series of *B. phutunio* was collected from different parts of the lake and from various streams in the Myitkyina District. The average length of the specimens is about 30 mm.

Barbus sophore (Ham. Buch.).

1822. *Cyprinus sophore*, Hamilton Buchanan, *Fish. Ganges*, pp. 310, 389, pl. xix, fig. 86.
1839. *Cyprinus sophore*, McClelland, *Asiat. Research.*, XIX (2), pp. 285, 382.
1842. *Cyprinus sophore*, Cuvier & Valenciennes, *Hist. Nat. Poisson*, XVI, p. 388.
1844. *Leuciscus stigma, id., ibid.*, XVII, p. 93, pl. cccclxxxix.
1844. *Leuciscus Duvaucelii, id., ibid.*, XVII, p. 95, pl. ccccxci.
1844. *Leuciscus sulphureus, id., ibid.*, XVII, p. 96.
1849. *Systomus sophore*, Jerdon, *Madr. Journ. Lit. Sc.*, XV, p. 316.
1867. *Puntius modestus*, Kner, *Novara Fische.*, p. 348, pl. xv, fig. 3.
1868. *Puntius stigma*, Day, *Proc. Zool. Soc. London*, p. 198.
1868. *Barbus sophore*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 152.
1869. *Barbus (Puntius) stigma*, Day, *Proc. Zool. Soc. London*, p. 375.
1878. *Barbus stigma*, Day, *Fish. India*, p. 579, pl. cxli, fig. 5.
1889. *Barbus stigma*, Day, *Faun. Brit. Ind., Fish.* I, p. 329.
1889. *Barbus stigma*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 300.
1911. *Barbus stigma*, Chaudhuri, *Rec. Ind. Mus.*, VI, p. 15.
1916. *Barbus sophore*, Chaudhuri, *Mem. Ind. Mus.*, V. p. 436.
1916. *Barbus sophore*, Sundara Raj, *Rec. Ind. Mus.*, XII, p. 256.

The characteristic black caudal spot, as also the dark mark across the base of the middle of the dorsal fin, are present in all the specimens ; but the coloured lateral band is often absent. Barbels are absent.

Ten specimens of *B. sophore* were obtained from the shallower parts of the lake along the western shore, and one from a small muddy stream along the Kamaing Jade Mines Road at Kamaing in the Myitkyina District. The largest of these specimens is 39 mm. long.

Esomus[1] altus (Blyth).

1860. *Nuria alta*, Blyth, *Journ. Asiat. Soc. Bengal*, XXIX, p. 162.
1868. *Nuria alta*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 201.
1869. *Nuria alta*, Day, *Proc. Zool. Soc. London*, p. 558.
1878. *Nuria danrica* var. *alta*, Day, *Fish. India*, p. 583, pl. cxlv, fig. 8.
1885. *Nuria danrica*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) II, p. 301.
1889. *Nuria danrica* var. *alta*, Day, *Faun. Brit. Ind., Fish.* I, p. 334, fig. 106.
1889. *Nuria danrica*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 301.
1910. *Nuria danrica* var. *alta*, Jenkins, *Rec. Ind. Mus.*, V, p. 138.
1923. *Esomus altus*, Ahl, *Mitt. Zool. Mus. Berlin*, XI, p. 39.
1928. *Esomus altus* Hora & Mukerji, *Rec. Ind. Mus.*, XXX, p. 42, figs. 1*a*, 1*b*, 1*c*.

In the recent revision of the genus *Esomus* by Hora and Mukerji this species was dealt with in detail. It is a strictly Burmese species and has so far been reported from Tenasserim, Rangoon, Moulmein, Pegu, Prome and Mandalay.

Two specimens of *E. altus* were collected from Chaungwa in the Myitkyina District ; their average length is 70 mm.

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[1] Attention may be drawn here to Jordan (*Classification of Fishes*, III, (2), p. 144, 1923) who, on the authority of Nichols, considers *Pogonocharax* Regan (*Ann. Mag. Nat. Hist.*, (7) XIX , p. 261, 1907) to be only a synonym of *Esomus* Swainson.

Rasbora daniconius (Ham. Buch.).

1822. *Cyprinus daniconius & anjana*, Hamilton Buchanan, *Fish. Ganges*, pp. 327, 329, 391, pl. xv, fig. 89.
1864. *Rasbora dandia*, Bleeker, *Cyp. & Cobit. Ceylon*, p. 18, pl. i, fig. 3.
1868. *Rasbora daniconius*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 194.
1878. *Rasbora daniconius*, Day, *Fish. India*, p. 584, pl. cxlvi, fig. 2.
1889. *Rasbora daniconius*, Day, *Faun. Brit. Ind., Fish.* I, p. 336.
1910. *Rasbora daniconius*, Jenkins, *Rec. Ind. Mus.*, V, p. 138.
1911. *Rasbora daniconius*, Chaudhuri, *Rec. Ind. Mus.*, VI, p. 18.
1919. *Rasbora daniconius*, Annandale, *Rec. Ind. Mus.*, XVI, p. 125.
1921. *Rasbora daniconius*, Hora, *Rec. Ind. Mus.*, XXII, p. 743.

The number of predorsal scales is variable. In specimens from the Indawgyi Lake and some parts of Assam and Burma there are 12 rows in front of the dorsal fin, while in individuals from other parts of the same areas there are 14 rows. We can, however, find no other differences to separate the two forms.

R. daniconius is common all over the lake and in the adjoining streams. A very large series was collected from different parts of the lake and from the various muddy and rocky streams and pools in the Myitkyina District. The average length of the specimens is 40 mm.

Rasbora rasbora (Ham. Buch.).

1822. *Cyprinus rasbora*, Hamilton Buchanan, *Fish. Ganges*, pp. 329, 391, pl. ii, fig. 9.
1868. *Rasbora Buchanani*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 196.
1878. *Rasbora Buchanani*, Day, *Fish. India*, p. 584, pl. cxlv, fig. 10.
1889. *Rasbora buchanani*, Day, *Faun. Brit. Ind., Fish.* I, p. 337, fig. 107.
1913. *Rasbora rasbora*, Chaudhuri, *Rec. Ind. Mus.*, VIII, p. 252.
1916. *Rasbora rasbora*, Sundara Raj, *Rec. Ind. Mus.*, XII, p. 259.
1921. *Rasbora rasbora*, Hora, *Rec. Ind. Mus.*, XXII, pp. 187, 744.
1923. *Rasbora rasbora*, Hora, *Journ. Nat. Hist. Soc. Siam*, VI (2), p. 152.

The caudal fin is distinctly tipped with black as is the case with all Burmese examples.

R. rasbora is more or less common in the lake, as also in the pools and streams roundabout, but it appears to be less common than *R. daniconius*.

Four specimens were obtained from the western area of the lake and three from the streams at Kamaing in the Myitkyina District. The largest specimen before us measures 80 mm. in length.

Rohtee alfrediana (Cuv. & Val.).

1844. *Leuciscus Duvaucelii*, Cuvier & Valenciennes, *Hist. Nat. Poisson*, XVII, p. 77, (*nec* p. 95).
1844. *Leuciscus Alfredianus*, Cuvier & Valenciennes, *Hist. Nat. Poisson*, XVII, p. 78, pl. cccc LXXXVIII.
1860. *Osteobrama cotis*, Blyth, *Journ. Asiat. Soc. Bengal*, XXIX, p. 158.
1868. *Osteobrama Alfrediana*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 324.
1878. *Rohtee cotio* var. *Alfrediana* (in part), Day, *Fish. India*, p. 587, pl. cxlvii, fig. 2.
1889. *Rohtee cotio* var. *alfrediana*, Day, *Faun. Brit. Ind., Fish.* I, p. 341, fig. 109.
1889. *Osteobrama Alfrediana*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 316.
1921. *Rohtee alfrediana*, Hora, *Rec. Ind. Mus.*, XXII, p. 188.

There are 18—22 predorsal scales. The numbers of scales along the lateral line vary from 48 to 52, and there are $9\frac{1}{2}$ to $10\frac{1}{2}$ rows of scales between the lateral line and the base of the ventral. There are no barbels.

The spirit specimens of the species are bright silvery in colour, the portion above the lateral line being olivaceous. A silvery lateral band is present. A black crescentic band is usually present just behind the gill cover. A whitish rod-shaped mark on the occiput is characteristic of the species.

According to the field notes of Dr. Chopra *R. alfrediana* is " extremely abundant in the southern part of the lake and in the Nanyinhka[1] stream. It is considered as one of the best edible fish."

A large series of this species was collected from different areas of the lake ; the largest specimen is 115 mm. long.

Rohtee belangeri (Cuv. & Val.).

1844. *Leuciscus Belangeri,* Cuvier & Valenciennes, *Hist. Nat. Poisson,* XVII, p. 99.
1868. *Smiliogaster Belangeri,* Günther, *Cat. Fish. Brit. Mus.,* VII, p. 328.
1878. *Rohtee Belangeri,* Day, *Fish. India,* p. 587, pl. cxlvii, fig. 4.
1889. *Rohtee belangeri,* Day, *Faun. Brit. Ind., Fish.* I, p. 342.
1889. *Osteobrama Belangeri,* Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 318.
1921. *Rohtee belangeri,* Hora, *Rec. Ind. Mus.,* XXII, p. 188, fig. 2*a*.

We have examined a large series of *R. belangeri* from Rangoon, Pegu, Prome and Mandalay in Burma, and a few specimens from Manipur in Assam, and find that Day's description is not accurate in all respects. We, therefore, give below a summary of our observations.

The length of the head is contained from 4 to 4½ times and the depth of the body about 2⅓ times in the length of the body without the caudal. The diameter of the eye 3½ to 4½ in the length of the head, 1 to 1½ diameters from the tip of the snout and 1½ to 2 diameters apart.

The dorsal fin is inserted just above the middle of the ventral and lies midway between the tip of the snout and the base of the caudal fin. The pectoral is as long as the length of the head up to the opening of the nostrils.

The scales are small and vary greatly in number and arrangement. There are about 65 to 78 scales along the lateral line, 14½ to 20½ between the lateral line and the base of the ventrals and 20 to 35 before the dorsal fin.

Hora (*op. cit.*) has rightly pointed out that the " species is distinguished from the rest included in the genus *Rohtee* by the fact that the whole of the abdominal edge is sharp whereas in others it is sharp behind the ventrals but flat and rounded in front of them."

In the spirit specimens the back is dark greyish, while the belly is silvery glossed with gold. A black band from the shoulder to the base of the pectoral fin is generally present. The scales have dark spots at their free margins. The orbit is orange-coloured.

In the Indawgyi Lake *R. belangeri* is not so common as *R. alfrediana* and *R. feae ;* only a single specimen 240 mm. in length was obtained from the western part of the lake.

[1] Nanyinhka is a fairly big stream that feeds the south end of the lake.

Rohtee feae (Vincig.).

1889. *Osteobrama Feae,* Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 311, pl. x, fig 10.
1921. *Rohtee feae,* Hora, *Rec. Ind. Mus.*, XXII, p. 189, fig. 2*b*.

The specimens before us agree in all details with Vinciguerra's description except that there are 12 rays, 4 osseous and 8 branched, in the dorsal fin, and not 11 as mentioned by Vinciguerra.

In the Indawgyi Lake *R. feae* is not so common as *R. alfrediana*. In certain parts of the lake, specially in the south-western area, the fishermen do not differentiate between the two species and they are known as *Nga-hpa-ma*. The fishermen of Chaungwa (a large fishing village at the junction of the Indaw and the Nam Ting rivers), however, distinguish *R. feae* from *R. alfrediana* and call them *Nga-hpa-ma* and *Nga-salam-bya* respectively.

Three specimens of this species were procured, two from the lake and one from Namkawng *chaung* at Kamaing in the Myitkyina District. The specimen from Kamaing is 165 mm. long.

Distribution.—R. feae has so far been recorded from Mandalay, Bhamo and Tabung, in Burma.

Barilius guttatus Day.

1869. *Opsarius guttatus,* Day, *Proc. Zool. Soc. London,* p. 620.
1878. *Barilius guttatus,* Day, *Fish. India,* p. 593, pl. cxlix, fig. 3.
1889. *Barilius guttatus,* Day, *Faun. Brit. Ind., Fish.* I, p. 351.
1889. *Barilius guttatus,* Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 310.

The interorbital width is slightly smaller than the length of the snout which is about $1\frac{1}{2}$ times the diameter of the eye. There are no barbels. The pectoral fin is nearly as long as the head without the snout.

No specimens of *B. guttatus* were found in the lake. The only two specimens in the collection were obtained from the Kamaing fish market. The larger of the two examples is 162 mm. in length.

Danio aequipinnatus (McClell.).

1839. *Perilampus aequipinnatus,* McClelland, *Asiat. Research.*, XIX (2), p. 393, pl. lx, fig. 1.
1853. *Leuciscus aequipinnatus,* Bleeker, *Verh. Bat. Gen.*, XXV, p. 66.
1858. *Leuciscus lineolatus,* Blyth, *Journ. Asiat. Soc. Bengal,* XXVII, p. 219.
1868. *Danio lineolatus,* Günther, *Cat. Fish. Brit. Mus.*, VII, p. 282.
1878. *Danio aequipinnatus,* Day, *Fish. India,* p. 596, pl. cl, fig. 5.
1889. *Danio aequipinnatus,* Day, *Faun. Brit. Ind., Fish.* I, p. 356, fig. 111.
1889. *Danio aequipinnatus,* Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 304.
1913. *Danio aequipinnatus,* Chaudhuri, *Rec. Ind. Mus.*, VIII, p. 252.
1918. *Danio aequipinnatus,* Annandale, *Rec. Ind. Mus.*, XIV, pp. 35, 68, 211.
1919. *Danio aequipinnatus,* Chaudhuri, *Rec. Ind. Mus.*, XVI, p. 283.
1921. *Danio aequipinnatus,* Hora, *Rec. Ind. Mus.*, XXII, p. 193.
1923. *Danio aequipinnatus,* Hora, *Rec. Ind. Mus.*, XXV, p. 582.
1923. *Danio aequipinnatus,* Hora, *Journ. Nat. Hist. Soc. Siam,* VI (2), p. 153.
1924. *Danio aequipinnatus,* Hora, *Rec. Ind. Mus.*, XXVI, p. 28.
1924. *Danio aequipinnatus,* Myers, *Amer. Mus. Novit. New York* (150), p. 3.

In colour the specimens agree in all details with that of the specimens described by Hora from various streams in Manipur, Assam.

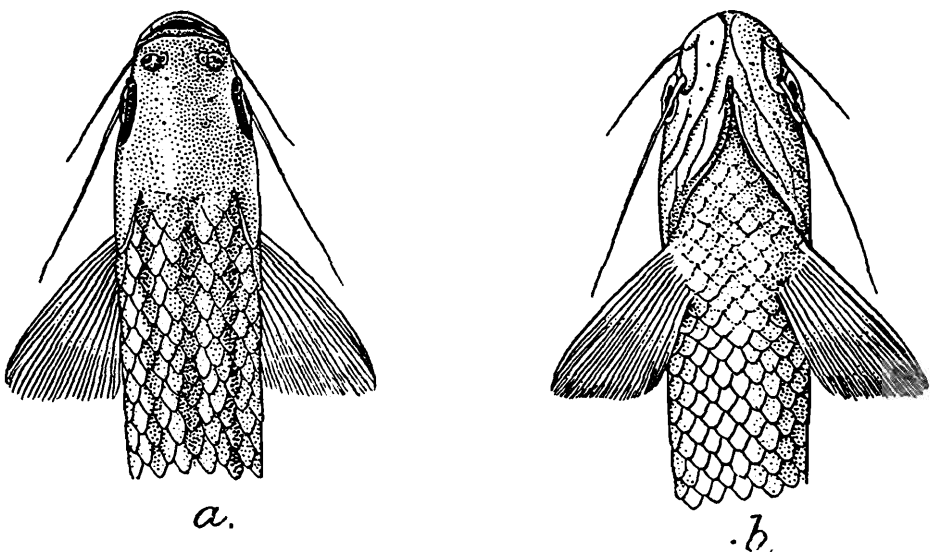
Only two specimens of *D. aequipinnatus* were obtained, one from a rocky stream about half a mile from Namma Rest House, and the other from Sattan *chaung* inside and near the Paudawmu cave about 8 miles from Kamaing, in the Myitkyina District. They are about 50 mm. long.

Danio (Brachydanio) rerio (Ham. Buch.).

(Plate VII, fig. 5).

1822. *Cyprinus rerio*, Hamilton Buchanan, *Fish. Ganges*, pp. 323, 390.
1839. *Perilampus striatus*, McClelland, *Asiat. Research.*, XIX (2), pp. 290, 397, pl. xxxxvi, fig. 1 (from H. B.'s Mss.).
1868. *Barilius rerio*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 292.
1868-1869. *Danio lineatus*, Day, *Proc. Zool. Soc. London*, pp. 198, 378.
1878. *Danio rerio*, Day, *Fish. India*, p. 597, pl. cli, fig. 4.
1889. *Danio rerio*, Day, *Faun. Brit. Ind., Fish.* I, p. 358.
1921. *Danio rerio*, Hora, *Rec. Ind. Mus.*, XXII, p. 743.

In 1822 Hamilton Buchanan described the species as *Cyprinus rerio* which he had originally found in the Kosi River on the northern boundary of Bengal. In his manuscript drawings of fishes there is a finished figure numbered 144 and labelled *Cyprinus kirki jongja*. Unfortunately the figure is partly damaged, the head portion having been eaten away by insects. Although damaged and inaccurate in some respects, it shows the beautiful bright colouration which is a striking feature of *D. rerio*. No figure of the species was included in the plates which were published with the same author's *Fishes of the Ganges*, but the figure of *C. kirki jongja* was reproduced by McClelland. Day's figure of *D. rerio* is poor and does not show any detail.



TEXT-FIG. 8.—*Danio* (*Brachydanio*) *rerio* (Ham. Buch.) from Myitkyina District.

(*a*) Dorsal view of anterior portion of body, × 2.
(*b*) Ventral view of anterior portion of body, × 2.

The specimens under report differ from normal specimens of *D. rerio* in having a distinct lateral line extending in some cases to the base of the ventral, greater number of predorsal scales and smaller number of coloured bands on the caudal fin. These characters, however, do not justify the erection of a new species, but for the purpose of reference we give below a complete description and publish a figure of a Burmese specimen.

The lateral line has been described as " scarcely observable " (Hamilton Buchanan) or " absent " (Day) in *D. rerio*. We have carefully examined a large series of specimens of the species from different localities in the collections of the Indian Museum and find that the lateral line in this species is very variable. In the following table we give the results of our examination from which it is clear that the lateral line in specimens from different localities may be present, rudimentary or absent.

Registered number.	Locality.	Donor.	Number of specimens examined.	Lateral line present.	Lateral line rudimentary.	Lateral line. absent.
Cat. 872 ..	?	Asiat. Soc. of Bengal.	11	2-6 scales in 4.	2	5
2482 ..	Orissa ..	F. Day ..	1	..	..	1
F.1882/1 ..	Bhura, U. P.	Mus. Coll.	Many	1-2 scales in most cases.	In some ..	In few.
F.1883/1 ..	Amanghar, U. P.	Do. ..	Do.	Do. ..	Do. ..	Do.
F.4948/1 ..	Naini Tal Dist.	Do. ..	Do.	Do. ..	Do. ..	Do
F.4950/1 ..	Do. ..	Do.	1	..	..	1
F.4953-62/1	U. P. ..	Do. ..	10	2-3 scales in most cases.	In some.	..
F.7143-49/1	Darrang ..	S. W. Kemp	7	2-6 scales in 6.	..	1
F.8571-72/1	Orissa ..	N. Annandale.	2	..	..	2
F.9353/1 ..	Cooch Behar	T. Southwell.	Many	2-4 scales in most cases.	..	In some.

D. 2/7, A. 3/12-14, P. 1/12, V 8, C. 20-22, L. l. 28-30, L. tr. 6.

The dorsal profile rises gradually from the tip of the snout to the commencement of the dorsal fin beyond which it gradually slopes down to a level almost parallel to the ventral margin of the caudal peduncle. The ventral profile is considerably arched to the base of the anal fin.

The length of the head is contained from 3·7 to 4·1 times and the depth of the body from 3·6 to 3·7 times in the total length of the body excluding the caudal. The diameter of the eye is contained from 3·1 to 3·4 times in the length of the head. The snout is shorter than the diameter of the eye and is contained from 1·5 to 1·7 times in the interorbital width.

The dorsal fin is inserted slightly in advance of the anal ; its longest ray is as long as the head without the snout. The pectorals are generally as long as the head, including the snout. They scarcely reach the ventrals which are usually separated from the anal by a short distance. In younger specimens, however, the pectorals very nearly reach the ventrals and the ventrals extend to the anal. The caudal fin is moderately emarginate and is as long as the pectoral. The paired fins are provided with small scaly appendants.

The scales are medium-sized, thin and shining. The lateral line is incomplete and, as noted above, extends in some cases to the base of the ventrals. There are two pairs of barbels. The maxillary barbels are

variable in length and may extend up to as far as the middle of the pectorals. The rostral barbels are considerably shorter and nearly twice as long as the diameter of the eye.

The ground colour of the body is dark yellow, darker above and lighter below. Four dark bluish longitudinal parallel bands run along the sides alternating with silvery ones. The lowermost coloured band is, in some cases, narrow, and does not extend beyond the anal fin. In many cases the coloured bands are wavy, in others they break up irregularly into small rods or dots. All the fins are diaphanous. Usually there is a narrow bluish band across the dorsal fin ; two or three such bands are also present in the anal and three or more in the caudal.

D. (*Brachydanio*) *rerio* is common in the muddy and rocky streams roundabout Kamaing, in the Myitkyina District. It was found also in the Sattan *chaung* inside and near the Paudawmu cave about 8 miles from Kamaing.

A large series of this species was collected from different streams in the Myitkyina District.

Measurements in millimetres.

Total length without caudal	32·0	29·0	29·0
Length of head	8·5	7·0	7·0
Height of body	8·5	8·0	8·0
Length of snout	2·0	2·0	2·0
Diameter of eye	2·5	2·25	2·25
Interorbital width ..	3·5	3·0	3·0
Length of caudal peduncle	5·0	5·0	5·0
Least height of caudal peduncle ..	4·0	3·5	3·25
Length of pectoral fin	8·5	7·5	7·5
Length of ventral fin	5·0	4·5	4·5

Danio (Brachydanio) choprae Hora.

1928. *Danio* (*Brachydanio*) *choprae*, Hora, *Rec. Ind. Mus.*, XXX, p. 39, fig. 2.

This species was collected at the same time as the rest of the collection under report, and was described as a new form by Dr. S. L. Hora in the paper cited above.

D. (*Brachydanio*) *choprae* is a small species never exceeding 30 mm. in length and does not occur in the Indawgyi Lake. Several specimens were collected from various small rocky streams roundabout Kamaing and Namma, in the Myitkyina District.

Laubuca (Laubuca) laubuca (Ham. Buch.).

1822. *Cyprinus laubuca*, Hamilton Buchanan, *Fish. Ganges*, p. 260.
1839. *Perilampus guttatus*, McClelland, *Asiat. Research.*, XIX (2), p. 394.
1868. *Chela laubuca*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 335.
1878. *Perilampus laubuca*, Day, *Fish. India*, p. 598.
1889. *Perilampus laubuca*, Day, *Faun. Brit. Ind., Fish.* I, p. 360, fig. 112.
1916. *Laubuca* (*Laubuca*) *laubuca*, Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, III, p. 48.

There is no black blotch at the base of the caudal fin. The dorsal, the anal and the caudal fins are tipped with black. The filiform outer rays of the ventrals do not reach the anal, nor do the falcate pectorals extend to the anus.

L. (*Laubuca*) *laubuca* is not very common in the lake ; only two specimens were collected from the northern part of the lake. The specimens vary from 45-55 mm. in length.

Chela sladeni Day.

1869. *Chela sladoni*, Day, *Proc. Zool. Soc. London*, p. 622.
1878. *Chela sladoni*, Day, *Fish. India*, p. 600, pl. clii, fig. 3.
1889. *Chela sladoni*, Day, *Faun. Brit. Ind., Fish.* I, p. 363, fig. 113.
1889. *Chela sladeni*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p 319.

We adopt, with Vinciguerra, the correct specific name *sladeni* in preference to *sladoni* as it was spelt by Day.

C. sladeni was not found in the lake, and only one specimen of it measuring 106 mm. in length was taken at Kamaing, in the Myitkyina District.

Family CLUPEIDAE.

Gudusia variegata (Day).

1869. *Clupea variegata*, Day, *Proc. Zool. Soc. London*, p. 263.
1878. *Clupea variegata*, Day, *Fish. India*, p. 639, pl. clxi, fig. 4.
1889. *Clupea variegata*, Day, *Faun. Brit. Ind., Fish.* I, p. 375.
1889. *Clupea variegata*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 354.
1907. *Clupea variegata*, Lloyd, *Rec. Ind. Mus.*, I, p. 221.
1910. *Clupea variegata*, Jenkins, *Rec. Ind. Mus.*, V, p. 138.
1917. *Gudusia variegata*, Regan, *Ann. Mag. Nat. Hist.* (8) XIX, p. 308.
1924. *Gudusia variegata*, Myers, *Amer. Mus. Novit. New York* (150), p. 1.

There are 14 to 18 ventral spines in front of the pelvic fin and 10 to 11 spines behind it.

G. variegata is fairly common in the rivers and streams connected with the Indawgyi Lake.

In the collection before us there are two specimens from the Namsanda stream in the northern end of the lake and one from Namkawng *chaung* at Kamaing, in the Myitkyina District. The largest of the three specimens is 170 mm. long.

Family NOTOPTERIDAE.

Notopterus notopterus (Pallas).

1769. *Gymnotus notopterus*, Pallas, *Spicil. Zool.* VII, p. 40.
1800. *Notopterus kapirat*, Lacépède, *Hist. Nat. Poisson*, II, p. 190.
1868. *Notopterus kapirat*, Günther, *Cat. Fish. Brit. Mus.*, VII, p. 480.
1866-1872. *Notopterus kapirat*, Bleeker, *Atl. Ichth.*, VI, p. 146.
1878. *Notopterus kapirat*, Day, *Fish. India*, p. 653, pl. clix, fig. 4.
1889. *Notopterus kapirat*, Day, *Faun. Brit. Ind., Fish.* I, p. 406, fig. 129.
1889. *Notopterus kapirat*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 355.
1913. *Notopterus notopterus*, Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, II, p. 9.
1918. *Notopterus notopterus*, Annandale, *Rec. Ind. Mus.*, XIV, p. 53.
1923. *Notopterus notopterus*, Hora, *Journ. Nat. Hist. Soc. Siam*, VI (2), p. 175.

The length of the head without the opercular flap is less than $\frac{1}{5}$ the length of the body. The pectoral fins are as long as the length of the head behind the middle of the eye.

N. notopterus is a common fish in the Indawgyi Lake, specially in its south-western area. It is said to live generally in the deeper parts, but " during floods and high water it hides itself in reeds and grass in shallow water." In the lake it grows to a weight of about 2 lbs.

Five specimens were collected from the south-western part of the lake and one from Kamaing, in the Myitkyina District. The largest one from the lake is 270 mm. long.

Family BELONIDAE.

Xenentodon cancila (Ham. Buch.).

1822. *Esox cancila*, Hamilton Buchanan, *Fish. Ganges*, pp. 214, 380, pl. xxvii, fig. 70.
1841. *Belone Graii*, Sykes, *Trans. Zool. Soc. London*, II, p. 367, pl. lxiii, fig. 4.
1846. *Belone cancila*, Cuvier & Valenciennes, *Hist. Nat. Poisson*, XVIII, p. 455.
1866. *Belone cancila*, Günther, *Cat. Fish. Brit. Mus.*, VI, p. 253.
1878. *Belone cancila*, Day, *Fish. India*, p. 511, pl. cxviii, fig. 5.
1889. *Belone cancila*, Day, *Faun. Brit. Ind. Fish.* I, p. 420, fig. 136.
1889. *Belone cancila*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 349.
1913. *Belone cancila*, Chaudhuri, *Rec. Ind. Mus.*, VIII, p. 256.
1922. *Xenentodon cancila*, Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, IV, p. 134.
1923. *Xenentodon cancila*, Hora, *Journ. Nat. Hist. Soc. Siam*, VI (2), p. 175.

In some specimens there are three dark blotches along the sides between the pectorals and the anal fin.

X. cancila was not found in the lake, but it is fairly common in the Namsanda stream in the north end of the lake.

Six specimens were collected from the Namsanda stream and one from Chaungwa, in the Myitkyina District.

Family PERCIDAE.

Ambassis ranga (Ham. Buch.).

1822. *Chanda ranga*, Hamilton Buchanan, *Fish. Ganges*, pp. 113, 371, pl. xvi, fig. 38.
1822. *Chanda lala*, Hamilton Buchanan, *Fish. Ganges*, pp. 114, 371, pl. xxix, fig. 39.
1828. *Ambassis alta*, Cuvier & Valenciennes, *Hist. Nat. Poisson*, II, p. 183.
1859. *Ambassis alta*, Günther, *Cat. Fish. Brit. Mus.*, I, p. 227.
1875. *Ambassis ranga*, Day, *Fish. India*, p. 51, pl. xiv, fig. 6.
1889. *Ambassis ranga*, Day, *Faun. Brit. Ind., Fish.* I, p. 485.
1910. *Ambassis ranga*, Jenkins, *Rec. Ind. Mus.*, V, p. 138.
1913. *Ambassis ranga*, Chaudhuri, *Rec. Ind. Mus.*, VIII, p. 256.
1916. *Ambassis ranga*, Sundara Raj, *Rec. Ind. Mus.*, XII, p. 278.
1921. *Ambassis ranga*, Hora, *Rec. Ind. Mus.*, XXII, p. 204.

The vertical border of the preoperculum is closely serrated and serrations are also present on the lower margin of its horizontal border. The upper margin of the horizontal border is provided with only a few serrations at the free angle.

The colour of the specimens in spirit is yellowish-orange, mottled with minute dark brown dots all over. A blackish shoulder spot is present in some specimens. In some cases there are 5 to 6 narrow slightly curved blackish vertical bands in the middle of the body. These bands, as was observed by Hora, are less distinct or entirely absent in young individuals. The caudal fin is slightly tipped with black.

A. ranga is very common in the Indawgyi Lake and in various small rocky streams in this part of the country, and is represented in the collection by a large number of specimens ; the average length of the specimens is 65 mm.

Ambassis baculis (Ham. Buch.).

1822. *Chanda baculis*, Hamilton Buchanan, *Fish. Ganges*, pp. 112, 371.
1828. *Ambassis baculis*, Cuvier & Valenciennes, *Hist. Nat. Poisson*, II, p. 187.
1875. *Ambassis baculis*, Day, *Fish. India*, p. 51, pl. xv, fig. 1.
1889. *Ambassis baculis*, Day, *Faun. Brit. Ind., Fish.* I, p. 485.
1910. *Ambassis baculis*, Jenkins, *Rec. Ind. Mus.*, V, p. 138.

The vertical limb of the preoperculum is entire ; the whole of the lower limb and the ridge above it are strongly serrated.

Day is not consistent in his accounts of *A. baculis* and *A. nama.* In the descriptions of *A. nama* and *A. baculis* he states that " the vertical limb of preopercle is entire," while in the distinguishing characters between the two species he observes that " *A. baculis* principally differs from *A. nama* in its form being higher, its lower jaw shorter and not crooked to one side, *its vertical limb of preopercle being strongly serrated* and its possessing no canine or enlarged teeth in its jaws," We have examined a specimen of *A. nama* which was figured by Day in the " Fishes of India " and some of Day's specimens of *A. baculis*, and find that the vertical limb of the preoperculum is entire in both the species. Fairly enlarged teeth also are present in Day's specimens of *A. baculis* from the N. W Provinces as well as in the specimens under report.

A. baculis is more or less common in the lake and different streams, but less so than *A. ranga.*

Five specimens were collected from the south-western area of the lake and one from a sluggish stream in the vicinity. The average length of the specimens is 75 mm.

Family NANDIDAE.

Badis badis (Ham. Buch.).

1822. *Labrus badis*, Hamilton Buchanan, *Fish. Ganges*, pp. 70, 368, pl xxv, fig 23.
1853. *Badis Buchanani*, Bleeker, *Verh. Bat. Gen.*, XXV, p. 106, pl. ii, fig. 3.
1861. *Badis Buchanani*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 367.
1875. *Badis Buchanani*, Day, *Fish. India*, p. 128, pl. xxxi, fig. 6.
1889. *Badis Buchanani*, Day, *Faun. Brit. Ind., Fish.* II, p. 80, fig. 38.
1889. *Badis buchanani*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 166.
1912 *Badis badis*, Sewell & Chaudhuri, *Ind. Fish of Prov. Util. etc.*, p. 12, fig. c.
1913. *Badis badis*, Chaudhuri, *Rec. Ind. Mus.*, VIII, p. 256.
1919. *Badis badis*, Chaudhuri, *Rec. Ind. Mus.*, XVI, p. 286.
1921. *Badis badis*, Hora, *Rec. Ind. Mus.*, XXII, p. 204.

In colouration these specimens very nearly agree with Dav's description excepting that the vertical bands are 8 or 9 instead of 6. The colour pattern in general is very vivid in young individuals, but becomes more or less dull as they grow in size.

B. badis is quite common in the various muddy and rocky streams and pools in the Myitkyina District.

A large series of specimens was collected from various muddy and rocky streams. The average length is 35 mm.

Badis dario (Ham. Buch.).

(Plate VII, figs. 6, 7, 7*a*.)

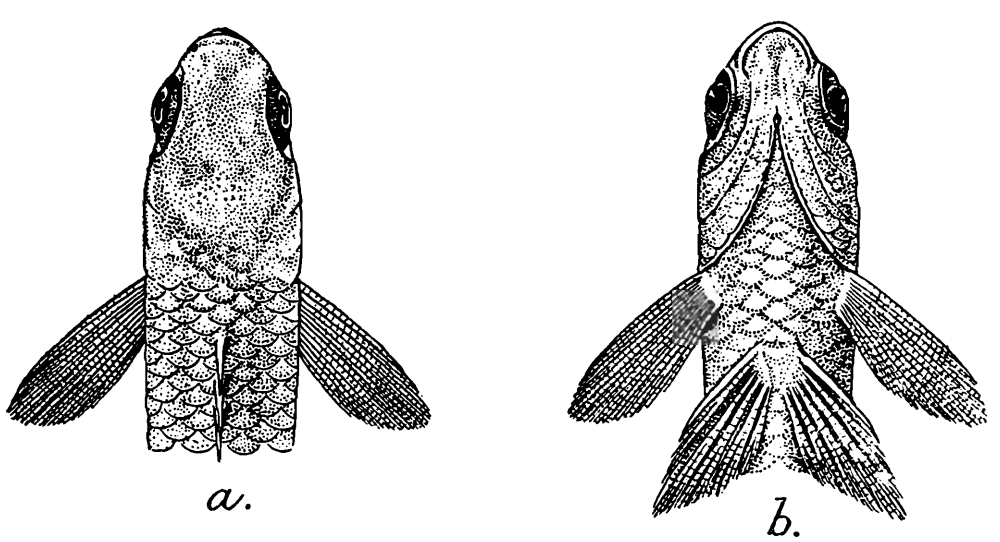
1822. *Labrus dario*, Hamilton Buchanan, *Fish. Ganges*, pp. 72, 368.
1861. *Badis dario*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 367.
1875. *Badis dario*, Day, *Fish. India*, p. 129.
1889. *Badis dario*, Day, *Faun. Brit. Ind., Fish.* II, p. 82.

As the specimens from Upper Burma, which we refer to *B. dario*, differ in several respects from the published descriptions of the species, we give below a detailed description of our specimens.

D. 15/5-7, A. 3/7-8, P. 10-12, V. 1/5, C. 18, L. l. 26-28, L. tr. 8.

The length of the head is almost equal to the depth of the body and is contained from 3 to 3·4 times in the total length of the body without the caudal. The diameter of the eye is contained from 3 to 3·6 times in the length of the head and is slightly longer than the interorbital width. The snout is shorter than the diameter of the eye and is almost equal to the interorbital width. The convexity of the dorsal profile, as also the depth of the body, are less than those of *B. badis* (Ham. Buch.).

The dorsal fin commences just above the ventrals. The soft part is slightly higher and posteriorly ends in a sharp acute angle. The pectorals are short and spatulate. The ventrals do not reach the anal which is inserted slightly behind the middle of the dorsal fin. Like the dorsal the anal fin also ends in a sharp angle posteriorly. The last anal spine is the longest. The caudal fin is wedge-shaped. All the fin rays are branched distally. Both the dorsal and the anal fins are scaly at their bases. The scales are of moderate size.



TEXT-FIG. 9.—*Badis dario* (Ham. Buch.) from Myitkyina District.

(*a*) Dorsal view of anterior portion of body, × 5.
(*b*) Ventral view of anterior portion of body, × 5.

The ground colour of the specimens in spirit is dirty whitish with minute pinkish dots uniformly distributed; slightly bigger spots are found along the margins of the scales. In some specimens there are 7 or 8 faint pinkish vertical bands along the sides of the body. All the fins, with the exception of the pectorals which are more or less diaphanous, are dusky.

In the manuscript drawings of Hamilton Buchanan there is a finished figure and an outline drawing, numbered 93 and labelled *Labrus darhi*. This is undoubtedly the figure of the species which Hamilton Buchanan in 1822 described as *Labrus dario*. Of the other species, *Labrus badis*, he published a figure in the plates of his *Fishes of the Ganges* (pl. xxv, fig. 23). This published figure is quite distinct from the manuscript drawing referred to above and Day (*Proc. Asiat. Soc. Bengal*, p. 205, Sept. 1871) is certainly wrong in considering the two as belonging to the same species. The differences lie in the form of the fish, the form of the fins, the form of the head and eyes, as also the position of the mouth and the operculum. Further, the presence of the lateral line in the published figure clearly shows that it is quite distinct from *Labrus darhi* (=*Labrus dario*) in which the lateral line is entirely absent.

The unpublished figures which we reproduce (pl. vii, figs. 7, 7*a*) are undoubtedly of the fish under consideration and which is now known as *Badis dario* (H. B.). Hamilton Buchanan's is the only figure of the species which we can find and we, therefore, reproduce enlarged figures of this fish showing details of the lepidosis, as also the form of the fins and the number of the fin rays in each.

We are indebted to Dr. S. L. Hora for the information that "*Darhi*" as the common name of the species is mentioned in Hamilton Buchanan's manuscript notes, which are preserved in the library of the India Office, London.

Like *B. badis*, *B. dario* is quite common in various muddy and rocky streams in the Myitkyina District.

A large series of this species was collected from different muddy and rocky streams in the district. It appears to be a smaller species than *B. badis*, none exceeding 20 mm. in length. Day's statement about *B. dario* growing to a maximum length of "three inches" requires confirmation.

Family MASTACEMBELIDAE.

Mastacembelus armatus (Lacép.).

1800. *Macrognathus armatus*, Lacépède, *Hist. Nat. Poisson.* II, p. 286.
1861. *Mastacembelus armatus*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 542.
1876. *Mastacembelus armatus*, Day, *Fish. India*, p. 340, pl. lxxiii, fig. 2.
1889. *Mastacembelus armatus*, Day, *Faun. Brit. Ind., Fish.* II, p. 334.
1889. *Mastacembelus armatus*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 180.
1916. *Mastacembelus armatus*, Sundara Raj, *Rec. Ind. Mus.*, XII, p. 290.
1919. *Mastacembelus armatus*, Annandale, *Rec. Ind. Mus.*, XVI, p. 125.

This species is widely distributed in the Indawgyi Lake along the shores and shallower parts and lives in mud near the shore and in the hollows of floating logs of trees. It is said to grow to about 4 lbs.

Four specimens were collected from different parts of the lake and another specimen, 560 mm. long, from Chaungwa, in the Myitkyina District.

Family CHAUDHURIIDAE.

Chaudhuria caudata Annandale.

1918. *Chaudhuria caudata*, Annandale, *Rec. Ind. Mus.*, XIV, pp. 39-42, pl. i, fig. 1 ; pl. iv, figs. 1-10.
1918. *Chaudhuria caudata*, Whitehouse, *Rec. Ind. Mus.*, XIV, p. 65.
1919. *Chaudhuria caudata*, Regan, *Ann. Mag. Nat Hist.* (9) III, p. 198.
1923. *Chaudhuria caudata*, Annandale & Hora, *Ann. Mag. Hist. Nat.* (9) XI, pp. 327-333.

The single specimen measuring 31 mm. in length, which we provisionally refer to this species, was collected from Namkawng stream at Kamaing in the Myitkyina District. This specimen differs from the Inlé Lake specimens in that the eyes are comparatively dorsally placed and the interorbital width is consequently narrower. This slight difference in the position of the eyes may be the result of pressure due to preservation. This appears very probable, as the bones of the skull of this fish are extremely delicate and the jaws are very feeble.

On the sides there is a series of open **V**s of a dark purplish-brown colour with their apices directed anteriorly.

Family OPHICEPHALIDAE.

Ophicephalus marulius Ham. Buch.

1822. *Ophicephalus marulius*, Hamilton Buchanan, *Fish. Ganges*, pp. 65, 367, pl. xvii, fig. 19.
1861. *Ophiocephalus marulius*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 478.
1876. *Ophiocephalus marulius*, Day, *Fish. India*, p. 363, pl. lxxvi, fig. 4.
1889. *Ophiocephalus marulius*, Day, *Faun. Brit. Ind., Fish.* II, p. 360.
1889. *Ophiocephalus marulius*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 182.

The usual large deep black ocellus encircled by a whitish ring at the upper part of the base of the caudal fin and five lateral black patches below the lateral line are present. The lateral marks are somewhat elongated in the younger individuals.

O. marulius is more or less common in the lake and is believed to live in areas with a muddy bottom. It is known to grow to a weight of about 15 lbs.

Four specimens were collected from the lake and one from Chaungwa. The largest specimen from the lake is 300 mm. long.

Ophicephalus striatus Bloch.

1793. *Ophicephalus striatus*, Bloch, *Nat. Ausl. Fische*, VII, p. 141, pl. cccIix.
1822. *Ophiocephalus wrahl*, Hamilton Buchanan, *Fish. Ganges*, p. 60.
1831. *Ophiocephalus striatus*, Cuvier & Valenciennes, *Hist. Nat. Poisson*, VII, p. 417.
1861. *Ophiocephalus striatus*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 474.
1876. *Ophiocephalus striatus*, Day, *Fish. India*, p. 366.

1889. *Ophiocephalus striatus*, Day, *Faun. Brit. Ind., Fish.* II, p. 363.
1889. *Ophiocephalus striatus*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 184.
1916. *Ophiocephalus striatus*, Sundara Raj, *Rec. Ind. Mus.*, XII, p. 270.
1918. *Ophiocephalus striatus*, Annandale, *Rec. Ind. Mus.*, XIV, p. 54.
1922. *Ophiocephalus striatus*, Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, IV, p. 317.
1923. *Ophiocephalus striatus*, Hora, *Journ. Nat. Hist. Soc. Siam*, VI (2), p. 180.

The species is fairly common in the lake, and two specimens of it were collected from different areas, while two were also obtained at Chaungwa. The largest individual before us is 175 mm. long.

Ophicephalus gachua Ham. Buch.

1822. *Ophiocephalus gachua*, Hamilton Buchanan, *Fish. Ganges*, pp. 68, 367, pl. xxi, fig. 21.
1831. *Ophiocephalus marginatus*, Cuvier & Valenciennes, *Hist. Nat. Poisson*, VII, p. 411.
1861. *Ophiocephalus gachua*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 471.
1876. *Ophiocephalus gachua*, Day, *Fish. India*, p. 367.
1889. *Ophiocephalus gachua*, Day, *Faun. Brit. Ind., Fish.* II, p. 364.
1889. *Ophiocephalus gachua*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 185.
1916. *Ophiocephalus gachua*, Sundara Raj, *Rec. Ind. Mus.*, XII, p. 275.
1918. *Ophiocephalus gachua*, Annandale, *Rec. Ind. Mus.*, XIV, p. 35.
1919. *Ophiocephalus gachua*, Annandale, *Rec. Ind. Mus.*, XVI, p. 137.
1921. *Ophiocephalus gachua*, Hora, *Rec. Ind. Mus.*, XXII, p. 743.
1922. *Ophiocephalus gachua*, Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, IV, p. 321.
1923. *Ophiocephalus gachua*, Hora, *Rec. Ind. Mus.*, XXVI, p. 31.
1923. *Ophiocephalus gachua*, Hora, *Journ. Nat. Hist. Soc. Siam*, VI (2), p. 181.

The species is very common in the Indawgyi Lake and the various streams in the Myitkyina District.

Quite a large number of specimens were collected, and the largest one in the collection, taken at Chaungwa, is 200 mm. long.

Ophicephalus punctatus Bloch.

1793. *Ophicephalus punctatus*, Bloch, *Nat. Ausl. Fische*, VII, pl. cccIviii.
1822. *Ophiocephalus lata*, Hamilton Buchanan, *Fish. Ganges*, pp. 63, 637, pl. xxxiv, fig. 18.
1861. *Ophiocephalus punctatus*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 469.
1876. *Ophiocephalus punctatus*, Day, *Fish. India*, p. 367, pl. lxxviii, fig. 1 (var.).
1889. *Ophiocephalus punctatus*, Day, *Faun. Brit. Ind., Fish.* II, p. 364.
1889. *Ophiocephalus punctatus*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 186.
1916. *Ophiocephalus punctatus*, Sundara Raj, *Rec. Ind. Mus.*, XII, p. 273.
1921. *Ophiocephalus punctatus*, Hora, *Rec. Ind. Mus.*, XXII, p. 207.

The back is deep brown, while the sides are yellowish, and there are also many irregular lateral patches of a black colour on the back. There is a very narrow yellowish stripe along the sides. Above the stripe there are about 10 to 12 blackish blotches. All the fins are mottled with black. The lateral line is interrupted before the 18th or 19th scale, but is continued again one scale below.

O. punctatus is fairly common in the lake and the pools. Two specimens were collected from the western parts of the lake and one from a pool near-by. The specimens are not full grown ; the largest one being 102 mm. long.

Family ANABANTIDAE.

Anabas testudineus (Bloch).

1792. *Anthias testudineus*, Bloch, *Nat. Ausl. Fische*, VI, pl. cxxi.
1797. *Perca scandens*, Daldroff, *Trans. Linn. Soc.*, III, p. 62.
1822. *Cojus cobojius*, Hamilton Buchanan, *Fish. Ganges*, pp. 98, 370.
1831. *Anabas scandens*, Cuvier & Valenciennes, *Hist. Nat. Poisson*, VII, p. 249.
1861. *Anabas scandens*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 375.
1877. *Anabas scandens*, Day, *Fish. India*, p. 370, pl. lxxvii, fig. 3.
1889. *Anabas scandens*, Day, *Faun. Brit. Ind., Fish.* II, p. 367, fig. 120.
1916. *Anabas scandens*, Sundara Raj, *Rec. Ind. Mus.*, XII, p. 276.
1922. *Anabas testudineus*, Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, IV, p. 334.
1923. *Anabas testudineus*, Hora, *Journ. Nat. Hist. Soc. Siam*, VI (2), p. 181.

A large black caudal spot and a smaller one at the hind border of the operculum are present. The colour of the specimens in spirit is uniformly dusky ; the belly being pale yellowish.

A. testudineus is not so common in the lake itself, as it is in ponds, ditches, pools and streams in the Myitkyina District.

Three specimens of the species were collected from the south-western area of the lake and several others from various ponds and pools, etc. The largest individual is 80 mm. long.

Trichogaster fasciatus Bl. Schn.

1801. *Trichogaster fasciatus*, Bloch-Scheinder, *Syst. Ichth.*, p. 164.
1822. *Trichopodus colisa*, Hamilton Buchanan, *Fish. Ganges*, pp. 117, 372.
1861. *Trichogaster fasciatus*, Günther, *Cat. Fish. Brit. Mus.*, III, p. 387.
1877. *Trichogaster fasciatus*, Day, *Fish. India*, p. 374, pl. lxxviii, fig. 6.
1889. *Trichogaster fasciatus*, Day, *Faun. Brit. Ind., Fish.* II, p. 372, fig. 123.
1889. *Trichogaster fasciatus*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 187.
1912. *Trichogaster fasciatus*, Sewell & Chaudhuri, *Ind. Fish of Prov. Util. etc.*, p. 10, fig. 5.
1922. *Trichogaster fasciatus*, Weber & Beaufort, *Fishes, Indo-Austral. Archipel.*, IV, p. 341.

There is generally a vertical bar at the base of the caudal fin.

T. fasciatus is quite common in the southern and western ends of the lake, from where a large series were collected. Two specimens were also obtained from a small muddy stream along the Kamaing Jade Mines Road at Kamaing, in the Myitkyina District. None of the individuals exceed 60 mm. in length.

Parasphaerichthys, gen. nov.

This new genus, for which we propose the name *Parasphaerichthys*, is represented in the collection by two specimens. They are small, about 23 mm. long, compressed and more or less oblong in shape. The mouth is greatly protactile, its cleft oblique and very small. The jaws are unequal, the lower one being considerably longer than the upper. The lateral line is entirely absent. The preorbital and the horizontal limb of the preoperculum are finely serrated. The eyes are very large. The dorsal fin is composed of 4 spines and 6 rays. The anal has 13 spines and 12 rays. The ventrals originate slightly behind the pectorals.

In general appearance this fish appears to be very closely allied to *Sphaerichthys* Canestrini,[1] but differs in several important characters. The characters of the two genera are tabulated below :

Sphaerichthys Canestrini.	*Parasphaerichthys*, gen. nov.
Jaws equal.	Jaws unequal.
Lateral line vestigial.	Lateral line absent.
Dorsal fin with 8-12 spines and 7-10 rays.	Dorsal fin with 4 spines and 6 rays.
Anal fin with 8-10 spines and 18-22 rays.	Anal fin with 13 spines and 12 rays.
Ventrals originate slightly before pectorals.	Ventrals originate slightly behind pectorals.

Genotype.—Parasphaerichthys ocellatus, sp. nov. from small muddy streams along the Kamaing Jade Mines Road—a few miles from Kamaing in the Myitkyina District.

Parasphaerichthys ocellatus, sp. nov.

(Plate VIII, figs. 4, 4*a*.)

D. 4/6, A. 13/12, P. 9, V 1/5, C. 16, L. l. 27-28, L. tr. 11.

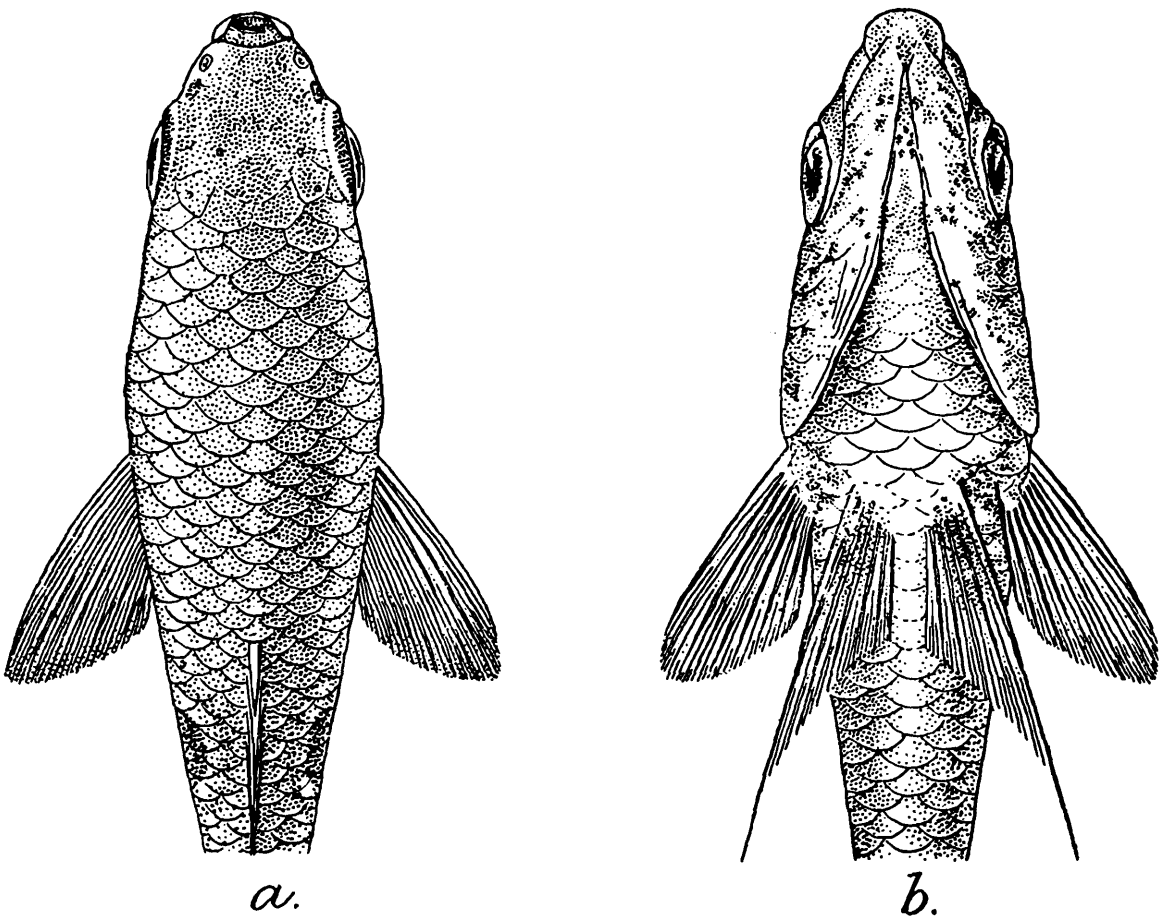
The length of the head is contained from 2·6 to 2·7 times and the depth of the body about 2·5 times in the total length of the body without the caudal. The eyes are situated in the anterior half of the head and their diameter is contained 3·4 times in the length of the former. The interorbital space is only slightly wider than the diameter of the eye. The length of the snout is shorter than the orbital width. The caudal peduncle is considerably higher than long.

The origin of the dorsal fin is just above or slightly behind the commencement of the anal and is nearer to the base of the caudal than to the tip of the snout. The last dorsal spine is the longest and is about as long as the head behind the middle of the eye. The pectoral is inserted in the lower half of the body ; its 1st, 8th and 9th rays are entire. The ventral spine is fairly long and the inner branch of the first ventral ray is produced into a long simple filament reaching as far as the middle of the anal. The anal originates almost below the pectoral ; it extends beyond the base of the caudal which latter is slightly rounded and is nearly as long as broad. Both the anal and the caudal fins are scaly at their bases.

The scales are large and arranged on the body in 27-28 scales in a longitudinal series and 11 in a transverse series. The opercular bones are all covered with scales and are entire, except for the horizontal limb of the preoperculum, which is finely serrated. Both the jaws are provided with fleshy lips and small conical teeth.

[1] Canestrini, J.—*Verh. Zool.-bot. Gesellsch. Wien*, X, p. 707 (1860).

The ground colour of the specimens in spirit is dusky. A dirty whitish fairly broad and indistinct lateral band runs along the entire length of



TEXT-FIG. 10.—*Parasphaerichthys ocellatus*, gen. et sp. nov.

(*a*) Dorsal view of anterior portion of body of type-specimen, × 5
(*b*) Ventral view of anterior portion of body of the same, × 5.

the body. There are small patches of white and black scattered here and there. The chin and the thorax are whitish. A very conspicuous deep black large ocellus bordered by white is present in the middle of the body. The fins are more or less diaphanous with fine black dots especially in the dorsal and anal fin membrane.

P. ocellatus was not found in the Indawgyi Lake or in the adjoining streams. The two specimens under report were collected from small muddy streams along the Kamaing Jade Mines Road, a few miles from Kamaing in the Myitkyina District.

Type-specimen.—No. F. 11011/1 in the collection of the Zoological Survey of India (*Ind. Mus.*), Calcutta.

Measurements in millimetres.

Total length without caudal ..	23·0	22·5
Length of head	8·5	8·5
Height of body	9·0	9·0
Length of snout..	2·0	2·0
Diameter of eye..	2·5	2·5
Interorbital width	3·0	3·0
Length of caudal peduncle	2·5	2·5
Least height of caudal peduncle	4·0	4·0

Family INDOSTOMIDAE, nov.

This new family is closely allied to the family Solenostomidae and to a certain extent to the Syngnathidae of the order Solenichthyes Regan,[1] but differs from either in several important characters. It may be defined as follows :

Highly specialised forms of small freshwater pipe-fish with a tubular trunk slightly compressed dorso-ventrally, and a long drawn out tail which is provided with a small fan-shaped caudal fin at the tip. The head is of moderate size produced into a dorso-ventrally compressed short snout. The mouth is small, terminal, slightly oblique and bordered by small intermaxillaries, maxillaries and mandibles which are roughened but without teeth. The vomer, palatines, and pterygoids are also without teeth. The post-temporal is suturally united to the skull. The verte-brae are without any articular process ; none of the anterior vertebrae are fused together or united to the skull. The body is enveloped by calcareous scutes forming distinct rings round the body. The rings, with the exception of the first or the scapular ring, correspond to the vertebrae ; the ventral plates of the first seven rings are comparatively feebly ossified. There is no lateral line. The external olfactory organ is represented by a pair of open pits situated in close proximity near the eyes. There are two dorsal fins ; both the pectoral and the ventral fins are fairly well developed, the latter being inserted below and somewhat behind the middle of the former ; the anal is situated immediately below or slightly behind the rayed dorsal. The operculum is well developed. The gill-openings are separate and moderately wide. There are four complete lobate gills. The branchiostegal rays are six in number.

Remarks.—As has been pointed out above the family Indostomidae is closely allied to the families Solenostomidae and Syngnathidae, but it differs from these families in several important characters some of which we tabulate below :—

Solenostomidae.	Syngnathidae.	Indostomidae.
1. Body compressed, tail very short with an extremely long and broad caudal fin.	1. Body elongated, angular or laterally compressed or rounded ; tail long and prehensile in cases where the small caudal fin is absent.	1. Body tubular, slightly compressed dorso-ventrally ; long drawn out tail with a small fan-shaped caudal fin.
2. Skin with large stellate ossifications, leaving large interspaces naked, arranged in longitudinal and transverse-series, forming an uninterrupted dorsal and ventral median keels before first dorsal and ventrals, rendering the anterior part of the trunk immovable.	2. Skin completely armoured by bony scutes, arranged regularly in series, and forming rings round the body, which, with the exception of the first, correspond to the vertebrae.	2. Same as in Syngnathidae.

[1] For a detailed account of the order Solenichthyes see Jungersen, H. F.—*D. Kgl Danske Vidensk. Selsk. Skrifter* (*Natur. Og. Math.*) Ser. 7, VIII, pp. 270-363, pls. i-vii (1910). See also Weber, M. & de Beaufort, L. F.—*The Fishes of the Indo-Austral. Archipel.*, IV, pp. 7-114 (1922).

Solenostomidae.	Syngnathidae.	Indostomidae.
3. One spinous and one soft dorsal fin ; the latter opposite the anal. Both with unbranched rays.	3. One soft dorsal (exceptionally absent), generally opposite the minute anal which is usually present.	3. One spinous and one soft dorsal fin, the latter opposite the anal. Both with branched rays.
4. Large ventrals opposite the spinous dorsal.	4. Ventrals absent.	4. Small ventrals below and somewhat behind the middle of the pectorals.
5. One nasal opening.	5. Two nasal openings.	5. Two nasal openings.
6. Gill openings wide.	6. Gill openings reduced to small dorsal apertures.	6. Gill openings moderately wide.
7. Three anterior vertebrae suturally united to the skull.	7. Three anterior vertebrae immovably joined together.	7. Anterior vertebrae free.

Indostomus, gen. nov.

The anterior dorsal fin consists of 5 short slender and sharp spines, one on each of the rings behind the 2nd ring. They are not connected with one another by membrane. The posterior dorsal is higher than the body and consists of 6 soft rays, all of which are branched distally. The anal fin, which is about as high as the dorsal, also consists of 6 branched rays. The pectorals are more or less rounded, and their rays are entire. The ventrals are with 1 spinous ray and 3 branched ones.

The other characters of the genus have been fully enumerated above in the description of the family.

The genus is monotypic and endemic in the Indawgyi Lake, in the Myitkyina District, Upper Burma, where the only known type-species, *I. paradoxus*, was found.

Indostomus paradoxus, sp. nov.

(Plate X, figs. 1, 2, 3.)

D_1. 5, D_2. 6. A. 6, P. 25-26, V. 1/3, C. 12.

The trunk is more or less tubular, slightly compressed dorso-ventrally, and the part from the posterior end of the dorsal fin to the base of the caudal is considerably narrow. The head and the snout are moderately compressed. On the body there are usually 22 rings of scutes, of which 8, including the scapular, lie in front and 9 caudals behind the second dorsal.

There are three pairs of cristae on the dorsum, which run parallel to one another on either side of the dorsal fins ; the innermost pair of the dorsal cristae extend posteriorly as far as the 18th scutum as a continuous ridge without any spines. The second pair of dorsal cristae run as far as the 16th scutum ; the third, or the outermost pair, is somewhat curved

outwards in the anterior half and are continuous with the superior cristae of the tail. There are two pairs of lateral cristae in the trunk, of which the superior ones curve downwards one ring in front of the insertion of the anal fin, and then run straight to terminate on the 18th ring, while the inferior cristae curves downwards about its middle and continues posteriorly as the ventro-lateral crista of the tail on each side. There is a pair of inferior cristae which can equally be described as lateral or ventral and which start slightly below the middle of the pectoral fin, curve round the middle and extend up to the 18th segment. A pair of ventral cristae start from the inner edge of the pectorals and running externally curve round the anus and then run to the tip of the caudal laterally on the sides of the anal. A low median crista is also present on the tail region starting from the end of the anal fin and terminating about the tip of the tail. The operculum is moderately arched and has 5-6 finely serrated radiating ridges.

The length of the head is contained from 3·8 to 4·1 times and the depth of the body from 9 to 9·8 times in the total length of the body without the caudal. The eyes, which are very prominent, are situated in the anterior half of the head, and their diameter is contained about 6·5 times in the length of the former. The interorbital space is slightly narrower than the diameter of the eye. The length of the snout is twice the diameter of the eye.

The first dorsal consists of 5 short, more or less stout and sharp spines, each of which has a membranous attachment at the base, but the membranes are not continuous.

The second dorsal is situated nearer the tip of the snout than the base of the caudal fin. The anal is inserted just below the dorsal and resembles it in the number of its rays. The pectoral is slightly shorter than the ventral and is more or less rounded ; the latter begins below the posterior third of the pectoral. The caudal fin is fan-shaped and slightly longer than the ventral.

The lower jaw is slightly longer than the upper. Both the jaws are toothless, but there are a number of fine ridges along the outer margin of both the jaws. The gape of the mouth is equal to the diameter of the eye. The opening of the external nostrils are two narrow slits situated in front of the orbital ring.

The colour of the specimens in spirit is light olivaceous green, darker above and lighter below, and clouded with fine darkish spots all over the body. The spines of the first dorsal are blackish. Both the rayed dorsal and anal fins are banded with black and white. The pectorals and the caudal have a central blackish band, while the ventrals are blackish near the bases.

A large series of *I. paradoxus* was collected from different parts of the Indawgyi Lake and the majority of the specimens were dredged from the north end of the lake near Nyaungbin. According to Dr. Chopra's field notes the bottom of this part of the lake consisted of " hard black clay massed together in small lumps. A great deal of submerged rotten and rotting vegetation. Water is nowhere more than 14 or 15 feet ; not very clear on account of the green algae floating about."

Type-series.—No. F. 11013/1 in the collection of the Zoological Survey of India (*Ind. Mus.*), Calcutta. Collected from the north end of the Indawgyi Lake near Nyaungbin.

Measurements in millimetres.

Total length without caudal	25·0	27·0	26·0
Length of head	6·6	6·5	6·5
Height of body	2·75	2·95	2·95
Length of snout	2·0	2·0	2·0
Diameter of eye	1·0	1·25	1·0
Interorbital width	0·75	1·0	0·75
Height of dorsal fin	3·75	4·0	3·5
Height of anal fin	3·75	4·0	3·25
Length of pectoral fin ..	1·5	1·75	1·5
Length of ventral fin	2·0	2·0	2·0
Length of caudal fin ..	2·5	2·75	2·5

Family SYNGNATHIDAE.

Doryichthys dünckeri, sp. nov.

(Plate X, fig. 4.)

D. 32, A. 3, P. 18, C. 9, Rings 16+32, subdorsal rings 1+6.

The body is elongated and nearly as high as broad. The trunk region is heptagonal while the tail is tetragonal. The shields are transversely striated and their margins are fairly prominent. The intermedial shields are not prominent.

The inferior cristae of the trunk and the tail are discontinuous, while the median cristae of the trunk and the inferior cristae of the tail are continuous. The superior cristae of the trunk and the tail are discontinuous. The posterior end of the superior cristae of the trunk is continued nearly to the end of the dorsal, while the anterior end of the superior cristae of the tail extends to the first anterior ring of the tail. The ventral crista is very prominent. The operculum is more or less vaulted and has a complete longitudinal keel which is devoid of radiating ridges.

The head is nearly $\frac{1}{7}$ of the total length of the body including the caudal fin and nearly half as long as the trunk. The snout is about $1\frac{1}{2}$ times as long as the postorbital part of the head and about 3 times the diameter of the eye. The eyes are prominent and their diameter is about $\frac{1}{6}$ of the length of the head. The interorbital space is concave and half as wide as the orbit.

The tail is longer than the trunk and head. The dorsal fin is considerably less in height than the maximum depth of the body and its base is slightly elevated. The caudal appears to be rounded and is nearly $\frac{1}{2}$ the length of the postorbital part of the head.

The colour in spirit is greenish. On the trunk there is a lateral dark band on each side; another narrower band passes from the tip of the snout through the eye to the hind border of the operculum.

The single type-specimen was procured from Namkawng *chaung* at Kamaing in the Myitkyina District, and is 100 mm. long including the caudal fin.

Relationships.—*D. dünckeri*, sp. nov. is closely allied to *D. caudocarinatus* M. Web., known from a single female specimen from North New Guinea, and *D. retzii* (Blkr.) which is common in different parts of Sumatra, Java, North a d South New Gui ea, Philippines, Bisma ck Archipelago, New Caledonia, etc. The points of differences of *D. dünckeri* from these two species are shown below :—

D. caudocarinatus M. Web.	*D. retzii* (Blkr.).	*D. dünckeri*, sp. nov.
D. 42 ; Rings 20+28 ; Subdorsal rings 2+8.	D. 34-40 ; Rings 16-17+28 -31 ; Subdorsal rings 1-2 +7-8.	D. 31-32 ; Rings 16+32 ; Subdorsal rings 1+6.
5 radiating ridges below opercular keel.	Generally 1-2, exceptionally 3 or none radiating ridges below the opercular keel.	No radiating ridges below the opercular keel.
Eye about 6½ times in head.	Eye about 5 times in head.	Eye about 6 times in head.
Snout slightly longer than postorbital part of head.	Snout as long as or somewhat shorter than postorbital part of head.	Snout 1½ times longer than postorbital part of head.
Tail slightly shorter than trunk and head.	Tail considerably longer than trunk and head.	Tail slightly longer than trunk and head.
Caudal as long as postorbital part of head.	Caudal about equal to postorbital part of head.	Caudal 1⅔ times in postorbital part of head.

Type-specimen.—No. F. 11018/1 in the collection of the Zoological Survey of India (*Ind. Mus.*), Calcutta.

Family TETRAODONTIDAE.

Tetraodon cutcutia Ham. Buch.

1822. *Tetrodon cutcutia*, Hamilton Buchanan, *Fish. Ganges*, pp. 8, 362, pl. xviii, fig. 3.
1870. *Tetrodon cutcutia*, Günther, *Cat. Fish. Brit. Mus.*, VIII, p. 290.
1878. *Tetrodon cutcutia*, Day, *Fish. India*, p. 703, pl. clxxxii, fig. 5.
1889. *Tetrodon cutcutia*, Day, *Faun. Brit. Ind., Fish.* II, p. 493.
1889. *Tetrodon cutcutia*, Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 359.

As in the Indian specimens, the caudal fin is tipped with carmine, but there is no red spot on the throat.

T cutcutia is common all over the lake, generally in the shallower parts, and is also found in some streams and pools connected with the lake. It is said to inhabit " clear water with sandy bottom." This fish is not used fresh but is made into *Nga-pi*, the favourite drink of the Burmese.

A large number of specimens were collected from various parts of the lake and a few from streams. The largest specimen is 74 mm. long.