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ON A COLLECTION OF FISH FROM SIAM.

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WITH PLATES 10 to 12 and 1 text figure.

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With an introduction by MALCOLM A. SMITH.

INTRODUCTION.

The collection of fish referred to in this article was made by my wife and myself, chiefly in Bangkok or its immediate neighbourhood. Most of the specimens were caught in the months of November, December and January, three of the dry months of the year when the water in the country is steadily diminishing in quantity. The collection does not profess by any means to be complete for Bangkok, although we believe that nearly all the well known species are represented. There is still, however, a vast field of research for any naturalist who takes up the study of Ichthyology in Siam, and it is to be hoped that the present article will stimulate someone to do so. We are deeply indebted to Dr. Sunder Lal Hora for working out the entire collection.

Most of the specimens that were collected in Bangkok were taken with an ordinary seine net in the canals and ponds with which the city abounds. A large number were also caught in the Chao Phya river, chiefly at the fishing stakes at Nontaburi some 5 kilometres above Bangkok. They were netted by the fishermen in the course of their daily avocation. Traffic upon the river makes it impossible to erect fishing stakes within the city limits, but numbers

of them are to be seen both above and below the boundaries. The stakes above the city lie about 62 km. from the sea. They are well within tidal influence and some degree of salinity of the water obtains there every year at the end of the dry season. Thus it is that a certain number of marine species will be found in the collection which was intended primarily to be one of strictly fresh-water fish. <sup>1</sup>

Fish abound everywhere in Bangkok and its environs, and no amount of capture by line, trap or net seems to make much impression upon their numbers. Net fishing is naturally responsible for far greater destruction than any other method of capture, but where this has been forbidden, as in the large dock built by Phra Bhakdi at Sapatoom some years ago, the increase in the number of fish has been so great that the place is now overstocked.

This condition does not hold farther up country where, owing to uncontrolled methods of capture the depletion of fish in some of the rivers has been very great. Fortunately the Government has now realized the seriousness of the matter and some form of conservation is soon to be instituted. <sup>2</sup>

We have endeavoured, as far as possible, to give the Siamese names to the species here enumerated, but the task, except where the very common ones are concerned, is not encouraging. As no scientific study of the fishes of the country has yet been undertaken by the Siamese people there is naturally no standardization of names, while the fact that the same fish may have different names in different localities and also at different periods of its growth, does not help to clarify matters. In assigning the native names we have had much help from H. S. H. Mom Chao Sanitiwongse, who with a local fisherman has been through our entire collection. To him also we are indebted for many interesting notes in connection with the fish of this country.

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<sup>1</sup> Recently we received a specimen of the Saw-fish (*Pristis perroteti* Müll. and Henle) some four feet in length from these stakes, and the young of sharks are not infrequently caught there.

<sup>2</sup> Since writing the above Dr. Hugh M. Smith, former United States Commissioner of Fisheries, has arrived in the country to advise the Government on fish preservation.



Of the mosquito larvae-eating species of Siam we as yet know very little, and in connection with anti-malarial measures the study of them is important. On this point the following note which we take from the Annual Report of the Department of Fisheries, Bengal, 1922, will be of interest, as the two countries have many species in common.

"The following genera which destroy mosquito larvæ are commonly found in Bengal :—

*Haplochilus*, *Ambassis*, *Trichogaster*, *Anabas*, *Badis*, *Barbus*, *Nuria*.

In some cases such as the genus *Haplochilus*, all the species are of equal utility, whereas in others, as *Barbus*, certain species are of much greater value than others. In addition to the above, there are other fishes distributed throughout the province (such as *Amblypharyngodon mola*, *Callichrous pabda*, *Cirrhhina reba*, *Nandus marmoratus*, *Notopterus notopterus*, *Ophiocephalus punctatus* and *gachua*) which have been found to feed on mosquito larvæ during the earlier stages of their growth. When they attain maturity, however, they feed on the smaller larvæ-eating species, thus being inimical eventually to anti-malarial measures. If future attempts are to be made to combat the mosquito by this method, suitable indigenous species should be made use of and no attempt should be made to introduce exotic varieties."

To the list given above we can also add the genera *Betta* and *Belone* both of which are well known to feed on the larvae of mosquitoes.

Within the last few years, the Irrigation Department has built locks across certain of the main waterways of the country, and more are in process of construction. The effect which these barrages will have in obstructing the migration of certain species of fish to their breeding grounds remains to be seen, and on this subject a most interesting account of what happened at the lock on the Prasak river was recently given us by Mr. Percy Lee, Superintendent of Works, Irrigation Department. We quote his letter in full :—

"When the river supply drops at the end of the flood season, the fish known as the "Pla soi"<sup>1</sup> work their way upstream to their breeding grounds, but last year owing to the completion of the barrage across the Prasak river, the fish, when they arrived early in November, found themselves cut off, as the gates of the barrage had been lowered to impound the water for navigation purposes; in the course of a few days millions had accumulated just below the gates, covering an area of about 3000 square yards to a depth of about two feet.

"As it was not possible to raise the gates without damage to navigation an attempt was made to help the fish over the gates by human agency. In each span of the barrage, of which there are six, a couple of large baskets were lowered from pulleys attached to the steel superstructure to within a foot or two of the water surface where men were ready to fill them with fish scooped out of the water with small hand nets, and when full they were hauled up and dumped out upstream.

"It took about five minutes to fill, raise, empty and lower the baskets and as each basket load contained over 250 fish it was reckoned that about 300,000 fish were passed over per day of 8 hours. This system was carried on for about three days but had to be abandoned as it was too costly to work for one thing and for another it was too slow a process and would have taken months.

"It was then decided to try the experiment of passing the fish through the navigation lock and this proved an enormous success and saved the situation as the fish were dying in hundreds and causing the whole place to smell.

"The lock gates were operated just as they are for the passage of boats, that is, the lower gates were opened and kept open until it was seen that the lock chamber was full of fish, they were then closed, the water in the chamber raised to the level of the water upstream of the barrage, the upper gates then opened and the fish passed out. As the water was quite clear it was most interesting

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<sup>1</sup> *Cyclocheilichthys*, *Balantoecheilus* or *Puntius* species. M. A. S.



to watch the fish pass out in two continuous streams hugging each side of the lock.

"The filling and emptying of the lock occupied the best part of an hour and a half and it was therefore only possible to carry out this operation about six times a day, but in the course of about 15 days most of the fish had been passed upstream.

"Later a fish ladder was constructed and fixed to one of the gates of the barrage but by then most of the fish had disappeared and as the design was not good very few fish escaped by it; this year it is proposed to erect a fish ladder of better design and have it ready before the arrival of the fish."

Most of the fresh-water fish are eaten by the country people, but to the majority of Europeans in Bangkok they are, as an article of food, unknown. This is a pity as the flesh of some of them is excellent, and would form a welcome variation in the dietary of which they so often complain.

By far the most common species eaten are the Mud-fishes "Pla chorn" (*Ophiocephalus striatus*) and "Pla duk" (*Clarias* species), and the Climbing Perch (*Anabas testudineus*). They are to be found in every market and, being capable of surviving for a considerable time out of water, can always be bought fresh. "Pla chorn", the first named, is the best of them and is invariably used as diet for invalids.

"Pla tepo" and Pla sawai" (*Pangasius* species) have a very delicate, though somewhat rich, flesh. Young individuals of these species are often caught in the river at Bangkok, but the adults usually remain in the upper reaches of the river beyond tidal influence. They are common at Ayuthia and Paknampo and, at a house in the Annamite colony at Samsen in Bangkok "Pla tepo" are kept in stock alive. They thrive well in captivity, being fed chiefly upon rice.

Other well known food fishes are "Pla bieo" (*Belodontichthys dinema*), "Pla nua on" (*Cryptopterus cryptopterus*), "Pla salat" (*Notopterus notopterus*), "Pla kayeng" (*Macrones* and *Liocassis* species), "Pla mu" (*Botia* species) and the Eels (*Synbranchus bengalensis* and *Pisoodonophis boro*).

## PART I

*Cyprinoidea* (Cobitidae, Cyprinidae, Gyrinocheilidae),  
and  
*Siluroidea* (Clariidae, Siluridae, Plotosidae, Pangasidae,  
Bagaridae, Ariidae, Bagridae).

## CYPRINOIDEA.

## Family COBITIDAE.

1. *BOTIA MODESTA* Bleeker.

ปลาหมอขาว (pla mu khao).

1922. *Botia modesta*, Hora, Rec. Ind. Mus. xxiv, p. 317.

There are four young and two adult specimens in the collection. In the young specimens there are from 8 to 10 vertical black bands on the sides, besides a broad band just in front of the base of the caudal fin, which is so characteristic of the species.

*Locality*:—Nontaburi.

*Further distribution*:—Siam.

2. *BOTIA HYMENOPHYSA* (Bleeker).

ปลาหมอขี้ลาย (pla mu khang lai).

1922. *Botia hymenophysa*, Hora, Rec. Ind. Mus. xxiv, p. 317.

In one of the three specimens of this species in the collection, the ventral fins are totally absent. Superficially there appear to be in that region three raised brownish areas, two occupying the positions of the bases of the fins and a third in the middle behind them. On dissection I have not been able to find any trace of the pelvic girdle, and this is probably another instance in which the absence of fins is due to some injury to the developing embryo.<sup>1</sup> The fish in all other respects is quite normal. The accumulation of such facts is likely to have a great bearing on determining the validity of certain apodal fish genera.

*Locality*:—Nontaburi.

*Further distribution*:—Manipur valley (Assam), Burma, Siam and the Indo-Australian Archipelago.

## Family CYPRINIDAE.

3. ? *PARALAUBUCA TYPUS* Bleeker.

PLATE 10, fig. 2.

ปลาแปบ นวล (pla paep nuan).

1881. *Paralaubuca typus*, Sauvage, Nouv. Archiv. Mus. Hist. Nat. Paris (2) iv, p. 189, (1881).

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<sup>1</sup> Hora, Rec. Ind. Mus. xxii, p. 31 (1921).



I refer with considerable hesitation three specimens to this species. None of these examples exceeds 70 mm. without the caudal. The lateral line begins considerably below the upper angle of the operculum and abruptly descends downwards. After 15 scales it becomes horizontal and is continued over eight more scales when it ends. A short tube is given off from the lateral line organs on each scale, which on the first fifteen scales is directed upwards and backwards, but as soon as the lateral line becomes horizontal, it is directed downwards and backwards. A second lateral line above the last third of the pectoral fin, runs parallel to the first for a length of 9 to 10 scales and then is continued to the base of the caudal running distinctly in the lower half of the tail. The eye is provided with a narrow, transparent, circular eyelid. The pectoral fin is considerably longer than the head and just reaches the base of the ventral. The colour in spirit is silvery, darker above and lighter below. In some specimens there is a long oval patch of dark colour in the middle of the outer rays of the pectoral. The caudal is deeply emarginate and its inner margin is edged with grey.

*Localities*:—Bangkok, Nontaburi.

*Further distribution*:—Siam, Cochin-China.

PRINCIPAL MEASUREMENTS IN MILLIMETRES.

Total length without caudal	..	69.0	66.5	58.6
Length of head	..	15.6	15.0	14.0
Height of body	..	21.0	20.7	19.2
Diameter of eye	..	5.8	5.8	5.0
Length of snout	..	3.2	3.5	3.0

4. *MACROCHIRICHTHYS MACROCHIRUS* (Cuv. and Val.).

ปลาทองพลู (pla tong plu).

1916. *Macrochirichthys macrochirus*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 54, fig. 23.

This species is represented by two specimens in the collection, which are 195 and 281 mm. in length respectively. In the larger specimen the height of the body is greater than the length of the head and is contained 4.3 times in the total length without the caudal.

*Localities*:—Bangkok, Nontaburi.

*Further distribution*:—Siam and the Indo-Australian Archipelago.

5. *CULTER SIAMENSIS*, sp. nov.

PLATE 10, fig. 1; PLATE 11, figs. 4, 5.

ปลาทองพลู (pla tong plu).

D. 9. P. 13. V. 7. A. 24.

The dorsal profile is deeply concave above the snout, but behind the head it is almost straight and horizontal; the ventral



profile is convex throughout. The abdominal edge is compressed and carinated throughout its length. The length of head is contained 4.5 times and the depth of body 3.6 times in the total length without the caudal. The eye is very prominent and is situated almost in the anterior half of the head; its diameter is contained 4 times in the length of the head. The snout is slightly longer than the eye and so is the interorbital width. The mouth is fairly wide and is obliquely directed upwards, there is a well-marked hook in the middle of the lower jaw and a corresponding depression in the upper. The maxilla just extends to below the anterior margin of the orbit. The barbels are absent. The gill-openings are very wide and the membranes of the two sides meet in the mid-ventral line before joining the isthmus. The gill-rakers are long and setiform and the longest among them is shorter than half the diameter of the eye.

The lateral line is without an abrupt or a conspicuous curve, but it is interesting in several other respects. On the right side of the only individual examined, there appear to be two lateral lines. The upper one is interrupted after 27 scales, then drops to the lower series of scales and is continued to the base of the caudal. The lower lateral line is very short and exists over 28 scales only; it commences below the 13th. scale of the upper lateral line and ends below the 41st. scale and throughout its length is situated on the series of scales immediately below the upper lateral line. On the left side of the individual there appear to be three distinct lateral lines over a part of the body. The uppermost lateral line commences from behind the gill-opening and is continued over 27 scales bending abruptly upwards over the last two. The median lateral line begins below the 11th. scale of the upper and exists on 18 scales only. The inferior lateral line originates below the 3rd. scale of the median and is continued to the base of the caudal. These are about 90 scales along the lateral line, 12 rows between it and the origin of the dorsal.

A scale from below the base of the dorsal fin is almost circular or broadly oval in outline. The nucleus is situated much nearer the apex than the base. There are fine innumerable circular striae and only a few radii going to the apex and none to the base.

The alimentary canal is much shorter as compared with other cyprinoid fishes; it is a little longer than the body without the caudal and has only two loops in its entire length. The oesophagus imperceptibly passes into the stomach which is of almost uniform calibre throughout. Externally there is constriction between the stomach and the intestine which near its origin is as wide as the stomach but becomes narrower as it approaches the anus.

The pharyngeal bones are well developed and the teeth are moderately strong but not "slender." The teeth are arranged in



three series, the outer two containing four each and the inner only two, those in the two outer series are hooked near their extremities, while those of the inner row are short and possess blunt, rounded apices.

The air-bladder is well developed and by a pair of constrictions is divided into three chambers, the middle one being the largest. The following are the measurements of the three chambers:—

Anterior chamber	...	25 mm.
Median chamber	...	40 mm.
Posterior chamber	...	6 mm.

The tripartite condition of the air-bladder has been considered to be of generic importance by Günther,<sup>1</sup> but it may be remarked that this condition is also met with in other cyprinoid fish as abnormalities as is shown in the discussion of the species of the genus *Gyrinocheilus* discussed in this paper further on. I have also found a tripartite bladder in the species of *Cosmochilus* that I have examined.

The dorsal fin possesses an almost slender spine and is situated opposite the space between the ventrals and the anal. Its commencement is almost equidistant between the base of the caudal and the nape. The pectoral is almost as long as the head and is separated from the base of the ventral by a considerable distance. The other fins are damaged in the specimen. The caudal appears to be deeply forked.

The colour in spirit is silvery all over, the upper surface of the head and body are light gray while the sides are slightly yellowish. It appears that the inner margin of the caudal fin is coloured black. The pupil of the eye is gray and the iris deep yellow.

Most of the species of this genus that have hitherto been known, are found in China, Tonkin<sup>2</sup> and in the Island of Formosa.<sup>3</sup> Dünker's<sup>4</sup> species from Kuala Lumpur, which he doubtfully referred to the genus *Pseudolaubuca* may possibly belong to *Culter*, but it has a distinct curvature in the lateral line and only 13 rays in the anal fin. The new species described above differs in several important points from the recognised definition of the genus *Culter*, for instance in the course of the lateral line and the structure of the pharyngeal teeth. These in themselves are of perhaps sufficient value to distinguish the new species generically from *Culter*. This course has not been adopted in this paper, firstly because I have no

1 Günther, Cat. Brit. Mus. Fish. vii, p. 328 (1868).

2 Sauvage, Bull. Soc. Biol. France, p. 213 (1884).

3 Oshima, Ann. Carnegie Mus. xii, p. 249 (1919).

4 Dünker, Mitteil. Nat. Mus. Hamburg, xxi, p. 183 (1904).

material from China and other places for comparison, and secondly because the new species is represented by a single individual in the collection. The latter fact does not permit the study of individual variations, malformations and other abnormalities.

*Locality* :—Bangkok.

PRINCIPAL MEASUREMENTS IN MILLIMETRES.

Total length without caudal	..	..	175.0
Length of head	..	..	38.2
Depth of body	..	..	48.0
Diameter of eye	..	..	9.5
Length of snout	..	..	10.8
Interorbital width	..	..	11.2
Longest ray of dorsal	..	..	26.5
Longest ray of anal	..	..	39.0
Base of dorsal	..	..	14.0
Base of anal	..	..	37.0

6. CHELA OXYGASTROIDES (Bleeker).

ปลาทองพลู (pla tong plu).

1916. *Chela oxygastroides*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 51, fig. 22.

This species is represented by a single specimen 104 mm. in length without the caudal.

*Locality* :—Bangkok.

*Further distribution* :—Siam and the Indo-Australian Archipelago.

7. RASBORA RASBORA (Ham. Buch.).

ปลาซิวควาย (pla siew kwai).

1889. *Rasbora buchanaui*, Day, Faun. Brit. Ind. Fish. I, p. 337, fig. 107.

There are three adult and one young specimen of this species in the collection.

*Localities* :—Bangkok, Nontaburi.

*Further distribution* :—India, Burma and Siam.

8. RASBORA ARGYROTÆNIA (Bleeker).

ปลาสร้อย (pla soi).

1916. *Rasbora argyrotænia*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 61.

I refer two young specimens from Koh Chang to this species. They are somewhat grayish in colour.

*Locality* :—Koh Chang.

*Further distribution* :—Siam, Malay Peninsula and Indo-Australian Archipelago.



9. *Danio aequipinnatus* (McClelland).

ปลาปัก (pla ba).

1890. *Danio aequipinnatus*, Vinciguerra, Ann. Mus. Stor. Nat. Genova (2) ix, p. 176.1919. *Danio aequipinnatus*, Chaudhuri, Rec. Ind. Mus. xvi, p. 283.

This species is represented by two specimens, which are provided with small tubercles arranged in definite rows on the under surface of the head. This species has not so far been found east of Burma and its occurrence in Siam is recorded here for the first time.

*Locality*:—Nakon Sritamarat mountains (Peninsular Siam).

*Further distribution*:—Deccan, Ceylon, Himalayas, Assam and Burma.

10. *Luciosoma setigerum* (Cuv. and Val.).

ปลาอี๋ย อี้ว (pla ai'ao).

1916. *Luciosoma setigerum*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 87.

There are two specimens, the largest 97 mm. without the caudal.

*Localities*:—Bangkok, Nontaburi.

*Further distribution*:—"Malacca" and the Indo-Australian Archipelago.

11. *Leptobarbus hoeveni* (Bleeker).

ปลาปัก (pla ba).

1916. *Leptobarbus hoeveni*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 96, figs. 39, 40.

There are two specimens in the collection, the largest is 23 cm. in length.

*Locality*:—Bangkok.

*Further distribution*:—Borneo and Sumatra.

12. *Amblyrhynchichthys truncatus* (Bleeker).

ปลาหนาม หลั่ง (pla nam lang).

1916. *Amblyrhynchichthys truncatus*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 105, fig. 46.

This species is represented by a single young specimen in the collection, which is 140 mm. in length without the caudal.

*Locality*:—Bangkok.

*Further distribution*:—Sumatra, Borneo and Siam.

13. *Dangila siamensis* Bleeker.

ปลาซ่า (pla sa).

1881. *Dangila siamensis*, Sauvage, Nouv. Archiv. Mus. Hist. Nat. Paris (2) iv, p. 176.

There is a single specimen 142 mm. in length, which agrees fairly closely with Sauvage's description of the species. The upper lip, which is hidden beneath the free fold of the skin covering the snout, is distinctly fringed.

*Locality* :—Bangkok.

*Further distribution* :—Petchaburi (S. W. Siam).

14. *THYNNICHTHYS THYNNOIDES* (Bleeker).

ปลานวลจันทร์ (ph nuan chan).

1916. *Thynnichthys thynnoides*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 122, fig. 56.

There are two young specimens of this species, the largest is 132 mm. in length without the caudal.

*Locality* :—Nontaburi.

According to Weber and Beaufort this species is found only in Borneo and Sumatra, but Sauvage<sup>1</sup> has recorded it from Cambodia.

15. *OSTEOCHILUS MELANOPLEURA* (Bleeker).

ปลาพรหมณี (pla prom)

1916. *Osteochilus melanopleura*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 127.

There are three young specimens in the collection hardly exceeding 12 cm. in length.

*Localities* :—Bangkok, Nontaburi.

*Further distribution* :—Singapore, Borneo, Sumatra and Siam.

16. *HAMPALA MACROLEPIDOTA* (Cuv. and Val.),

ปลากระซูด (pla ka-sud).

1916. *Hampala macrolepidota*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 143, fig. 60.

This species is represented by two young specimens in the collection.

*Locality* :—Bangkok.

*Further distribution* :—Tenasserim, Siam, Indo-China, Malacca and the Indo-Australian Archipelago.

17. *CYCLOCHEILICHTHYS DUMERILII* Bleeker.

ปลาหนามหล้าง (pla nam lang).

1881. *Cyclocheilichthys dumerilii*, Sauvage, Nouv. Archiv. Mus. Hist. Nat. Paris (2) iv, p. 182.

I refer to this species three young and one fairly grown spec-

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<sup>1</sup> Sauvage, Nouv. Archiv. Mus. Hist. Nat. Paris (2) iv, p. 164 (1881).



imen. They agree fairly closely with Sauvage's description of the species. In the young the body is comparatively more compressed from side to side and the scales are very thin. The opercular borders overlap each other behind the sucker-like organ on the under surface of the head.

*Localities* :—Bangkok, Nontaburi.

*Further distribution* :—Siam.

18. *CYCLOCHEILICHTHYS APOGON* (Cuv. and Val.).

ปลาหนาม หลิ้ว (pla nam lang).

1916. *Cyclocheilichthys apogon*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 156.

Of this species there are two specimens. They are 68 and 86 mm. in length respectively without the caudal.

*Locality* :—Bangkok.

*Further distribution* :—Burma, Siam, Malay Archipelago, Bunguran Islands.

19. *BARBUS (LISSOCHILUS) DUKAI* Day.

1916. *Lissochilus dukai*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 168.

This species is represented by two specimens, the largest being 150 mm. in length without the caudal.

*Locality* :—Nakon Sritamarat mountains, (P. Siam).

*Further distribution* :—Rivers of the Himalayan range, North-eastern Bengal, Southern Shan States and the Malay Peninsula.

20. *BARBUS (LISSOCHILUS) DEAURATUS* Cuv. and Val.

1881. *Barbus deauratus*, Sauvage, Nouv. Archiv. Mus. Hist. Nat. Paris (2) iv, p. 183, pl. vi, fig. 5.

There are three adult specimens from Koh Chang, which I refer to this species. They agree fairly closely with the description of the species as given by Sauvage. The colour is, however, somewhat different. All the fins are grayish and the outer margins of the caudal are streaked with black. The largest specimen is 111 mm. in length without the caudal.

*Locality* :—Koh Chang, Gulf of Siam (mountain stream).

*Further distribution* :—Cochin-China.

21. *BARBUS (PUNTIVUS) JAVANICUS* Bleeker.

ปลาตะเพียนขาว (pla ta-pien khao).

1916. *Puntius javanicus*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 197.

There are three specimens of this species; the largest is 106 mm. in length without the caudal.

*Locality* :—Bangkok.

*Further distribution* :—Siam, Cambodia, Sumatra and Java.

22. BARBUS (PUNTIUS) SCHWANEFELDI Bleeker.

ปลากระแห (pla ka-hae).

1916. *Puntius schwanefeldi*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 178.

The specimens, which I refer to this species, possess 9 rows of scales between the lateral line and the origin of the dorsal fin and 13 scales in front of dorsal. The last half of the dorsal is coloured black. Of the three specimens of this species in the collection, the largest is 102 mm. in length without the caudal.

*Localities* :—Bangkok, Nontaburi.

*Further distribution* :—Siam, "Malacca", Sumatra and Borneo.

23. BARBUS (PUNTIUS) BINOTATUS Cuv. and Val.

1916. *Puntius binotatus*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 186, fig. 74.

There are two young specimens about 73 mm. in length without the caudal from Koh Chang which I refer to *Barbus* (*Puntius*) *binotatus*. In both there is a deep black spot immediately below the anterior rays of the dorsal fin and a persistent oval black band over three or four scales near the base of the caudal fin.

*Locality* :—Koh Chang, Gulf of Siam (mountain stream).

*Further distribution* :—Indo-Australian Archipelago and Philippines.

24. BARBUS (PUNTIUS) BREVIS (Bleeker).

ปลาตะเพียนทราย (pla taphien sai).

1916. *Puntius brevis*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 176, fig. 70.

This species is represented by two specimens in the collection.

*Locality* :—Bangkok.

*Further distribution* :—Siam and Java.

25. BARBUS (PUNTIUS) SMITHI, sp. nov.

ปลาตะเพียน (pla ta-pien).

PLATE 11, fig. 1.

D. 3/8. A. 3.5.

In general facies the new species is very much like *Puntius nini* recently described from Borneo by Weber and Beaufort 1, but

<sup>1</sup> Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 202, fig. 75 (1916).



differs from all the known species of the genus in the possession of a strong, denticulated anal spine and extremely thin scales which are firmly adherent to the body.

The fish is strongly compressed and greatly elevated. The dorsal profile rises considerably from the tip of the snout to the base of the dorsal fin. The head between the eyes is somewhat concave. The height of the body is contained about 2 times and the length of head from 3 to 3.3 times in the total length without the caudal. The eye is large and prominent, its diameter is contained from 2.7 to 3 times in the length of the head. It is situated in the anterior half of the head for the greater part of its length. The snout is considerably shorter than the eye. The interorbital width is almost equal to the diameter of the eye. The snout is bluntly pointed and the mouth is somewhat inferior. The maxilla does not extend to below the anterior margin of the eye.

There are no barbels. The origin of the dorsal is slightly behind that of the ventral and its commencement is slightly nearer to the base of the caudal than to the tip of the snout. The last osseous dorsal spine is strongly denticulated behind. The pectorals are shorter than the head and extend considerably beyond the origin of the ventrals. The ventrals are slightly longer than the pectorals and extend to the base of the anal fin. The anal fin is short and contains only 5 branched rays besides three spines; the third spine is osseous, strong and sharply denticulated behind. The caudal fin is deeply forked.

The scales are extremely thin and are firmly adherent to the body. There are about 36 along the lateral line, 9 scales above it to the base of the dorsal and 6 below it to that of the ventral.

Colour in spirit is silvery, upper half brownish. The nape is darkish and there is a dark streak along the anterior border of the dorsal fin. The posterior half of the dorsal and the anal and the inner margin of the caudal is infuscated with gray.

*Locality* :—Bangkok.

MEASUREMENTS IN MILLIMETRES.

Total length without caudal	..	70.0	62.3
Length of head	..	23.0	18.6
Height of body	..	33.4	30.5
Diameter of eye	..	8.3	6.1
Length of snout	..	5.5	5.8
Interorbital width	..	8.0	6.7
Length of caudal peduncle	..	12.0	12.2
Height of caudal peduncle	..	10.5	9.0
Longest ray of dorsal	..	25.5	21.0
Longest ray of anal	..	19.0	14.0
Length of pectoral	..	17.6	14.5
Length of ventral	..	18.0	15.2

26. *COSMOCHILUS HARMANDI* Sauvage.

PLATE 11, figs. 2, 3.

ปลาแขยงน้ำเงิน (pla ka-yeng nam ngern).

1881. *Cosmochilus harmandi*, Sauvage, Nouv. Archiv. Mus. Hist. Nat. Paris (2) iv, p. 180, pl. vii, fig. 2.

There is a single young specimen in the collection, which I assign to this species. It differs from Sauvage's description of *Cosmochilus harmandi* in having bigger eyes, longer caudal fin and a more pointed snout, but these differences are always found in the young of cyprinoid fishes.

Sauvage described this species from Cambodia, which is close to Siam.

Besides this there is only one other known species of this genus, from Borneo.<sup>1</sup>

*Locality* :—Bangkok.

## MEASUREMENTS IN MILLIMETRES.

Total length without caudal	..	..	83.5
Length of head	..	..	22.0
Height of body	..	..	30.2
Diameter of eye	..	..	8.0
Length of snout	..	..	6.6
Interorbital width	..	..	9.0
Length of caudal peduncle	..	..	18.7
Height of caudal peduncle	..	..	10.0
Longest ray of dorsal	..	..	26.5
Longest ray of anal	..	..	16.0
Length of pectoral	..	..	17.0
Length of ventral	..	..	17.2
Length of caudal	..	..	27.0

27. *CIRRHINA MICROLEPIS* Sauvage.

ปลา นวล จันทร (pla nuan chan).

1881. *Cirrhina microlepis*, Sauvage, Nouv. Archiv. Mus. Hist. Nat. Paris, (2) iv, p. 173, pl. viii, fig. 2.

I refer to this species a single specimen 26 cm. in length, in the collection. It agrees fairly closely with Sauvage's description of the species.

*Locality* :—Bangkok.

*Further distribution* :—"See-Moun, Lakône, Pnôm-Penh, Me-Kong, à Tmà-Kré." (Indo-China).

28. *CATLA CATLA* (Ham. Buch.).

ปลา กะโห้ (pla ka-ho).

1889. *Catla buechanani*, Day, Faun. Brit. Ind. Fish. i, p. 287, fig. 99.

There are two young specimens of this species in the collection.

<sup>1</sup> Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 142, fig. 59 (1916).



*Locality* :—Nontaburi.

*Further distribution* :—India, Burma and Siam.

29. *BALANTIOCHEILUS MELANOPTERUS* (Bleeker).

ปลาหนามหลัง หางดำ (pla nam lang hang dam).

1916. *Balantiocheilus melanopterus*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 206, fig. 76.

This species is represented by two immature specimens in the collection. The largest is 67 mm. in length without the caudal.

*Locality* :—Nontaburi.

*Further distribution* :—Siam, Sumatra and Borneo.

30. *LABEO (MORULIUS) CRY SOPHEKADION* (Bleeker).

ปลาปาก (pla ka).

1916. *Labeo (Morulus) crysophekadion*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 210, fig. 80.

There are two young and one half-grown specimens of this species in the collection.

*Localities* :—Bangkok, Nontaburi.

*Further distribution* :—Siam and the Indo-Australian Archipelago.

Family *GYRINOCHEILIDAE*.

31. *GYRINOCHEILUS KAZNAKOEI* Berg.

PLATE 12, figs. 4-7.

1906. *Gyrinocheilus kaznakoi*, Berg, Comp. Rend. Trav. Soc. Imp. Nat. St. Pétersbourg, xxxvii, pp. 305-307 and 364-366.

In the collection there are four young specimens which I refer to this species. In general facies and build the members of the genus *Gyrinocheilus* are not unlike those of the genus *Garra*,<sup>1</sup> to which they also correspond in not having any well-marked specific characters. Only two species of the genus *Gyrinocheilus* are known so far; one was described by Vaillant,<sup>2</sup> the author of the genus, from Borneo in 1902 and the other from Siam by Berg (*loc. cit.*) in 1906. Berg had specimens of both the species before him and distinguished the Siamese form, *G. kaznakoi*, from *G. pustulosus* by the following five characters :—

i. By the presence of a well-marked proboscis on the snout, in front of and between the eyes, equal in length to the diameter of the eye and studded with tubercles.

ii. By the presence of two small proboscides on the sides of the head.

<sup>1</sup> Hora, *Rec. Ind. Mus.* xxii, p. 633 (1921).

<sup>2</sup> Vaillant, *Notes Leyden Mus.* xxiv, pp. 107-122, figs. 30-32, pls. 1-2 (1902).

iii. By the presence of a clear, oblique groove at the junction of pre-, inter- and subopercular bones. The groove runs forwards from the lower margin of the gill-cover and ends below the middle of the eye; it is 1.5 times the diameter of the eye in length.

iv. By the presence of a much longer air-bladder, whose anterior chamber is 3 times the length of the posterior.

v. By the presence of a deep black spot near the upper corner of the gill-opening. The tail fin is covered with numerous black spots which form a chequered pattern on the rays.

Judging from these characters alone, the specimens in the present collection belong to neither of the two forms, because in the former the air-bladder is of an absolutely different nature, and they do not possess any groove on the sides of the head except the wrinkles which are usually caused by putting specimens in strong preservatives direct. On handling a big collection of *Garra* it became quite clear to me that such characters as are tabulated above have little significance in determining the specific limits of the species of hill-stream genera, and especially those which are still in the process of adaptation to their environment. It will, therefore, be worth while, even at the cost of repetition, to discuss the significance of these characters here, taking them one by one.

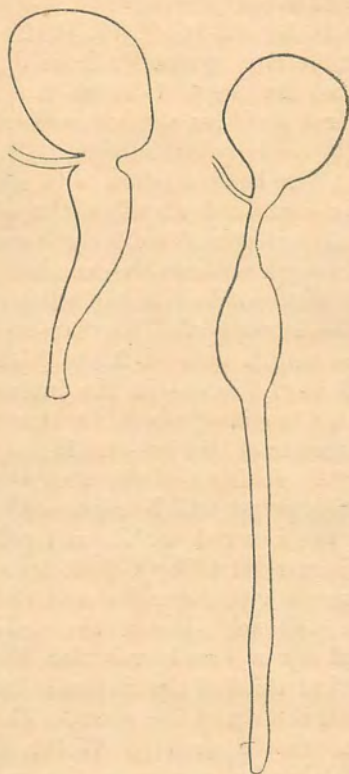
The proboscis on the snout varies considerably with age and in older specimens it is generally well-marked. Of the four specimens before me, in two it is fairly well marked, while in the other two, which are below 55 mm. in length without the caudal, it is hardly distinguishable and is represented by a raised area which in front is separated by a shallow groove. The lateral proboscides are not at all distinguishable in the young. Specimens of *G. pustulosus* figured by Vaillant (*loc. cit.*) appear to possess well-marked median and lateral proboscides.

I do not find any oblique groove on the sides of the head in the position indicated by Berg in my specimens, and as I have no others for comparison, I am not able to say anything definite on this point.

The air-bladder is known to have undergone considerable degeneration from the normal cyprinoid form in the hill-stream fishes of the family. After taking considerable pains in using the character of the air-bladder for distinguishing the various species of the genus *Garra*, I had to give it up, because it not only differed in the various species of the genus but showed considerable variation in individuals of the same species. The same fact is amply illustrated by an examination of the bladder in two of the four examples of *Gyrinocheilus* with me. In a specimen 125.5 mm. in total length, it is only 28 mm. in length and is divided into four parts. The anterior chamber is almost circular in outline and has very thin walls,



but is covered by a thick fibrous coat which attaches it firmly to the body wall; just at its termination the pneumatic duct from the



Form of air-bladder in two specimens  
of *Gyrinocheilus kasnakoi* Berg.

oesophagus opens in to the bladder. This chamber is followed by a short narrow tube, which dilates into another chamber, behind which the bladder is continued as a narrow cylindrical tube to its termination. The walls of the last three parts are moderately thick. The following are the dimensions of the various chambers:—

The thin-walled anterior chamber	6.2 mm.
The narrow tube connecting two dilated chambers	3.0 "
The second dilated chamber	5.5 "
The last cylindrical tube	13.3 "

In a second specimen 66.3 mm. in total length, the bladder is of a normal cyprinoid form and is 8 mm. in length, the posterior chamber being considerably longer than the anterior.

The last character, that of colouration, can hardly be of any

significance, since a black spot is also present in *G. pustulosus* behind the upper corner of the gill cover.<sup>1</sup>

In view of the facts stated above I give a detailed description of the species with figures.

D. 3/9. A. 2/5. P. 13. V. 8.

The dorsal profile rises gradually from the tip of the snout to the base of the dorsal fin, beyond which it is almost straight and horizontal. The ventral profile is straight and horizontal in front of the ventrals. The body is subcylindrical with the under surface somewhat flattened. The head is short and gradually tapers anteriorly, its length is contained about 4 times in the total length without the caudal. The depth of the body is contained from 4.8 to 5.3 times in the total length without the caudal. The eye is small and is situated in the posterior half of the head, its upper margin is almost in line with the dorsal profile, its diameter is contained from 4.5 to 6.2 times in the length of head, 2.2 to 3.5 times in the length of the snout and 1.9 to 2.3 times in the interorbital width. The snout is provided with a median proboscis which in its free portion is not as wide as the diameter of the eye and in length is equal to half the diameter of the eye. In front of the nostrils on each side there is a hard, oval, whitish patch which represents a lateral proboscis. All these proboscides are covered with small prickle-like tubercles. The tip of the snout is marked off by a short transverse groove. The tip of the snout is covered with tubercles and there are two lateral tubercular areas, one on each side of the median proboscis. The nostrils are separated by a broad, valvular flap and are situated almost wholly in the first third of the distance between the anterior margin of the orbit and the tip of the snout. The under surface of the head is similar to that figured by Weber and Beaufort for *G. pustulosus*, except that in my specimens the so called upper lip is not provided with a deep median notch.

The lateral line runs straight from the upper corner of the lower gill-opening to the middle of the base of the caudal fin. There are about 41 scales along its length, 6 longitudinal series of scales above it to the base of the dorsal and 4 between it and the base of the ventral. There are a few loose scales near the origin of the ventral forming an appendage. In front of the ventrals on the under surface the scales are very much reduced and to the naked eye appear to be almost absent on the chest.

The dorsal fin commences above the 10th. scale of the lateral line and its base extends to above the 22nd. scale of the same, its base is almost as long as the distance between the base of the ventral and that of the anal. The longest ray of the dorsal is slightly

<sup>1</sup> Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 224 fig. 89 (1916).



longer than the depth of the body below it. The pectoral is shorter than the head and is separated from the ventrals by a considerable distance; it contains only one undivided ray. The ventrals extend beyond the anal opening by one-third of their length. The anal is short and, when adpressed, does not reach the base of the caudal. The caudal is forked, in young specimens one of the lobes is usually longer than the upper.

The upper surface and sides of the head and body are dark, the under surface is pale olivaceous. There is a black band on the dorsal surface behind the head, it terminates on the sides of the body in black spots behind the superior gill-openings. There are short black bands on the sides and on the dorsal surface of the body, and there are longitudinal series of spots on the tail corresponding to the rows of scales. A series of black spots is usually present on the bases of the rays of the dorsal fin. There are irregular rows of black spots on the proximal half of the caudal fin. There is an oblique black band on the upper aspect of the pectoral fin, it runs almost along the outer margin of the fin in the last three-fourths of its length.

In the table given below I give the lengths of various structures in hundredth of total length without the caudal and for convenience of reference have included the measurements of the two specimens from which Berg (*op. cit.*) described *G. kaznakoi*.

	Berg's specimens.		Specimens from Dr. Smith's collection.		
Total length including caudal.	198 mm.	151 mm.	125.5 mm.	82 mm.	66.3 mm.
Length of head .. ..	21.7	21.9	25.0	25.3	26.2
Height of head .. ..	14.7	14.7	14.3	15.3	14.6
Breadth of head .. ..	15.3	15.2	16.0	15.0	15.0
Diameter of eye .. ..	3.0	3.8	4.0	4.9	5.8
Interorbital width .. ..	8.7	8.7	10.0	11.5	11.2
Length of snout .. ..	12.6	12.1	14.0	13.5	12.8
Height of body .. ..	18.7	20.7	19.0	20.6	19.7
Length of caudal peduncle ..	19.9	18.7	14.0	14.6	15.0
Base of dorsal fin .. ..	20.8	21.1	23.0	23.0	21.7
Height of dorsal fin .. ..	19.9	19.5	20.0	20.3	20.0
Base of anal fin .. ..	7.2	7.0	7.8	6.4	5.8
Height of anal fin .. ..	15.6	15.6	17.0	16.9	16.8
Length of pectoral fin .. ..	24.7	23.4	24.5	22.3	22.0
Length of ventral fin .. ..	17.1	17.5	18.0	18.4	17.2

From the above table it will be seen that in young individuals the head and the eyes are proportionately bigger than in the older specimens, and that the variation in proportions in this respect is quite gradual.

The minute structure of the scales is of considerable interest. A scale from below the base of the dorsal fin is broadly heart-shaped; the distal margin is trilobed and the basal broadly pointed. A slight emargination is present at either side at the point to which the scale is covered with its epidermal sheath. Three quite distinct regions may be recognized, a basal of an almost triangular form which is covered by epidermis, a large subcircular nuclear region and a broad distal region, which surrounds the nuclear region as a border and is separated from the basal by the emarginations already mentioned. The nuclear region is reticulate in the centre and sculptured with both concentric and longitudinal lines round the periphery. At the distal border the longitudinal lines are continued to the margin in the form of radii and towards the two sides additional striae running from the margin inwards to different distances take their place. The distal region is separated from the nuclear region by a strong subcircular groove, which is incomplete at the base. Numerous fine concentric striae are present outside this groove as well as inside it. The basal region is sculptured with fine, close-set, longitudinal striae, some of which are in continuity with those that form the reticulate pattern on the nuclear region.

There has been some controversy over the systematic position of the genus *Gyrinocheilus*. Vaillant (*loc. cit.*) referred it to the subfamily Homalopterinae but Boulenger<sup>1</sup> was of opinion that it should be made to represent a separate subfamily. Berg in 1906 erected a subfamily (Gyrinocheilini) to accomodate it. Regan<sup>2</sup> in 1911 remarked that the place of *Gyrinocheilus* "in the system seems to be in the family Cyprinidae next to *Crossocheilus* and *Discognathus*." Weber and Beaufort (*loc. cit.*) included it in the family Cyprinidae without any comment. There seems to be little doubt that judging from their appearance the members of the genus *Gyrinocheilus* are remarkably similar to those of the genera *Crossocheilus* and *Garra*, but this outward similarity, in my opinion, is directly correlated with the life of these fishes in moderately rapid-running waters. The presence of "the slender toothless lower pharyngeals", the structure of the scales, the remarkable modification of the gill-openings to form inhalent and exhalent apertures and the structure of the mouth, lips and jaws are in my opinion better defined characters than those that separate Cyprinidae, Cobitidae and Homalopteridae from one another.

*Locality*:—Nontaburi.

*Further distribution*:—Pailin (S. E. Siam).

1 Boulenger, *Cambridge Nat. Hist.* vii, p. 582 (1909).

2 Regan, *Ann. Mag. Nat. Hist.* (8) viii, p. 29 (1911).



## SILUROIDEA.

## Family CLARIIDAE.

## 32. CLARIAS BATRACHUS (Linn.).

ปลาตุ๊ก (pla duk).

1913. *Clarias batrachus*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 190, fig. 74.

There is only one specimen 16.5 cm. in length in the collection.

*Locality* :—Bangkok.*Further distribution* :—Ceylon, British India, Burma, Malay Archipelago, Philippines.

## 33. CLARIAS TEYSMANNI Bleeker.

1913. *Clarias teysmanni*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 191.

This species is represented by a single adult specimen in the collection.

*Locality* :—Nakon Sritamarat mountains.*Further distribution* :—Ceylon, Malay Archipelago.

## Family SILURIDAE.

## 34. WALLAGO ATTU (Bl. and Schn.).

ปลาค้ำ (pla khae).

1913. *Wallago attu*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 201.

There is a single half-grown specimen in the collection.

*Locality* :—Bangkok.*Further distribution* :—Ceylon, India, Burma, Siam, Sumatra and Java.

## 35. BELODONTICHTHYS DINEMA (Bleeker).

ปลาเขี้ยว (pla hiao).

1913. *Belodontichthys dinema*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 204, fig. 79.

There is one half-grown specimen of this species in the collection.

*Locality* :—Nontaburi.*Further distribution* :—Siam, Malay Archipelago, Sumatra and Borneo.

## 36. CALlichrous BIMACULATUS (Bloch).

ปลาซุกรมพอน (pla sa-yum pon).

1913. *Callichrous bimaculatus*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 209.

A specimen 14.2 cm. in length without the caudal is present in the collection.

*Locality* :—Nontaburi.

*Further distribution* :—Ceylon, India, Burma, Siam and the Indo-Australian Archipelago.

37. *CRYPTOPTERUS CRYPTOPTERUS* (Bleeker).

ปลาเนื้ออ่อน (pla neu on).

1913. *Cryptopterus cryptopterus*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 218.

There are two fully grown specimens of this species in the collection.

*Locality* :—Nontaburi.

*Further distribution* :—Siam, the Malay Archipelago, Sumatra and Borneo.

38. *CRYPTOPTERUS BLEEKERI* (Bocourt).

ปลาแดง (pla deng).

1864. *Cryptopterus bleekeri* Günther, Cat. Brit. Mus., Fish. v, p. 44.

This species is represented by two specimens; the larger 18.2 cm. in length. In both the specimens there is a black bar at the base of the caudal fin and the rays of the pectoral, anal and caudal fins are powdered with black.

*Localities* :—Nontaburi, Bangkok.

*Further distribution* :—Pnom-Penh, Siam.

Family *PLOTOSIDAE*.

39. *PLOTOSUS CANINUS* Ham. Buch.

ปลาตุกทะเล (pla duk talé).

1913. *Plotosus caninus*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 227.

There is only one specimen of this species in the collection.

*Locality* :—Nontaburi.

*Further distribution* :—Ceylon, India, Burma, Andamans, British N. Guinea, Celebes, Aru Islands and Indo-Australian Archipelago.

Family *PANGASIDAE*.

40. *PANGASIUS HYPOPHthalmus* (Sauvage).

ปลาฉี่ดอง (pla ai dong).

1881. *Helicophagus hypophthalmus*, Sauvage, Nouv. Archiv. Mus. Hist. Nat. Paris. (2) iv, p. 170, pl. vii, fig. 1.

There is a young specimen 145 mm. in total length without the caudal in the present collection which I refer to this species with hesitation. The posterior nostril is situated slightly behind the anterior and above the line joining the middle of the



eye to the anterior nostril. I have not been able to find any teeth on the palate of this fish. The absence of teeth at certain stages during the development of this species has already been noticed by Sauvage. The proportions of my specimen differ from those given by him but this I think is due to the fact that mine is quite young.

*Locality* :—Bangkok.

*Further distribution* :—Mé Kong and Cambodia.

41. *PANGASIUS LARNAUDII* Bocourt.

ปลาเทโพ (pla te-po).

1866. *Pangasius larnaudii*, Bocourt, Nouv. Archiv. Mus. Hist. Nat. Paris, (1) ii, p. 15, pl. 1. figs. 2 2a.

I refer to this species two specimens. They agree fairly closely with the description and figures of the species by Bocourt (*loc. cit.*). The distal half of the divided rays of the dorsal and some of the outer rays of the caudal are dotted with black. The largest specimen is 150 mm. in length without the caudal.

*Locality* :—Nontaburi.

*Further distribution* :—Cambodia and Siam.

42. *PANGASIUS PANGASIUS* (Ham. Buch.).

ปลาสิ้งกะวาดขาว (pla sangkawart khao).

1913. *Pangasius pangasius*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 256.

There are two young specimens of this species in the collection. The vomerine and the palatine patches of teeth are confluent with one another and form one semicircular patch.

*Locality* :—Bangkok.

*Further distribution* :—India, Burma and Java.

43. *PANGASIUS MICRONEMA* Bleeker.

ปลาสิ้งกะวาดท็องโต (pla sangkawart tong to).

1913. *Pangasius micronema*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 261.

There is a single specimen about 150 mm. in length without the caudal which I refer to this species.

*Locality* :—Nontaburi.

*Further distribution* :—Java, Borneo and Sumatra.

44. *PANGASIUS SIAMENSIS* Steind.

ปลาสิ้งกะวาดเหลื่อง (pla sangkawart leuang).

1879. *Pangasius siamensis*, Steindachner, Sitzung. math.-nat. Classe Akad. Wiss. Wien, lxxviii, p. 393.

There are two young specimens which I refer to this species.

*Pangasius macronema* Blkr. appears to be closely allied to this species, but for want of material for comparison I am unable to say anything on this point.

*Locality* :—Bangkok.

#### Family BAGARIDAE.

##### 45. GLYPTOTHORAX SIAMENSIS, sp. nov.

PLATE 12, figs. 1—3.

D. 1/6. A. 4/10, P. 10. V. 6.

It is a long and narrow fish with the head and body considerably depressed. The dorsal profile rises imperceptibly from the tip of the snout to the base of the dorsal beyond which it runs almost straight to the base of the caudal. The head is slightly longer than broad and is almost elliptical in outline, its length is contained 4.4 times in the total length without the caudal. The snout is broad and is broadly rounded anteriorly, it is just as long as the postorbital part of the head. The eyes are minute and are placed on the dorsal surface of the head, their diameter is contained about 13 times in the length of the head. The interorbital width is equal to the distance between the nostrils and the eye. The occipital process is about 3 times as long as broad at its base. The height of the body is 1.2 times the depth of the head and is contained 6.4 times in the total length without the caudal. There are four pairs of broad barbels, the nasals are as long as the distance between their bases, the maxillary barbels extend to the end of the base of the pectoral fin, the outer mandibular to the base of the pectoral spine and the inner to the end of the gill-opening on the under surface. The mouth is situated on the under surface considerably behind the tip of the snout, its gape is slightly less than half the width of the head. The teeth are sharp and pointed and are arranged in crescentic bands, those of the upper jaw remain exposed even when the mouth is shut. The anterior lip is provided with papillae and is joined to the lower lip by flattened lateral expansions of the skin. The posterior lip is smooth and the labial groove is widely interrupted. The skin immediately behind the lower lip is papillated. The adhesive apparatus on the thorax is well developed, it is much longer than broad. The anus is provided with a papilla behind it and is situated almost in the middle of the distance between the origin of the pectoral spine and the base of the caudal fin. The least height of caudal peduncle is contained 2.3 times in its length.

The dorsal fin commences above the middle of the pectoral and the origin of its spine is nearer to the tip of the snout than to the commencement of the adipose fin; its longest ray is greater than the depth of the body below it, the length of the bony portion of its



spine equals the greatest depth of the head. The pectoral is slightly shorter than the head and is separated from the ventral by a distance equal to one-fourth of its length, its spine is devoid of any adhesive apparatus on its ventral aspect. The ventral is much shorter than the pectoral and extends considerably beyond the anal-opening, it is situated considerably behind the base of the dorsal. The anal is well developed and its base is as long as the bony portion of the dorsal spine. The base of the adipose dorsal is almost equal to half the distance between it and the base of the rayed dorsal. The caudal is much longer than the head and is deeply emarginate, its shortest middle ray is two-fifths of the longest. The lobes are pointed and the upper is slightly longer than the lower.

The colour in spirit is grayish all over, somewhat darker on the back and lighter on the under surface. There are indications of dark bands on the two dorsal and the anal fins.

*Glyptothorax siamensis* is closely allied to *G. platypogonoides* and may ultimately prove to be a variety of it. I have examined only one specimen of the new species and find that it differs from the description of *G. platypogonoides* as given by Weber and Beaufort<sup>1</sup> in the characters tabulated below.

<i>G. platypogonoides.</i>	<i>G. siamensis.</i>
Height 5—5½, head 4 <sup>2</sup> / <sub>5</sub> , eye 8—11.	Height 6.4, head 4.4, eye 13.
Lowest part of caudal peduncle equalling twice its length.	Lowest part of caudal peduncle contained 2.3 times in its length.
Origin of ventrals about below end of base of dorsal.	Origin of ventrals considerably behind base of dorsal.

Weber and Beaufort in the synoptic table of this genus attach great importance to the proportion of the body height to the total length and it is on this consideration mainly that I have separated a specimen in the Malcolm Smith collection from *G. platypogonoides*, which is known only from Sumatra.

*Locality*:—Nakon Sritamarat hills (P. Siam).

MEASUREMENTS IN MILLIMETRES.		
Total length without caudal	..	115.5
Length of head	..	26.0
Depth of head	..	15.2
Width of head	..	23.0
Height of body	..	18.0
Length of snout	..	12.0
Interorbital width	..	7.0
Diameter of eye	..	2.0

<sup>1</sup> Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 267 (1913).

Length of caudal peduncle ..	25.5
Least height of caudal peduncle ..	10.8
Longest ray of dorsal ..	20.0
Length of bony portion of dorsal spine ..	15.5
Longest ray of anal ..	18.0
Length of pectoral ..	25.0
Length of ventral ..	20.0
Length of caudal ..	28.0
Length of adhesive apparatus ..	14.0
Breadth of adhesive apparatus ..	10.5

### Family *ARIIDAE*.

#### ✓ 46. *KETENGUS TYPUS* Bleeker,

ปลา กุก ห้ว หิน (pla ook hua hin).

1913. *Ketengus typus*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 317, fig. 138.

This species is represented by two young specimens in the collection.

*Locality* :—Nontaburi.

*Further distribution* :—Andamans, Siam, Penang and the Indo-Australian Archipelago.

#### 47. *HEMIPIMELODUS SIAMENSIS* Sauvage.

ปลา กุก ขาว (pla ook khao).

1881. *Hemipimelodus siamensis*, Sauvage, Nouv. Archiv. Mus. Hist. Nat. Paris, (2) iv, 172, pl. viii, fig. 5.

I refer to this species a specimen 150 mm. in length without the caudal. The length of the head is contained 3.6 times, the height of the body 4.5 times in the total length without the caudal. The dorsal spine is strong and bony, its length is equal to the post-orbital part of the head, it is roughened anteriorly and finely denticulated posteriorly.

*Locality* :—Nontaburi.

*Further distribution* :—Laos and I. of Fu-kok (Gulf of Siam).

#### 48. *HEMIPIMELODUS BORNEENSIS* (Bleeker).

ปลา กุก เข้ม (pla ook khem).

1913. *Hemipimelodus borneensis*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 327.

A young specimen 86 mm. in length without the caudal in the collection belongs to this species.

*Locality* :—Nontaburi.

*Further distribution* :—Siam, Sumatra and Borneo.



## Family BAGRIDAE.

## 49. MACRONES GULIO (Ham. Buch.).

ปลามังกร (pla mang kong).

1913. *Macrones gulio*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 344.

There are two young specimens of this species in the collection.

*Locality* :—Nontaburi.*Further distribution* :—Ceylon, India, Burma, Malay Archipelago, Penang.

## 50. MACRONES NEMURUS (Cuv. and Val.).

ปลากรด หม้อ (pla kot mor).

1913. *Macrones nemurus*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 341.

This species is represented by three adult specimens in the collection. It appears to be an extremely voracious fish. From the stomach of a specimen 146 mm. in length without the caudal, I have taken five young carp averaging about 50 mm. in length without the caudal. The walls of the stomach are heavily infested with encysted round worms and so is the mesentery in some specimens.

*Locality* :—Nontaburi.*Further distribution* :—Siam and the Indo-Australian Archipelago.

## 51. MACRONES NIGRICEPS (Cuv. and Val.).

ปลาเมฆง ไปขาว (pla ka-yeng bai khao).

1913. *Macrones nigriceps*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 337.

Only a single young specimen of this species exists in the collection.

*Locality* :—Nontaburi.*Further distribution* :—Siam and the Malay Archipelago.

## 52. MACRONES WOLFFI (Bleeker).

ปลาหนาม หล้าง (pla nam lang).

1913. *Macrones wolffi*, Weber and Beaufort, Fish. Indo-Austral. Archipel. ii, p. 340.

In the collection this species is represented by three specimens, the largest is 125 mm. without the caudal.

*Locality* :—Nontaburi.*Further distribution* :—Siam, Sumatra and Borneo.

53. *BAGROIDES* sp.

There are two immature specimens in the Malcolm Smith collection which I am unable to identify specifically. The height of the body in them is contained about 4 times and the length of the head about 5 times in the total length without the caudal. The dorsal spine is slightly longer than the head but is not as high as the depth of the body below it. The pectoral spine is relatively stronger than the dorsal spine which is about 1.3 to 1.5 times as long as the pectoral spine. The caudal is deeply emarginate and its lobes are produced into filaments. The colour of the body is brownish except on the under surface which is much lighter. There are two lighter bands on the body, one running from the commencement of the adipose fin to in front of the anal and the other about the middle of the length of the tail. The adipose fin is grayish except for a lighter margin posteriorly, other fins except the caudal grayish in their distal halves. The adipose fin is contiguous with the dorsal.

Two species<sup>1</sup> of the genus *Bagroides* have already been recorded from Siam and I have found on comparison that my specimens do not agree with the descriptions of these species by Weber and Beaufort.<sup>2</sup> I have refrained from giving them any specific name firstly because these fishes are liable to considerable variation during growth and secondly because no material of this genus is available for comparison in the Indian Museum.

*Locality* :—Nontaburi.

54. *LIOCASSIS SIAMENSIS* Regan.

ปลาเขยงหิน (pla ka-yeng hin).

1913. *Liocassis siamensis*, Regan, Ann. Mag. Nat. Hist. (8) xi, p. 550.

Regan described this species from a single specimen 90 mm. in length from the Bangpakong River, Siam, and distinguished it from *Liocassis poecilopterus* by the proportion between the breadth and the length of the head, which in *L. poecilopterus* is  $1\frac{1}{2}$  to  $1\frac{1}{2}$  and in *L. siamensis* is  $1\frac{1}{5}$ . In the present collection there are three specimens which I refer to *L. siamensis*, the largest among them only 76 mm. in length including the caudal. They agree fairly closely with the description of the species by Regan, differing only slightly in colour.

*Locality* :—Nontaburi.

*Further distribution* :—Siam.

<sup>1</sup> Sauvage, *Nouv. Archiv. Mus. Hist. Nat. Paris* (2) iv, p. 161 (1881).

<sup>2</sup> Weber and Beaufort, *Fish. Indo-Austral. Archipel.* ii, pp. 349-351 (1913.).



## PART II.

This, the second and concluding part of my report on the Siamese fishes collected by Dr. and Mrs. Malcolm Smith contains a systematic treatment of 48 species, which are distributed among 28 families. Most of the species dealt with are either from brackish water, or are estuarine or marine forms and are fairly widely distributed in the Oriental Region. There is only one endemic brackish-water species, and about a dozen freshwater forms in all. One hundred and twenty-eight specimens have been examined.

Family *DASYBATIDAE*.55. *DASYBATUS BLEEKERI* (Blyth).

ปลากระเบนขาว (pla ka-ben khaō).

1909. *Trygon bleekeri*, Annandale, Mem. Ind. Mus. ii, p. 26, pl. iii, fig. 9.

1913. *Dasybatus bleekeri*, Garman, Mem. Mus. Comp. Zool. Harvard, xxxvi, p. 379.

There is a single young specimen of this species in the collection (15 cm. across the disc). Of the dorsal denticles, which in the adult form a "wine-glass-shaped figure," very few are present and are irregularly scattered. The whole of the under surface is of a uniform white colour, but there is a slight indication of the beginning of a dark brown margin.

*Dasybatus bleekeri* is chiefly an Indo-Burmese fish, but its range extends to the Malay Peninsula.

*Locality*:—Nontaburi.

Family *OPHICHTHYIDAE*.56. *PISOODONOPHIS BORO* (Ham. Buch.)

ปลาไหล (pla lai).

1916. *Pisoodonophis boro*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iii, p. 297, fig. 138.

This widely distributed Oriental species is represented by two half-grown specimens in the collection.

*Locality*:—Nontaburi.

Family *MURAENIDAE*.57. *MURAENA* (*GYMNOTHORAX*) *RUPPELLI* McClelland.

1916. *Muraena* (*Gymnothorax*) *ruppelli*, Weber and Beaufort, op. cit., p. 372.

A specimen of this species was sent from Bangkok by Dr. Malcolm Smith in 1916 to the Indian Museum. The species is fairly widely distributed in the seas of the Oriental Region.

Family *SYNBRANCHIDAE*.58. *SYNBRANCHUS BENGALENSIS* (McClelland).

ปลาไหล (pla lai).

1916. *Synbranchus bengalensis*, Weber and Beaufort, op. cit., p. 416, fig. 213.

There is only one young specimen of this species in the present collection, but there are two more specimens in our collection sent in 1916 from Bangkok. The species is found in the fresh and brackish waters of India, the Malay Archipelago and the Philippines.

*Localities* :—Bangkok, Hua Také, near Bangkok.

Family *CLUPEIDAE*59. *SETIPINNA MELANOCHIR* (Blkr.).

ปลาเมว (pla meo).

1913. *Setipinna melanochir*, Weber and Beaufort, op. cit. ii, p. 28, fig. 15.

This species is represented by a single specimen in the collection. Its length without the caudal is 175 mm. *Setipinna melanochir* is found in fresh and brackish waters of Siam, the Indo-Australian Archipelago and China.

*Locality* :—Nontaburi.

60. *ENGRAULIS MYSTAX* (Bl. and Schn.)

ปลาหมึก (pla mong kroi).

1913. *Engraulis mystax*, Weber and Beaufort, op. cit., p. 38.

There are two specimens of this species, the larger one is 140 mm. in length without the caudal. *Engraulis mystax* occurs in seas and estuaries of India, the Indo-Australian Archipelago, Singapore, North Celebes and China.

*Locality* :—Nontaburi.

61. *COILIA MACROGNATHUS* Bleeker.

ปลาหางไก่ (pla hang kai).

1913. *Coilia macrognathus*, Weber and Beaufort, op. cit., p. 49.

Of the three specimens of this species in the collection, the largest is only 135 mm. in length without the caudal. *Coilia macrognathus* is known only from the estuaries of Borneo and Siam.

*Locality* :—Nontaburi.

62. *HILSA TOLI* (Cuv. and Val.)

ปลาตะลุมพุก (pla talum puk).

1917. *Hilsa toli*, Regan, Ann. Mag. Nat. Hist. (8) xix, p. 306.

There is only one half-grown specimen of this species in the



collection. The species is found in the seas and estuaries of India, the Malay Peninsula and the Archipelago.

*Locality* :—Nontaburi.

Family *ELOPSIDAE*.

63. *MEGALOPS CYPRINOIDES* (Brouss.).

ปลากระบอก (pla ka-bork).

1913. *Megalops cyprinoides*, Weber and Beaufort, op. cit. ii, p. 5, fig. 4.

There is a single specimen of this species. Its length without the caudal is 135 mm. The species is very widely distributed, its range extends from the east coast of Africa and Madagascar, through the Malay Archipelago to Australia, Philippines and China.

*Locality* :—Nontaburi.

Family *NOTOPTERIDAE*.

64. *NOTOPTERUS NOTOPTERUS* (Pall.).

ปลาชลาด (pla salat).

1913. *Notopterus notopterus*, Weber and Beaufort, op. cit., p. 9.

This species is represented by two specimens in the collection, the larger being about 23 cm. in length. *Notopterus notopterus* is known to occur in fresh waters of India, Burma, Siam, Sumatra and Java.

*Locality* :—Bangkok.

65. *NOTOPTERUS CHITALA* (Ham. Buch.).

ปลาหางแพน (pla hang pen) or ปลาเกลาย (pla klai).

1913. *Notopterus chitala*, Weber and Beaufort, op. cit., p. 10, fig. 6.

A specimen of this species about 260 mm. in total length is present in the collection. The species is found in fresh waters of India, Burma, Siam and the Indo-Australian Archipelago.

*Locality* :—Nontaburi.

Family *BELONIDAE*.

66. *XENENTODON CANCILA* (Ham. Buch.).

ปลากระทุงเหว (pla katung heo meuang).

1889. *Belone cancila*, Day, Faun. Brit. Ind., Fish. i, p. 420, fig. 136.

There are four specimens of this species. The largest is about 15 cm. in length without the caudal.

*Xenentodon cancila* is chiefly an Indo-Burmese freshwater fish and its range extends as far east as the Malay Peninsula.

*Locality* :—Bangkok.

Family *HEMIRHAMPHIDAE*.67. *XENARCHOPTERUS ECTUNTIO* (Ham. Buch.).

ปลากระทิงเหว (pla katung heo).

1922. *Xenarchopterus ectuntio*, Weber and Beaufort, Fish. Indo-Austral. Archipel. iv, p. 165.

There are two fairly grown specimens in the collection which I assign to this species. They agree in almost every respect with the description of the species as given by Weber and Beaufort, but differ in having the triangular part of the upper jaw one and a half times or a little more as long as broad.

This species is widely distributed in the Indo-Australian Archipelago and is known from Hongkong, Burma and Australia.

*Locality* :—Bangkok.

Family *SERRANIDAE*.68. *LATES CALCARIFER* (Bloch.).

ปลากระพงน้ำจืด (pla kapong nam cheut.)

1889. *Lates calcarifer*, Day, op. cit. i, p. 440.

There is a single young specimen of this species in the collection. *Lates calcarifer* is found in seas, backwaters and mouths of tidal rivers from the coasts east of the Persian Gulf to the Malay Archipelago and beyond.

*Locality* :—Nontaburi.

Family *APOGONIDAE*.69. *AMBASSIS THOMASSI* Day.

ปลาข้าวเม่า (pla khao mao).

1889. *Ambassis thomassi*, Day, op. cit. i, p. 486.

This species is represented by two specimens. *Ambassis thomassi* was originally described from the coasts of Canara, but since then its range has been extended as far east as the Malay Peninsula (Dünker, Mitteilungen Nat. Hist. Mus. Hamburg, xxi, p. 148, 1905).

*Localities* :—Bangkok, Nontaburi.

Family *PRISTIPOMATIDAE*.70. *DATNIOIDES QUADRIFASCIATUS* (Sevastinof).

ปลากระพงลาย (pla ka-pong lai).

1889. *Datnioides quadrifasciatus*, Day, op. cit. ii, p. 635, fig. 162.

There are as many as six specimens of this species in the collection, the largest specimen is 22 cm. in length. *Datnioides quadrifasciatus* is known from the estuaries of the Ganges, rivers of Burma and the Malay Archipelago.

*Locality* :—Nontaburi.



Family *SQUAMIPINNES*.71. *SCATOPHAGUS ARGUS* (Bloch).

ปลาแปบลาย (pla pep lai).

1889. *Scatophagus argus*, Day, op. cit., ii, p. 18, fig. 6.

There are two specimens of this species in the collection. The species is found in the Indian Ocean and its range extends to China and Australia.

*Locality* :—Nontaburi.

72. *TOXOTES MICROLEPIS* Blyth.

ปลาเลื้อ (pla seu).

1889. *Toxotes microlepis*, Day, op. cit. ii, p. 22, fig. 9.

This species is represented by four specimens. *Toxotes microlepis* is known from Burma and Siam and its range extends to Borneo and Sumatra.

*Localities* :—Bangkok, Nontaburi.

Family *NANDIDAE*.73. *PRISTOLEPIS FASCIATA* (Bleeker).

ปลาหมอช้างเหยียบ (pla mor chang yiep).

1889. *Pristolepis fasciata*, Day, op. cit. ii, p. 85, fig. 40.

This species is represented by three young specimens. The species is found in the fresh waters of Burma, Siam and the Malay Archipelago.

*Locality* :—Bangkok.

Family *POLYNEMIDAE*.74. *POLYNEMUS PARADISEUS* Linn.

ปลาหนดพรมณ์ (pla nuat pram).

1889. *Polynemus paradiseus*, Day, Faun. Brit. Ind. Fish. ii, p. 102.

There are two grown-up specimens of this species in the collection. *Polynemus paradiseus* is known from the seas of India and from along the coasts of Burma to the Malay Archipelago.

*Localities* :—Nontaburi, Bangkok.

Family *SCIAENIDAE*.75. *SCIAENA AXILLARIS* (Cuv. and Val.).1889. *Sciaena axillaris*, Day, op. cit. ii, p. 116.

This species is represented by a single specimen. The species is commonly found in the seas of India.

*Locality* :—Nontaburi.

Family *CARANGIDAE*.76. *CARANX CARANGUS* (Bloch).

ปลา ทุ่น (pla ka-nun).

1889. *Caranx carangus*, Day, op. cit. ii, p. 153.

There are two specimens of this species in the collection. The species occurs in the seas of India, the Indian Ocean and the tropical Atlantic.

*Locality* :—Nontaburi.

77. *GAZZA MINUTA* (Bloch).

ปลา เปป ทะเล (pla pep ta-lé).

1889. *Gazza minuta*, Day, op. cit. ii, p. 194, fig. 66.

This species is represented by two specimens in the collection. *Gazza minuta* is known from the seas of India and its range extends to the Malay Archipelago and beyond.

*Locality* :—Nontaburi.

Family *ECHENEIDIDAE*.78. *ECHENEIS NAUCRATES* Linn.

ปลา ติด (pla tit).

1889. *Echeneis naucrates*, Day, op. cit. ii, p. 214.

There is a single specimen about a foot in length of this species in the collection. *Echeneis naucrates* is the commonest form in the Indian seas and is generally found in all the tropical and temperate seas.

*Locality* :—Nontaburi.

Family *BATRACHIDAE*.79. *BATRACHUS GRUNNIENS* (Bloch).

ปลา ฬิ หลก (pla pi lork).

1889. *Batrachus grunniens*, Day, op. cit. ii, p. 229, fig. 38.

Of this species there are only two specimens. *Batrachus grunniens* is found in the seas of India and its range extends to the Malay Archipelago.

*Locality* :—Nontaburi.

Family *GOBIIDAE*.80. *GLOSSOGOBIOUS GIURIS* (Ham. Buch.).

ปลา ภู ขวาย (pla bu sai).

1919. *Glossogobius giuris*, McCulloch & Ogilby, Rec. Austr. Mus. xii, p. 236.

This widely distributed species is represented by three specimens. The range of the species extends from the East Coast of



Africa, through the seas and fresh waters of India to the Malay Archipelago, Australia and beyond.

*Localities* :—Bangkok, Nontaburi.

81. APOCRYPTES SERPERASTER Richardson.

ปลาเคียว (pla keua).

1889. *Apocryptes serperaster*, Day, Faun. Brit. Ind. Fish. ii, p. 275, fig. 93.

There are three specimens of this species in the collection. *Apocryptes serperaster* occurs in the seas and estuaries of India and China.

*Locality* :—Nontaburi.

82. BUTIS BUTIS (Ham. Buch.)

ปลาบู๋เกล็ดขาว (pla bu klet kheng).

1889. *Eleotris butis*, Day, op. cit., p. 296.

In the collection this species is represented by four specimens. It is known to occur in the seas and estuaries of India and the Malay Archipelago.

*Localities* :—Bangkok, Nontaburi.

83. OXYELEOTRIS SIAMENSIS (Günther).

ปลาบู๋เอื้อย (pla bu er-i).

1861. *Eleotris siamensis*, Günther, Cat. Fish. Brit. Mus. iii, p. 129.

There are two specimens of this interesting species in the collection, the larger being 95 mm. in total length. *Oxyeleotris siamensis* appears to be endemic in Siam.

*Localities* :—Bangkok, Nontaburi.

84. OXYELEOTRIS MARMORATA (Blkr.).

1913. *Eleotris (Oxyeleotris) marmorata*, Weber, Siboga Exped. Fische, p. 448.

The species is represented by five specimens, the largest being 290 mm. in length. This species is probably the largest fish among the Gobies and is known to grow as long as 46 cm.

*Oxyeleotris marmorata* is found in the rivers of Siam, Borneo and Sumatra.

*Localities* :—Bangkok, Nontaburi.

85. PERIOPHTHALMUS SCHLOSSERI (Pall.).

ปลาตีน (pla tin).

1889. *Periophthalmus schlosseri*, Day, op. cit., p. 281.

1903. *Periophthalmus phya*, Johnstone, Fasciuli Malayenses, Zoology part i, p. 296, pl. xiv.

There are only two specimens of this species; the larger one is 95 mm. in total length. The species is found along the coasts and in the tidal rivers of India and the Malay Peninsula and Archipelago.

*Locality* :—Bangkok.

#### Family MASTACEMBELIDAE.

##### 86. MASTACEMBELUS ARMATUS var. FAVUS Hora.

ปลา กะ ติง (pla ka-ting).

1923. *Mastacembelus armatus* var. *favus*, Hora, Mem. As. Soc. Bengal, vi, (in press).

I have examined a number of specimens of this widely distributed species from Siam both in Dr. Annandale's collection from the Talé Sap and in the Malcolm Smith collection. All of these show a more or less similar colour pattern consisting of a network of wide dark meshes enclosing between them circular or elliptical whitish areas. I have separated these individuals on this character into a new variety, which I have called *favus*.

*Locality* :—Nontaburi.

##### 87. RHYNCHOBDELLA ACULEATA (Bloch).

ปลา หลด (pla lot).

1889. *Rhynchobdella aculeata*, Day, Faun. Brit. Ind. Fish. ii, p. 331, fig. 10.

This species is represented by a single specimen. The dorsal fin is provided with 15 spines only. There are three black ocelli along the base of the soft dorsal and one at the base of the caudal fin.

*Rhynchobdella aculeata* is found in brackish waters within tidal influence and in the deltas of Indian, Burmese and Sind rivers. The range of the species extends to Borneo and Moluccas.

*Locality* :—Bangkok.

#### Family MUGILIDAE.

##### 88. MUGIL DUSSUMIERI Cuv. and Val.

ปลา กะบอก (pla kabork).

1922. *Mugil dussumieri*, Weber and Beaufort, op. cit., p. 235.

To this species I refer a young specimen. The species is widely distributed in the Oriental Region.

*Locality* :—Nontaburi.

#### Family OPHIOCEPHALIDAE.

##### 89. OPHIOCEPHALUS STRIATUS Bloch.

ปลา ชอน (pla chorn).

1922. *Ophiocephalus striatus* Weber and Beaufort, op. cit. iv., p. 317.

There are altogether four specimens of this species in the



collection, the largest is about 10.5 inches in length. The species is quite common in rivers, lake and ponds of the Oriental Region.

*Localities* :—Bangkok, Koh Chang (G. of Siam).

90. *OPHIOCEPHALUS GACHUA* Ham. Buch.

ปลา ก้าง (pla kang).

1922. *Ophiocephalus gachua*, Weber and Beaufort, op. cit., p. 321.

This common and widely distributed Oriental species is represented by three specimens. The largest is about 7 inches in length.

The specimens from Koh Chang are deep black in colour with the exception of a dull white margin to all the fins except the pectorals.

*Localities* :—Bangkok, Koh Chang (G. of Siam).

91. *OPHIOCEPHALUS LUCIUS* (K. v. H.) Cuv. and Val.

ปลา กะสง (pla ka-song).

1922. *Ophiocephalus lucius*, Weber and Beaufort, op. cit., p. 326.

Of the six specimens of this species in the collection the largest is about 5.5 inches in length. *Ophiocephalus lucius* is found in the Indo-Australian Archipelago, Siam and China.

*Locality* :—Bangkok.

92. *OPHIOCEPHALUS MICROPELTES* (K. v. H.) Cuv. and Val.

ปลา ชะโด (pla sa-do).

1922. *Ophiocephalus micropeltes*, Weber and Beaufort, op. cit., p. 328.

There is one young and one adult specimen of this species in the collection. The characteristic colouration of the species is well marked in the young.

*Locality* :—Nontaburi.

Family *ANABATIDAE*.

93. *ANABAS TESTUDINEUS* (Bloch).

ปลา หมอ (pla mor).

1922. *Anabas testudineus*, Weber and Beaufort, op. cit., p. 334, fig. 86.

There are four specimens of the Climbing Perch in the collection. The largest is about 6.5 inches in length and the number of dorsal spines in all the specimens is xvii. The species is widely distributed in the fresh and brackish waters of the Oriental Region and its range extends to South China and the Philippines.

*Locality* :—Bangkok.

## 94. CTENOPS VITTATUS (Cuv. and Val.)

1922. *Ctenops vittatus*, Weber and Beaufort, op. cit., p. 351, fig. 91.

This species is represented by five specimens in the collection. In one specimen (collectors number 1116) the proximal portion of the anal fin is provided with a series of black blotches, while the distal portion is spotted with dark.

*Ctenops vittatus* is found in Sumatra, Java, Borneo, Cochinchina and Siam.

*Locality* :—Bangkok.

## 95. TRICHOPODUS TRICHOPTERUS (Pall.)

ปลากระดี่ หม้อ (pla kadi mor).

1922. *Trichopodus trichopterus*, Weber and Beaufort, op. cit., p. 365, fig. 93.

There are five specimens of this species. *Trichopodus trichopterus* is known from the Malay Archipelago, Siam and Cochinchina.

*Locality* :—Bangkok.

## 96. TRICHOPODUS LEERI (Blkr.).

ปลากระดี่ นก (pla kadi nang).

1922. *Trichopodus leeri*, Weber and Beaufort, op. cit., p. 367.

There are only four specimens of this species in the collection, the largest being 9.5 cm. in length. *Trichopodus leeri* has so far been recorded from Sumatra, Borneo, Siam and the Malay Peninsula.

*Locality* :—Bangkok.

## Family SOLEIDAE.

## 97. SYNAPTURA ORIENTALIS (Bl. and Schn.).

ปลาลิ้นหมา (pla lin ma).

1923. *Synaptura orientalis*, Hora, Mem. Ind. Mus. v, p. 759.

There are two specimens of this species, the larger is 170 mm. in length. *Synaptura orientalis* is found in the seas of India and China.

*Locality* :—Nontaburi.

## Family CYNOGLOSSIDAE.

## 98. CYNOGLOSSUS XIPHOIDEUS Günther.

ปลาลิ้นควาย (pla lin kwai).

1862. *Cynoglossus xiphoideus*, Günther, Cat. Fish. Brit. Mus. iv, p. 495.1913. *Cynoglossus xiphoideus*, Weber, Siboga Exped., Fische, p. 441.

There is a single specimen which I refer to this species. It is 258 mm. in length and possesses 122 rays in the dorsal and 98 in



the anal fin. The length of the head is contained 5.8 times and the height of the body 4.6 times in the total length. The length of the snout is contained 2.2 times in the length of the head.

There are three well developed lateral lines on the left side, but none on the right side. The rostral hook is produced as far back as the angle of the mouth or a little further. The interorbital space is almost as wide as the longitudinal diameter of the lower eye and is slightly concave.

Günther described this species from two specimens from Siam, and since then the fish has been found by the Novara and the Siboga Expeditions.

*Locality*.—Nontaburi.

#### Family SYNGNATHIDAE.

##### 99. MICROPHIS BOAJA (Bleeker).

ปลาจิ้มฟันจระเข้ (pla chim fan choraké).

1922. *Microphis loaja*, Weber and Beaufort, op. cit., p. 47.

This species is represented by four half-grown specimens in the collection. The fish is known to occur in the Indo-Australian Archipelago, Cochín-China, China and Formosa.

*Localities*:—Bangkok, Nontaburi.

#### Family GYMNODONTES.

##### 100. CHONERHINUS MODESTUS (Bleeker).

ปลาปากเป๋าทอง (pla pak pao tong).

1870. *Xenopterus modestus*, Günther, Cat. Fish. Brit. Mus. viii, p. 271.

Of the four specimens of this species the largest is 112 mm. in total length including the caudal. The species is known from Borneo, Sumatra and the Malay Peninsula.

*Locality*:—Nontaburi.

##### 101. TETRAODON PALEMBANGENSIS Bleeker.

ปลาปากเป๋าเขียว (pla pak pao khio).

1870. *Tetrodon palembangensis*, Günther, op. cit., p. 288.

There are six specimens of this species in the collection, the largest being 56 mm. in length. There is a marked difference in the colouration of the individuals before me. In very young individuals about 45 mm. in length, the sides of the body are covered with a network of wide brown meshes. The upper surface is marked with transverse bands, while the under surface is much lighter in colour and is speckled with brown patches. In specimens about 50 mm. and upwards the whole of the body assumes more or less a grey tint

while the under surface is a little lighter. The caudal fin is black with a light hinder margin.

*Tetraodon palembangensis* is known from the rivers of Sumatra, Borneo and Siam.

*Locality* :—Nontaburi.

102. TETRAODON LIURIS Bleeker.

ปลาปาก เป้าดำ (pla pak pao dam).

1870. *Tetrodon liuris*, Günther, op. cit., p. 288.

Of this species there are four young specimens in the collection, the largest being 67 mm. in length. The colouration is more or less similar to that described by Günther, but instead of having a number of ocelli, there is only one, very prominent, ocellus almost in the middle of the body beneath the base of the dorsal fin. The species is known from the rivers of Sumatra and Borneo.

*Locality* :—Nontaburi.

EXPLANATION OF PLATE 10.

Fig. 1. Lateral view of *Culter siamensis*, sp. nov.  $\times 7/9$ .

" 2. Lateral view of *Paralaubuca typus* Bleeker.  $\times 2$ .

EXPLANATION OF PLATE 11.

Fig. 1. Lateral view of *Barbus (Puntius) smithi*, sp. nov. (nat. size).

*Cosmochilus harmandi* Sauvage.

" 2. Lateral view (nat. size).

" 3. Under surface of head and chest.  $\times 2$ .

*Culter siamensis*, sp. nov.

" 4. Pharyngeal bone and teeth (magnified).

" 5. Pharyngeal tooth (still further magnified).

EXPLANATION OF PLATE 12.

*Glyptothorax siamensis*, sp. nov.

Fig. 1. Lateral view (slightly reduced).

" 2. Upper surface of head and anterior part of body (slightly reduced).

" 3. Under surface of head and chest (slightly reduced).

*Gyrinocheilus kaznakoi* Berg.

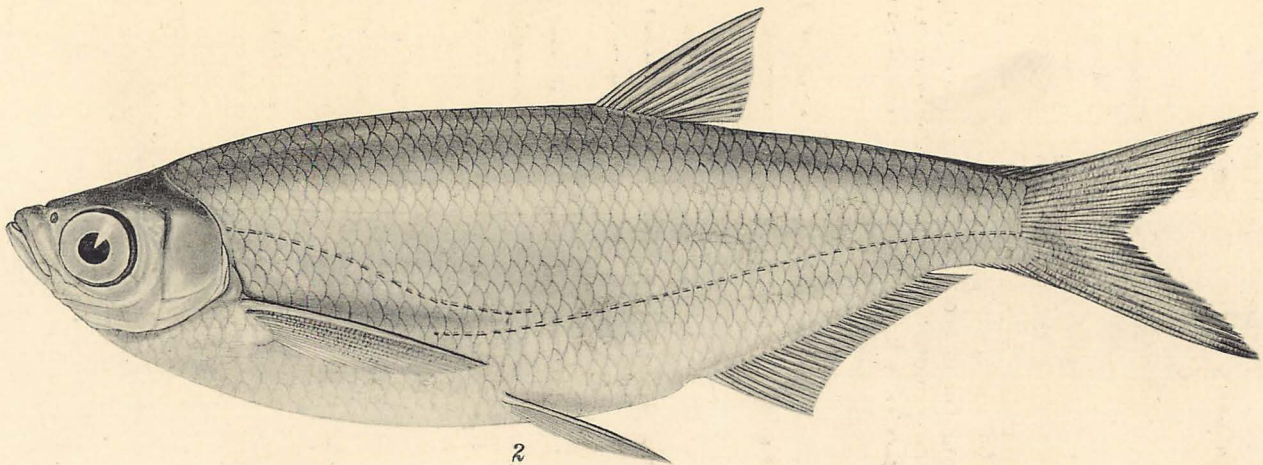
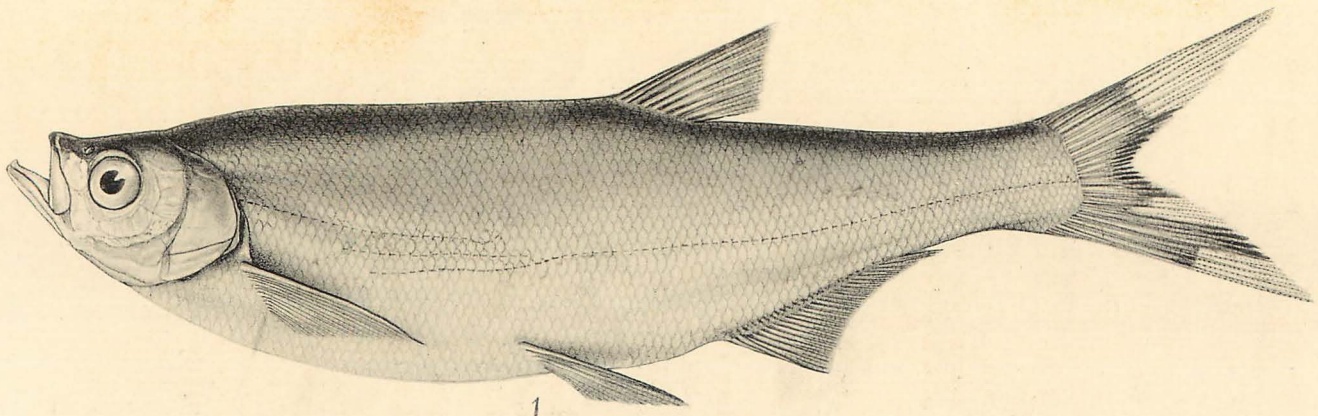
" 4. Lateral view (slightly reduced).

" 5. Upper surface of head and anterior part of body (slightly reduced).

" 6. Under surface of head and chest (slightly reduced).

" 7. Scale from the side above the lateral line (highly magnified).



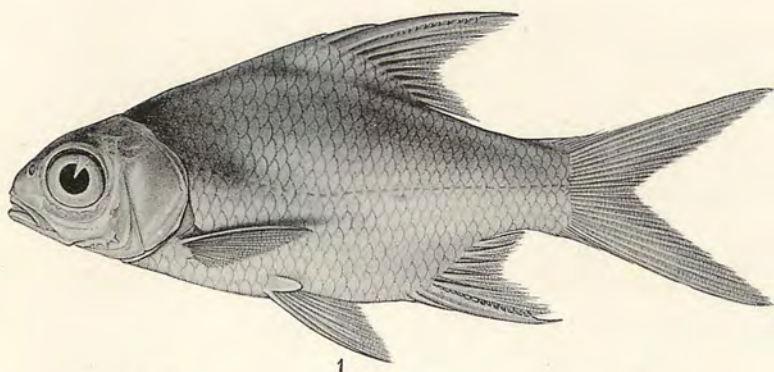


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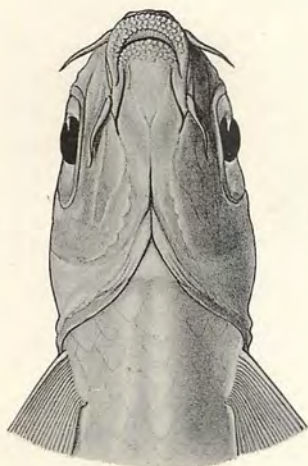
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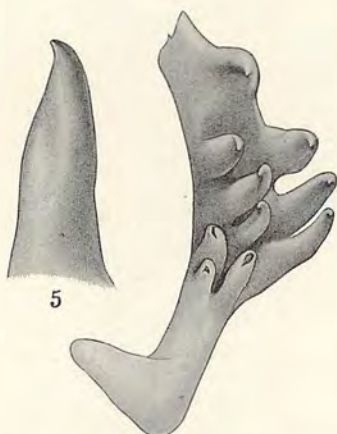




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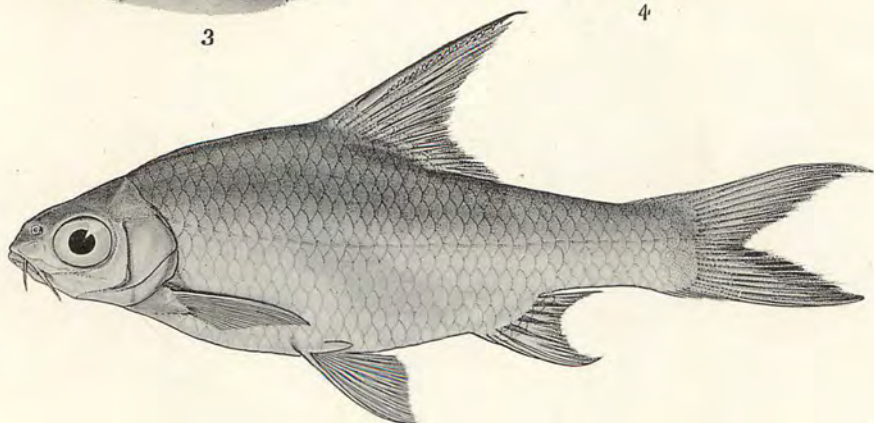
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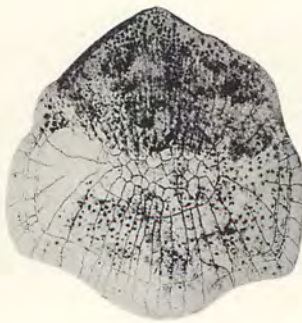
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