NOTES ON FISHES IN THE INDIAN MUSEUM.

By SUNDER LAL HORA, *D.Sc., Officiating Superintendent, Zoological Survey of India.*

(Plate XI.)

IX. ON A NEW VARIETY OF *Polynemus sextarius* BL. & SCHN.

Professor J. P. Mullan of St. Xavier's College, Bombay, has kindly sent me a few specimens of *Polynemus* for examination with the remark that, " in Bombay the specimens of *Polynemus sextarius* invariably bear seven free pectoral rays and not six as mentioned by Day." It is a recognised fact that in distinguishing the various species of the genus *Polynemus* the free pectoral filaments form very good diagnostic characters. To test the validity of Professor Mullan's remark I have examined a large series of specimens of *P. sextarius* in the Museum collection and have also carefully studied the specimens of other species in this genus in order to find out the extent of variation in the number of pectoral filaments. I have found some variation regarding the number of free pectoral rays in three instances, (*i*) in a specimen of *P. heptadactylus* there are six filaments on the right and seven on the left side, (*ii*) in a specimen of *P. tetradactylus* there are four filaments on the right and five on the left side and (*iii*) in a specimen of *P. sextarius* var. *mullani* there are six free rays on the left and seven on the right side. Professor Mullan's examples from Bombay, though similar to *P. sextarius* in most respects, do not fall within its recognised specific limits, for they possess seven free pectoral filaments and a large, well-developed air-bladder. In my opinion they represent a new variety of *P. sextarius* and I have great pleasure in naming it *mullani* after its discoverer. A specimen of the new variety from Sind in our old collection had been referred to *P. sextarius* by Day. I have examined over a dozen specimens of the new variety.

The air-bladder of *P. sextarius* is described by Günther [1] as " excessively small, pointed at both extremities, of the shape and size of a grain of oats." According to Day[2] the bladder is " small and simple." In most of the specimens that I have examined the vessel is small and simple, but its relative size appears to diminish with the growth of the fish. In two examples, one from Madras, the original of Day's figure in the Fishes of India and the other from Bombay, the air-bladder is well-developed and extends as far back as the commencement of the anal fin. In this respect the two specimens agree with var. *mullani*. In *P. heptadactylus* the bladder is stated to be absent both by Günther and Day, but I have found it in a greatly reduced form in young individuals.

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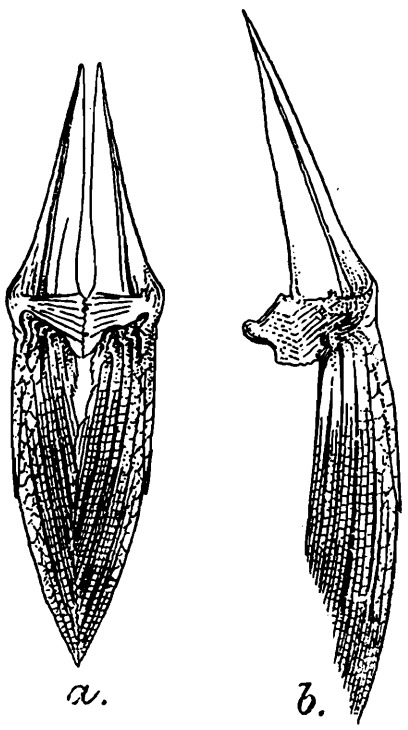
[1] Günther, *Cat. Fish. Brit. Mus.* II, pp. 321, 326 (1860).
[2] Day, *Fish India*, p. 177 (1876).



TEXT-FIG. 1.—Pelvic fin and girdle of *Polynemus sextarius* var. *mullani*, nov.
a. Normal fin and skeleton.
b. Abnormal skeleton with fin of left side absent.

For a detailed description of the species I can refer to Weber and Beaufort's[1] work on the *Fishes of the Indo-Australian Archipelago*. The same description will suffice for the variety except that the lengths of the various spines in the fins are somewhat variable.

Polynemus sextarius is found in seas from the East Coast of Africa through British India and Ceylon to Siam, and China. The variety *mullani* is so far known from Bombay and Sind.

I have to record here the total absence of the pelvic fin of the left side in a specimen of *Polynemus sextarius* var. *mullani*. The only trace of the skeleton of the missing fin is the basal portion of the basi-pterygium, which is fused with the basi-pterygium of the right side. In my opinion this abnormality is the result of cessation of development due to external causes during embryonic life or in the early stages of development.

X. ON A NEW SPECIES OF *Brachyamblyopus* BLEEKER.

Professor Meggitt of the Rangoon University has kindly sent me a small collection of fish for determination. In this lot I have found three specimens, which, in my opinion, represent a new species of the genus *Brachyamblyopus*.[2] In my recent paper [3] on the eel-like Gobioid fishes I failed to grasp the generic limits of *Brachyamblyopus* and erroneously referred my new species from the Chilka Lake[4] to *Trypauchenophrys*,[5] which I now consider to be a synonym of *Brachyamblyopus*. *Trypauchenopsis* Volz[6] from Sumatra is characterized by the absence of canines and of the blind pouch-like depressions in the opercular region. In my opinion this last genus is also synonymous with *Brachyamblyopus*. In this note I propose to describe Bleeker's genus in detail along with the description of a new species from Burma.

Genus **Brachyamblyopus** Bleeker.

1874. *Brachyamblyopus*, Bleeker, *Arch. Néer. Sc. Nat.* IX, p. 329.
1902. *Trypauchenopsis*, Volz, *Zool. Anz.* XXVI, p. 555.
1910. *Trypauchenophrys*, Franz, *München Abh. Ak. Wiss. Math.-Phys. Kl. Suppl.-Bd.* IV, p. 68.

Bleeker described this genus from Sumatra and characterized it as, " Dentes utraque maxilla acuti subverticales, serie externa ceteris long-

[1] Weber and Beaufort, *Fish. Indo-Austral. Archipel.* IV, p. 210 (1922).
[2] Bleeker, *Arch. Néer. Sc. Nat.* IX, p. 329 (1874).
[3] Hora, *Rec. Ind. Mus.* XXVI, pp. 155-163 (1924).
[4] Hora, *Mem. Ind. Mus.* V, p. 757, fig. 34 (1923).
[5] Franz, *München Abh. Ak. Wiss. Math-Phys. Kl. Suppl.-Bd.* IV, p. 68 (1910).
[6] Volz. *Zool. Anz.* XXVI, p. 555 (1902).

iores curvati, canini nulli ; intermaxillares biseriati, inframaxillares pluriseriati. Corpus elongatum altitudine 9 ad 10 in ejus longitudine, capite compresso non latiore quam alto obtuso convexo, oculis minimis. Maxilla inferior cirris nullis. Squamae parvae cute quasi immersae. Caudalis tota cum dorsali et anali unita. B. 5. D. 6-29 ad 6-32. A. 28 ad 34."

" Sp. typ. *Amblyopus brachysoma* Blkr." [1]

Without making any reference to *Brachyamblyopus*, Volz, in 1902, described a new genus *Trypauchenopsis* from Sumatra and defined it as, " Diese Gattung unter-scheidet sich von *Amblyopus* durch das Fehlen von grossen Caninen, von *Trypauchen* und *Trypauchenichthys* durch den Mangel einer blindsackartigen Vertiefung über dem Operculum." There appears to me no difference between the two genera, but on the other hand it seems quite probable that Volz's *Trypauchenopsis intermedius* is the same species as Bleeker's *Brachyamblyopus brachysoma*. From the descriptions, the two species appear to be almost identical. In 1910, Franz described a new genus—*Trypauchenophrys*—from Japan and diagnosed it as, " Trypauchen-ähnlich, aber unbeschuppt. Kein Loch über dem Kiemendeckel, kein Loch an Stelle des Auges. Die Augen schimmern vielmehr als schwarze Punkte durch die Haut." There are no valid differences between the three genera discussed above and the important points, *viz.*, the absence of canine teeth and of the pouch-like depressions in the opercular region, are common to all of them.

The genus *Brachyamblyopus* may be defined as follows :—

A genus of Gobioid fishes comprising elongated eel-like forms, in which the dorsal, caudal and the anal fins are continuous, there is only one dorsal fin. The ventrals are united to form a cup-shaped disc and the pectorals are small. There are several series of minute and subequal teeth in both jaws and the canines are absent. The scales are either rudimentary or absent. The eyes are small and dorsally approximated. The pouch-like depressions in the opercular region are absent.

The genera of the sub-family Taenioninae may be distinguished by the following key :—

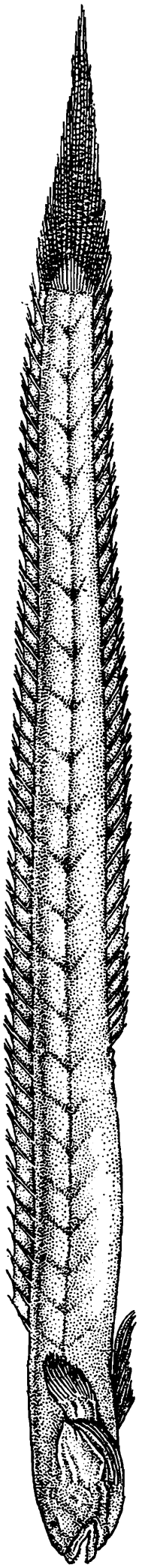
I. Eyes large ; disc formed by the ventrals bipartite	*Paragobioides.*
II. Eyes small ; disc formed by the ventrals entire	
a. A single series of teeth in each jaw	*Tynlastes.*
b. Several series of teeth in each jaw.	
1. Outer series of teeth produced into well-developed recurved canines	*Taenioides.*
2. All the teeth subequal, no canines	*Brachyamblyopus.*

Brachyamblyopus burmanicus, sp. nov.

D. 6-36/39 ; A. 33-35 ; P. 14 ; V 1/5.

This is a long and narrow species, in which both the dorsal and the ventral profiles are straight and horizontal. The head is depressed from above downwards and the body is compressed from side to side. The length of the head is contained 7·5 to 9·9 times and the depth of the body 14 to 16 times in the total length without the caudal. Both the length

[1] For *Amblyopus brachysoma* see Bleeker, in *Nat. Tijdschr. Ned. Ind.* (n. s.) V, p. 510 (1853).



TEXT-FIG. 2.—Lateral view of *Brachyamblyopus burmanicus*, sp. nov. × 2.

of the head and the depth of the body are proportionately greater in older than in young individuals. The length of the head is 1·2 to 1·4 times its width and 1·6 times its greatest height. The eyes are small and are situated on the dorsal surface. The mouth is small and is directed obliquely upwards. Both the jaws are equal. There are several rows of teeth in both jaws, those of the outer series appear to be slightly longer than the others. There are no canines. The dorsal fin commences slightly behind the pectoral and is continuous with the caudal. The anal is similar to the dorsal. The caudal is very long, it is almost twice the length of the head.

The length of the pectoral is slightly less than half the length of the head and is nearly two-thirds the length of the ventral.

The colour in spirit is uniformly grayish yellow. The middle rays of the caudal fin are black.

The specific limits of the species assigned to *Brachyamblyopus* are not well defined, so it is rather difficult to discuss the relationships of the new species. It is, however, closely related to the Sumatran species, *B. brachysoma*, but differs from it in the possession of fewer rays in the pectoral and a greater number of rays in the dorsal fin.

Locality.—A small pond opening into the Rangoon River about 3 miles below Rangoon.

Type-specimen :—F 10746/1, *Zoological Survey of India* (*Ind. Mus.*).

Measurements in millimetres.

	A	B
Total length excluding caudal	83·3	45·0
Length of caudal .	18·5	10·5
Length of head . .	8·4	6·0
Greatest height of head	5·2	3·6
Greatest width of head .	6·7	4·2
Height of body . . .	5·2	3·2
Length of pectoral . .	4·0	2·7
Length of ventral . .	6·0	3·5

XI. ON THE FISHES OF THE GENUS *Parapsilorhynchus* HORA.

The genus *Parapsilorhynchus*[1] was erected in 1921 to accommodate Annandale's [2] *Psilorhynchus tentaculatus* from the Western Ghats and my new species *Parapsilorhynchus discophorus* from the same locality. The latter species was then described from a single specimen, which on comparison with the material of the former species in our collection was considered to be specifically distinct. But since then I have made collections in the Poona and the Satara districts of the Bombay Presidency, and have also examined a number of specimens obtained by our collector, Mr. R. Hodgart, near Khandhalla. The examination of this additional material has convinced me that the two species are identical. The close similarity in the form and structure of the two species has already been pointed out and the differences, on which they were considered to be distinct, vanish altogether when a large series of specimens is examined. In all specimens a callous pad of skin can be made out behind the lower lip. In those specimens, in which this portion is elevated and forms a disc, the lip is not conspicuously bilobed ; while in others, in which it is depressed, the disc is absent and the lower lip is distinctly bilobed. All intermediate stages between the form figured in Annandale's paper and that figured in my notes have been observed in the material before me.

The pharyngeal teeth are arranged in two rows and not in three as described by Annandale. There are 5 teeth in the outer row and 4 in the inner. Sometimes worn out teeth are found [3] just outside the rows of pharyngeal teeth and, in all probability, the outermost row of 2 teeth mentioned by Annandale was of this nature.

There is a specimen of *P. tentaculatus* from Pachmarhi in our collection. The species is thus found both in the Western Ghats and the Satpura Hills at Pachmarhi.

XII. THE SYSTEMATIC POSITION OF THE CYPRINOID GENUS *Psilorhynchus* MCCLELLAND.

In 1839, McClelland [4] established the genus *Psilorhynchus* to include Buchanan's [5] two species, *viz.*, *Cyprinus sucatio* and *C. balitora*, from the northern and north-eastern parts of Bengal. He characterized it as, " Muzzle elongated and flattened, eyes placed on the edges of the head, mouth small and suctorial without cirri, opercula small, caudal bifid, dorsal opposite to ventrals." He figured these species from the manuscript drawings of Hamilton Buchanan and gave a short description of each. McClelland had only examined a single specimen of *Psilorhynchus balitora* from Upper Assam and had assigned this genus to his composite subfamily Apalopterinae. In 1868, Günther [6] included it in the group

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[1] Hora, *Rec. Ind. Mus.* XXII, pp. 13-17, text-fig. (1921).

[2] Annandale, *Rec. Ind. Mus.* XVI, pp. 128, 129, pl. i, figs. 4, 4*a*, pl. iii, fig. 2 (1919).

[3] Annandale & Hora, *Rec. Ind. Mus.* XVIII, p. 165 (1920).

[4] McClelland, Indian Cyprinidae in *As. Res.* XIX, pp. 300, 428, pl. (1839).

[5] Buchanan, *Fish Ganges*, pp. 347, 348, 393, 394 (1822).

[6] Günther, *Cat. Fish. Brit. Mus.* VII, p. 343 (1868) ; also *Intro. Stud. Fish.*, p. 604 (1880).

Homalopterina and remarked, "I follow McClelland in associating the following genus with *Homaloptera*. Besides its general outward appearance, scarcely anything is known of its characters, and it is not impossible that future researches will assign to it another place in the system." Day,[1] in his monograph of Indian Cyprinidae, assigned *Psilorhynchus* to the subfamily Cyprininae. He had examined a specimen of *Psilorhynchus balitora* in the Calcutta Museum and he found the air-bladder of this example "rather large, divided by a constriction into an anterior and posterior portion and not enclosed by bone." In the *Fishes of India* [2] and later on in the *Fauna of British India*[3] he retained *P. balitora* in the genus *Psilorhynchus* and considered *P. sucatio* as a doubtful synonym of *Homaloptera bilineata* (Blyth).[4] Moreover, he regarded the genus *Psilorhynchus* as "a connecting link between *Homaloptera* and *Discognathus*." Sauvage[5] described a new species of *Psilorhynchus* from China, but in his diagnosis he has not referred to the internal characters. Vinciguerra [6] in 1889 very ably discussed the relationships of *Psilorhynchus* basing his arguments on the evidence then available, and clearly established that Buchanan's *Cyprinus sucatio* is not only not a synonym of *H. bilineata*, but is not congeneric with it. In 1919, Jordan[7] considered *Psilorhynchus* a synonym of *Homaloptera*, but in 1923,[8] he definitely assigned it to the family Cobitidae. Annandale[9] described a new species of *Psilorhynchus* from the Western Ghats and while revising the Indian species of this genus I[10] was greatly influenced by this fresh material in defining the genus. The only other specimens that I examined then were 2 badly preserved examples of *P. balitora* and a few young individuals from the Naga Hills and the base of the Darjiling Himalayas. In 1921, I[11] proposed a new genus for Annandale's species but had not enough material to characterize McClelland's genus. In a small collection of fish sent by Mr. G. E. Shaw from the Darjiling Himalayas I[12] was fortunate to find 3 specimens of Buchanan's *Cyprinus sucatio* and later on Drs. Kemp and Chopra brought two more specimens of the same species[13] from the Siju Cave, Garo Hills, Assam. I have already redescribed this species and have made a few observations on its air-bladder. In this note I propose to describe the pharyngeal teeth of *P. sucatio* and of the young specimens I obtained in the Naga Hills. Unfortunately the two specimens of *P. balitora* in our collection have been so badly handled that I have not been able to find these structures in them. The systematic position of a Cyprinoid genus is chiefly determined by the character of its pharyngeal teeth and the nature of its air-bladder.

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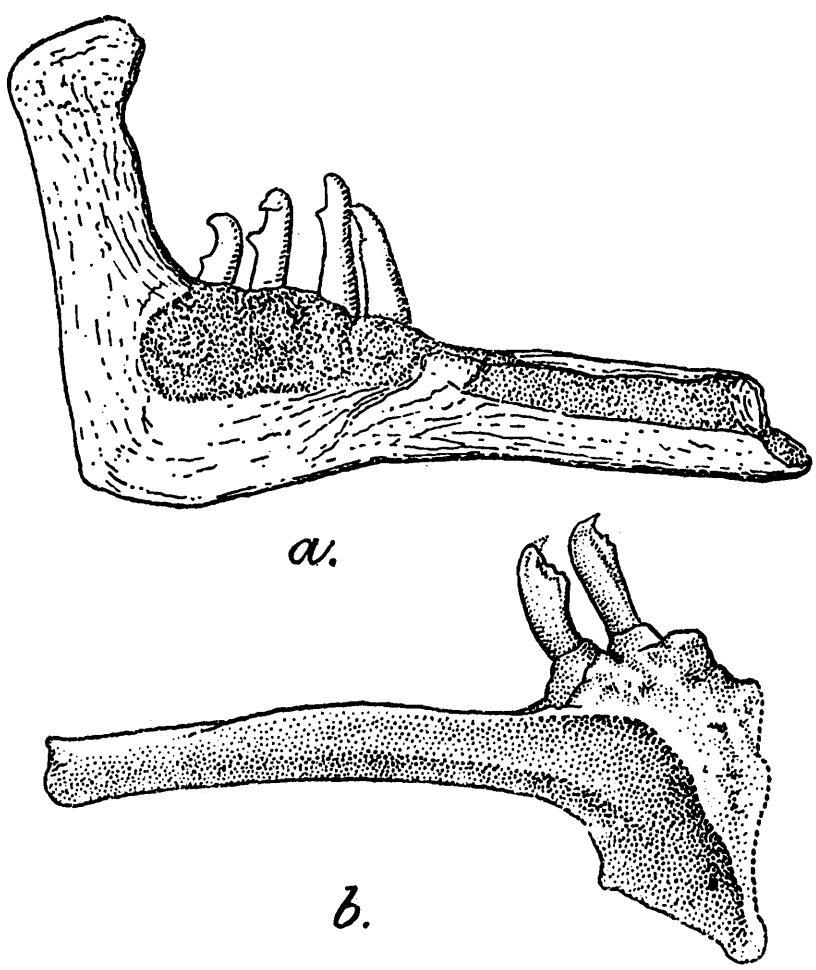
[1] Day, *Journ. As. Soc. Bengal* XL, pt. II, pp. 106, 107 (1871).
[2] Day, *Fish. India*, p. 527, pl. cxxi, fig. 7 ; cxxii, fig. 3 (1878).
[3] Day, *Faun. Brit. Ind. Fish.* I, p. 244 (1889).
[4] Blyth, *Journ. As. Soc. Bengal* XXIX, p. 172 (1860).
[5] Sauvage, *Bull. Soc. Phil. Paris.* (7) II, p. 88 (1878).
[6] Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, pp. 192-207 (1890).
[7] Jordan, *The Genera of Fishes* II, p. 195 (1919).
[8] Jordan, *The Classification of Fishes*, p. 145 (1923).
[9] Annandale, *Rec. Ind. Mus.* XVI, pp. 128, 129, pl. i, figs. 4, 4*a* ; pl. iii, fig. 2 (1919)
[10] Hora, *Rec. Ind. Mus.* XIX, pp. 207-212 (1920).
[11] Hora, *Rec. Ind. Mus.* XXII, pp. 13-17 (1921).
[12] Hora, *Rec. Ind. Mus.* XXII, pp. 731-733, pl. xxix, figs. 1, 1*a*. (1921).
[13] Hora, *Rec. Ind. Mus.* XXVI, p. 27 (1924).

The pharyngeal bones are very slender and each bears 4 teeth, which are arranged in a single row. Each tooth is sharp and pointed and is more or less sickle-shaped near its apex. Such normal teeth are found only in young specimens from the Naga Hills; while in the preparations of *P. sucatio* one or two normal teeth are present and the remaining are of the nature of flat teeth with truncate crowns. The apex of such a flat tooth is somewhat crenulated. The material at present available does not permit any discussion regarding the form of the teeth, but the fact, that in all preparations there are four teeth arranged in a single row, is very significant.

I have already pointed out that the bladder in *P. balitora* shows progressive degeneration. On an examination of a number of specimens of *P. sucatio* I have come to the same conclusion. The posterior chamber is greatly reduced and the anterior is covered with a thick, fibrous coat. In some specimens bony processes from the adjoining vertebrae have partially enclosed the anterior chamber.

From the arrangement of the pharyngeal teeth and the presence of a number of simple rays in the paired fins it is clear that *Psilorhynchus* does not belong to the family Cyprinidae. The absence of barbels and the presence of a free bladder in the abdominal cavity separate it from the Homalopteridae. From the Cobitidae it is distinguished by the presence of large scales, by the presence of several simple rays in the



TEXT-FIG. 3.—Pharyngeal bone and teeth of fishes of the genus *Psilorhynchus*.
a. Psilorhynchus sp. (Naga Hills). *b. Psilorhynchus sucatio* (Ham. Buch.).

horizontally placed paired fins, by the absence of barbels and in its general facies. I propose for it a new family—Psilorhynchidae, which may be defined as follows :—

The family Psilorhynchidae comprises small hill-stream species, in which the back is greatly arched and the under surface is flattened. The snout is broad and spatulate ; it is elongated and flattened. The eyes are large and are situated at the sides of the head ; they are usually visible from below. The mouth is small and is situated considerably behind the tip of the snout. The barbels are absent. The dorsal is situated slightly in advance of the ventral and the paired fins are horizontally placed ; at least 4 outer rays of the pectoral and 2 of the ventral are simple. The gill-openings are narrow. The gill membranes are united with the isthmus. There are no pseudobranchiae. The pharyngeal bones are slender and there are 4 teeth on each which are arranged in a single row. The air-bladder is of the normal form but is greatly reduced ; it is either entirely free in the abdominal cavity or is partially covered by bone. The posterior chamber is very small and the anterior is covered by a thick fibrous coat.

XIII. On certain new and rare species of "Pipe Fish" (Fam. Syngnathidae).

In 1913, our entire collection of Syngnathid fishes was sent to Dr. Georg Duncker of Hamburg for determination, and he incorporated the results of his investigations in his excellent paper on the revision of the family.[1] Since then more material has accumulated chiefly through the efforts of the Surgeon Naturalist to the Marine Survey of India and in this paper I have described and figured some new and interesting forms found in this additional material. I have erected a new genus for Weber's *Syngnathus corrugatus* [2] and have described a new species in the same genus. Another new form has been provisionally referred to *Syngnathus*, and a note has been added on three young specimens in the collection which I have doubtfully named as *Corythoichthys fasciatus*. *Syngnathus argyrostictus*, which has hitherto been known only from the Far East, is here recorded from two places in Indian waters. The presence in our collection of Weber's two interesting species, *viz.*, *S. corrugatus* and *S. uncinatus*,[3] from the Malay Archipelago, is of special interest as each of these has so far been known from a single immature specimen.

Genus **Syngnathus** Linn.

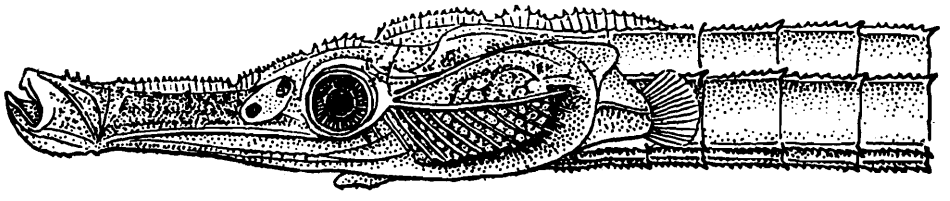
Syngnathus (?) uncinatus Weber.

1913. *Syngnathus uncinatus*, Weber, *Siboga-Expeditie, Fische*, p. 110, fig. 36.
1915. *Syngnathus (?) uncinatus*, Duncker, *Mitt. Naturh. Mus. Hamburg* XXXII, p. 86.
1922. *Syngnathus (?) uncinatus*, Weber and Beaufort, *Fish. Indo-Austral. Archipel.* IV, p. 84, fig. 35.

This species is represented by a single young specimen in our collection. It is 55 mm. in length and was obtained by Major Sewell in Octavia

[1] Duncker, *Mitt. Naturh. Mus. Hamburg* XXXII, pp. 9-120 (1915).
[2] Weber, *Siboga-Expeditie, Fische*, p. 112 (1913).
[3] Weber, *op. cit.*, p. 110 (1913).

Bay (Nankauri Harbour) at a depth of 12 fathoms on a bottom of sand and mud. It agrees very closely with Weber's description and figure and differs slightly in details of colour marking. The colour bands in the caudal region are better defined and the longitudinal brown patches below the dorsal and the lateral part of the trunk are absent.



Text-fig. 4.—Lateral view of head and anterior part of body of *Syngnathus* (?) *uncinatus* (Weber) × 8.

Weber based his description on a single specimen 60 mm. in length found on the reef at Banda. My specimen is also young and it is difficult to be sure of its generic position.

Localities.—Banda and Octavia Bay (Nankauri Harbour). (Marin Survey Sta. 614.)

Syngnathus argyrostictus Kaup.

(Plate xi, fig. 6.)

1922. *Syngnathus argyrostictus*, Weber and Beaufort, *op. cit.*, p. 82.

There are altogether 15 specimens in our collection which I refer to this species ; of these three were obtained by the late Dr. Annandale in the Ennur backwater near Madras, while the remainder were collected by Dr. Kemp in the Marmugoa Bay (Portugese India). The species has hitherto been known only from the Far East (Malay Peninsula, Penang, Formosa, Japan and South of China) and its occurrence in Indian waters at two different places is of great interest. The specimens agree in all particulars with Duncker's (*op. cit.*, p. 84) description of the species and I give a figure to show slight differences in colouration, etc.

Syngnathus (?) investigatoris, sp. nov.

(Plate xi, fig. 4.)

D. 23 ; P. 15 ; C. 12 ; Rings 15+33 ; subdorsal, 1+4.

This is a small and slender species in which the ventral keel is fairly prominent, the trunk is heptagonal and the tail tetragonal. The shields are indistinctly striated transversely and their margins are prominent but smooth. The intermedial shields are oval and well developed. The superior cristae of the trunk terminate near the posterior border of the third tail shield ; these are not continuous with the superior cristae of the tail, which are deflected anteriorly and terminate near the anterior border of the first tail shield quite close to the termination of the median cristae of the trunk. The inferior cristae of the trunk are continuous with those of the tail. The length of the head is contained about 7·5 times in the total length without the caudal and is little more than twice in the length of the trunk. The snout is shorter than the postorbital part of the head and is twice the diameter of the eye ; it is cylindrical

and possesses a prominent, smooth, median keel on the dorsal surface extending as far back as the narrow interorbital region. There is a low median crest on the head and a more prominent one on the nape and the nuchal shield. There are low ridges commencing from the middle of the orbit and extending backwards for a distance equal to the diameter of the orbit. The operculum is provided with a low curved keel, which is bent upwards and under a high power lens can be traced as far back as the gill-opening. There are lines radiating from the keel. The base of the dorsal is slightly elevated above the dorsal profile. The pectoral, anal and caudal fins are fairly well developed.

The colour in spirit is very characteristic of the species. It is yellowish brown with about 10 annular bands of deeper colour situated at almost equal intervals, one on every fifth segment. There are lighter bands placed at the junctions of the shields ; these bands become broader and more marked near the inferior cristae and along the ridge each encloses a white spot in the middle. The middle portion of each shield along the inferior ridge is conspicuously white and thus a series of white spots is formed longitudinally. The sides of the snout and the cheeks are deep brown. There is a whitish longitudinal streak on the sides of the snout just in front of the eye.

Locality.—There are two specimens in our collection collected by Major Sewell in the Mergui Harbour in a large surface net (Marine Survey Sta. 581).

Relationships.—Both the specimens in the collection are young and, therefore, I am not certain about the generic position of the species. From the nature of the opercular keel it seems quite probable that it may belong to the sub-genus *Siphostoma* of the genus *Syngnathus*. It is very closely allied to Weber's *S. punctatus*,[1] but can be readily distinguished from it in the possession of a snout shorter than the post-orbital part of the head and in its characteristic colouration.

Type-specimen.—F 10723/1, *Zoological Survey of India* (*Ind. Mus.*)

Genus **Corythoichthys** Kaup.

(?) **Corythoichthys fasciatus** (Gray).

(Plate xi, fig. 1.)

There are three young specimens in our collection which I refer to *Corythoichthys fasciatus* with great reserve and after a considerable amount of hesitation. To facilitate reference in future I give below a description of these specimens with a figure.

D. 28 ; Rings, 16+37, subdorsal rings, 2nd caudal to 7th.

It is a long and slender fish in which the ventral keel is prominent. The trunk is heptagonal and the tail tetragonal. The shields are coarsely

[1] Weber, *Siboga-Expelitie, Fische*, p. 113 (1913), and Weber and Beaufort *Fish. Indo-Austral. Archipel.* IV, p. 86, fig. 36 (1922).

serrated transversely and their edges are prominent and smooth. The intermedial shields are present; they are more marked in the tail region and are somewhat sunk below the level and probably contain the lateral line organs. The superior cristae of the trunk terminate on the 5th caudal shield and are not continuous with those of the tail. The superior cristae of the tail are deflected below the dorsal and are continued to the beginning of the fist caudal shield. The median cristae of the trunk terminate slightly below the superior cristae of the tail. The superior cristae of the trunk and the tail are continuous. The length of the head is contained about 8 times in the total length excluding caudal and 2 times in the length of the trunk, which is contained slightly less than $2\frac{1}{2}$ times in the length of the tail. The length of the snout is almost equal to the remaining part of the head. There are low median crests on the snout, on the head behind the eyes and on the occipital and nuchal shields. Low ridges also run from the margin of the orbits backwards for a short distance. The opercular keel is prominent and rectilinear. There is a short ridge below the orbit and another just in front of the base of the pectoral.

The colour in spirit is yellowish. There are 5 to 6 gray circular bands situated at almost equal distances in the tail region. The caudal fin is blackish with dull white margin. The head is of a lighter colour than the body.

Locality.—The 3 young specimens in our collection were obtained by Major Sewell in surface nets in Morrison Bay, Mergui Archipelago (Marine Survey Sta. 574 and 578).

Relationships.—These young examples are very similar to Weber's *Corythoichthys crenulatus,*[1] but in them the ridges on the head, body and operculum do not show any sign of serrature. Moreover, the origin of the dorsal is on the last trunk shied in *C. crenulatus,* while it is on the second tail segment in the juvenile specimens. In this last respect they differ from adult specimens of *C. fasciatus,* of which I have not examined any young specimen. At first sight these examples were considered to be the young of *Syngnathus spicifer,* but in them the median cristae of the trunk are subcontinuous with the superior cristae of the tail, while in *S. spicifer* the median trunk cristae are strongly deflected on the last trunk ring and become continuous or subcontinuous with the inferior cristae of the tail.

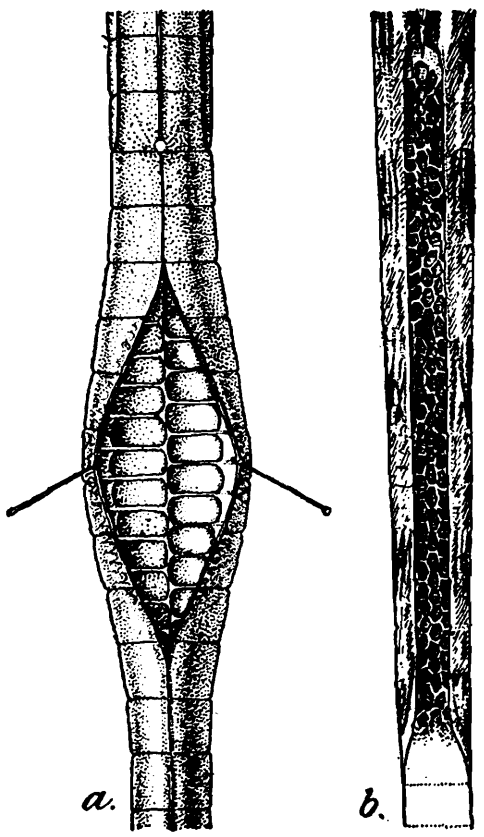
Genus **Bhanotia,** nov.

The genus *Bhanotia* may be defined as follows :—

It is a genus of Syngnathidae comprising short and relatively stout fishes. The shields are finely corrugated transversely and the ridges are fairly prominent and serrated. The snout is slender and is equal in length to the postorbital part of the head; its ventral profile almost forms a straight line with the ventral profile of the head. The snout is provided with a few spines on its dorsal surface. The dorsal profile

[1] Weber and Beaufort, *Fish. Indo-Austral. Archipel.* IV, p. 72, fig. 30 (1922).

of the head rises abruptly in the orbital region and forms an angle with the dorsal profile of the snout. The eyes are prominent. The occipital and the nuchal shields are provided with median crests, which are serrated. The supraorbital ridges, which are serrated, are continued on to the occiput. The operculum is crossed by a complete, longitudinal and serrated keel. The superior cristae of the trunk and tail are discontinuous. The inferior cristae of the trunk and tail are continuous. The median cristae of trunk and the superior cristae of tail are subcontinuous. The intermedial shields or scutella are present or absent. The prenuchal and the nuchal shields are present. The tail is more than twice as long as trunk. The dorsal is situated mostly on the anterior caudal rings. The anal, the pectoral and the caudal are present. The eggs are large and are arranged in two rows, they are placed in isolated open cells in the caudal region of the male and are laterally protected by ventrally converging folds of skin, which meet in the midventral line, opening out lengthwise to let out the young fishes.



TEXT-FIG. 5.—Brood pouches of the genera *Corythoichthys* and *Bhanotia*.
a. Bhanotia × 3¾
b. Corythoichthys × 2¼.

Relationships.—The genus *Bhanotia* is closely allied to *Corythoichthys* Kaup from which it differs in the character of the brood pouch, in the size and number of eggs and in the fact that all the prominences on the head and body are serrated. The snout is short and on its dorsal surface is provided with spines.

I have called this genus after the name of my esteemed friend Mr. Kali Das Bhanot.

Distribution:—Karakelang Islands (Malay Archipelago) and Rutland Island (Andamans). These fishes are usually found living on coral reefs near the shore.

Type species:—*Bhanotia corrugatus* (Weber).

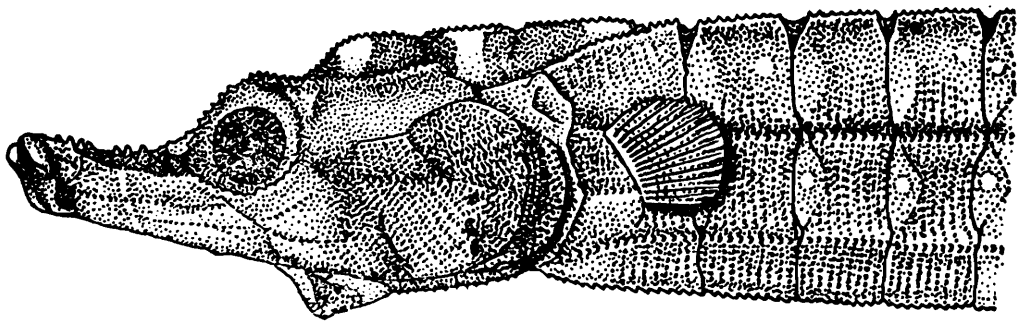
? Bhanotia corrugatus (Weber).

(Plate, xi, fig. 2.)

1922. *Corythoichthys corrugatus*, Weber and Beaufort, *op cit.*, p. 72, fig. 30.

Weber described this species from a single specimen 65 mm. in length from Karakelang Islands. In the collection of the Indian Museum there is a specimen 79 mm. in length collected by Major Sewell at the extreme north end of Rutland Island (Andamans). Our specimen agrees fairly closely with Weber's description and figure of the species, but differs in the fact that it is provided with intermedial shields (scutella). There are other minor differences in colouration and proportions, but

these are in all probability due to the age of the two specimens. The differences in proportions can be made out by a reference to the table of measurements. The fin formula, etc., is :—D. 30 ; P. 14 ; Rings 15+43 ; subdorsal 1+7.



Text-fig. 6.—Lateral view of head and anterior part of body of ? *Bhanotia corrugatus* (Weber) ×7.

The brood pouch begins from the commencement of the first caudal shield and extends over eleven rings. The lateral plates in this region are better developed to give support to the chamber, but the walls of the chamber are mainly formed by cutaneous folds, which meet in the midventral line. There are 16 to 17 rows of embryos on each side ; these are placed in separate cells isolated by thin folds of skin. The portion of the brood pouch on the 10th and 11th caudal shield is empty.

Measurements in millimetres.

Total length excluding caudal	79·0
Length from tip of snout to anus	27·0
Length of head	7·1
Greatest depth of body	5·0
Length of snout	3·9
Diameter of eye	1·6
Length of pectoral	1·6
Length of caudal	2·0

Bhanotia sewelli, sp. nov.

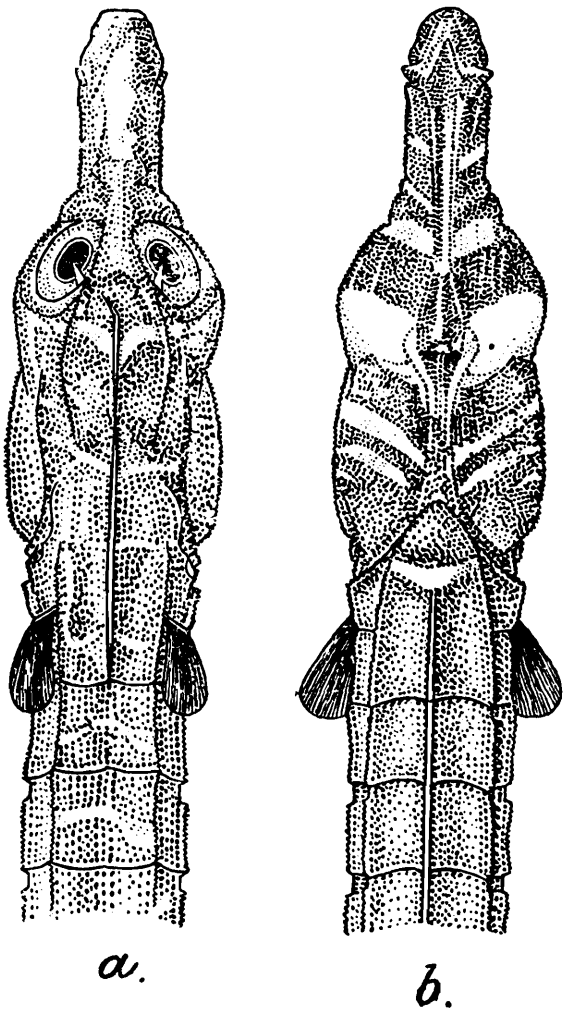
(Plate xi, fig. 5.)

D. 31 ; P. 16 ; A. 3 ; C. 10 ; Rings 15+43 ; subdorsal 1+6.

In this species the ventral crista is very prominent, the trunk is heptagonal and the tail tetragonal. The length of the trunk is contained 2·3 times in the length of the tail. Both the head and the body are corrugated. All the ridges on the head and the edges of the shields are prominent and serrated. The intermedial shields (scutella) are absent. The length of the head is contained 9·8 times and the depth of the body 20·3 times in the total length without the caudal. The length of the head is contained 2·6 times and the depth of the body 5·5 times in the length of the trunk. The snout is short and slender ; it is shorter than the postorbital part of the head and is one and a quarter times the diameter of the eye ; anteriorly it is turned upwards and its dorsal profile forms an angle with the dorsal profile of the head, which rises abruptly in the orbital region. The orbits are very prominent. There are a number of spines along the middorsal line of the snout, these are continued as a

low crest in the interorbital region for a short distance. There is a well-marked, interrupted crest on the nape. In front of and along the inner border of each nostril there is a prominence with about 3 spines ; similar prominences bearing 4 spines are obliquely placed slightly behind the tip of the snout one on each side. The orbital borders are also serrated and from their middle curved ridges run as far back as the end of the occiput. There are low ridges on the under surface of the snout. The operculum is provided with a well-developed, longitudinal keel and a number of low radiating ridges. The superior cristae of the trunk extend as far back as the origin of the 28th dorsal ray, but are not continuous with the superior cristae of the tail. The superior cristae of the tail extend almost to the anterior border of the first caudal shield. The median cristae of the trunk end below the superior cristae of the tail and are almost subcontinuous with them. The inferior cristae of the trunk and tail are continuous.

The colour in spirit is very characteristic of the species. It is uniformly gray with light, white streaks on the back, one corresponding to each shield. In the posterior region of the tail these white streaks are continued on to the sides. There is a series of about 7 small, rounded spots on the anterior trunk shields between the inferior and the median



Text-fig. 7.—*Bhanotia sewelli*, sp. nov.

a. Upper surface of head and anterior part of body. *b*. Under surface of head and anterior part of body.

cristae. There are faint indications of one or two other rows of spots

also. There is a V-shaped white band on the head running from eye to eye and pointed backwards in the middle. The mid-dorsal surface of the snout and the anterior half of the interorbital region is also white. On the under surface of the head there is a broad V-shaped band running between the posterior margins of the eyes and sharply directed backwards in the middle. Behind it there are three narrower bands and in front of it is a broad transverse band. The tip of the snout is white and there are one or two broken white lines behind it.

Locality.—This species is represented by a single young specimen in our collection. It was obtained by Major Sewell on the coral reef at the South Point of Outram Island (Andamans).

Type-specimen.—F 10690/1, *Zoological Survey of India* (*Ind. Mus.*).

Bhanotia sewelli is readily distinguishable by its characteristic colouration.

I have named this fish after Major R. B. Seymour Sewell, formerly Surgeon Naturalist to the Marine Survey of India and now Director, Zoological Survey of India.

Measurements in millimetres.

Total length excluding caudal	60·9
Length from tip of snout to anus	22·7
Length of head	6·2
Greatest depth	3·0
Length of snout	2·0
Diameter of eye	1·6
Length of pectoral	0·9
Length of caudal	2·0

Genus **Ichthyocampus** Kaup.

Ichthyocampus bannwarthi Duncker.

(Plate xi, fig. 3.)

1915. *Ichthyocampus bannwarthi*, Duncker, *Mitt. Naturh. Mus.* XXXII, p. 93.

There is a single specimen of this species in our collection. It is about 120 mm. in total length and was collected by Major Sewell at Tor (Sinaitic Peninsula) while stationed there in 1917. It agrees very closely with Duncker's description of the species. The edges of the shields are not prominent and it is rather difficult to count the number of rings. Some of the dermal filaments appear to have fallen off in the specimen.

Locality.—Suez.

Genus **Doryichthys** (Kaup) Duncker.

Doryichthys insularis Hora.

1925. *Doryichthys insularis*, Hora, *Rec. Ind. Mus.* XXVII, p. 38, p. ii, fig. 1.

Besides the six specimens collected by the late Dr. Annandale in a small stream at Birchgunge (S. Andamans), there are two more speci-

mens obtained by Dr. Kemp in a rocky stream at Corbyn's Cove, North (S. Andamans). In colouration and general facies this species is similar to Duncker's *Doryichthys ocellatus* from Ceylon, but differs in the possession of fewer rays in the dorsal fin and in having a greater number of trunk shields.

Locality :—South Andamans.

XIV On a new species of the genus *Kanduka* Hora.

Quite recently I[1] described this interesting genus from a single specimen obtained at the mouth of the river Hughli at a depth of 15 fathoms. In the late Dr. Annandale's collection from the Ennur backwater near Madras I have found a small specimen, which is congeneric with *Kanduka michiei*, but in certain respects is more highly specialized than the geno-type. I propose for it the name :—

Kanduka annandalei, sp. nov.

When fully inflated it is a spherical ball-like fish with the mouth situated almost in the middle of the anterior surface. The length of the fish is slightly greater than either its height or its breadth. The back is somewhat flattened and there is a raised area along the middle of the back longitudinally. The length of the head is almost equal to half the total length without the caudal. The eyes are situated much nearer to the tip of the snout than to the gill-openings. The greatest diameter of the eye is contained 3·5 times in the length of the head. The snout is almost as long as the diameter of the eye. The interorbital surface is broad and is greater in length than the diameter of the eye. The eyes are covered by adipose eyelids. There are clear oval patches of translucent skin below and behind the eyes. The nostrils are situated nearer to the eyes than to the tip of the snout. Each nostril consists of two broad flaps, which are joined at the base and are imperforate in the centre. The mouth is small and transverse and both the jaws possess well marked median sutures. The lips are fleshy, papillated and continuous at the angle. The gill-openings are very small.

The dorsal and the anal fins are totally absent. The pectoral consists of 17 rays and is situated along with the gill-opening in a pouch-like depression ; it is spiral in its horizontal axis and is rather difficult to spread out. The caudal is fairly long and can be retracted into a well-marked pouch. The caudal is also spiral and is truncate at the apex. Below the pouch containing the caudal fin there are two more depressions, one of which probably lodges the anus.

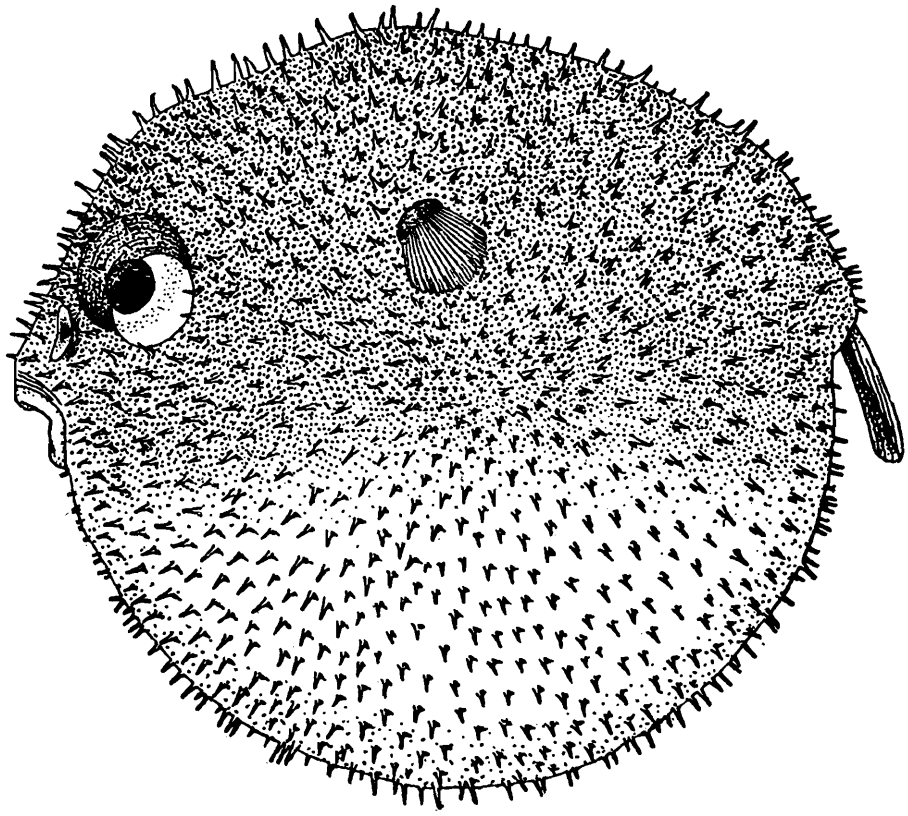
The entire fish, except the lips and the bases of the fins, is covered with long and pointed spines. The spines are absent from the translucent patches below the eyes and are tri- or tetra-radiate at the base.

The colour in spirit is grayish brown above and dull white below. The gray colour of the upper surface is due to the presence of a series of minute spots, which are definitely arranged to form a sort of a dendritic pattern.

The total length of the specimen is 14 mm. without the caudal fin.

[1] Hora, *Rec. Ind. Mus.* XXVI, pp. 579–582, pl. xxxiv (1924).

Locality.—Ennur backwater, near Madras. A single specimen was obtained with a D-net along with the young ones of *Tetraodon patoca* Ham. Buch.



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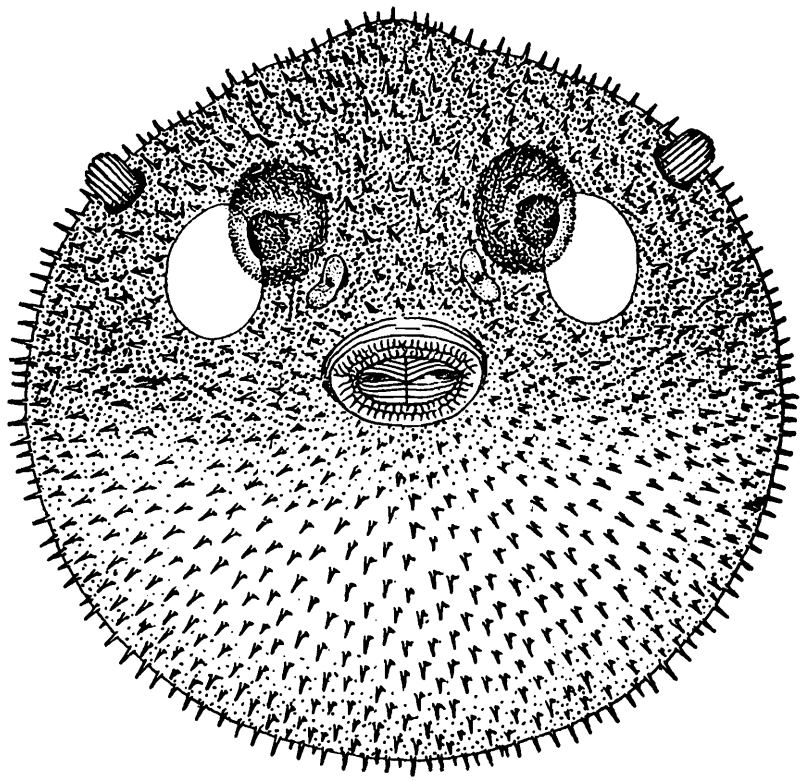

b.

TEXT-FIG. 8.—*Kanduka annandalei*, sp. nov.
a. Lateral view of the type-specimen × 7. *b.* The same as seen from in front × 7.

Type-specimen.—F 10736/1, *Zoological Survey of India* (*Ind. Mus.*).