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MARINE BIOLOGICAL AND OCEANOGRAPHIC INSTITUTIONS OF THE WORLD

III. THE BINGHAM OCEANOGRAPHIC LABORATORY

By ALICE M. CHILD

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WHEN Harry Payne Bingham, 1910, presented his private marine collection of deep-sea fishes to the Peabody Museum in 1930, the Bingham Oceanographic Laboratory became a reality. Its first staff member was Albert Eide Parr who later became Director, a post which he held until 1942 when he was succeeded by Daniel Merriman. Under Dr. Merriman's leadership, the staff increased to about a dozen people, plus several graduate students each year, all of whom performed various duties in connection with the Laboratory's program of teaching and research in oceanography.

Housed for the past two decades in a Victorian mansion on Hillhouse Avenue (the Peabody Museum Annex), the staff converted upstairs sleeping quarters into offices and laboratories. The lofty panelled ballroom of the old house provided nearly sufficient space for an extensive scientific library, and brick-paved wine-cellars in the sub-basement were utilized as aquarium rooms. But such quarters, designed for gracious living in the ample style of the '80s, still lacked certain twentieth century amenities essential to the operation of a modern research laboratory. Light, air, well-planned space, up-to-date water systems for feeding aquarium tanks, machinery for temperature control, heavy-duty wiring for complicated electrical equipment—all these aids to research were either conspicuous by their absence or at best ingenious makeshifts. Even in the 1940s it became increasingly clear to the new Director that some sort of physical expansion would eventually have to be provided if high standards of research were to keep pace with new developments in oceanography, and teaching facilities were to be adequate to meet the new demands of the future.

And so, on October 30th, 1959, a new and modern building—the gift of the Bingham family and of Wendell W. Anderson, 1922, and William Robertson Coe, 1949 hon.,—was dedicated at a brief ceremony and presented to Yale University. Over 500 guests attended the dedication ceremonies which were held, appropriately enough, in the remodeled ballroom of the Bingham's old quarters. After these short formalities, the guests were taken on a tour of inspection of the new building, and ended their tour in the Dinosaur Room of the Peabody Museum, where toasts were drunk to the continued success and good fortune of the Bingham Oceanographic Laboratory.

The culmination of years of planning by the Directors of the Bingham Laboratory and the Peabody Museum, and their combined staffs, the Bingham's new home is one phase of the building expansion program of scientific facilities at Yale. This

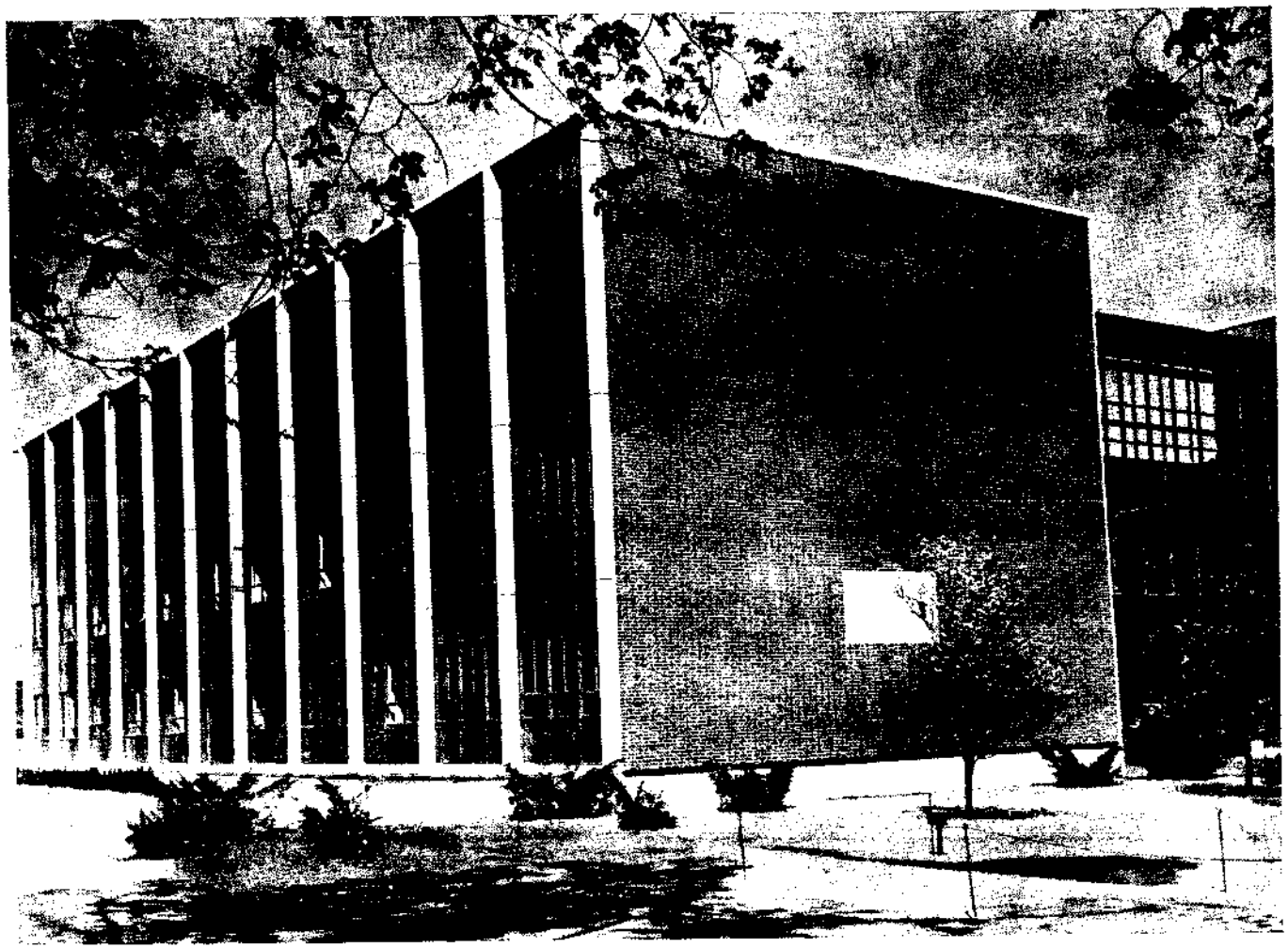
latest development for the benefit of the natural sciences incorporates many interesting features, one of which is the series of six connecting rooms on the ground floor, four of them containing aquarium tanks which are being used for experimental purposes. These four rooms have separate temperature controls, and the aquaria are supplied by both fresh and salt-water circulating systems, 6,000 gallons of sea water being circulated through tanks by a specially designed pumping system. The piping for this system is entirely of plastic, so that no toxic substances are given off to be absorbed by the fish. The fifth room in the series is equipped as an operating room, and the sixth room—the so-called ' Hot Lab '—is being utilized for work involving the handling of radioactive materials in connection with experimental work on fishes.

There are one or two offices, including the Director's, on the first floor, but most of the staff offices and laboratories are on the second. Also on the second floor is a large, well arranged library containing an irreplaceable collection of over 1,000 scientific journals, hundreds of books and 15,000 reprints. On the other side of the building a well equipped photography laboratory includes two dark rooms and a ' soft ray ' machine for X-Ray work on specimens.

In addition to the aquarium suite, the first floor of the Bingham Laboratory boasts several convenient working and storage facilities. A large cement-floored gear room has a distinctly nautical flavour, with nets, seines, and trawls suspended from an ingenious arrangement of overhead hooks and pulleys. Ranged on shelves along the walls are a variety of traps and cages used for collections ' in the field.' The fish specimen storage room with its hundreds of feet of steel shelving is rapidly filling up with specimens accumulated from recent expeditions. Due to lack of space, these extensive collections had hitherto had to be stored in all sorts of inaccessible spots round and about the University. A machine shop and a shipping room are located opposite double doors which lead into the building from an outside loading platform. At the end of the first floor corridor is a publication storage room containing a full set of files of the Journal of Marine Research and the Bulletin of the Bingham Oceanographic Collection, both of which publications are issued by the staff of the Bingham Laboratory, and date back to the early 1930s. Here also reposes a sizeable collection of reprints of the articles written by members of the Bingham staff for other scientific journals.

Also on the first floor is the Seminar Room. Designed to accommodate thirty or more students, this room is an important addition to the expanding program of teaching at the new Bingham Laboratory. Although oceanography is not a department per se at Yale and no graduate or undergraduate degrees are offered in this subject, graduate seminars in oceanography and ichthyology are being attended by students who are taking their doctorates in such departments as Zoology, Chemistry, Physics, Geology, Botany and Microbiology, many of whom are doing their research and preparing their theses under the supervision of the Bingham staff. Plans for the coming academic year include the addition to the teaching and research staff of both a chemical and physical oceanographer, and course offerings will be expanded accordingly.

That there is an acute and growing need for trained oceanographers is emphasized by the reports of the Committee on Oceanography of the National Academy of Science which, under the auspices of the National Research Council and the National Science Foundation, is engaged in exploring the predictable trends and scope of



oceanography which may be expected to prevail over the next ten years. There is obviously an increasing interest in matters oceanographic on the part of the public and, best of all, a constant stream of inquiries is pouring into the new Laboratory from prospective students who wish to qualify for this challenging field.

By gradually increasing its staff and expanding its teaching program, the Bingham Oceanographic Laboratory is on its way to meet the challenge of the future, a challenge with which, to quote the Director's speech at the Dedication last October, 'I assure you we will more than keep pace.' Exploiting to the fullest degree its splendid new physical plant without compromising the high standards of research set up by a small and dedicated staff in spite of great material difficulties, Dr. Merriman feels strongly that 'the free pursuit of academic knowledge for its own sake' must be made available to the rising generation of students of oceanography, a subject which is 'not a science, but the focus of many sciences.'

NOTES

ON AN EPIZOIC GASTROPOD, *SAPTADANTA NASIKA* PRASHAD & RAO, ON THE SHELLS OF *PTEROCERA* LAMARCK

A heavy infestation by a hitherto little known epizoic gastropod on a shell of *Pterocera lambis* (Linne) from Minicoy in the Laccadive group of Islands was brought to my notice by Dr. S. Jones, Chief Research Officer of the Central Marine Fisheries Research Station, Mandapam Camp. It was later identified by me as *Saptadanta nasika* Prashad and Rao under the family Lepitellidae. Several other shells of *P. lambis* (Linne) and *P.chiragra* (Linne) infested in a similar manner by the same species and reported to have been received from Mangalore were obtained subsequently from a chank godown of a shell dealer in Kilakarai, Ramnad district. The original description by Prashad and Rao (1934) of *Saptadanta nasika gen. et sp. nov.* was based on a specimen found on *Trochus niloticus* Linne from the

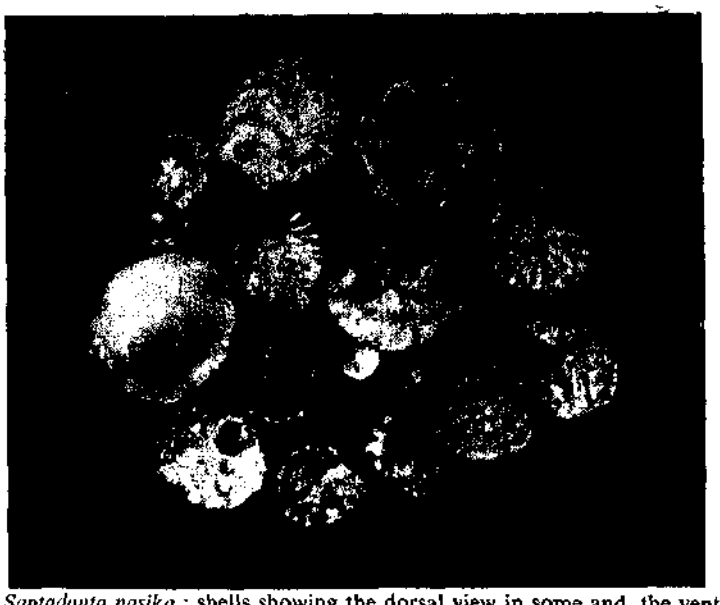


FIG. 1. *Saptadanta nasika :* shells showing the dorsal view in some and the ventral view in others. Depressions on some of the shells indicate reinfestation by younger individuals of the same species. x 1½.

Andamans. The occurrence of the same species on other shells of commercial importance recorded here for the first time, it is hoped, will be of some scientific interest. The availability of a large number of individuals enabled furnishing a detailed description of the conchological and other characteristics of the species.

The shell is fairly thick, low, conical, oval at base and whitish with a slightly greenish or brownish tint. The apex is a little recurved and placed at about a third of the distance from the posterior end. There is a varying number of radiating

ridges up to twenty-seven starting from the apical region and extending to the margin. The ridges are of a lighter hue than the intermediary grooves which are greenish or darkish brown. The peripheral region has a faintly marked groove a little away from the margin. When viewed from the ventral surface the edge of the shell presents well marked crenulations corresponding to the outer radiating ridges with the grooves in between. The inner surface of the shell is porcellanous and white. In a few comparatively thinner shells of smaller size and lighter build, the inner peripheral region has irregular brownish radiations alternating with light yellowish markings and the central deeper region a whitish brown colouration. The measurements of representative sample of shells of different sizes are given in table 1.

The observations being confined to dried up specimens, it was not possible to study the soft parts. The radula, however, was well preserved in the material examined and when it was moistened and cleared with a weak solution of caustic potash, it presented a structure which agreed in all details with the earlier description by Prashad and Rao (1934). The radular formula is 2.1.1.1.2. The central tooth is broad with a large median cusp and three other smaller ones on either side ; the lateral is arched with about eight cusps of which one is much larger than the rest ; the inner marginal is slender with a series of small cusps on its inner face and the outer marginal is stout, a little shorter than the one preceding it and bears short cusps on both the inner and outer faces at its tip.

Table showing measurements of shells with the number of radiations in Saptadanta nasika

Serial Number	Linear measurements in centimeters				Number of Ridges
	Length	Breadth	Apex to Ant. Margin	Height	
1*	1.35	1.20	1.10	0.41	26
2	1.35	1.29	1.27	0.53	24
3	1.30	1.00	1.00	0.45	25
4	1.30	1.00	1.00	0.40	25
5	1.40	1.00	1.20	0.48	27
6*	1.45	1.30	1.18	0.54	25
7*	1.05	0.90	0.80	0.30	19
8	1.08	0.98	0.85	0.35	25
9	1.20	0.70	0.90	0.30	25
10	1.05	0.88	0.85	0.36	27
11	1.05	1.00	0.78	0.21	21
12	0.75	0.78	0.65	0.30	21
13	0.80	0.75	0.65	0.20	18
14	0.90	0.88	0.82	0.32	27
15	0.85	0.80	0.70	0.21	22
16	0.65	0.50	0.45	0.20	22
17	0.60	0.50	0.48	0.25	24
18	0.50	0.35	0.25	0.15	20
19	0.45	0.30	0.30	0.15	24
20	0.30	0.25	0.20	0.10	20

* Reinfested with younger individuals of the same species.

The boundary of each one of the excavations on the surface of the shell has the same outline of the form which secures attachment and with a ring of close-set impressions conforming to the crenulations on the margin of the shell. The sides of the excavations are slightly sloping and the floor has a roughly oval ridge or elevation with a central depression. The ridge is a little higher and more conspicuous behind than in front and externally to it is a groove round the base. When two or more animals settle very close, the excavations made by them coalesce. Their formation is so characteristic that they can be identified and ascribed to the species even if the animals have dropped out of the infested shells.

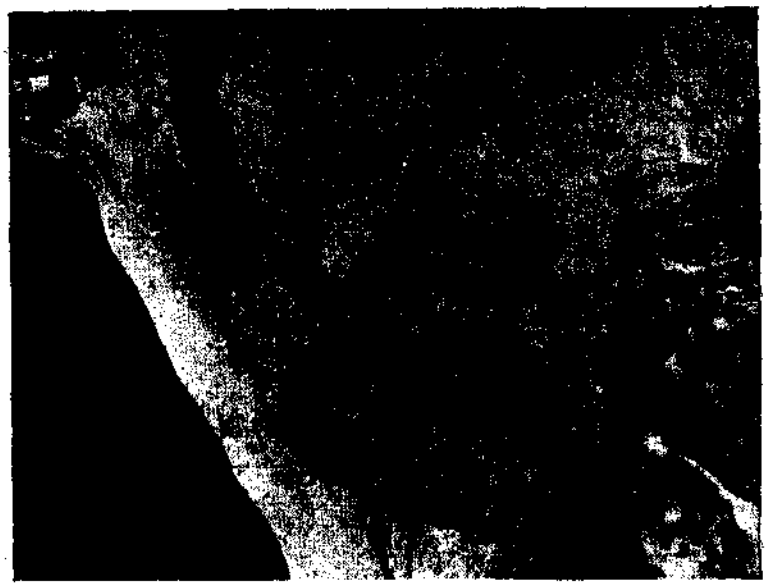


FIG. 2. *Saptadanta nasika :* excavations made by the form on *Pterocera* shell. Marginal row of close-set minute impressions and an oval ridge with a central depression may be noted. x 2.

In *Pterocera* the infestation has been found to be the highest close to the apical region although it occurs on other parts of the shell like the ventral surface of the body whorl and the fingered processes. Often the damage caused by the species is very great as nearly fifty and occasionally more have been found infesting a single shell. In the manufacture of fancy articles like flower vases and lamp shades *Pterocera* are largely used and those drilled with excavations caused by this species are considered unsuitable for the purpose.

I wish to express my very sincere thanks to Dr. S. Jones, Chief Research Officer, Central Marine Fisheries Research Station, Mandapam Camp, for the keen interest taken in the preparation of this note.

Central Marine Fisheries Research Station,
Mandapam Camp.

K. VIRABHADRA RAO

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RECORD OF MALE *PARAPENAEOPSIS ACCLIVIROSTRIS* ALCOCK

WHILE revising the prawns of the Penaeus group Alcock (1905) created the species *acclivirostris* of genus *Parapenaeopsis*. The material he studied comprised 34 prawns, all females, obtained from Madras, Ganjam, Vizagapatam, the Palk Strait and the Persian Gulf. The male of this species has not been described so far.

A few small prawns, resembling young *Metapenaeus affinis* in general form and colour, were taken in the month of March 1960 from the 'dol' (fixed bag net) catches made off Sassoon Docks in Bombay at a depth of 6 to 7 fathoms. They measured 26 to 46 mm. from tip of rostrum to end of telson. Later in the same month, from an otter trawl catch from deeper waters of 15 to 20 fathoms off the same locality a large individual measuring 58 mm. was obtained. On close examination these prawns proved to be *Parapenaeopsis acclivirostris* Alcock. Out of the 19 individuals collected 9 are males.

Alcock's (1906) description and figures of the female tally with the present material in almost all details. The rostrum has 7 to 8 teeth and in the female it does not pass beyond the tip of the second segment of the antennular peduncle. The antennular flagella are subequal and 7/10 of the length of their peduncle in the female. The fifth pair of legs reaches almost to the tip of antennal scale.

The males are far smaller than the females. The 9 males examined are within a length range of 26 to 31 mm. and all of them appear to be adult as could be seen from the full development of their petasma. Three mature females with ripening ovaries measure from 44 to 58 mm. in length. The rostrum in the male just surpasses the eye and falls short of the tip of the basal segment of the antennular peduncle. The petasma reaches the basis of the third pereiopod. The distolateral projections of the lateral lobes are reflected posterolaterally making an angle of 60° with the longitudinal axis of the petasma. The distance between the tips of the projections is a little less than half the total length of the petasma. The width across the lateral lobes at their widest region is about a third of the petasmal length (Fig. 1 *a* and *b*). The distal piece of the appendix masculina is horse-hoof shaped, minutely setose and about half the length of the basal piece. On its posterodistal aspect are found one large and one or two smaller tongue like processes (Fig. 1 *c*).

Parapenaeopsis acclivirostris very closely resembles *P. tenellus* (Bate), and Alcock himself was doubtful of the validity of the new species he created. With the discovery of the male, its specific identity can now be established.

The main differences in the external sexual characters of the males of the two species are given below.

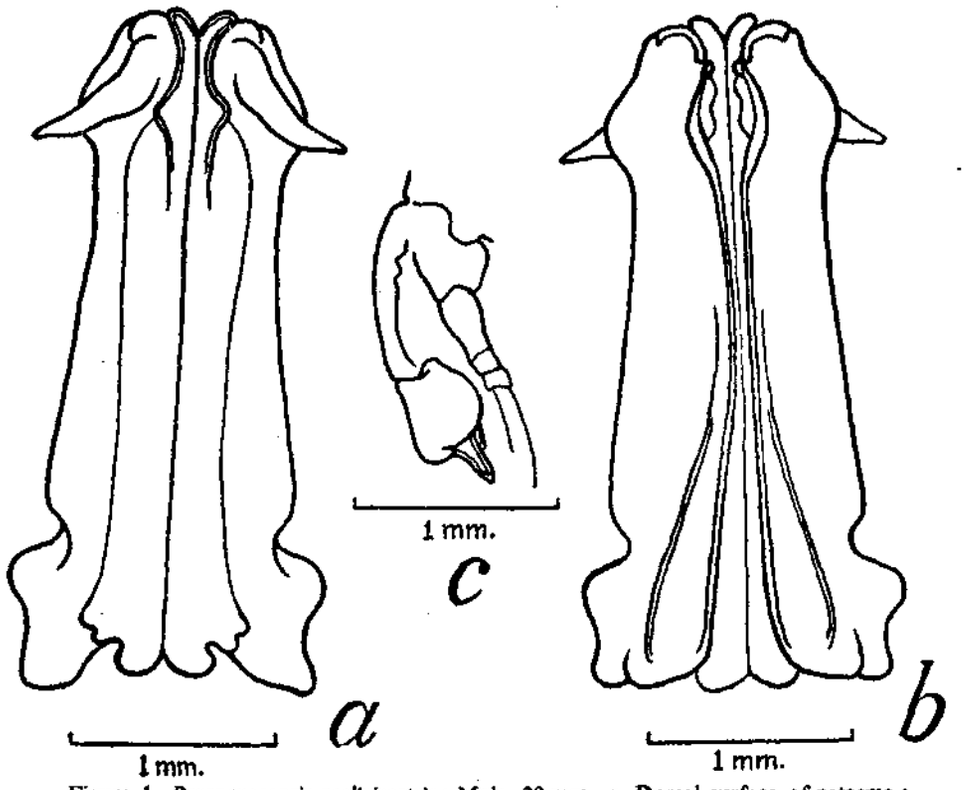

Figure 1. *Parapenæopsis acclivirostris* : Male, 30 mm. *a*. Dorsal surface of petasma ; *b*. Ventral surface of petasma ; *c*. Appendix masculina

Character	*P. acclivirostris*	*P. tenellus* (Kubo, 1949 ; Dall, 1957)
Petasma :	Disotolateral projections of the lateral lobes are not long and slender. Distance between tips of projections is a little less than half the petasmal length. Lateral lobes not expanded laterally ; distance across their most lateral extremities is about a third of the petasmal length.	Distolateral projections of the lateral lobes are long and slender. Distance between tips of projections is four-fifths of petasmal length. Lateral lobes are expanded laterally ; distance across their most lateral extremities is half the length of the petasma.
Appendix masculina :	Distal piece half the length of basal piece with two or three posterodistal tongue-like processes.	Distal piece a third as long as the basal piece with one posterodistal tongue-like process.

P. acclivirostris is one of the four species of *Parapenaeopsis* devoid of mastigobranchiae on the first and second pair of pereiopods. The other three are *P. hungerfordi* Alcock, *P. venusta* de Man, and *P. tenellus* (Bate). *P. acclivirostris* and *P.*

tenellus are remarkable species among Penaeinae in that they lack the isolated epigastric tooth.

I am thankful to Shri M. Krishna Menon, Research Officer (Prawns), Central Marine Fisheries Research Substation, Ernakulam for helpful criticism.

Central Marine Fisheries Research Substation,
Bombay-1. M. M. KUNJU

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ON THE SPECIFIC IDENTITY OF A RIBBONFISH (FAMILY TRICHIURIDAE) DESCRIBED BY HAMILTON (1822) FROM THE RIVER GANGES

IN the course of codifying the nomenclature of the species described by Hamilton in his ' Gangetic Fishes ' (1822), it was found that the description of one of the forms he had tentatively assigned to *Trichiurus lepturus* called for clarification as to its position in the System. It is evident that Hamilton, while recognising the similarities his specimens evinced to *T. lepturus*, was also aware of the many points of differences from its then known descriptions and drawings, for he remarked that '. . . . I think it unnecessary to multiply distinctions, and shall only add a full description, so that those who have an opportunity may judge how far any differences to be observed in different places may be adequate to distinguish these kindred fishes into different species '. This description which appeared under his second Order Apodes which contained ' Fishes having the dorsal spine or bone and wanting ventral fins ' was not accompanied by a figure but the salient characters mentioned therein are as follows :

1. Elongate, with head and body considerably compressed, the latter resembling ' the blade of a very sharp sword '.

2. Colour, bright silvery throughout the body.

3. Head and body devoid of scales.

4. Lower jaw ending bluntly, but longer than the upper ; jaws with long distant teeth, and tips of each jaw with two teeth longer than the others.

5. Vent situated before mid-length of body ; tail having both edges sharp and mid-ventrally ' indented with almost seventy-four small prickles, and terminate in a very long slender point, which towards its end resembles a bristle '.

6. Eyes are placed high.
7. Gill-covers large and finely cut at edges ; gill-openings also large.
8. Lateral line decurved from nape and running along lower half of body.
9. Dorsal fin long with 114 rays.
10. Pectorals short, sharp above, each with 11 rays.

While several of the later ichthyologists have not remarked on Hamilton's description of this trichiurid, Day (1878) relegated it to the synonymy of *Trichiurus haumela* (Forskal) with no comments. Recently, Tucker (1956) had adduced reasons to show that *Trichiurus lepturus* Linnaeus and *T. haumela* (Forskal) are conspecific, the former name having priority over the latter, with which view we also agree.

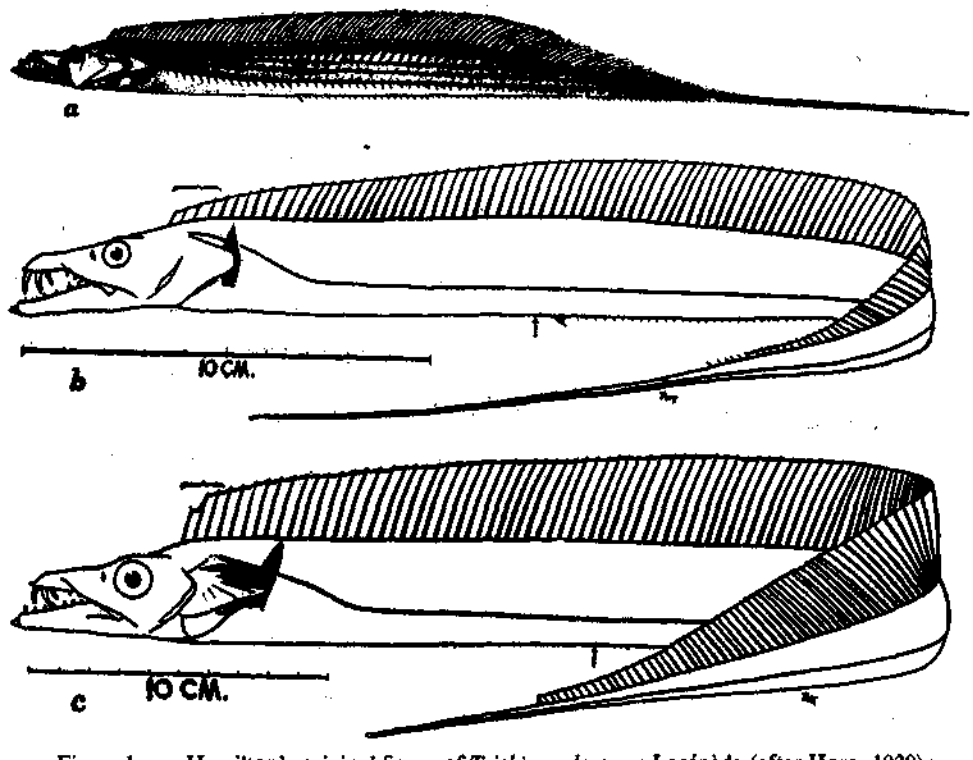

Figure 1. *a*, Hamilton's original figure of *Trichiurus lepturus* Lacépède (after Hora, 1929); *b*. *Lepturacanthus savala* (Cuvier) and *c*. *Trichiurus lepturus* Linnaeus (*b* and *c* after Tucker, 1956).

Hora (1929) found that original drawings of this trichiurid labelled as *Trichiurus lepturus* Lacépède, and those of some other species described by Hamilton, but not published by him during his time or subsequently by other workers did exist in the Asiatic Society Collections as well as at the British Museum (Natural History). The published figure of Hamilton's *T. lepturus* (Hora, *op. cit.*, pl. xviii, fig. 1) shows that it is in conformity with the description except that the dorsal fin is shown as

having 118 rays and the anal with 83 indented spinules instead of 114 and 74 respectively.

In the light of recent researches on the trichiuroids in general (Tucker, 1956), and certain species of these fishes occurring in Indian waters (James, 1959), it is now clear that Hamilton's description and drawing of *Trichiurus lepturus*, does not represent *Trichiurus lepturus* Linnaeus as redefined by Tucker (*cp. cit.*), but definitely depicts an allied species, *Lepturacanthus savala* (Cuvier) (=*Trichiurus savala* Cuvier, of Day and several other workers). The characters such as the dagger-like enlarged second anal spine (as shown in the drawing) ; the anal spinules breaking the ventral profile throughout the length of the fin and the spinules directed backwards ; the relatively smaller eyes (about 7.0 times in head length in the figure) ; the fin ray counts, and the bristle-like terminal part of the tail help in fixing the specific identity of this species as *L. savala*, at the same time distinguishing it from *T. lepturus* in which the corresponding anal spine is rudimentary ; the anal spinules absent or if present not breaking through the skin ; eyes large (5.0 to less than 7.0 in head length) and the terminal part of the tail relatively shorter and tapering gradually. However, as seen from Fisheries Reports, it is evident that *T. haumela* (=*T. lepturus*), also occurs in the Hooghly and Matla estuaries. In addition to these, two other lesser known ribbonfishes, namely *Eupleurogrammus intermedius* (Gray), and *E. muticus* (Gray) also occur in the Gangetic estuary as collections obtained by one of us from the Matla and Hooghly estuaries indicate. Both *L. savala* and *T. lepturus* are easily distinguishable from the genus *Eupleurogrammus* Gill in several characters including the decurved lateral line and the total absence of the pelvic fins. The diagnostic characters of these four Indian species and a synopsis to their identification have been given elsewhere (James, 1959).

Incidentally it may be mentioned here that all these four species have also been obtained from fish catches landed at Sassoon Docks, Bombay, on a single day. It has been interesting to find that at many places where they are fished or form part of regular catches along the Indian coast, more than one or all these four species of trichiurids occur even in a single haul which has often presented difficulties to the untrained eye in distinguishing them.

Summary

Trichiurus lepturus Hamilton (*nec* Linnaeus) is relegated here to the synonymy of *Lepturacanthus savalva* (Cuvier). Attention is also drawn to the occurrence of the four Indian species *Trichiurus lepturus* (of which *T. haumela* (Forskal) is a synonym), *Lepturacanthus savala*, *Eupleurogrammus intermedius*, and *E. muticus* in the Gangetic estuary and along the Bombay Coast.

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E. G. Silas
P. S. B. R. James

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A SHORT ACCOUNT OF THE WAHOO, *ACANTHOCYBIUM SOLANDRI* (CUVIER & VALENCIENNES)

RECENTLY it has been possible to collect a few specimens of *Acanthocybium solandri* from Vizhingam (Lat. 08° 22′ N., Long. 76° 59′ E.), South-West Coast of India ; and a description of the species is given below, as no account of it is available from Indian waters, except for a mention of its occurrence around Minicoy Island by Jones and Kumaran (1959) and in the Wadge Bank area off Cape Comorin by John (1959).

A. solandri is widely distributed, and is recorded from the circum-tropical parts of the Pacific, Atlantic and Indian Oceans. The first record of this species from the Indian Ocean (Arabian Sea) is that of Boulenger (1897) who gives a detailed description of a specimen collected and sent to the British Museum by Surgeon-Lieut.—Col. Jayakar from Muscat. Other records of this fish from the Indian Ocean are from the Delagoa Bay and Durban coasts in South Africa (Smith, 1949) ; Ceylon coast (Deraniyagala, 1952 ; Munro, 1955) ; and from Minicoy Island (Jones and Kumaran, 1959) ; the Wadge Bank area in India* (John, 1959) ; and subsequently from Andamans and Tuticorin (Jones, Silas and Dawson, 1960).

DESCRIPTION

Acanthocybium solandri (C. & V.)

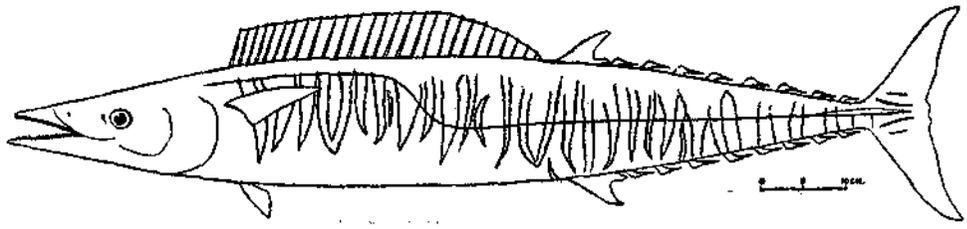
Cybium solandri Cuvier & Valenciennes 1841, *Hist. Nat. Poissons*, 8, 192.

Acanthocybium solandri. Boulenger, 1879, *Proc. Zool. Soc. London*, 272 ; Hardenberg, 1934, *Treubia*, 14(3) 292 ; Smith, 1949, *Sea fishes of South Africa*, 301, PL. LXIV, fig. 843 ; Fraser-Brunner, 1950, *Ann. Mag. Nat. Hist.*, (12) 3 : 162, fig. 35 ; de Beaufort, 1951, *Fishes of the Indo-Australian Archipelago*, 9: 228 ; Deraniyagala, 1952, *Coloured Atl. Some. Vert. Ceylon, I, Fishes*, 100-101, figs. 47, 48 ; Munro, 1955, *Marine and Fresh water Fishes of Ceylon*, 220, pl. XLIII, fig. 649 ; Jones and Kumaran, 1959, *Indian J. Fish.* 6(1) : 49 ; John, 1959, *Bull. Centr. Res. Inst., Univ. Kerala*, 7(1) : 133; Jones, Silas & Dawson, 1960. *J. Mar. biol. Assoc. India*, 2 (1). 134 .

D1. XXIII-XXVII ; D2. III, 9—10+8—10 ; A. III, 9—10+7—9 ; P. ii.21 ; V. I, 5 ; Vert. 62-64.

Body, enlongated and cigar-shaped, covered with small, narrow, rhomboidal scales ; those at the base of vertical fins elongated and lanceolate. Head, very long

* Dr. S. Jones, Chief Research Officer, in a personal communication informs me that he has seen a specimen of *A. solandri* on 16-3-1956 at Colachel (South of Vizhingam).



Acanthocybium solandri (Cuvier & Valenciennes)

and slender. Depth of body 6.2-6.8, length of head 4.0-4.3, caudal 8.4-9.5 in standard length. Diameter of eye 9.2-9.8 in length of head, and 2.5 in interorbital space. Snout long and beak-like, 1.9-2.1 in length of head. Cleft of mouth wide, extending to below anterior edge of eye; posterior part of maxillary covered by the preorbital. Jaws strong, set with a series of trenchant, closely set, slightly serrated teeth which increase in size posteriorly ; about 40-45 such teeth in lower jaw and 45-50 in upper jaw. Chin pointed, slightly projecting. Villiform teeth in a club-shaped patch on vomer and in an elongated band on palatines. Branchial lamellae reticulate. Gill-rakers absent. Preopercular edge slightly serrated. Anterior dorsal, well developed, high, a little longer than second dorsal, originating above base of pectoral ; spines sub-equal, highest behind middle of fin, $\frac{1}{4}$ length of head. Second dorsal, small, originating a little in advance of anal which is similar to former. Pectoral, originating a little anterior to origin of anterior dorsal, 1.9-2.2 in head, reaching to below 10-11th dorsal spine. Ventrals small, thoracic, about half length of pectoral. Caudal, short, lunate and 1.9-2.2 in head. Lateral line, with many perpendicular branches, high at anterior part of body, descending abruptly in a strong curve below the second third of anterior dorsal, terminating on tail in a strong keel which is about $\frac{1}{8}$ length of head. Number of vertebrae 62-64.

In fresh condition colour of the body is steel-blue above and paler ventrally. Sides with 25-30 vertical faint bars. Anterior dorsal similar to body in colour, but paler. Second dorsal, pectoral and caudal fins blackish ; ventrals and anal dusky.

General Remarks

The various body measurements and fin counts of *A. solandri*, taken from fresh material, are given in the Tables 1 and 2. The above description is based on these measurements. The figure is drawn, proportionately, based on the measurements taken from fish No. 4.

No significant differences are noticed in the various body proportions and the fin counts of *A. solandri* described from the Indian waters and from other places, except from Indonesia (Hardenberg, 1934). In his description of the species from Indonesian waters, Hardenberg (*l.c.*) gives the second dorsal fin count as 7. This is probably an error which is later followed by de Beaufort (*l.c.*), and Munro (*l.c.*). It may also be mentioned here that the specimen described by him has comparatively shorter head, which is contrary to all existing description of the species both from the Indo-Pacific and the Atlantic. The number of fin rays in the second dorsal is also 11-13 (its range in the present material is 12-13) and not 7.

A. solandri, known as *Oria Neemeen* or simply *Oria meen* in the local dialect, appears to be not very common at Vizhingam. This fish is occasionally caught

TABLE I

Body Measurements of *Acanthocybium solandri* in mm.

S. No.	Date	Weight Kg.	Sex & Stage of maturity	Furcal length	Standard length *	Greatest body depth	Head length	Maxillary length	Snout length	Eye diameter	Snout to pectoral	Snout to ventral	Snout to 1st dorsal	Snout to 2nd. dorsal	Snout to anal	Pectoral length	Pelvic length	Height of 1st. dorsal **	Height of 2nd. dorsal	Height of anal	Vertebrae
1	20-11-1959	10.51	♀ II	1,200	1,122	170	260	132	130	28	275	295	280	690	745	135	70	55	52	61	—
2	24-11-1959	10.06	♂ II	1,130	1,045	160	242	121	124	25	252	257	262	657	694	128	66	57	55	55	64
3	17-12-1959	8.23	♀ II	1,055	984	168	245	120	125	25	258	267	274	634	667	128	58	54	52	51	63
4	5- 1-1960	7.31	♂ II	1,054	985	148	231	115	112	25	246	263	253	631	650	112	52	46	43	56	—
5	22- 1-1960	11.43	♀ II	1,205	1,128	182	265	135	137	28	281	305	286	701	756	128	60	55	59	65	62
6	8- 2-1960	8.23	♂ II	1,139	1,064	157	259	131	131	27	272	283	276	680	722	120	66	57	56	54	—
7	17- 3-1960	7.77	♀ II	1,090	1,020	153	247	124	121	26	256	265	272	—	—	—	—	—	—	—	62

* From the tip of snout to the origin of caudal fin.
** Height of 1st dorsal taken at 1st. dorsal spine.

in November-March by open-sea fishermen using No. 1 hooks, baited with sprats, goat-fishes and squids. During the above period this species is reported to have been caught also at other centres south of Vizhingam ; and often brought to the Connemera Market, Trivandrum.

TABLE II

Fin Counts of *A. solandri*

Serial No. of fish	1st dorsal fin	2nd dorsal fin	Dorsal finlets	Anal fin	Anal finlets	Pectoral fin	Ventral fin
1	XXVI	III, 9	10	III, 9	8	ii, 21	I, 5
2	XXVI	III, 10	8	III, 10	8	ii, 21	I, 5
3	XXV	III, 10	9	III, 10	9	ii, 21	I, 5
4	XXVII	III, 10	8	III, 10	8	ii, 21	I, 5
5	XXV	III, 9	9	III, 10	8	ii, 21	I, 5
6	XXV	III, 10	8	III, 10	7	ii, 21	I, 5
7	XXIII	III, 10	9	III, 10	8	ii, 21	I, 5

The Wahoo is a large oceanic and pelagic fish ; voracious in habits, feeding mainly on other pelagic and shoaling fishes. Examination of the stomach contents of the specimens collected at Vizhingam showed that they were mainly feeding on shoaling fishes like frigate mackerel (*Auxis thazard*), Indian mackerel (*Rastrelliger kanagurta*) and other scombroid fishes. All the specimens examined from Vizhingam are immature.

Two types of parasities have been collected from *A. solandri* examined from Vizhingam. One of them is a large species of digenetic trematode found in the stomachs of all the fish examined ; and it appears to be similar to the species of *Distomum*, recorded by Kishinouye (1923) from the stomachs of this fish from Japan. Another is an interesting lernaeid copepod parasite, which has not yet been identified, collected from the body wall of the fish No. 5 in the present material. These external copepod parasites are tough in texture, very much elongated and thread-like (10.5-12.0 cm. in length), and with an anterior lobed organ which gets embedded in the body wall of the fish to get firm hold, while the rest of the parasite is suspended freely outside. Their general colour when fresh is bluish-green.

I am greatly indebted to Dr. S. Jones, Chief Research Officer, Central Marine Fisheries Research Station, Mandapam Camp for the encouragement and help in the preparation of this note. My sincere thanks are also due to the Superintendent, Trivandrum Zoo, for kindly extending library facilities to me.

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NEW RECORDS OF SCOMBROID FISHES FROM THE ANDAMAN-NICOBAR WATERS

IN the course of a visit to the Andamans and Nicobars during February-March 1960, we were able to obtain seven species of Scombroid fishes, six of which have not hitherto been recorded from this area, and two of which are new records for the Indian Seas. In fact, Herre (1941), while listing 490 species of fishes from the Andaman waters drew attention to the paucity of our knowledge of the pelagic fishes of the area. He recorded only three scombroid species, namely, *Scomber microlepidotus* Ruppell, *Rastrelliger brachysoma* (Bleeker), and *Rastrelliger kanagurta* (Ruppell). Of these, *S. microlepidotus* is now considered to be a synonymy of *R.canagurta*, thus leaving only two scombroid species as having been recorded from this area. Our collections include the following species :

1. The Indian Mackerel, *Rastrelliger canagurta* (Cuvier): 3 specimens between 225 and 250 mm. from Port Blair, Andamans.

2. The Eastern Little Tunny, *Euthynnus affinis affinis* (Cantor) : 1 specimen 562 mm. caught off Port Blair, Andamans. New record for Andamans and Nicobar waters.

3. The Double-lined Mackerel, *Grammatorcynus bicarinatus* (Quoy & Gaimard) : 1 specimen, 449 mm. taken on hook and line off Ross Island, Port Blair, Andamans. New record for Indian Seas.

4. The Dog-toothed Tuna, *Gymnosarda unicolor* (Ruppell) : 3 specimens measuring 514, 680, and 685 mm. caught off Port Blair, Andamans. New record for Indian Seas.

5. The Striped Seer, *Scomberomorus* (*Cybium*) *commerson* (Lacépède) : 2 specimens taken on troll line between Long Island and Mayabundur and one specimen caught off Ross Island, Port Blair, Andamans. New record for Andamans and Nicobar waters.

6. The Wahoo, *Acanthocybium solandri* (Cuvier & Valenciennes)* : 2 specimens 1020 and 1200 mm. taken on troll line between Long Island and Mayabundur, Andamans. New record for Andamans and Nicobar waters. Hitherto reported from Indian waters from only the Laccadive Seas (Jones & Kumaran, 1959) ; and the Wadge Bank off Cape Comorin (John, 1959). In July, this year, we obtained one specimen from Tuticorin. Deraniyagala (1952) has recorded this species off Ceylon coast.

7. The Sail Fish, *Iistiophorus gladius* (Broussonnett) : Skeleton and fin of one specimen caught off Malacca Bay, Car Nicobar in 1958. New record for Andamans and Nicobar waters.

The Atlas *cum* Report on the "Average year's fishing conditions of the Tuna long-line fisheries" edited by the Nankai Regional Fisheries Research Laboratory

*For information regarding the occurrence of this species in the Indian Ocean, reference is invited to the note by Narayana Rao (1960). *J. Mar. biol. Ass. India*, 2(1) : 130-33

(1958 edition, published in July 1959) indicates that the Japanese long-line fishing operations in the Andamans and Nicobar waters at different months of the year yielded seven commercially important species hitherto not reported from that area. They are, *Thunnus germo* (Lacépède), *Thunnus orientalis* (Temminck & Schlegal), *Parathunnus mebachi* (Kishinouye), *Neothunnus macropterus* (Temminck & Schlegal), *Xiphias gladius* (Linnaeus), *Kajikia mitsukurii* (Jordan & Snyder), and *Eumakaria nigra* (Nakamura). More recently, Nakagome (1959 *a* & *b*) has also indicated the occurrence of the Yellowfin Tuna, *Neothunnus macropterus*, and the Big-eyed Tuna, *Parathunnus mabachi* from the Andamans and Nicobar waters.

Besides these species, it will not be surprising if improved fishing methods and more intensive surveys eventually show that other Scombroids, such as the Skipjack, *Katsuwonus pelamis* (Linnaeus) ; the Oriental Bonito, *Sarda orientalis* (Temminck & Schlegal) ; the Frigate Mackerels, *Auxis thazard* (Lacépède) and *A. thynnoides* Bleeker ; the Indian Spanish Mackerel, *Scomberomorus* (*S.*) *guttatus* (Bloch & Schneider) ; the Indian Long-tailed Tunny, *Kishinoella tonggol* (Bleeker) ; the Short-nosed Spear Fish *Tetrapturus brevirostris* (Playfair) ; etc., which occur in the tropical Indian Ocean and in the Indian Coastal waters are also present in the Andamans and Nicobar waters.

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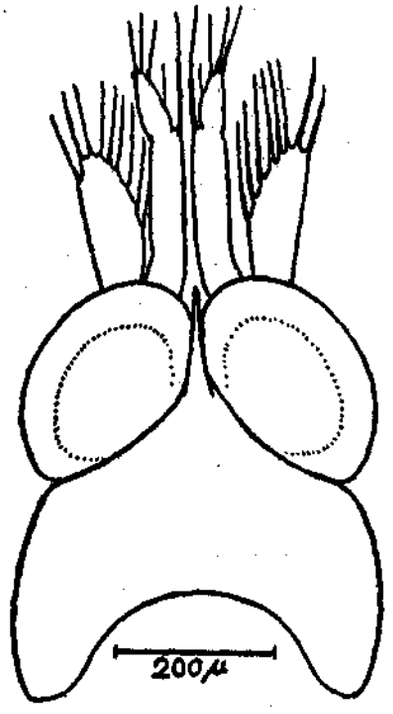
NOTES ON SOME DECAPOD LARVAE—A CORRECTION

In our description of the first larval stage of *Anchistus inermis* (*J. zool. Soc. India*, 9, 22-39, 1957) we had stated that the larva has no rostral spine. However, since Dr. Bruce pointed out in a recent personal communication the presence of a distinct rostral spine in *A. incomis* Miers, *A. miersi* (de Man) and *Paranchistus* (?) *biunguiculatus* Borradaile, although short in *Paranchistus*, we re-examined our material. We have now discovered that the first larva of *A. inermis* also possesses a short rostral spine. In the freshly hatched larva the spine is usually curved and hidden by the large eyes and is likely to escape notice. The revised illustration given here shows the rostrum in *A. inermis* in a dorsal view.



Our thanks are due to Dr. A. J. Bruce, East African Marine Fisheries Research Organisation, Zanzibar, for drawing our attention to this fact.

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