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ON A GIANT MORAY EEL, *THYRSOIDEA MACRURA* (BLEEKER) FROM THE PALK BAY WITH NOTES ON SOME ASPECTS OF ITS ANATOMY

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DURING the course of field observations at Mandapam on 14th October 1965, the author came across a large male specimen of the giant moray eel, *Thyrsoidea macrura* measuring 3031 mm total length and weighing 7·26 kg. which was caught in a trawl net at 6 fathoms depth in the Palk Bay off Mandapam (Plate I, fig. 1). Although smaller specimens of this species are known to occur at various parts of the Indian coast, such large specimens of this species are of rare occurrence and as far as the author is aware, there have not been any recent reports of such instances from India or elsewhere. Weber and de Beaufort (1916) state that ' this eel is probably the largest apodal fish in existence ' giving its length as more than 3000 mm. Smith (1949) states that it is ' the longest and possibly the largest known eel growing to be over 10 ft. in length '. Gunther (1870) and Day (1878) remarked that the species is known to attain a length upwards of 10 ft. (=3048 mm). Except Gunther (1870) who referred to a specimen 10 ft. long, actual record of length and details for specimens over 3000 mm are lacking. The present specimen therefore is of considerable interest in that it is the first record of a giant specimen from the Indian region in recent times and also for the anatomical details given in this note which have not been studied so far. The stuffed specimen has been kept in the Museum of the Central Marine Fisheries Research Institute, Mandapam Camp (Reg. No. CMFRI-F 38/96).

T. macrura is widely distributed in the Indo-Pacific and has been reported by earlier authors (Kner, 1865-67 ; Day, 1878 ; Gunther, 1870 ; Weber, 1913 ; Weber and de Beaufort 1916 ; Smith, 1949, 1962) from Sumatra, Java, New Guinea, South Africa, India including Andamans, Ceylon, Burma, Formosa, Palew Islands and Queensland. Recent reports of this species from India are those of Nair (1947) on its young stages and of Bal and Mohamed (1957) on a specimen 1686 mm in an account of the eels of Bombay, where it is caught on long lines and consumed by poor people.

Description : Body elongate, laterally compressed behind the angle of mouth to beyond the gill opening from where it gradually becomes thicker and roundish attaining a maximum at anus. Further behind, the thickness decreases and the body becomes laterally compressed to tip of tail.

Head (from snout to gill opening) 12·6 in length and 4·4 in distance from snout to vent ; Height (at anus) 39·8 in length ; Head and trunk 2·8 in tail ; Eye 40 in head and 3·3 in snout, situated far anteriorly, about 2 diameters from tip of snout. Teeth pointed, maxillaries with 24 teeth in the outer row and 12 in the inner row. Mesially, 3 large depressible fang-like teeth. Mandibles with an outer row of 24 nearly equal and inner row of 7 larger teeth. Dorsal (about 489) and anal

(about 350) fins densely enveloped in skin. Anal confluent with dorsal round the tip of tail. Pectorals and pelvics absent. Lateral line distinct throughout the course in the form of a single row of white horizontal dashes (about 190) interrupted by vertical dashes (about 19) at irregular intervals. Gill rakers absent.

Colour, in fresh condition uniform dark brown except midventral side of trunk which is whitish (about 3 cm. wide). Net work of fine white streaks present over the head, and trunk in the background of dark brown colour (Plate I, fig. 2). Margins of fins tinged with black. Specimen turned deep dark brown on keeping in cold storage overnight.

Habitat : Known to inhabit shallow waters of the sea along the coast, entering lagoons and river mouths and even ascend up the rivers.

TABLE I

Measurements of three specimens of* Thyrsoidea macrura *in millimetres :*

S. No.	Character	Specimen Number 1	2	3
1.	Total length (snout to tip of tail) ..	3031	2176	2630
2.	Snout to vent	1076	822	875
3.	Head length (snout to gill opening) ..	240	180	215
4.	Snout (tip of snout to front margin of eye) ..	20	17	22
5.	Eye diameter (horizontal)	6	8	6
6.	Interorbital space	15	12	17
7.	Predorsal distance	129	127	151
8.	Snout to anal	1085	820	894
9.	Length of dorsal	2806	2007	2480
10.	Length of anal	1892	1351	1737
11.	Height at orbit	28	25	30
12.	Height at gill opening	82	51	88
13.	Height at anus	76	38	67
14.	Height half metre in front of tip of tail ..	46	28	53
15.	Thickness at gill opening	43	41	57
16.	Thickness midway between gill opening and anus	53	45	60
17.	Thickness at anus	64	32	65
18.	Thickness half metre in front of tip of tail ..	25	17	27
19.	Origin of lateral line from snout ..	161	156	185

Anatomical notes : Each of the organs of the viscera is enclosed in a tough, opaque whitish peritoneal membrane, and are united by thick mesenteries. The buccal cavity is large. Gills are prominent with two rows of filaments, the largest

* Since the paper was sent to press, two other male specimens of this species were collected by Mr. Sriramachandramurty, the first (Sp. No. 2), 2176 mm from a drift net at Vedalai (Gulf of Mannar) on 20-4-66 and the second (Sp. No. 3), 2630 mm in length from a trawl net at Mandapam (Palk Bay) on 22-6-66. Detailed measurements of these along with those of the largest one (Sp. No. 1) mentioned already are given in Table I.

filament measuring 48·5 mm in length. The dorsal and ventral limbs of each gill are united by a membrane, probably to offer resistance to water forcibly propelled through the branchial cavity. The oesophagus measures 32 cm (up to origin of stomach), the stomach 34 cm and the intestine 51 cm. The inner surface of oesophagus and rectum are flesh coloured, the stomach brown, duodenum dark brown and the middle intestine light brown. Mucosal folds are about 6 anteriorly and 12 posteriorly in the oesophagus, 12 in the stomach and 15 in the intestine. The folds are higher in the stomach than elsewhere (which may be partly due to the nearly empty stomach in this specimen).

The middle intestine which commences 29·5 cm from the anterior end of the duodenum measures 15 cm in length and is highly twisted and constricted to form 11 round or irregular chambers, irregularly spaced in a longitudinal series (Fig. 1).

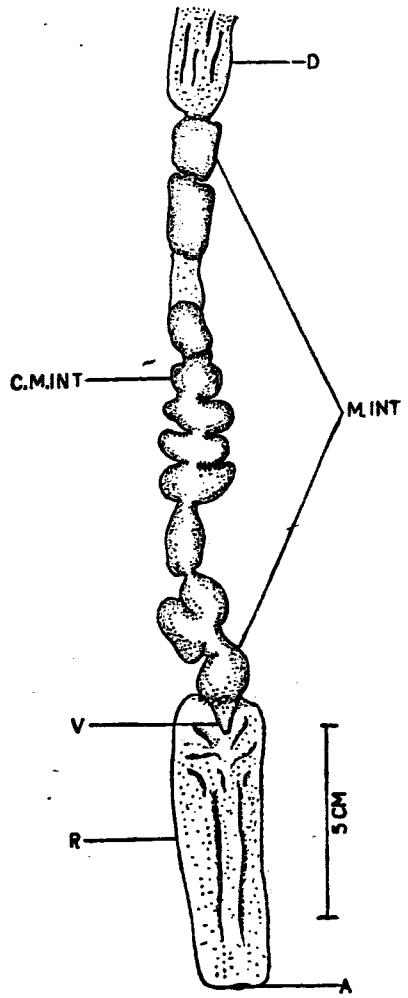

FIG. 1. The twisted middle intestine and rectum (cut open) of *Thyrsoidea macrura* to show the valve. A : Anus ; C.M. INT : Chamber of middle intestine ; D : Duodenum ; M. INT : Middle intestine ; R : Rectum ; V. Valve.

Between the middle intestine and the rectum, a valve (nozzle-like) is formed by the invagination of the anterior portion of the internal lining of the rectum. The rectum is a comparatively wider chamber, opening at the anus. The twisted nature of the middle intestine and the presence of a valve have also been noticed by Suyehiro (1940) in eels of the families Anguillidae (*Anguilla japonica*), Congridae (*Astroconger myriaster, Alloconger anagoides*), Muraenesocidae (*Muraenesox cinereus*) and Muraenidae (*Gymnothorax kidako*).

The stomach of the specimen contained two small partly digested specimens of *Leiognathus splendens* and one big otolith (1·4 cm in length), probably of a larger fish. All along the intestine, traces of semidigested food were present. The chambers of middle intestine contained soft digested and unidentifiable matter, which on application of pressure on the last chamber passed into the rectum through the valve. Whether the special structure of the middle intestine and the valve in any way help to eject out faecal matter in the form of large lumps at irregular intervals is not clearly understood. It may also be stated here the arrangement is not known to be present in several other groups of fishes but seems to be a common feature, as pointed out already, in many families of eels.

The liver is elongated, measuring 23 cm in length and 4·3 cm in width, with a notch at the anterior end and no indication of separation into left and right lobes except for a groove on the dorsal side which runs along the posterior 2/3 length of liver. Viewed from ventral side, the portion of the liver on the left side of the groove is narrower than that of the other side and encloses a large gall bladder (full of bile) which is located mostly on the dorsal side of liver (13 cm from anterior end of liver) but visible on the ventral side also. The maximum length of the gall bladder is 42 mm and its width 26 mm. The spleen is small and triangular in shape, located at the origin of duodenum. Pyloric caeca are absent.

The heart is elongate, contained in a tough pericardial membrane. The pericardial fluid is chocolate brown in colour. The auricles are elongate, the right one slightly larger than the left. The ventricle is cylindrical, elongate and highly muscular. It is connected with the pericardial membrane by strong fleshy threads. A prominent, saccular, bulbous arteriosus is present at the base of the ventral aorta. The Cuvierian ducts are very prominent.

The main body of the kidneys (18·6 cm) is situated behind the anus in the extension of the body cavity. In front of the anus they extend for about 25 cm in the form of narrow strips. The ventral surface of kidneys is convex and the dorsal surface flat. The two kidneys are closely approximated, the right one being slightly smaller than the left. Both the kidneys are lobulated along their entire length, width at anterior end being 2·7 cm and at the posterior end 1·8 cm. They are dark brown in colour with black dots scattered all over the surface. Air bladder is absent.

The testes are compressed and ribbon-shaped with broad anterior extremities. The testis of the right side is larger and measures 34 cm in length and 8 mm in width and that of the left side measures 23·6 cm in length and 4·5 mm in width. The fish was in stage II of maturity but the compressed nature, small size and appearance of testes suggest that they are probably not functional. This may be related to the age of the fish.

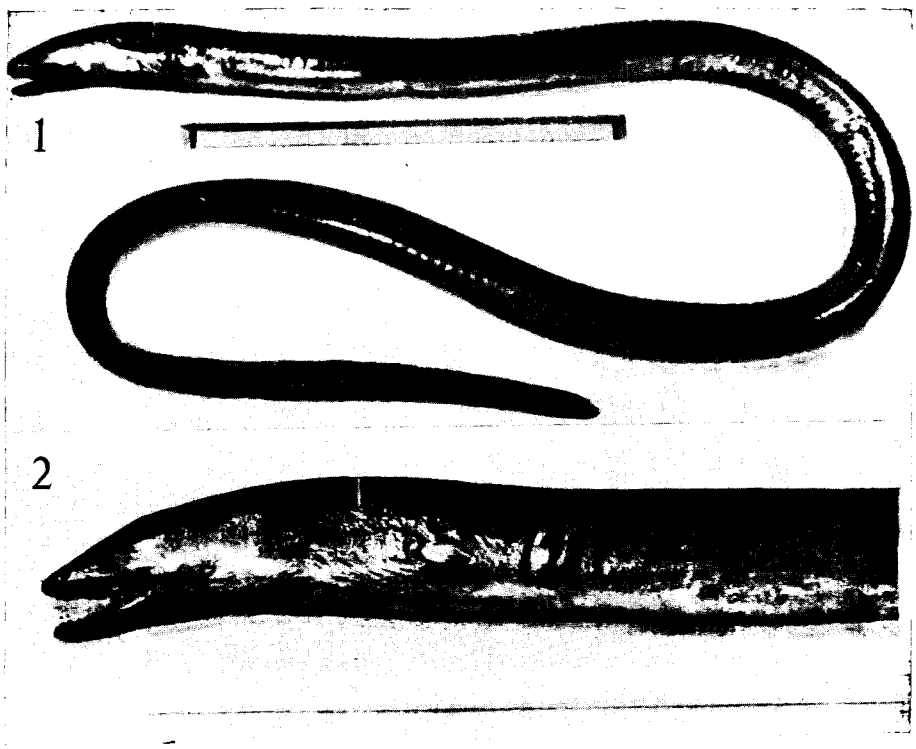

PLATE I

1. *Thyrsoidea macrura*, entire specimen. The white marks indicate the origin of lateral line and position of anus. 2. Enlarged view of the head and part of trunk of the same.

The myotomes are ' V '-shaped the lower portion of ' V ' pointing posteriorly and are arranged in two rows, the dorsal 3·6 cm and the ventral 4·6 cm in height. About 68 pre-anal and 130 post-anal myotomes were enumerated.

SUMMARY

A large male specimen of the giant moray eel, *Thyrsoidea macrura* (Bleeker) measuring 3031 mm total length which becomes the second largest specimen on actual record in the world is reported from Indian waters with detailed description, measurements and anatomical notes. Measurements of two other male specimens collected subsequently are also given.

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