

## A SYSTEMATIC ACCOUNT OF THE EELS OF BOMBAY

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(With fourteen text figures)

### INTRODUCTION

Eels form an important fishery in different parts of the world and they have attracted the attention of naturalists since the beginning of this century, when the Danish scientist Johannes Schmidt (1906) made the sensational discovery of the breeding migration of the European eel. They are a fairly large group of fishes, represented by a number of genera and species. Day (1889) recorded 42 species of eels belonging to 13 genera and 2 families from Indian waters, and subsequent workers have added a few more to this list. On the Bombay coast Hefford (1922) recorded two species of eels in the catches of the steam trawler 'William Carrick', and Sorely (1922) eight species during his general survey of the fisheries of the Bombay State. Fowler (1932) placed on record two species of eels from Bombay. However, a full account of the taxonomy of the anguilliform fauna of Bombay waters is not available, and hence an attempt has been made here to describe the various species of marine eels occurring along the Bombay coast. For this purpose, collections of eels were made regularly from Sassoon Dock and Versova, two fish-landing centres which contribute greatly to the fish supply of Bombay city.

The observations made during the course of this investigation show the occurrence of fourteen species belonging to seven genera and five families. Four of these, namely *Muraenichthys gymnopterus* (Blk.), and *Pisodonophis cancrivorus* (Rich.), *Ophichthys cephalozona* (Blk.), and *O. apicalis* (Benn.) are being reported for the first time from the Bombay coast. Of the eight species recorded by Sorely (op. cit.), only five are found in this collection.

### KEY TO THE SPECIES RECORDED<sup>1</sup>

- |   |     |                                  |
|---|-----|----------------------------------|
| 1. Caudal present   | ... | 2                                |
| Caudal absent   | ... | 12                               |
| 2. Posterior nostril below eye in the form of<br>a valve in the upper lip | ... | <i>Muraenichthys gymnopterus</i> |
| Posterior nostrils superior or above the level<br>of eye                  | ... | 3                                |
| 3. Pectorals present  | ... | 4                                |
| Pectorals absent  | ... | 7                                |
| 4. Teeth multiserial, pharyngeal openings wide<br>-slits                  | ... | 5                                |
| 5. No canines in the jaws   | ... | <i>Uroconger lepturus</i>        |
| Canine teeth in the jaws  | ... | 6                                |

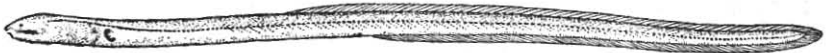
<sup>1</sup> The generic and specific names given here are according to Weber and de Beaufort (1916).

- |   |   |
|---|---|
| 6. Outer row of teeth in mandibles directed outwards ...  | <i>Muraenesox talabonoides</i>                        |
| Outer row of teeth in mandibles not directed outwards ...   | <i>Muraenesox cinereus</i>                            |
| 7. Head and trunk $1\frac{1}{2}$ times or more than tail ...  | <i>Thyrsoidea macrurus</i>                            |
| Head and trunk more or less equal to tail ...   | 8   |
| 8. Mesial teeth on intermaxillary plate, not longer than the peripheral series ...                              | <i>Muraena (Gymnothorax) picta</i>                    |
| Mesial teeth on intermaxillary plate, long and fang-like ...  | 9   |
| 9. Maxillary teeth in two or three series ...   | <i>Muraena (Gymnothorax) meleagris</i>                |
| Maxillary teeth in single series ...  | 10  |
| 10. Head and body with large jet-black spots separated from one another with narrow yellowish reticulations ... | <i>Muraena (Gymnothorax) favaginea var. favaginea</i> |
| Head and tail with dull yellowish reticulations on brown background ...   | 11  |
| 11. Well defined reticulations all over body, tail considerably shorter than head and body ...                  | <i>Muraena (Gymnothorax) pseudothyroidea</i>          |
| Lines on body and tail not well defined. Tail longer than the head and trunk ...                                | <i>Muraena (Gymnothorax) undulata var. undulata.</i>  |
| 12. Teeth granular and in bands ...   | 13  |
| Teeth conical and acute ...   | 14  |
| 13. Origin of dorsal behind end of pectorals ...  | <i>Pisodonophis boro</i>                              |
| Origin of dorsal above middle of pectorals ...  | <i>Pisodonophis cancrivours</i>                       |
| 14. Head and trunk more or less equal to tail ...   | <i>Ophichthys cephalozona</i>                         |
| Head and trunk $1\frac{1}{2}$ or more in tail ...   | <i>Ophichthys apicalis</i>                            |

## NOTES ON THE SPECIES

***Muraenichthys gymnopterus* (Bleeker).**

This eel is rarely found in this locality and only one specimen, 433 mm. long was obtained from among the shrimp catches landed at Versova by bag-nets from a depth of about 11 fathoms. Its colour was yellowish brown in fresh condition. The species is characterised by the anus being situated in the front half of the total length, and by the valve-like posterior nostrils in the upper lip beneath the eyes.

Fig. 1. *Muraenichthys gymnopterus* (Bleeker)

Day (1889) recorded two species belonging to this genus, viz. *M. schultzi* and *M. vermicularis* from Indian waters, while *M. gymnopterus* is reported here for the first time from India. The maximum size of this species recorded so far is only 266 mm. It has a fairly wide distribution and has been reported from South Africa, Ceylon, Java, Celebes, Philippines and China (Weber & Beaufort, 1916).

***Uroconger lepturus* (Richardson).**

This eel, known as 'tolaka' in Marathi, is commonly found in bag-net catches both at Sassoon Dock and Versova. Being a small fish growing to a maximum length of about 400 mm., it is never

obtained from the long-line catches. Although the species is edible it has no commercial value and is generally used as bait for long-line fishing. It is easily recognised by its dark brownish colour and whip-like tapering tail. The lateral line has a row of whitish spots. The largest size recorded during the course of this investigation is 284 mm.

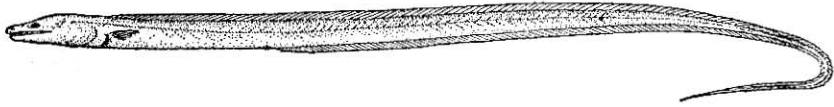


Fig. 2. *Uroconger lepturus* (Richardson)

Fowler (1927) appears to be the first to record this species from Bombay, though Day (1889) has recorded it from Indian waters. Nair (1946) collected its adults and larvae from the Madras coast. It has a widespread distribution and is reported from Oman, the seas of India, Ceylon, Java, Celebes, Sumatra, Philippines, and the China Sea.

#### ***Muraenesox talabonoides* (Bleeker).**

This species, which is the commonest of all the eels of Bombay, constitutes a very important fishery and it commands a good market, being an important food fish. It is generally landed by the hook-and-line fishermen and also by the trawlers. This fish is golden yellow in colour and is characterised by having externally directed teeth in the mandibles.

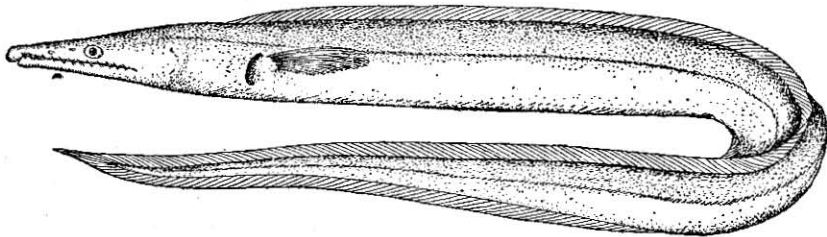


Fig. 3. *Muraenesox talabonoides* (Bleeker)

*M. talabonoides* is a tropical fish, not so widely distributed as the other two species of the genus. Day (1889) commented on its rarity in the Indian waters. The present investigation, however, shows that it is very common in Bombay waters, as noted by Sorley (1932) and Hefford (1922). The maximum size recorded is 2,080 mm.

#### ***Muraenesox cinereus* (Forsk.)**

This fish, ranging up to about 1,428 mm. in length, is found in small numbers in the commercial catches landed at Sassoon Dock and Versova. It is generally caught with the hook-and-lines and occasionally in the bag-nets as well as in trawl-nets. It has a dull white colour becoming fairly dark dorsally. The mouth is long with a drawn-out snout. The species is characterised by the presence of strong canine teeth with basal lobes on the vomerines. It is considered to be a good food fish and is

locally known as 'wam', a name which it shares with *M. talabonoides*. The larval forms and the elvers of *M. cinereus* are also obtained in fair numbers from Sassoon Dock and Versova in April and May. They are found mixed up with shrimp catches landed by the bag-nets approximately from 10 to 11 fathoms.

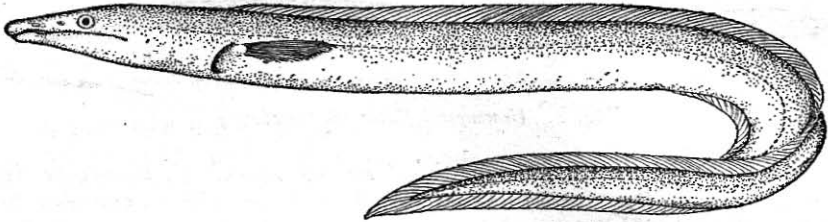


Fig. 4. *Muraenesox cinereus* (Forsk.)

Day (1889) observed that this is the most common of the *Muraenesox* species in Indian waters. Hefford (1922), Fowler (1927), and Sorley (1932) have noted its occurrence in Bombay waters in small numbers. Nair (1947) obtained the larvae and the adults of this fish from Madras waters. Pillay (1948) observed the species in commercial quantities in Kathiawar coast. Observations made on the numerous hauls taken by the trawlers along the Kathiawar coast showed occasional occurrence of this species, although the major portion of the eel catch comprised of *M. talabonoides*.

The species has a very wide distribution and is recorded from most of the places of the Indo-Australian Archipelago, east coast of Africa, Red Sea, coasts of India, Ceylon, Philippines, China and Japan.

#### **Thyrsoidea macrurus** (Bleeker).

This species is occasionally found among the long-line catches of Sassoon Dock and Versova. It has a very elongated body, deep brown in colour, and the largest specimen taken during this study was 1,686 mm. long. This species is consumed exclusively by the poorer people and does not constitute a fishery along this coast.

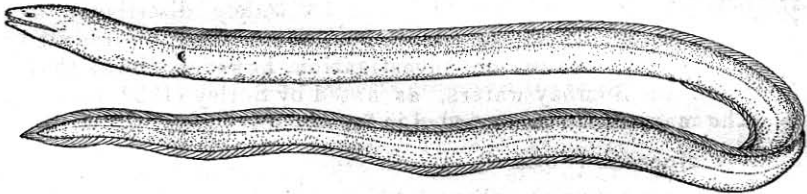


Fig. 5. *Thyrsoidea macrurus* (Bleeker)

Day (1889) reported this species as *Muraena macrura* from Indian waters but it was not recorded before from Bombay waters. It is known to occur in South Africa, Ceylon, a l ras coast, the Andamans, New Guinea, and Formosa. Nair (1947) recorded its larval forms from the Madras plankton.

***Muraena (Gymnothorax) picta* Ahl.**

This is a fairly common eel in the inshore waters of Bombay and is generally obtained both in the long-line and bag-net catches. It is not eaten and the fishermen consider its bite to be poisonous. Its characteristic colour is mottled brown on yellowish background. There is considerable amount of irregularity in the arrangement of the spots and consequently different patterns of colour can often be noticed within the species. The maximum size recorded here is 623 mm.

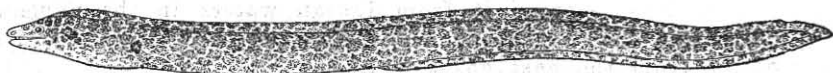


Fig. 6. *Muraena (Gymnothorax) picta* Ahl.

Day (1889) noted the occurrence of this species (*Muraena picta*) in Indian waters and Sorley (1932) from the Bombay State. It has a very wide distribution, being reported from South Africa, East Africa, Madagascar, south Arabia, seas of India, Ceylon, Malaya, Philippines, Australia and West Pacific Islands.

***Muraena (Gymnothorax) meleagris* Shaw.**

This species known as 'killis' in Marathi is frequently obtained in the long-line and bag-net catches. Small-sized specimens occur quite often among the shrimp catches both at Sassoon Dock and Versova. It is brown in colour, with deeper brown spots all over the body. This fish has no commercial importance except that it is consumed by the poor class of people. Normally it is used as bait in the long-line fishing. The fishermen consider the bite of this species also poisonous. The sizes recorded during these observations range from 312 mm. to 897 mm. in length.



Fig. 7. *Muraena (Gymnothorax) meleagris* Shaw

Though it has been recorded as *Muraena meleagris* by Day (1889) from the seas of India, till now there seems to be no definite record of its occurrence in Bombay waters. The distribution of *meleagris* is very wide as it occurs in south Africa, East Africa, Seychelles, Mauritius, India, Malay Archipelago, and the Pacific.

***Muraena (Gymnothorax) favaginea* Bloch and Schneider.**

This is the tessellated eel very frequently observed in Bombay and its neighbourhood. It has a jet black colour with well-defined reticulations of yellowish white lines making a completely tessellated appearance. Specimens of this fish are quite often obtained in the shore-seines, operating in shallow waters with rocky bottom. It is considered to be non-edible and poisonous. This species is also an attractive aquarium fish and a number of them are displayed in the Taraporevala Aquarium

at Bombay. There is no fishery for this species in the locality. The maximum size observed is 863 mm.



Fig. 8. *Muraena (Gymnothorax) favaginea* Bloch and Schneider

Day (1889) has recorded it from Indian waters in the name of *Muraena tessellata* and Sorley (1932) from Bombay waters. Besides, it has been reported from the east coast of Africa, Mauritius, South Arabia, Malay Archipelago, Sumatra, Singapore, New Guinea and China.

***Muraena (Gymnothorax) pseudothyrsoides* (Bleeker).**

This is a very common eel in Sassoon Dock and Versova, generally obtained in long-line as well as in bag-net catches. The species has light brownish spots on the head and body with dull yellowish lines or reticulations in between. It is also known as 'hessal' in Marathi. It is not edible and as such has no economic significance. However, this fish is often used as bait in the long line fishing. The largest size noted during the present investigation is 605 mm.

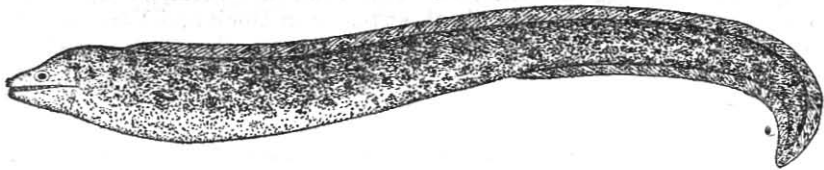


Fig. 9. *Muraena (Gymnothorax) pseudothyrsoides* (Bleeker)

This species has been recorded by Day (1889) from Indian waters and Sorley in Bombay waters. Its distribution extends from the Sind coast and India to the Seychelles, Malay Archipelago, Philippines, and China.

***Muraena (Gymnothorax) undulata undulata* (Lacepede).**

This species is very common in the rocky inshore areas of Bombay and many specimens are kept in the Taraporevala Aquarium. The fish

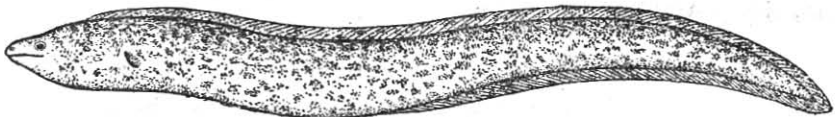


Fig. 10. *Muraena (Gymnothorax) undulata undulata* (Lacepede)

has a mottled appearance with reddish brown blotches on dull white background. One specimen collected from deeper waters by a long-line fisherman at Sassoon Dock measured 682 mm. In Marathi it is

known as 'hessal'. Apart from the fact that it is a good and hardy aquarium fish, it has no commercial value.

It has a very wide distribution, being reported from South Africa, east coast of Africa, Madagascar, Mauritius, Red-Sea, seas of India, Ceylon, Andaman Islands, Malay Archipelago, Philippines, Pacific Islands and China.

***Pisodonophis boro* (Hamilton-Buchanan).**

Two specimens, one from a rock-pool near Cuffe Parade and another from Dadar beach, were obtained during this study. The species is a burrowing form which is not normally met with in the commercial fish catches of this locality. It is easily distinguished by the absence of caudal fin and by the presence of bands of granular teeth on the jaws. The origin of dorsal is far behind the end of the pectorals. The body of the fish is dark grey while the median fins are whitish.



Fig. 11. *Pisodonophis boro* (Hamilton-Buchanan)

Being a very common eel in the fresh and brackish waters of India, it has been recorded by Day (1889), Ayyar (1932), Hora (1933), Aiyar *et al.* (1944), George and Desai (1944), and Chacko and Srinivasan (1954) from various parts of India. It is a widely distributed species and is known to occur in South Africa, east coast of Africa, India, Ceylon, Sumatra, Singapore, Java, Celebes, New Guinea and Formosa.

***Pisodonophis cancrivorus* (Richardson)**

This is a rare eel in this locality and is represented by only two specimens in the present collection. When fresh, it has a dark brown hue dorsally, and is light brown on the ventral aspect. The dorsal fin originates above the middle of the pectorals. The teeth are found in bands of several rows, the intermaxillary being arranged in a separate group from the rest. The tail is about  $1\frac{1}{2}$  times longer than the rest of the body.



Fig. 12. *Pisodonophis cancrivorus* (Richardson)

There is so far no record of this species from Indian waters, although its known distribution is very extensive. It is recorded from South Africa, Madagascar, Arabia, Ceylon, Penang, Singapore, Celebes, Samoa, Australia, Philippines, China and Japan.

***Ophichthys cephalozona* (Bleeker).**

This is a fairly common eel in the bag-net catches landed at Versova. It seldom occurs in the long-line catches and has no regular

fishery in Bombay. The body is purplish brown and the deep cross band on the nape described by various authors appears to be less conspicuous due to the deep brown colour of the body. The maximum size recorded is 830 mm., while the largest specimen in the present collection measured only 442 mm. in length.



Fig. 13. *Ophichthys cephalozona* (Bleeker)

There is no previous record of this species from Indian waters. It has a widespread distribution in the Indo-Pacific region having been recorded from Singapore, Ambon, Ceram, New Guinea, Philippines, Australia, China, Formosa and Japan.

#### **Ophichthys apicalis** (Bennett).

This species, locally known as 'devar', is fairly abundant in Sassoon Dock and Versova, being caught always in the bag-net catches. It is available throughout the year at both these places and generally occurs along with the small shrimp catches. It is a small vermiform fish with greenish tint in fresh condition. Ventrally the colour is more whitish. The tail is more than  $1\frac{1}{2}$  times the length of the rest of the body. Dorsal commences from above the origin of pectoral. The teeth are uniserial but vomerines are irregularly distributed. The maximum size recorded is 430 mm., while the largest specimen observed at Bombay measured 308 mm. in length.



Fig. 14. *Ophichthys apicalis* (Bennett)

This species is also not recorded from Indian waters so far, although it has been reported from South Africa, Madagascar, Ceylon, Singapore, Java, Celebes, Philippines and China.

#### REFERENCES

- Aiyar, R. G., Unny, M. M., and Varkey, P. M. (1944): Studies on the Leptocephali of Madras coast (Abstract). *31st Ind. Sci. Congress*, pp. 106-107.
- Ayyar, T. V. Ramakrishna (1932): A fish pest of the fields along the Coromandel coast (*Ophichthys boro*). *JBNHS.*, **36** : 276.
- Berg, Leo S. (1940): Classification of fishes, both recent and fossil. *Trav. Inst. Zool. Acad. Sci. U. S. S. R.* **5** (2).
- Chacko, P. I., and Srinivasan, R. (1954): *Hydrobiology and fisheries of the Vamsadara Estuary*, Govt. Press, Madras.
- Day, F. (1889): *Fauna of British India, Fishes-1*. London, p. 67.
- Fowler, H. W. (1927): Notes on some shore fishes from Bombay, *JBNHS.*, **32** : 253-263.
- George, C. J., and Desai, N. S. (1944): The biology of the fishes of the Mahim Creek. *Jour. Univ. Bombay*, **12** : 46.



Hefford, A. E. (1910) : Notes on a conger with abnormal gonads. *Jour. Mar. Biol. Assoc.* **8**, p. 318.

—————(1922) : *Report on the work of the steam trawler 'William Carrick'*. Govt. Central Press, Bombay.

Nair, R. V. (1946) : On the Leptocephalus of *Uroconger lepturus* (Rich.) from the Madras plankton. *Curr. Sci.* **15** : 318.

—————(1947) : On the metamorphosis of two Leptocephali from the Madras plankton. *Proc. Ind. Acad. Sci.*, **25**, pp. 1-14.

—————(1948) : Leptocephali of the Gulf of Manaar. *Ibid* **27** : 87.

Schmidt, Johannes (1906) : Contribution to the life history of eel (*Anguilla vulgaris* Flem.) *Rapp. cons. Expl. Mar.*, **5**, App. 4 : 137.

—————(1914) : First report on eel investigation, 1913, *Rapp. Conseil Expl. Mar.*, **19** : 2.

—————(1916) : Second report on eel investigation 1915, *Ibid.* **22** : 1-25.

Sorley, H. T. (1932) : *Marine fisheries of the Bombay Presidency*. Govt. Press, Bombay.

Weber, M., and de Beaufort, L. F. (1916) : *The fishes of Indo-Australian Archipelago.* **3** : 240.

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