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A new species of *Mustelus* (Family: Triakidae) from Indian EEZ

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A species of shark of the genus *Mustelus* belonging to the family Triakidae new to the science has been described. The new species was collected during the commercial trawling operation conducted along the continental slope of Indian EEZ. It is compared with its closely related species, *M. henlei* and *M. mosis* in terms of morphometrics, shape of dermal denticles, labial furrow and upper and lower teeth. New species agrees with *M. henlei* in the shape of dermal denticles and upper and lower teeth. These features links the new species to *M. higmani*, but have strong differences in various morphometric characters. *Mustelus mangalorensis* nov sp. also allied to *M. mosis* in terms of different morphometric characters, however shows strong differences in the length of upper labial furrow and in the shape of the teeth. Discovery of the new species of shark increases the number of species belonging of this family to 28 and also strengthens the rich ichthyofaunal biodiversity of Indian EEZ.

[Keywords: shark, morphometric, etymology, phylogenetic, geographic**]**

Introduction

The genus *Mustelus* Linck, 1790, belongs to the family Triakidae which is one of the largest shark families, with 9 genera and is distinguished from other similar genera by the presence of parabolic snout in dorsoventral view, angular and pointed in lateral view; mouth angular, lower jaw with straight or nearly straight edges; teeth with cusps absent or virtually so; body without black spots[1]. The species of *Mustelus* (smooth hounds, gummy sharks, palombos) are abundant temperate to tropical, inshore bottom dwelling sharks that figure prominently in artisanal and inshore commercial fisheries[2]. Members of the genus *Mustelus* are unusually difficult to separate from one another, particularly without the use of internal characters. Many of the morphological, morphometric and meristics charaters which are used for distinguishing species partially overlap; however, there exist considerable variation among the species[1]. There are about 27 valid species of this shark distributed in the world oceans, with only one species been reported from Indian waters; *M. mosis*[1,2,3,4,11,12,13]. While investigating the shark diversity in the Indian waters, a single specimen of *Mustelus* shark was encountered in the collection, whose few morphometric characters were found to be totally different from the species hitherto described. On further analysis, the species was found to be new to science.

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Materials and Methods

The type locality of the new species is Mangalore, South India (12° 28'2"N and 74° 09'5" E) at a depth of 200 m collected on 8-1-2009 (Fig. 1) by a commercial trawler. Morphometric measurements were recorded with dial calipers to the nearest millimeters and expressed as percentage of total length.

Results and Discussion

Holotype: Deposited in Fish Museum of School of Industrial Fisheries, Cochin University of Science and Technology, India, Reg no: SHK. 1/1, 576.84mm SL, 732.24mm TL)
Paratype: None
Systematics:
Order: Carchariniformes
Family: Triakidae
Genus: *Mustelus* Linck, 1790
Mustelus mangalorensis nov. sp

Diagnostic Features: An unspotted, bronzy slender *Mustelus* with strongly cuspidate teeth, mostly tricuspidate denticles, long upper labial furrow, long caudal peduncle, and broadly frayed posterior dorsal fin margins.

Description (based on a single specimen with 732.24mm TL, sex female) (Fig. 2)

Body fairly slender, head short, prepectoral length 21.59 % of total length; snout moderately long and blunty to sharply angular in lateral view, preoral snout 5.09%, preorbital snout 6.53% of total length; internarial space broad, 3.03% of total length, eyes large, eye length 3.34% of total length, interorbital space narrow, 6.45% of total length, mouth moderately long, subequal to eye length and 3.37% of total length, upper labial furrow longer than lower, upper furrows 4.9% of total length (Fig. 3), teeth cuspidate and asymmetric, with a strong primary cusp (Fig. 4), buccopharyngeal denticles confined to anterior third of palate and surface of tongue. Interdorsal space 26.86% of total length, trailing edges of dorsal fins and occasionally anal and caudal fins, naked with a broad, conspicuous dark band of bare ceratotrichia; first dorsal broadly triangular, with posteroventrally sloping posterior margin, its midbase closer to pelvic bases than to pectorals; pectoral fins moderately large, length of anterior margins 14.68% of total length, pelvic fins moderately sized, anterior margin length 5.02% of total length, width of posterior margin 10.12% of total length, anal height 5.57% of total length, anal caudal space greater than second dorsal height and 8.16% of total length, ventral caudal lobe more or less falcate. Crowns of lateral trunk denticles more or less tricuspidate, with longitudinal ridges extending their entire length (Fig. 5). Color iridescent bronzy brown above, grayish white below, no white spots or dark spots or dark bars.

Etymology: The specific name is derived after the type locality, Mangalore, a noun in the genitive.

Remarks: *Mustelus mangalorensis* sp. nov shows close similarity with *M. henlei* and *M. mosis* but differs strongly in most of the morphomeristic characters, namely preoral snout, upper labial furrow, interdorsal space, length of pelvic fin anterior margin and anal fin height. The new species strongly agrees with *M. henlei* in the shape of dermal denticles and upper and lower teeth. This feature links the new species to *M. higmani*, but they have strong differences in various morphometric characters. *Mustelus mangalorensis* nov sp. also allied to *M. mosis* in terms of different morphometric characters. But strongly differs in the length of upper labial furrow and in the shape of the teeth. Many of

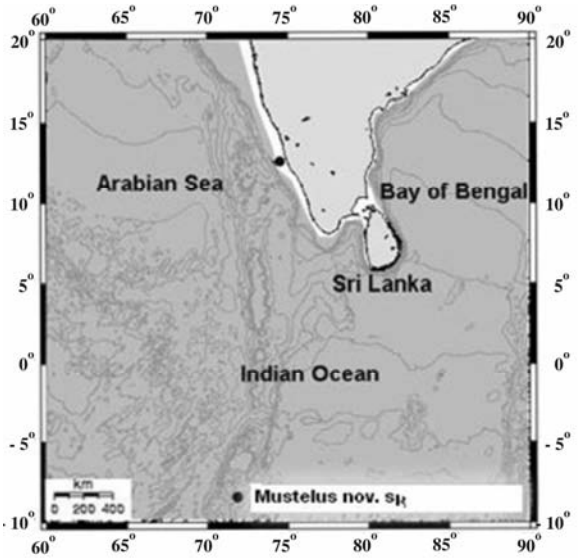

Fig. 1—Locality map of *Mustelus mangalorensis* nov. sp from the EEZ of India

Fig. 3—Ventral side of head

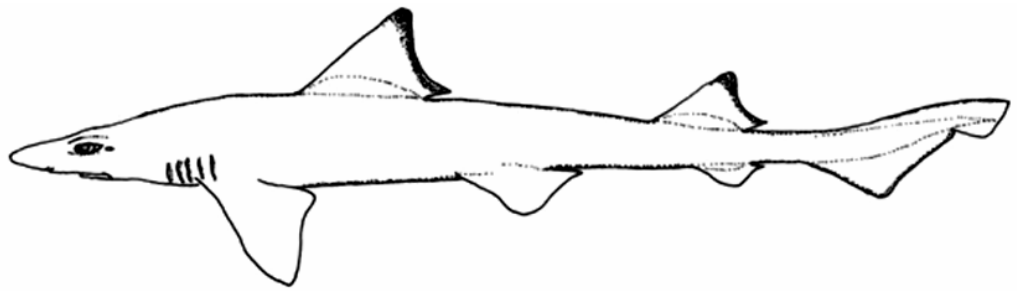

Fig. 2—Dorsolateral view of *Mustelus mangalorensis* nov. sp

Fig. 4—Vupper and lower teeth

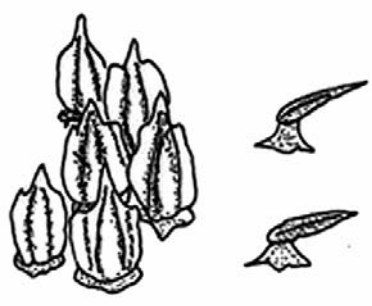

Fig. 5—Dorsal and lateral view of dermal denticles

Table 1—Morphometric measurements of *Mustelus mangalorensis* nov. sp with its closely related species

Sl. No	Measurements (in % of TL)	*Mustelus mangalorensis*	*M. henlei*	*M. mosis*	*M. higmani*
1	Prepectoral length	21.59	19-22	17-21	19-24
2	Preoral snout	5.09	6.4-8	5.7-7.5	6.9-10.3
3	Preorbital snout	6.53	6.6-8.4	5.8-7.8	6.9-9.9
4	Internarial space	3.03	2.6-3.4	2.6-3.2	2.7-3.8
5	Eye length	3.34	2.6-3.7	2.4-4.2	2.2-3.4
6	Interorbital space	6.45	3.9-5.35	3.7-5.1	4.5-6.3
7	Length of mouth	3.37	2.7-3.8	3-3.6	2.3-6.6
8	Upper labial furrow	4 .9	1.6-2.4	2-2.8	0.8-1.8
9	Interdorsal space	26.86	19-24	19-23	17-23
10	Length of pectoral fin anterior margins	14.68	13-16	12-16	11-14
11	Length of pectoral fin posterior margins	10.12	8-13	8-13	6.7-10
12	Length of pelvic fin anterior margin	5.02	6.2-7.9	6.2-7.9	6.7-10
13	Anal height	5.57	2.7-3.8	2.5-4.4	2.9-4.6
14	Anal caudal space	8.16	6.9-8.6	6.5-9	6-9.2

the morphological, morphometric and meristics charaters which are used for distinguishing species partially overlap; however, there exist considerable variation among the species. A few morphometric characters such as narrow interorbital space, which is 6.45% of TL, longer upper labial furrow; almost 4.9% of TL, high anal height, about 5.57% of TL, is not observed in any of the allied species. These taxonomic characters strongly differentiate the new species from closely related species Table 1.

The description of the new species of *Mustelus* increases the number of species of this family to 28 globally. Only one species of *Mustelus* is been reported from Indian waters, *M. mosis*[4]. According to him, *Mustelus* species have limited geographic distributions. This peculiar distributional pattern happens due to different oceanographic phenomena including changes in the normal current patterns, migration undertaken by these species, thereby causing sudden subsidence henceforth resulting in them being restricted in isolated geographic range[5]. Members of this genus has been considerable difficult in the past with separating it from Triakis[,5,6,7,8,9,10,11]. Ongoing phylogenetic studies should clearly explain the distributional pattern and speciation exhibited by this species. The new record of *Mustelus mangalorensis* nov. sp would be a further addition to the deep sea fish fauna of Indian EEZ.

Acknowledgement

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