Short Communication Journal of Indian Fisheries Association 50 (2) April-June 2023 page 61-64

Journal of Indian Fisheries Association

https://epubs.icar.org.in/index.php/JIFA/issue/view/3941

A New Record of *Harpadon nudus sp.* nov. and *Harpadon translucens* along Maharashtra, North-West Coast of India

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Abstract

The north-west coast of India in general and the Mumbai coast in particular is known for Bombay duck (family Synodontidae) fishery. Till date, only one species namely *Harpadon nehereus* (Hamilton, 1822) was recorded in this region. Here, we report two additional species of genus *Harpadon* Lesueur, 1825, which differ significantly from the usual *H. nehereus,* landed in the dol net fishery along north-west coast of India. Detailed taxonomy of the species along with illustrated description have been worked out for *Harpadon nudus sp*. nov. (Ganga, Thomas and Sukumaran, 2015) and *Harpadon translucens* (Saville-Kent, 1889).

Keywords:
Maharashtra, Bombay duck, Synodontidae, *Harpodon nudus sp*. nov, *H. translucens*

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Received : 20 March 2023
Accepted : 25 May 2023

Introduction

Genus *Harpadon* Lesueur, 1825 consists of six species, of which, only one species i.e., *Harpadon nehereus* (Hamilton, 1822) has reportedly supported Bombay duck fishery along the west coast of India (Bapat, 1970; Khan *et al*., 1992; Kurian, 2003). The species constitutes an important fishery along North-West (Maharashtra and Gujarat) and North-East (West Bengal and Odisha) coasts of India and contributes nearly 0.1 million tonnes forming 5% of the total marine capture fish landings noted by Khan (2016). The species is traditionally exploited by the indigenous stake net called "Dol net" (Bag net) in Maharashtra. Occurrence of *Harpadon nudus* sp. nov from the north eastern Arabian sea of India was reported by Ganga *et al.* (2015). There has been no record of the two species *Harpadon nudus* sp. nov Ganga, Thomas and Sukumaran, 2015 and *Harpadon translucens* Saville-Kent, 1889 along Maharashtra, the north-west coast of India until the present study.

Materials and methods

An unusual three specimens, greyish in colour, of Bombay duck, *Harpadon nudus* sp. nov Ganga, Thomas and Sukumaran, 2015 along with 70 kg of *Harpadon nehereus* were caught in first author's own dol net boat on 25th January, 2019 at a depth of 26 m and GPS No. 1931, 225/7232, 350. Four dol nets were operated at low tide, at about 4.45 PM and were hauled at 9.30 PM off Mumbai-Thane region (Fig.1). Similarly, Bombay duck *Harpadon translucens* along with 450 kg of *H. nehereus* was also caught in dol net operated for high tide on 25th March, 2019 at the same time, at the depth of 28 m and GPS No. 1931, 560/7231, 433 off Arnala-Satpati region north of Mumbai. The

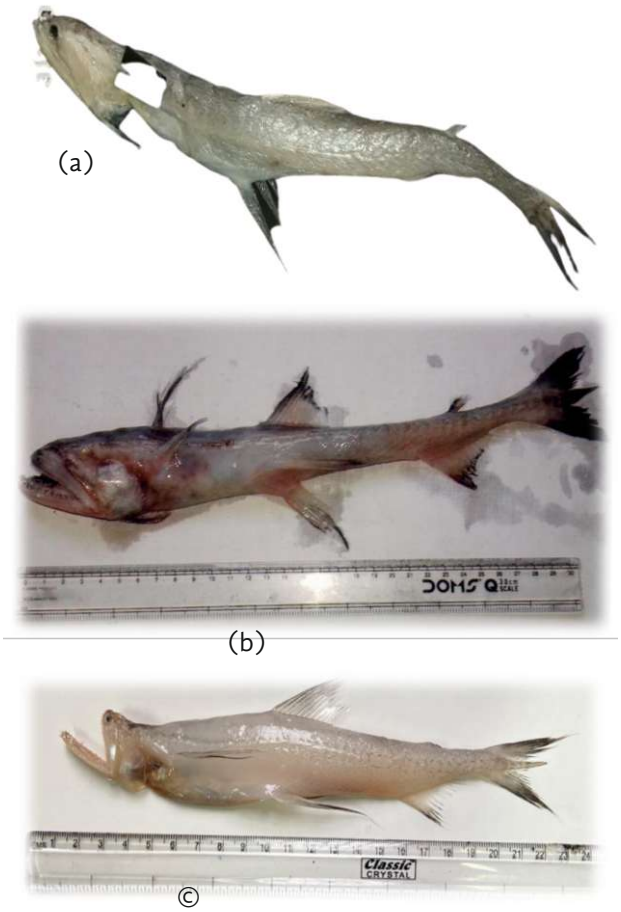

Fig. 1: A fresh specimen of (a) *Harpadon nudus* (b) *Harpadon translucens* (c) *Harpadon nehereus*

occurrence of these species at the depth of 26 and 28 m depth in dol net appeared to corroborate the suggestion of Jhonson *et al.* (1997) that the possibility of an off shore - inshore habitat grouping of the *Harpadon spp.* in the Indo-Pacific region based on phenotypic as well as osteological trait. The specimen of both the species in fresh condition was studied for morphometric and meristic counts. The taxonomic identification was done using key given by Saville-Kent (1889) (http://zipcodezoo.com/index.php/Harpadon_translucens#media) and Ganga *et al.* (2015).

Results and discussion

Diagnostic characters: Specimens of *Harpadon nudus* sp. nov. in fresh condition were silvery grey, caudal fin trilobed, lateral line continuous with central lobe, mouth gape extending far beyond eye, head with a short snout, eyes placed laterally, and nostril single pair close to snout tip, adipose fin present (Table 1, Fig. 2). Body proportions as percentage of standard length: snout to first dorsal 43.1 - 45.8, snout to adipose 78.5-80.0, Inter orbital distance 19.2-21.2, body depth (Pelvic) 10.8-12.3, body depth (anal) 8.3- 8.5, pectoral fin length 9.1-10.0, pelvic fin length 16.7-18.8, dorsal fin base 14.2-15.7; body proportions as percentage in head length: Eye diameter 11.4 -12.0. Meristic count: Dorsal fin ray 12-13, ventral fin ray 8-9,

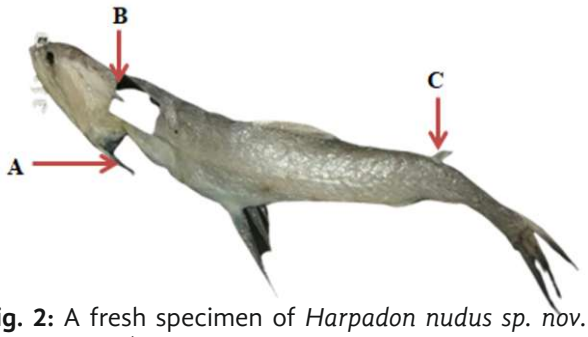

Fig. 2: A fresh specimen of *Harpadon nudus sp. nov.* (TL.144 mm) slender, scaleless, eyes big and silvery grey in colour. A: Branchiostegals extends beyond operculum B: short pectoral fin, C: adipose below

anal fin ray 12-14 and brachiostegals ray 17. The description ranges of morphometric and meristic count considerable similarity to *H. nudus* described by Ganga *et al* (2015). The head length (18.3-21.2), body depth at pectoral (7.5-9.2) was little smaller and anal fin base (6.1-6.9) indicated half in standard length compared to earlier study. It is quite likely that some of the differences may be attributed to the greater distance between two places. Similar difference was observed in *H. nehereus* by Bapat (1970). Further, he noted that this may be due to the ecological and environmental factors available in these areas.

Taxonomic, morphometric and meristic details: Class: Actinopterygii, Order: Aulopiformes, Family: Synodontidae, Genus: *Harpadon* Lesueur, 1825, Species: *nudus* and *translucens*, Locality: Mumbai-Thane and Arnala-Satpati region

Binomial name:

1. *Harpadon nudus* sp. nov. Ganga, Thomas and Sukumaran 2015
2. *Harpadon translucens* Saville-Kent, 1889

Diagnostic characters: Single specimen of *Harpadon translucens* Saville-Kent, 1889 (total length 325 mm) was examined. Body elongated, compressed and soft (Fig 3, a, b, c & d). Head short 25.2% in standard length (Table 1), snout round in dorsal view 9.6% in head length with a pair of nares. Mouth large, gap tending to be oblique. Jaws broadened through its entire length, lower jaw is 71.2% in head length, while upper jaw is 68.5% in head length, teeth unequal, recurring, bristle like protruding out at the mouth edge.

Meristic characteristics: Dorsal fin with 11 fin rays, originating just posterior to vertical with pelvic fin base, ventral fin with 9 fin rays, short and not reaching the anal opening. The pectoral fin with 10 rays, extends more than half the length from snout to origin of dorsal fin (Ganga *et al.*, 2015). Anal fin with 15 fins rays, hind single fin ray elongated and filamentous. Adipose dorsal fin situated above posterior half of anal fin, close to caudal fin than dorsal fin.

Lateral line scales 48, fairly prominent and continuous with central lobe to the caudal fin lobe. Pectoral fin 25.2% in SL, extending more than half the body length.

Table 1: Morphometric (% in standard length and head length) and meristic count of *Harpadon nudus sp.* nov. (n=3) and *Harpadon translucens* (n=1) and *H. nehereus* (n=15) along Maharashtra, North-West Coast of India.

Characters	*H. nudus sp.* nov	*H. translucens*	*H. nehereus*
Total length (mm)	144-195	325	135-210
Standard length (mm)	120-165	290	120-182
As % standard length in mm			
Snout to first dorsal	43.1-45.8	39.6	37.5-41.6
Snout to adipose (second dorsal)	78.5-80.0	77.6	71.5-77.7
Snout to anal opening	66.7-69.2	68.9	62.6-68.8
Inter dorsal distance	19.2-21.2	22.1	21.1-24.7
Head length	18.3-21.2	25.2	16.6-20.4
Snout length	3.3-4.8	2.4	1.9-2.8
Upper/Lower jaw length	15.0-16.1/16.7-19.4	1.8/1.7	13.1-15.5/13.8-15.8
Inter orbital space	3.3-4.8	5.5	3.4-4.3
Eye diameter	2.1-2.3	1.4	1.2-1.9
Nostril distance	3.5, 4, 4.6	3.4	1.7-2.4
Body depth (Pectoral/Pelvic)	7.5-9.2/10.8-12.3	14.8/12.7	15.7-20.1/17.3-20.1
Body depth (Dorsal / Anal)	9.2-10.9/8.3-8.5	12.7/7.2	17.1-20.2/10.6-12.9
Dorsal fin/base length	20.8-19.2/14.2-15.7	17.2/14.8	19.5-23.1/13.7-15.6
Pectoral fin/base length	9.1-10.0/1.6-2.4	25.2/4.5	18.5-25.3/2.8-4.0
Pelvic fin/base length	16.7-18.8/2.3-2.5	19.6/5.9	23.8-26.6/4.3-5.0
Anal fin/base length	10.8-13.3/6.1-6.9	12.1/14.5	11.8-14.8/11.0-14.1
Adipose/base length	2.5-3.6/1.5-1.8	7.2/2.1	4.2-6.2/1.1-2.1
As % head length in mm			
Snout length	18.2-22.8	9.6	10.8-15.3
Inter orbital space	18.2-22.8	21.9	19.1-24.5
Eye diameter	11.4-12.0	5.5	7.5-10.6
Upper/lower jaw length	74.3-84.0/91.4-92.0	68.5/71.2	74.6-87.2/77.0-88.3
Meristic count			
Dorsal fin ray	12-13	11	12
Pectoral fin ray	10	10	11-13
Ventral fin ray	8-9	9	9
Anal fin ray	12-14	15	12-15
Caudal fin ray	20-22	20	19
Branchiostegal rays	17	17	23-26
Lateral line scales	40-43	48	40
Nares	Single pair	Single pair	Two pairs

Length from snout to origin of 1st dorsal fin is 39.6% in SL. Caudal fin deeply forked with 20 fin rays, conspicuous thick conspicuous central lobe. Colour of the body is transparent and glassy with minute specks; pectoral, dorsal, pelvic and anal fins with black margin.

Head short and blunt with rounded snout, pectoral fin reaching dorsal fin, dorsal fin just posterior to vertical with pelvic fin base; caudal fin deeply forked with conspicuous median lobe (Ganga *et al.*, 2015). In *H. translusens* pectoral fin extends more than half the length from snout to origin of dorsal fin. Teeth bristle like, protruding out at the mouth (Saville- Kent, 1889). These characters are agreeing with the present specimen of *H. translucens* from North west coast of India. The occurrence of these species along with *H. nehereus* from north eastern Arabian Sea, India and presently along North West Coast of India may be geological fact that north of Indian Peninsula was Tethys Sea which enabled the Bombay duck and other ecological species move across from west coast to east coast of the peninsula before the formation of Arabian Sea and Bay of Bengal approximately 50 million years ago (Khan, 2016).

Distribution of the *H. nudus* has been recorded by Ganga *et al.* (2015) from continental slope region at around 300 m depth in the north - eastern Arabian Sea. The present record extends the distribution of this species to Maharashtra, north-west coast of India. Further, this is the first report of *H. translucens* being caught at a depth of 28 m along Maharashtra coast. This species has been reported along Antarctica, Australia, Queensland, Western Australia, India, Indonesia, Papua, New Guinea and Indo-West Pacific.

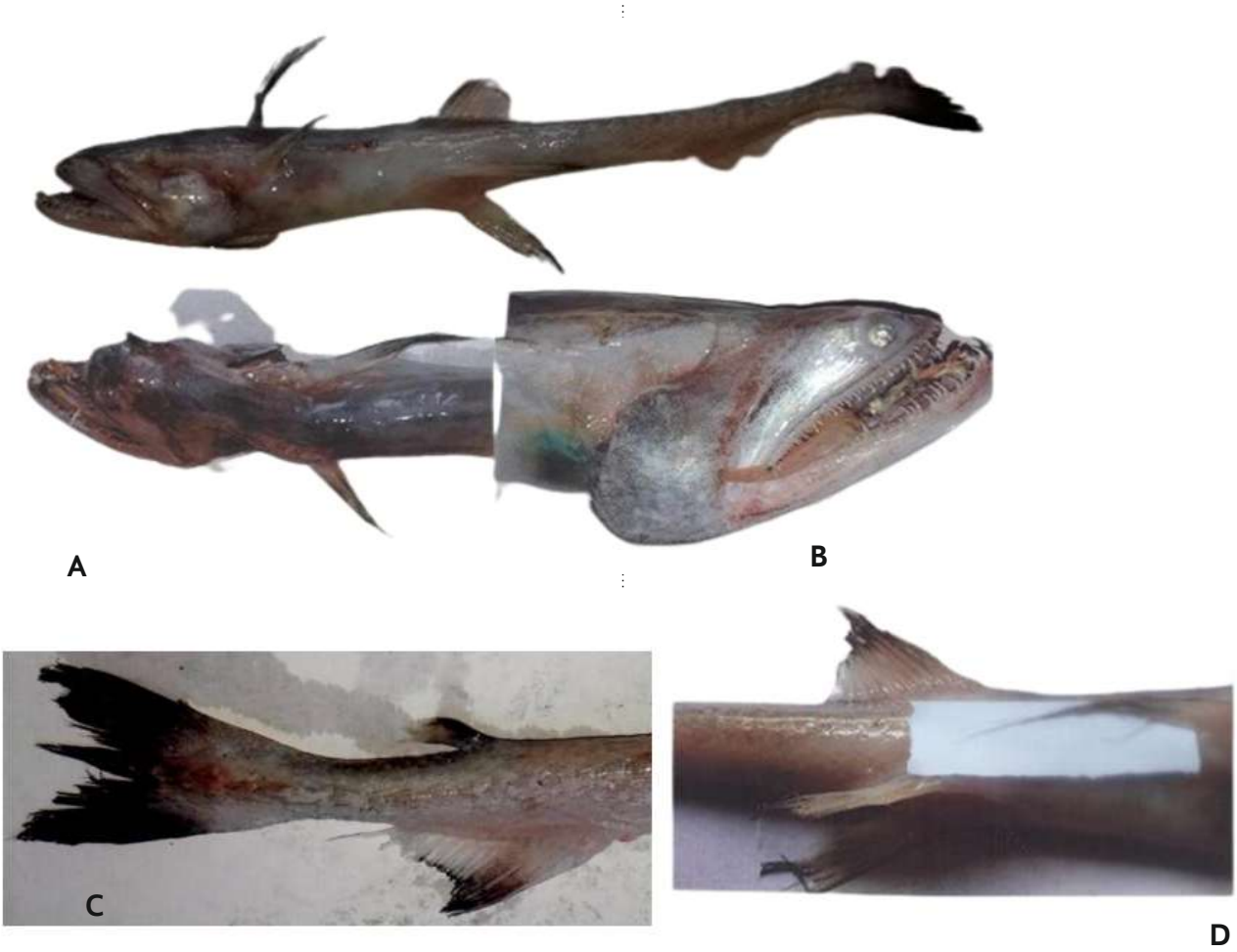

Fig 3: *Harpadon translucens* (TL-325 mm) (a). Head short, blunt with round snout and single pair of nares (b) Mouth gap tending to be oblique, lower jaw longer than upper jaw, unequal teeth along with recurring bristle like spikes, protruding out at the edge of mouth; The body is glossy and transparent with dark speckles, (c). Pectoral fin reaching to dorsal fin, pelvic short not reaching to anal vent, (d). Pointed median lobe of caudal fin, adipose fin situated above posterior half of the anal fin, hind single fin ray of anal fin elongated and filamentous

Conclusion

Only single species *H. nehereus* (Hamilton, 1822) has constituted the genus *Harpodon* Lesueur, 1825 fishery along the northwest coast of India until this study has found records of two more species of the same genus *H. nudus* and *H. translucens*.

Acknowledgments

The authors are thankful to the Dr. S.K Chakraborty, Rtd. HoD and Emeritus Professor, ICAR-Central Institute of Fisheries Education, Mumbai for correcting manuscript and Dr. U. Ganga for valuable suggestions. The first author is also thankful to the crew members for providing specimens of both the species.

Conflict of interest

The authors declare that there is no conflict of interest.

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