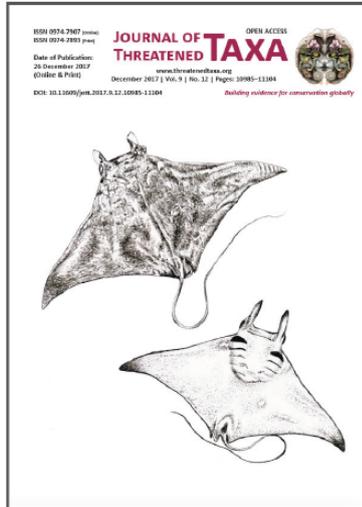


## OPEN ACCESS



The Journal of Threatened Taxa is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at [www.threatenedtaxa.org](http://www.threatenedtaxa.org). All articles published in JoTT are registered under [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/) unless otherwise mentioned. JoTT allows unrestricted use of articles in any medium, reproduction, and distribution by providing adequate credit to the authors and the source of publication.



## Journal of Threatened Taxa

Building evidence for conservation globally

[www.threatenedtaxa.org](http://www.threatenedtaxa.org)

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

### SHORT COMMUNICATION

#### **A FIRST RECORD OF THE BENTFIN DEVIL RAY *MOBULA THURSTONI* (LLOYD, 1908) (MYLIOBATIFORMES: MOBULIDAE) FROM THE INDIAN EEZ OF THE ANDAMAN SEA**

Swapnil Shivdas Shirke, M. Nashad, Monalisha Devi Sukham & H.D. Pradeep

26 December 2017 | Vol. 9 | No. 12 | Pp. 11074–11080  
10.11609/jott.3089.9.12.11074-11080



For Focus, Scope, Aims, Policies and Guidelines visit [http://threatenedtaxa.org/About\\_JoTT](http://threatenedtaxa.org/About_JoTT)

For Article Submission Guidelines visit [http://threatenedtaxa.org/Submission\\_Guidelines](http://threatenedtaxa.org/Submission_Guidelines)

For Policies against Scientific Misconduct visit [http://threatenedtaxa.org/JoTT\\_Policy\\_against\\_Scientific\\_Misconduct](http://threatenedtaxa.org/JoTT_Policy_against_Scientific_Misconduct)

For reprints contact <[info@threatenedtaxa.org](mailto:info@threatenedtaxa.org)>

Partner



Publisher/Host





ISSN 0974-7907 (Online)  
ISSN 0974-7893 (Print)

## A FIRST RECORD OF THE BENTFIN DEVIL RAY *MOBULA THURSTONI* (LLOYD, 1908) (MYLIOBATIFORMES: MOBULIDAE) FROM THE INDIAN EEZ OF THE ANDAMAN SEA

Swapnil Shivdas Shirke<sup>1</sup>, M. Nashad<sup>2</sup>, Monalisha Devi Sukham<sup>3</sup> & H.D. Pradeep<sup>4</sup>

### OPEN ACCESS



<sup>1,2</sup> Fishery Survey of India, Opp. PMB, Phoenix Bay Jetty, Port Blair, Andaman & Nicobar Islands 744101, India

<sup>3</sup> Fisheries Resource Management Division, Central Islands Agriculture Research Institute, ICAR, Port Blair, Andaman & Nicobar Islands 744105, India

<sup>4</sup> Fishery Survey of India, Opp. Microwave Station, Bogda Road, Mormugao, Goa 403803, India

<sup>1</sup>lishaniilforever@gmail.com (corresponding author), <sup>2</sup>nasharocks22@gmail.com, <sup>3</sup>smonalishadevi@gmail.com, <sup>4</sup>hdpradeep@gmail.com

**Abstract:** This manuscript deals with the Bent-fin Devil Ray *Mobula thurstoni* for its first time occurrence in the Andaman & Nicobar waters around the Indian EEZ which is a new locality record confirming the range extension of the species to the southeast of Bay of Bengal (the Andaman Sea). A female specimen of 318mm disc length and weighing 2.47Kg was caught by a multiday bottom trawler operated off North Bay and was landed at Junglighat fishing harbour, South Andaman. A detailed diagnostic description and morphometric measurements of *M. thurstoni* is provided. For the first time this species has been described from Indian waters and compared with the other related species, and so documenting its first occurrence in the Andaman & Nicobar waters.

**Keywords:** Devil Ray, Mobulidae, Myliobatoidae, range extension.

**Abbreviations:** WD - disk width, DL - disk length, AP - anterior projection, Rs - rostrum, PF - pelvic fin, HL - head length, SPL - spiracle length, ED - eye diameter, TL - tail length, CF - cephalic fin, OH - orbit height, CFL - cephalic fin length, CFW - cephalic fin width.

The mobulids are large sized zooplanktivorous elasmobranchs. They are distributed circumglobally in tropical, subtropical, and warm temperate waters (Croll et al. 2016). In earlier literature these beautiful creatures were portrayed as diabolical and ferocious brutes, even though they are harmless to human beings

(Saenz- Arroyo et al. 2006). Although their existence has been documented since the 17<sup>th</sup> century (Willughby & Ray 1686), information on their biology and ecology is scanty (Couturier et al. 2012; Croll et al. 2016). Meanwhile these species are well exploited worldwide (Croll et al. 2016) for their valuable gill rakers and face intense fishing pressure, even though they are listed as Near Threatened on the IUCN Red List (Walls et al. 2016).

The family Mobulidae includes two genera, *Manta* and *Mobula* with 11 identified species (Couturier et al. 2012). The genera are separated by the position of the mouth, which is located ventrally in *Mobula* and terminally in *Manta* (Townsend & Kyne 2010). The genus *Mobula* is presently represented by nine known species (Notarbartolo-di-Sciara 1988). The Pygmy Devil Ray *M. eregoodootenkee* (Bleeker, 1959), Atlantic Devil Ray *M. hypostoma* (Bancroft, 1831), Spinetail Devil Ray *M. japanica* (Muller & Henle, 1841), Short-fin Devil Ray *M. kuhlii* (Muller & Henle, 1841), Giant Devil Ray *M. mobular* (Bonnaterre 1788), Munk's Devil Ray *M. munkiana* (Notarbartolo-di-Sciara 1988), Lesser Guinean Devil Ray *M. rochebrunei* (Vaillant, 1979), Chilean Devil

**DOI:** <http://doi.org/10.11609/jott.3089.9.12.11074-11080> | **ZooBank:** urn:lsid:zoobank.org:pub:A06759FE-04EA-4BC2-8057-3A84B27ED22B

**Editor:** A. Biju Kumar, University of Kerala, Thiruvananthapuram, India.

**Date of publication:** 26 December 2017 (online & print)

**Manuscript details:** Ms # 3089 | Received 11 January 2017 | Final received 07 November 2017 | Finally accepted 22 November 2017

**Citation:** Shirke, S.S., M. Nashad, M.D. Sukham & H.D. Pradeep (2017). A first record of the Bentfin Devil Ray *Mobula thurstoni* (Lloyd, 1908) (Myliobatiformes: Mobulidae) from the Indian EEZ of the Andaman Sea. *Journal of Threatened Taxa* 9(12): 11074–11080; <http://doi.org/10.11609/jott.3089.9.12.11074-11080>

**Copyright:** © Shirke et al. 2017. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use of this article in any medium, reproduction and distribution by providing adequate credit to the authors and the source of publication.

**Funding:** None.

**Competing interests:** The authors declare no competing interests.

**Acknowledgements:** The authors are thankful to the fishermen of Bottom trawler PERIYAR operating from the Junglighat fish landing center, Port Blair, Andaman and Nicobar Islands, India for their effort and help provided.

Ray *M. tarapacana* (Philippi, 1893), and Bentfin Devil Ray *M. thurstoni* (Lloyd, 1908).

The close external resemblance of many species of mobulids has proven that their identification is problematic and has led to taxonomic ambiguities (Couturier et al. 2012). Lack of holotypes to accompany the original descriptions of *M. eregoodootenkee*, *M. kuhlii*, *M. mobular*, *M. tarapacana* and *M. thurstoni* make taxonomic work complicated and leads to misidentification of the new reports (Polack 2011). The large size and fast swimming abilities of most mobulid species make their study difficult even at well-established aggregation sites, otherwise killing or restraining of individuals are required (Couturier et al. 2012).

Reports of mobulids from Indian waters were mainly concentrated on *Manta birostris*. It had been reported from Saurashtra coast, Veraval (Sivaprakash 1965; Kunjipalu et al. 1981); Nachikuppam, Madras (James 1985); Karwar, (Telang & Harikantra 1998), Tuticorin (Armurgam 2002; Rajpakkiam et al. 1997); Honawar (Rajpakkiam et al. 2007); and Maharashtra (Rane 2002). In devil rays, *M. diabolus* is the dominant one and it has been reported from the Gulf of Mannar (Rajpakkiam et al. 1994); Vizhinjam, (Pillai 1998); Chennai (Baby 2010); Tuticorin (Zacharia & Kanthan 2010) and Andhra Pradesh (Satish kumar et al. 2013). Information on the biology and ecology of the other species of the devil rays are meagre, even though seven species have been reported

from Indian waters (Akhilesh et al. 2014). Some of these reports require confirmation too. The present study confirms the occurrence of *M. thurstoni* in Indian waters and also describes the Near Threatened species (Walls et al. 2016) and its range extension to the southeastern Bay of Bengal (Andaman Sea).

## MATERIALS AND METHODS

The present specimen was collected from the fish landing centre at Junglighat, South Andaman District (Fig. 1; Image 1) on 17 August 2016, landed by a bottom trawler having operated at Junglighat. The specimen was caught from a depth of 70m off North Bay, South Andaman District. A single female specimen of *M. thurstoni* was landed along with other species of mobulids like *Manta birostris* and *Mobula diabolus*. The specimen was identified following Compagno & Last (1999), photographed, and morphometric and meristic measurements were recorded. All proportional measurements are expressed as percentage of disc width (WD). The specimen was dissected; gill rakers and the lower jaw were removed for comparison and identification. The gut content was removed carefully and transferred to 4% of formalin and later was examined under binocular microscope OLYMPUS CH20i (10X magnification). The specimen was preserved in 10% formalin in the museum of the zonal base of Fishery Survey of India, Port Blair (No: MUS.FSI.PB/EB/09/2016).

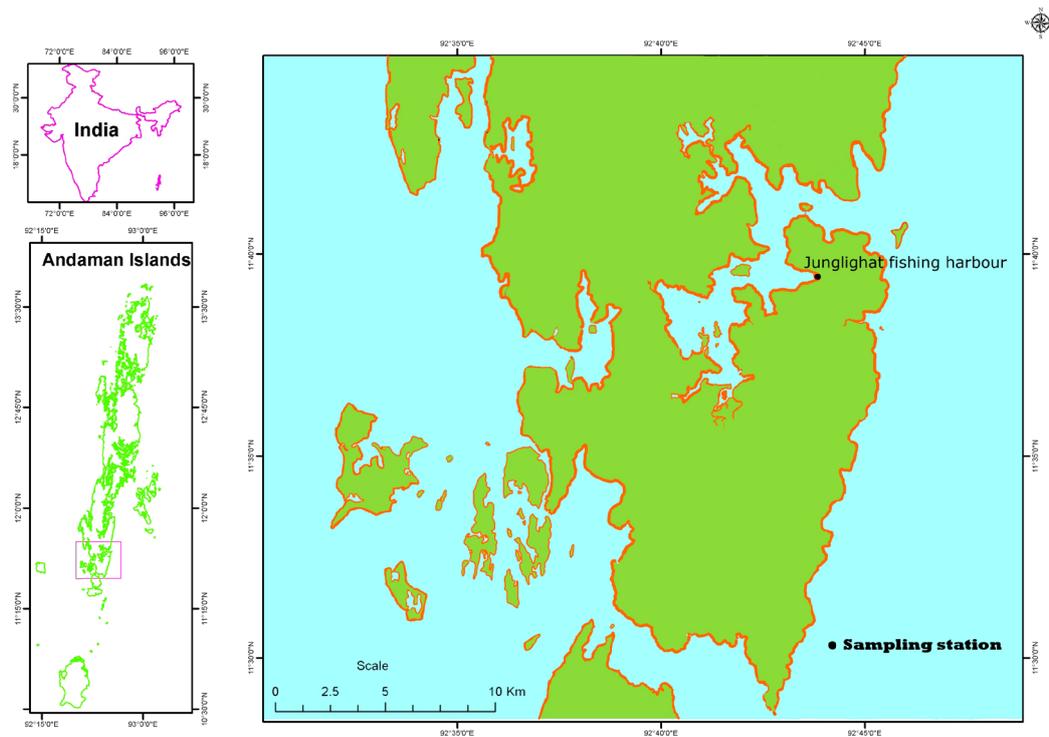


Figure 1. Map of South Andaman District showing the sampling station

## RESULTS

Order: Myliobatiformes

Family: Mobulidae (Gill, 1893)

Genus: *Mobula* (Rafinesque, 1810)

Species: *thurstoni* (Lloyd, 1908)

Specimen examined: MUS.FSI.PB/EB/09/2016, female, 17.viii.2016, disk width (WD) 624mm, disc length (DL) 318mm, weight 2.470kg.

## Diagnosis

The present specimen of *M. thurstoni* was a moderate size with a disc width (WD) of 624mm and disc length (DL) 318mm. It had a short head bearing short cephalic fins. The tip of the dorsal fin was white in colour, the spine was absent at the base of the tail. Cephalic fins were short extending from the tip of each fin to the corner of the mouth and less than the total disc width. The white ventral markings of the rostrum did not extend above the eyes. The tail base was found dorso-ventrally compressed and close to the dorsal fin. The pectoral fins' anterior margin had a distinctive slight double curvature. The size of the spiracle was small, sub-circular and below the margin of the pectoral fin where it meets the body. The DL is 51% of WD, HL is 17.8% of WD, SPL is 0.1% of WD, ED is 2.2 % of WD, TL is 65.1% of WD and 65.1% to DL, CFL is 12.1 % of WD, CFW is 4.6 % of WD. AP is 34.6 % WD, Rs to PF is 51% to WD, Tip of CF to mouth is 11.4% WD, OH is 2.4% to WD and mouth width is 11.2% to WD. Details of morphometric measurements of the present specimen in comparison with other reports (Notarbartolo-di-Sciara 1987; Mendonca et al. 2012; Mas et al. 2015) are given in Table 1.

## Colour

The dorsal surface of the body was deep blue-black in colour. The anterior portion of the ventral surface was fully white and distal half with a silver-brown sheen. The dorsal side head had a dark band stretching across the head behind the eyes.

## DISCUSSION

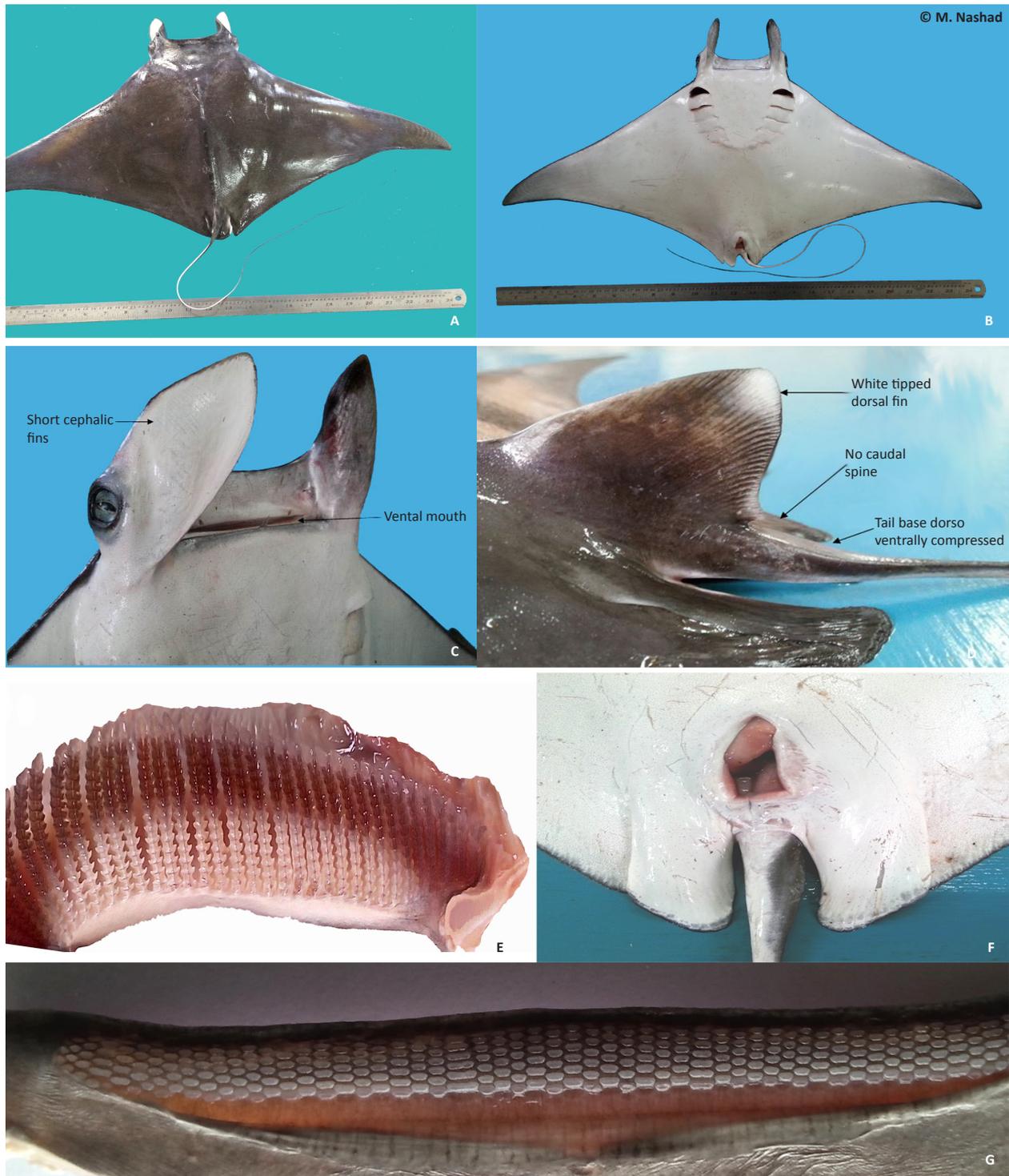
*Mobula thurstoni* has a worldwide distribution and is reported from the Pacific, Atlantic and Indian Oceans (White et al. 2006; Marshall et al. 2009; Kashiwagi et al. 2011; Walls et al. 2016). Even though the mobulids are widely distributed in the tropical, subtropical, and warm temperate oceans this is the first time *M. thurstoni* has been described from the EEZ of India. Hence, their geographical distribution has been extended from Southeast Asian Seas to the EEZ of Andaman & Nicobar Islands, India. Akhilesh et al. (2014) reviewed the

occurrence and distribution of chondrichthyans in the Indian waters and mentioned the occurrence of seven species of *Mobula*. But some species like *M. mobular* require confirmation, further there is no report on the morphometric and meristic counts of *M. thurstoni*.

*M. thurstoni* is usually pelagic or epipelagic in shallow, productive, neritic waters of <100m depth (Notarbartolo-di-Sciara 1988; Croll et al. 2016), although it is also caught in offshore pelagic waters (Mas et al. 2015) and around seamounts in the Mid-Atlantic Ridge (Mendonça et al. 2012). The present specimen was caught by a multiday trawler that operated at a depth range of 70–150 m along the North Bay, South Andaman. Segregation by size and sex is seasonal, with all size classes and sexes appearing together during the summer months (Notarbartolo-di-Sciara 1988).

Disc Width of the present specimen was 624mm and disc length was 318mm, which is 51% to disc width. The maximum WD recorded for *M. thurstoni* was 1,800mm (Notarbartolo-di-Sciara 1987). The maximum disc width recorded for a mobulid from Indian waters was a *M. diabolus* recorded at 4500mm, and an adult specimen of *M. japanica* recorded at 2300–2380 mm (Rekha et al. 2015). Width of disc at maturity for male and female is M: >1,500mm and F: 1,538mm respectively for *M. thurstoni* (Notarbartolo-di-Sciara 1987; White et al. 2006) hence the present specimen with a disc width (WD) of 624mm is a female juvenile.

The rear tips of pectoral fins can be used for identification of mobulids. In the case of *M. kuhlii* the anterior margin of pectoral fin is not undulated whereas, in *M. thurstoni* it is slightly convex in the anterior margin of the pectoral fin with a distinctive undulated profile (Compagno & Last 1999). In Myliobatidae, one row of laterally expanded medial plate-like teeth is present in both the jaws. In Mobulidae, teeth are usually found only in the lower jaw, but it was abnormally present in both jaws (Compagno & Last 1999). The examined *M. thurstoni* had hexagonal teeth with large rugosities on crown; teeth bands present on the both jaw having pavement-like mosaic arrangement teeth (Image 1G). In *M. kuhlii*, however, the teeth are transversely elongated (Compagno & Last 1999). *M. thurstoni* had a moderately long tail (about 60% of disc width in adults), in *M. japanica* the tail is longer than the disc when undamaged, in *M. tarapacana* the tail is much shorter than the disc (Compagno & Last 1999). The present specimen also consisted of a moderately long tail 65.1% in disc width and 127.7% to the disk length. Cephalic-fin length from fin tip to mouth corner is more than 16% of disc width in *M. eregoodootenkee*. Cephalic-fin length is



**Image 1. *Mobula thurstoni*: A - dorsal view; B - ventral view; C - dorsal fin tip; D - view of short cephalic fin; E - cloacal opening along with the dorso-ventrally compressed tail; F - gill rakers; G - lower jaw.**

less than 16% of disc width in *M. thurstoni* (Compagno & Last 1999). The present specimen had a short cephalic fin which is 9.1% to the total disc length and 12.1% to the disc width (Image 1D).

A sting is present at the tail base of *M. japanica*. The dorsal fin white-tipped and tail longer than disc when undamaged but in the case of *M. thurstoni* the caudal sting was absent with a white dorsal fin tip, but the tail

**Table 1. Morphometric measurements of the Bentfin Devil Ray, *Mobula thurstoni* [in mm and % of disc width] in comparison with previous records. Measurement ranges of *M. thurstoni* proposed by Notabartolo-DI-Sciara (1987) are indicated by numbers in bold italic. Proportional measures that did not fall inside this range are shown in bold.**

	Measurements	Range	Present specimen		Mas et al. 2015		Embryo specimen Mendonça et al. 2012	
			length in mm	% WD	length in mm	% WD	length in mm	% WD
1	Disc width	--	624	100	955	100	179	100
2	Disc length	47.8–55.7	318	51.0	458	48.0	101	56.4
3	Anterior projection	33.3–39.2	216	34.6	323	33.8	6	3.4
4	Rostrum to pelvic fin	51.1–59.2	318	51.0	475	49.7	0	0.0
5	Rostrum to vent	38.8–46.9	245	39.3	396	41.5		0.0
6	1 <sup>st</sup> gill slit Length	4.2–5.7	30.4	4.9	48.6	5.1	9	5.0
7	2 <sup>nd</sup> gill slit length	4.8–6.2	31.4	5.0	47.3	5.0	7	3.9
8	3 <sup>rd</sup> gill slit length	4.5–6.2	31.6	5.1	51.3	5.4	8	4.5
9	4 <sup>th</sup> gill slit length	4.6–5.8	31.6	5.1	48.1	5.0	7	3.9
10	5 <sup>th</sup> gill slit length	3.1–4.1	22.8	3.7	30.7	3.2	5	2.8
11	Between 1 <sup>st</sup> gill slit	11.7–13.8	71.9	11.5	112	11.7	26	14.5
12	Between 2 <sup>nd</sup> gill slit	-	27.7	4.4	103	10.8	15	8.4
13	Between 3 <sup>rd</sup> gill slit	-	58	9.3	86	9.0	-	-
14	Between 4 <sup>th</sup> gill slit	-	47	7.5	65	6.8	-	-
15	Between 5 <sup>th</sup> gill slit	4.6–5.5	31.7	5.1	48	5.0	-	-
16	Tip of cephalic fin to mouth	11.3–13.5	71.4	11.4	111	11.6	-	-
17	Orbit height	2.5–3.4	15	2.4	14.7	1.5	4	2.2
18	Between antorbitals	15.8–18.1	132	21.2	158	16.5	41	22.9
19	Preoral length	3.7–4.3s	27	4.3	34	3.6	11	6.1
20	Tip of cephalic fin to spiracle	12.6–14.2	82	13.1	124	13.0	-	-
21	Mouth width	11.2–13.3	69.9	11.2	106.1	11.1	27	15.1
22	Upper toothband length	8.0–9.7	52	8.3	84.1	8.8	-	-
23	Lower toothband Length	8.7–10.2	56.3	9.0	86.6	9.1	-	-
24	Branchial basket	-	-	-	111	11.6	-	-
25	Internarial distance	-	60.7	9.7	103.2	10.8	25	14.0
26	Pre-orbital length	-	49	7.9	80	8.4	-	-
27	Spiracle length	-	0.7	0.1	1.1	0.1	-	-
28	Interspiracle distance	-	105.6	16.9	151.9	15.9	-	-
29	Pre-dorsal length	-	269	43.1	-	-	96	53.6
30	Pre-cloacal length	-	270	43.3	-	-	94	52.5
31	Rostrum to 1 <sup>st</sup> gill slit	-	114.6	18.4	-	-	2	1.1
32	Rostrum to 2 <sup>nd</sup> gill slit	-	64.2	10.3	-	-	43	24.0
33	Rostrum to 5 <sup>th</sup> gill slit	-	190	30.4	--	-	-	-
34	Cephalic fin length	-	75.5	12.1	-	-	18	10.1
35	Cephalic fin width	-	28.9	4.6	-	-	11	6.1
36	Eye diameter	-	13.7	2.2	-	-	-	-
37	Head length	-	111.2	17.8	-	-	22	12.3
38	Dorsal fin base	-	39.2	6.3	-	-	10	5.6
39	Dorsal fin height	-	26.8	4.3	-	-	9	5.0
40	Pelvic fin length	-	36.4	5.8	-	-	14	7.8
41	Tail length	-	406	65.1	-	-	240	134.1

was short as compared to *M. japanica* (Compagno & Last 1999). The examined specimen also had a white-tipped dorsal fin, depressed tail base without sting and a short tail (Image 1B,C); in the case of *M. kuhlii*, it is quadrangular (Compagno & Last 1999).

Gill raker plates can be used as a good identification tool for mobulids because they show a distinctive appearance. The *M. tarpacana* was locally called “white” due to the white nature of the gills; the other species *M. japanica* and *M. thurstoni* were called “black” due to the black colour of the gill plates (Rekha et al. 2015). In the case of *M. japanica* the gill rakers are uniformly dark with a whitish tip (Photo Identification Guide Manta Trust) but in *M. thurstoni* it is uniformly dark up to mid region and the anterior portion is pale white in colour (Image 1G).

The stomach content of *M. thurstoni* caught from the Gulf of California were dominated by either euphausiids or mysid shrimps, although the two types of prey were never found together in the same stomach (Notarbartolodi-Sciara 1988). It mainly feeds on *Nyctiphanes simplex* during summer, when it is most abundant, and on *Mysidium* spp. during winter ambiguities (Couturier et al. 2012). These observations suggest that *M. thurstoni* is able to adapt and shift diet, according to the food dominantly available in a particular location. The present specimen’s gut was half full with a major share of *Lucifer hanseni* and *Nanocalanus* sp.

The population and population trend for *M. thurstoni* is so far unknown (Couturier et al. 2012). The Bentfin Devil Ray is suspected to have declined by almost 30% over three generations throughout its global range, which combined with international trade value for their gill plates, increasing domestic demand for meat, low fecundity, high intrinsic sensitivity to overexploitation (White et al. 2006; Croll et al. 2016), and the likelihood that fishing effort will increase, may affect the mobula population. All these factors may further decimate the population of mobulids if stringent conservation measures are not undertaken.

## REFERENCES

- Akhilesh, K.V., K.K. Bineesh, A. Gopalakrishnan, J.K. Jena, V.S. Basheer & N.G.K. Pillai (2014). Checklist of Chondrichthyans in Indian waters. *Journal of Marine Biological Association India* 56(1): 109–120; <http://doi.org/10.6024/jmbai.2014.1.01750s-17>
- Armurgam, G. (2002). On a Giant Devil Ray *Manta birostris* (Walbaum) landed at Tuticorin. *Marine Fisheries Information Series Technical and Education Series* 122: 23.
- Baby, G.K. (2010). A large *Mobula diabolus* landed at Ponnani. *Marine Fisheries Information Series Technical and Education Series* 206: 18.
- Compagno, L.J.V. & P.R. Last (1999). Family Mobulidae, pp. 1524–1529. In: Carpenter, K.E. & V.H. Niem (eds.). *The Living Marine Resources of the Western Central Pacific*. Volume 3, Part I, Rome, FAO.
- Couturier, L.I.E., A.D. Marshall & F.R.A. Jaine (2012). Biology, ecology and conservation of the Mobulidae. *Journal of Fisheries Biology* 80(5): 1075–1119; <http://doi.org/10.1111/j.1095-8649.2012.03264.x>
- Croll, D.A., H. Dewar & N.K. Dulvy (2016). Vulnerabilities and fisheries impacts: the uncertain future of Manta and Devil Rays. *Aquatic Conservation: Marine Freshwater Ecosystem* 26: 562–575.
- James, D.B. (1985). Notes on giant Devil Ray *Manta birostris* (Walbaum) caught off Madras. *Indian Journal of Fisheries* 32: 492–494.
- Kashiwagi, T., A.D. Marshall, M.B. Bennett & J.R. Ovenden (2011). Habitat segregation and mosaic sympatry of the two species of manta ray in the Indian and Pacific Oceans: *Manta alfredi* and *M. birostris*. *Marine Biodiversity Records* 4: 53; <https://doi.org/10.1017/S1755267211000479>
- Kunjipalu, K.K. & M.R. Boopendranath (1981). Notes on the catch of Giant ray *Manta birostris* (Walbaum) off Veraval, North West coast of India. *Indian Journal of Fisheries* 28: 1–2.
- Marshall, A.D., L.J.V. Compagno & M.B. Bennett (2009). Redescription of the Genus *Manta* with resurrection of *Manta alfredi* (Krefft, 1868) (Chondrichthyes: Myliobatoidei: mobulidae). *Zootaxa* 2301: 1–28.
- Mas, F., R. Forselledo & B.A. Domingo (2015). Mobulid ray by-catch in longline fisheries in the south-western Atlantic Ocean. *Marine Freshwater Research* 66(9): 767–777; <http://doi.org/10.1071/MF14180>
- Mendonça, S.A., C.L. Bruno, E.C. Macena, L.V. Danielle, F.V. Daniel & H.V. Hazin (2012). Record of a pregnant *Mobula thurstoni* and occurrence of *Manta birostris* (Myliobatiformes: Mobulidae) in the vicinity of Saint Peter and Saint Paul Archipelago (Equatorial Atlantic). *Pan-American Journal of Aquatic Science* 7(1): 21–26.
- Notarbartolodi-Sciara, G. (1988). Natural history of the rays of the genus *Mobula* in the Gulf of California. *US Fish and Wildlife Service Fishery Bulletin* 86: 45–66.
- Pillai, S.K. (1998). A note on giant devil ray *Mobula diabolus* caught at Vizhinjam. *Marine Fisheries Information Series Technical and Education Series* 152: 14–15.
- Polack, D. (2011). FISHWISE—a Universal Fish Catalogue. Available at [www.fishwise.co.za](http://www.fishwise.co.za). Downloaded on 20 January 2016.
- Rajpakkiam, S., T.S. Balsubramaniam, K.M.S.A. Hamza & S.M. Kasim (1994). On the unusual landing of lesser Devil Ray *Mobula diabolus* (Shaw) from Gulf of Mannar. *Marine Fisheries Information Series Technical and Education Series* 129: 20–21.
- Rajpakkiam, S., S. Sunderrajan & T.S. Balsubramaniam (1997). On two Large Devil Ray *Manta birostris* (Walbaum) landed at Tuticorin. *Marine Fisheries Information Series Technical and Education Series* 149: 16.
- Rajpakkiam, S., S. Gomathy & P. Jayganes (2007). Devil Ray *Manta birostris* at Tuticorin Chennai fishing Harbour. *Marine Fisheries Information Series Technical and Education Series* 191: 21.
- Rane, U.H. (2002). On a female Devil Ray *Manta birostris* (Walbaum) entangled in Bottom Set Gillnet at Kalwa Dharpada, Maharashtra. *Marine Fisheries Information Series Technical and Education Series* 177: 14.
- Rekha, J.N., P.U. Zacharia, D. Kumar, T.G. Kishor, N.D. Divya, P.K. Seetha & K.S. Sobhana (2015). Recent Trends in Mobulids Fishery in Indian Waters. *Indian Journal of Geo-marine Science* 44(9): 1265–1274.
- Saenz-Arroyo, A., C.M. Roberts, J. Torre, M. Carino-Olvera & J.P. Hawkins (2006). The value of evidence about past abundance: marine fauna of the Gulf of California through the eyes of the 16th to 19th century travellers. *Fish and Fisheries* 7: 128–146.
- Satish Kumar, M., M. Uma, M. Hanumantha & S. Ghose (2013). Incidental landing of Lesser Devil Ray *Mobula diabolus* (Shaw, 1804) at Dhummalpetha and Bhairavapalem, Andhra Pradesh. *Marine Fisheries Information Series Technical and Education Series* 216: 17–18.
- Sivaprakash, T.E. (1965). On the capture of two Giant Devil Rays *Manta birostris* (Walbaum) at Veravel, Saurashtra. *Journal of Marine Biological Association India* 7: 204–205.

- Telang, K.Y. & T.B. Harikantra (1998).** On a large devil ray landed at Karwar. *Marine Fisheries Information Series Technical and Education Series* 85: 11.
- Townsend, K.A. & P.M. Kyne (2010).** New records of the Japanese Devilray *Mobula japanica* (Müller & Henle, 1841) for Australian waters. *Memoirs of the Queensland Museum - Nature* 55(1): 225–230.
- Walls, R.H.L., S.P. Pardo, J.S. Bigman, T.B. Clark, W.D. Smith & J.J. Bizzarro (2016).** *Mobula thurstoni*. In: IUCN Red List of Threatened Species. Downloaded on 22 August 2016.
- White, W.T., T.B. Clark, W.D. Smith & J.J. Bizzarro (2006).** *Mobula japanica*. In 2010: 2010 IUCN Red List of Threatened Species. Downloaded on 20 August 2016
- Willughby, F. & J. Ray (1686).** *De Historia Piscium*. Oxford University Press, Sheldonian Theatre for the Royal Society.
- Zacharia, P.U. & K.P. Kanthan (2010).** Unusual heavy landing of rays and skates at Tuticorin Fisheries Harbour. *Marine Fisheries Information Series Technical and Education Series* 205: 13–15.







OPEN ACCESS



The Journal of Threatened Taxa is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at [www.threatenedtaxa.org](http://www.threatenedtaxa.org). All articles published in JoTT are registered under [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/) unless otherwise mentioned. JoTT allows unrestricted use of articles in any medium, reproduction, and distribution by providing adequate credit to the authors and the source of publication.

ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

December 2017 | Vol. 9 | No. 12 | Pages: 10985–11104

Date of Publication: 26 December 2017 (Online & Print)

DOI: 10.11609/jott.2017.9.12.10985-11104

[www.threatenedtaxa.org](http://www.threatenedtaxa.org)

#### Communications

***Nyctibatrachus mewasinghi*, a new species of night frog (Amphibia: Nyctibatrachidae) from Western Ghats of Kerala, India**  
-- Keerthi Krutha, Neelesh Dahanukar & Sanjay Molur, Pp. 10985–10997

**An interview-based survey to determine the conservation status of Softshell Turtles (Reptilia: Trionychidae) in the Irrawaddy Dolphin Protected Area, Myanmar**  
-- Steven G. Platt, Tint Lwin, Naing Win, Htay Lin Aung, Kalyar Platt & Thomas R. Rainwater, Pp. 10998–11008

**Notes on taxonomy and captive development of the *Rattus andamanensis* (Blyth, 1860) (Rodentia: Muridae) from southern Andamans, India**  
-- S.S. Talmale & T. Bharathimeena, Pp. 11009–11015

**Review and analysis of human and Mugger Crocodile conflict in Gujarat, India from 1960 to 2013**  
-- Raju Vyas & Colin Stevenson, Pp. 11016–11024

**Status of conflict mitigation measures in Nilambur, Western Ghats of Kerala, India**  
-- C.K. Rohini, T. Aravindan, K.S. Anoop Das & P.A. Vinayan, Pp. 11025–11032

#### Short Communications

**Notes on the taxonomy and distribution of two endemic and threatened dipterocarp trees from the Western Ghats of Kerala, India**  
-- M.S. Sanil, V.B. Sreekumar, K.A. Sreejith, A.J. Robi & T.K. Nirmesh, Pp. 11033–11039

**Phenology and seed germination of the Indian Screw Tree *Helicteres isora* L. (Malvales: Malvaceae)**  
-- Mariappan Muthukumar, Thirupathi Senthil Kumar & Mandali Venkateswara Rao, Pp. 11040–11044

**Additions to the sea snail fauna (Mollusca: Gastropoda: Opisthobranchia) of Lakshadweep Islands, India**  
-- B.K. Sneha Chandran, R. Ravinesh & A. Biju Kumar, Pp. 11045–11053

**Preliminary checklist of springtails (Arthropoda: Collembola) of Uttar Pradesh, India**  
-- Ramesh Singh Yadav, Pp. 11054–11059

**A new species of zygaenid moth *Elcysma ziroensis* (Lepidoptera: Zygaenidae: Chalcosiinae) from India**  
-- Punyo Chada, Monsoon Jyoti Gogoi & James John Young, Pp. 11060–11066

**Dragonflies and damselflies of University of North Bengal campus, West Bengal, India with new distribution record of *Agrionemis kalinga* Nair & Subramanian, 2014**  
-- Aaratrik Pal, Pp. 11067–11073

**A first record of the Bentfin Devil Ray *Mobula thurstoni* (Lloyd, 1908) (Myliobatiformes: Mobulidae) from the Indian EEZ of the Andaman Sea**  
-- Swapnil Shivdas Shirke, M. Nashad, Monalisha Devi Sukham & H.D. Pradeep, Pp. 11074–11080

**First records of the Indo-Pacific Finless Porpoise *Neophocaena phocaenoides* (G. Cuvier, 1829) (Cetartiodactyla: Phocoenidae) from Sri Lanka**  
-- Ranil P. Nanayakkara, Thomas A. Jefferson & Sandaruwan Abayaratne, Pp. 11081–11084

#### Notes

**Largest fungal fruit body from India**  
-- Manoj Kumar, Prahlad Singh Mehra, N.S.K. Harsh, Amit Pandey & Vijay Vardhan Pandey, Pp. 11085–11086

**Ichthyofauna of Udayasamudram Reservoir in Nalgonda District, Telangana State, India**  
-- Rachamalla Shyamsundar, Kante Krishna Prasad & Chelmala Srinivasulu, Pp. 11087–11094

**First record of migratory Grey-necked Bunting *Emberiza buchanani* Blyth, 1844 (Aves: Passeriformes: Emberizidae) as a winter visitor in Tiruchirappalli District, Tamil Nadu, India**  
-- T. Siva & P. Neelanarayanan, Pp. 11095–11096

**New distribution records of Elegant Water Shrew *Nectogale elegans* Milne-Edwards, 1870 (Mammalia: Eulipotyphla: Soricidae) from the western Himalaya, Uttarakhand, India**  
-- Aashna Sharma, Vandana Rajput, Vineet K. Dubey, Aavika Dhand, Shagun Thakur, J.A. Johnson, S. Sathyakumar & K. Sivakumar, Pp. 11097–11099

**The persistence of the Striped Hyena *Hyaena hyaena* Linnaeus, 1758 (Mammalia: Carnivora: Hyaenidae) as a predator of Olive Ridley Sea Turtle *Lepidochelys olivacea* Eschscholtz, 1829 (Reptilia: Testudines: Cheloniidae) eggs**  
-- Divya Karnad, Pp. 11100–11102

#### Book Review

**Book review: A Photographic Guide -- Endemic Woody Plants of The Western Ghats**  
-- Jis Sebastian, Pp. 11103–11104

**zoo!**  
Z Ü R I C H

**WILD  
ZOO**  
Threatened Taxa