

Report On Rare Occurrence Of Endangered Chilean Devil Ray, *Mobula tarapacana*, (Philippi, 1893) From Cuddalore Waters, Southeast Coast Of India

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Abstract

The Chilean devil ray also identified as the box ray or sickle fin devil ray is a species of ray in the family Mobulidae. In worldwide, it is found in tropical and subtropical oceans and mostly presented in offshore, only infrequently emerging in near the coast. A single female specimen of Chilean devil ray occurrence was noted from Annankoil fish landing centre, Parangipettai, Cuddalore waters, Southeast coast of India during August 2019. Based on the key identification characters like Strong bony ridge present along dorsal mid-line; caudal fin without spine the specimen was identified as *Mobula tarapacana*. The morphometric and meristic characters of the recorded specimen is also described. However previously this species has been recorded from the limited areas around the world along with this the extension range distribution of this species to this Coromandel coastal region is fully discussed here.

Keywords: *Mobula tarapacana*; Chilean devil ray; Endangered; Rare occurrence; Coromandel region; South east coast of India.

INTRODUCTION

In the group of the Batoids the largest growing species are coming under the family Mobulidae where it comprises of 2 genera Viz., *Manta* (Manta ray) and *Mobula* (Devil ray) (Nelson, 2006). Coming under the genus *Mobula* globally there are about nine known species (Nelson, 2006); Long horned mobula *Mobula eregoodootenkee* (Bleeker, 1959), Atlantic devil ray (*Mobula hypostoma* Bancroft, 1831), Spine tail devil ray (*Mobula japonica* Muller &

Henle, 1841), Shortfin devil ray (*Mobula kuhlii* Muller & Henle, 1841), Giant devil ray (*Mobula mobular* Bonnaterre, 1788), Munk's devil ray (*Mobula munkiana* Notarbartolodi- Sciara, 1987), Lesser Guinean devil ray (*Mobula rochebrunei* Vaillant, 1979), Chilean devil ray (*Mobula tarapacana* Philippi, 1893) and Bentfin devil ray (*Mobula thurstoni* Lloyd, 1908) (Notarbartolo-di-Sciara, 1987) (Boer *et al.*, 2014). Previously *Mobula tarapacana*, Chilean devil ray was reported in the areas such as, Sea of Okhotsk (Tomita *et al.*, 2013), Arabian Sea (Notarbartolo *et al.*, 2015), Pacific coast (Joshua Stewart *et al.*, 2018), Indian waters (Nair *et al.*, 2015) and it was distributed in the coastal areas of Western Atlantic: off Venezuela. Eastern Atlantic: South Africa. Reported from Cape Verde Indian Ocean: north-western Red Sea and India. Western Pacific: Japan, Taiwan, and probably tropical Australia. Eastern Pacific: Gulf of California and Chile (Debelius, 1998). Reported maximum sizes for females are 305.2 cm disc width (DW) from the Gulf of California (Notarbartolo di Sciara, 1988), 310 cm DW from Sri Lanka, and 328 cm DW from Indonesia (White *et al.*, 2006). Maximum sizes on record for males are 249.4 cm DW from the Gulf of California (Notarbartolo di Sciara, 1988) and 304 cm DW from Indonesia (White *et al.*, 2006). A report in Chilean devil ray to maximum size of 370 cm DW (Compagno and Last, 1999) which is not yet confirmed. The Aim of this paper to report the rare occurrence of *Mobula tarapacana*, Chilean devil ray from Cuddalore coasts also which is not common to this coastal waters.

MATERIALS AND METHODS

Mobula tarapacana, Chilean devil ray occurrence was noted at the date of 27.08.2019 from the Annankovil fish landing centre, Parangipettai (11°29' N; 79°46' E) (Fig.1), Cuddalore waters, South east coast of India. Meanwhile the regular visit to the landing centre was made in which the Chilean devil ray was caught on the Surface Gillnet which was targeted to the Pelagic fish species such as Sardines, Herrings, etc. As the Identification of the ray fish is done through the help of Field Guide to the Identification of Mobulid Rays (Mobulidae). Morphometric characteristics of the fish specimen were measured (Table. 1) and then sex is identified as female through the absence of claspers.

RESULTS

The study revealed the rare occurrence of the *Mobula tarapacana*, Chilean devil ray (Fig.2A) from the Cuddalore coastal waters. The Total length of the devil ray caught in the

Cuddalore coast on the date of 27.08.2019 measured to Total length of 270 cm, it weighs about 240 kg

Systematic classification

Kingdom: Animalia

Phylum: Chordata

Class: Chondrichthyes

Order: Myliobatiformes

Family: Mobulidae

Genus: *Mobula*

Species: *Mobula tarapacana*

Description to the species

A medium-sized devil ray with a broad and sub-terminal mouth, disc elongate and strongly falcate, spiracles slit-like and located above edge of disc, wide tooth bands, and no caudal spine. Strong bony ridge present along dorsal mid-line; anterior margins straight near origin, then slightly concave and then convex towards the slender apex. Spiracles slit-like and elliptical, located above edge of disc. Mouth sub-terminal. Upper and lower tooth-band width ~70% of mouth width; surface of crowns pitted with rounded concavities. Denticles densely cover most of the body surfaces, abrasive to touch. Branchial filter plates on gill arches fused together along their lateral margins, 50–69 plates on each arch, 13–22 lobes on each plate, terminal lobe circular with a short basal longitudinal ridge. Tail whip-like but short, slightly longer than disc in juveniles, much less than disc length in adults and rigid; an elongated depression present behind dorsal fin; dorsal fin small, apex broadly rounded, posterior margin straight; no caudal spine present (Fig. 2C).

DISCUSSION

Around the blue planet the maximum weight of this Chilean devil ray is recorded to 350kgs (Notarbartolo di Sciara, 1987). Whereas the devil ray caught in our present study weighs about 240kgs and measured to a total length of 270Cms from Snout to Tail region. Chilean devil rays are predominantly oceanic (Thorrold *et al.*, 2014), In some cases they are

occasionally recorded in coastal water regions. Limited information is available for this devil ray (Clark *et al.*, 2006). As this species is being assessed as Endangered (Marshall *et al.*, 2019). This species may have arrived from nearby areas through climate-induced migration that occurs during the Pre Monsoon season in around oceanic waters of Bay of Bengal. Previously the checklist of the marine fishes of Tamil Nadu is done; whereas the Chilean devil ray tend to have the locality of Gulf of Mannar region (Mogalekar *et al.*, 2018); Next to that no other further record of this species is found from Tamil Nadu coastal waters. That the population rate of the Mobulids are declining at a faster rate through by developing new form of technological intervention in fishing activity only the resources can be left out over for the upcoming future generations India is naturally having a vast resource but the conservation management and fisheries regulations need to be developed. However, the occurrence of this Chilean devil ray indicates the range extension of its distribution around the Coromandel coastal region, South east coast of India.

CONCLUSION

The present study confirms the rare occurrence of the endangered Chilean devil ray, *Mobula tarapacana* in the southeast coasts of India. Our findings can be considered as the report for documentation of the rare occurrence of the Endangered Chilean devil ray from Bay of Bengal waters in the Southeast coastal region of India.

ACKNOWLEDGEMENTS

The Authors are thankful to the authorities of Annamalai University for their support and encouragement.

REFERENCES

1. Nelson, J.S., *Fishes of the world*, (John wiley and sons, 4th Ed), 2006 pp.82.
2. Notarbartolo-di-Sciara, G., 1987. A revisionary study of the genus *Mobula* Rafinesque, 1810 (Chondrichthyes: Mobulidae) with the description of a new species. *Zool. J. Linn. Soc.* 91(1):1-91.
3. De Boer, M., Saulino, J., Lewis, T., & Notarbartolo-Di-Sciara, G. (2015). New records of whale shark (*Rhincodon typus*), giant manta ray (*Manta birostris*) and Chilean devil ray

- (*Mobula tarapacana*) for Suriname. *Marine Biodiversity Records*, 8, E10. doi:10.1017/S1755267214001432
4. Tomita, T., Kawai, T., Matsubara, H., and Nagata, R. (2013). Occurrence of the Chilean devil ray *Mobula tarapacana* (Elasmobranchii: Batoidea: Myliobatiformes) in the Sea of Okhotsk: first record from cold temperate waters. *Journal of Fish Biology* 83.
 5. Notarbartolo di Sciara, G., Serena, F., & Mancusi, C. (2015). *Mobula mobular*. The IUCN Red List of Threatened Species 2015 Retrieved on 23 August, 2018 available at <http://dx.doi.org/10.2305/IUCN.UK.2015-1.RLTS.T39418A48942228.en>
 6. Stewart, Joshua & Barroso, Alfredo & Butler, Rachel & Munns, Roger. (2018). Caught at the surface: myctophids make easy prey for dolphins and devil rays. *Ecology*. 99. 10.1002/ecy.2348.
 7. Nair, R.J., Zacharia, P.U., Dinesh Kumar, S., Kishor, T.G., Divya, N.D., Seetha, P.K. and Sobhana, K.S. 2015. Recent trends in the mobulid fishery in Indian waters. *Indian Journal of Geo-Marine Sciences* 44(9): 1265-1283.
 8. Debelius, H., 1998. *Fischführer Mittelmeer und Atlantik*. Jahr Verlag GmbH & Co., Hamburg. 305 p.
 9. Notarbartolo-di-Sciara G. (1988) Natural history of the rays of the genus *Mobula* in the Gulf of California. *Fishery Bulletin* 86, 45–66.
 10. White W, Giles J, Dharmadi, Potter I (2006) Data on the bycatch fishery and reproductive biology of mobulid rays (Myliobatiformes) in Indonesia. *Fish Res* 82:65–73.
 11. Compagno, L. J. V.; Last, P. R. 1999: Mobulidae: devil rays. In: Carpenter, K. E.; Niem, V. H. ed. *FAO species identification guide for fishery purposes. The living marine resources of the Western Central Pacific. Volume 3. Batoid fishes, chimaeras and bony fishes part 1 (Elopidae to Linophrynidae)*. Rome, FAO. Pp. 1397-2068
 12. Thorrold S.R., Afonso P., Fontes J., Braun C.D., Santos R.S., Skomal G.B. and Berumen M.L. (2014) Extreme diving behaviour in devil rays links surface waters and the deep ocean. *Nature Communications* 5, 4274.
 13. Clark, T.B., Smith, W.D. & Bizzarro, J.J. 2006. *Mobula tarapacana*. *The IUCN Red List of Threatened Species* 2006: eT60199A12309970.
 14. Marshall, A., Barreto, R., Bigman, J.S., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Herman, K., Jabado, R.W., Liu, K.M., Pardo, S.A., Rigby, C.L., Romanov, E. & Walls, R.H.L. 2019. *Mobula tarapacana*. *The IUCN Red List of Threatened Species* 2019: e.T60199A124451161. <https://dx.doi.org/10.2305/IUCN.UK.20193.RLTS.T60199A124451161.en>.

15. Mogalekar, Hs & Johnson, Canciyal & Patadiya, Dhaval & Chandran, Sudhan. (2018).
Marine and estuarine fish fauna of Tamil Nadu, India. 8. 231-271.

Table and Figures

Characteristics	Measurements (Cms)
Sex	Female
Weight	240 Kg
Total length	245
Head length	42
Trunk length	135
Trunk length	68

Table. 1. Morphometric estimation for *Mobula tarapacana* (Chilean devil ray) caught from Cuddalore waters, Tamil Nadu, Southeast Coast of India.

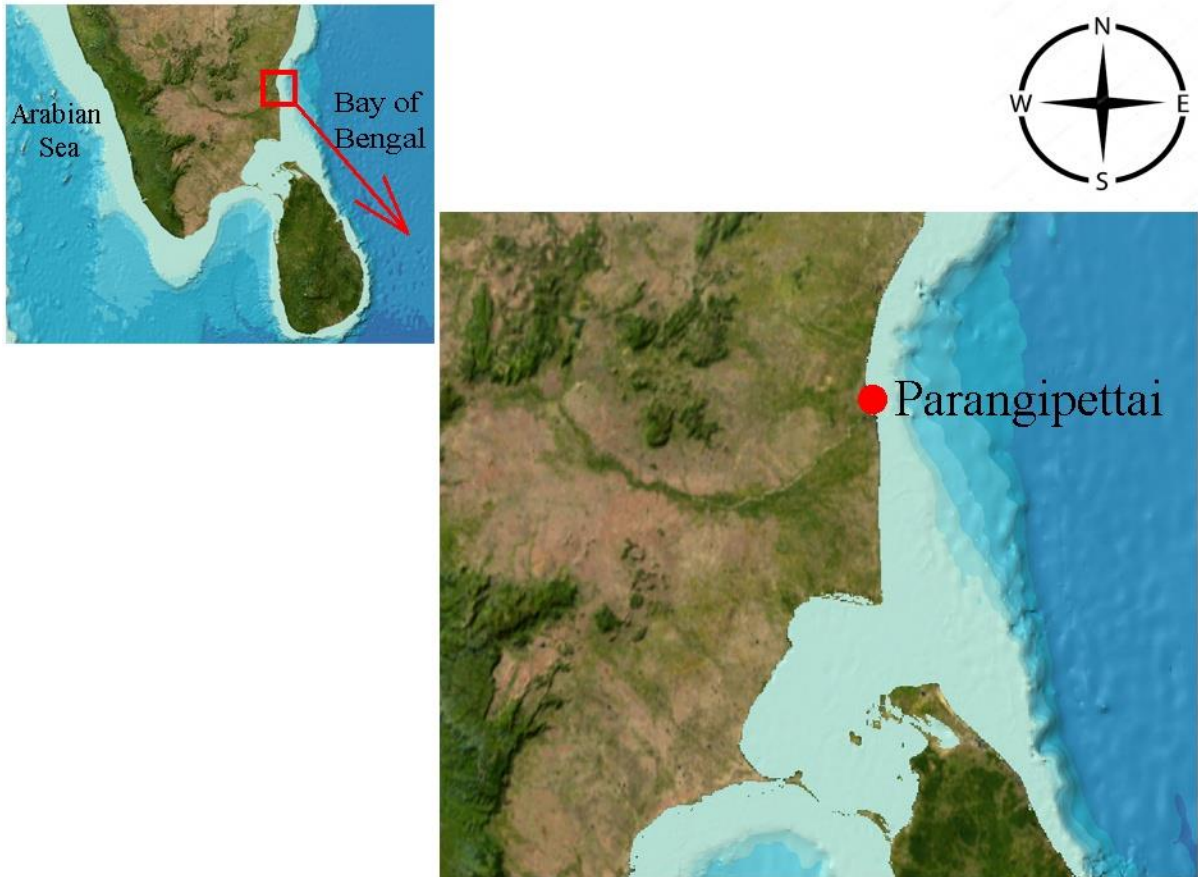


Fig. 1. The Red Mark Indicates the representation of Study area

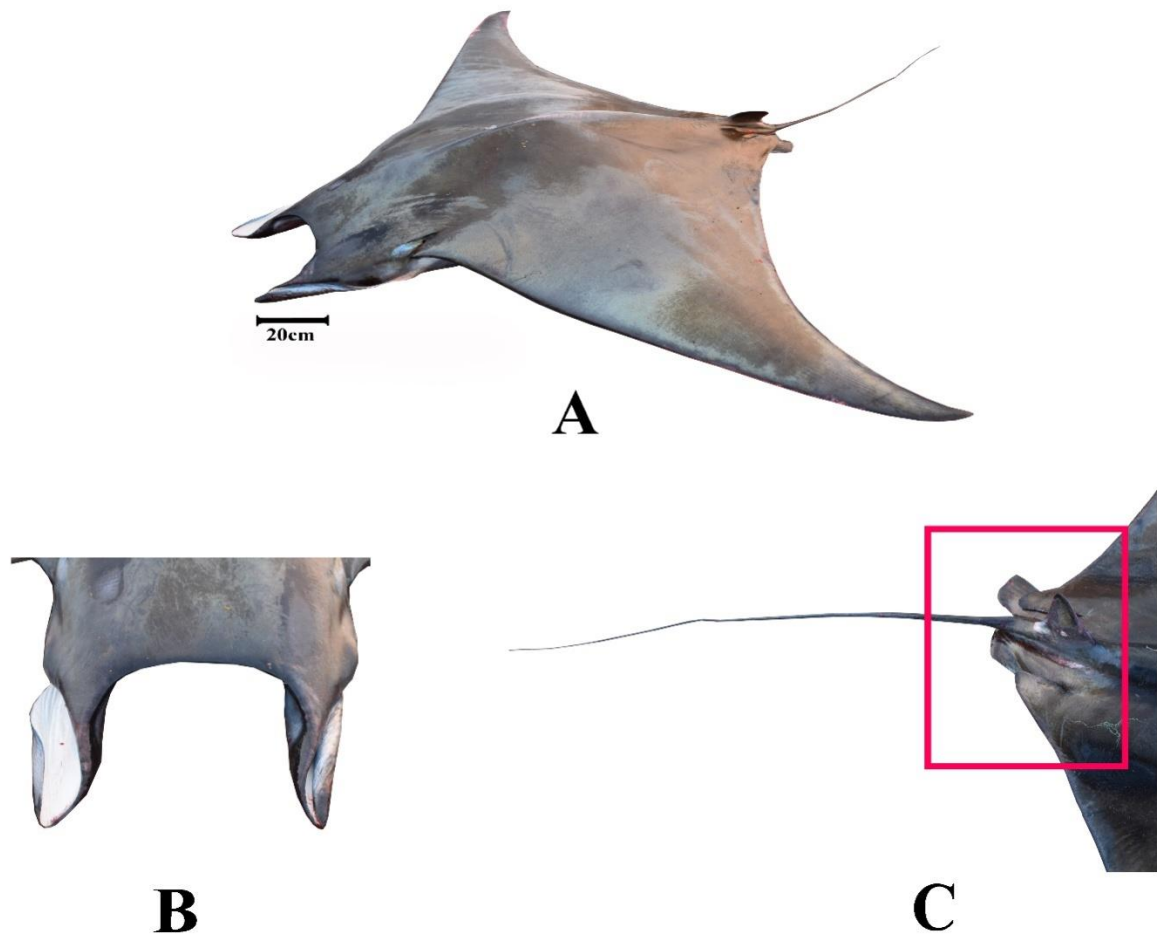


Fig.2A - Aerial view of *Mobula tarapacana*, Chilean devilray caught from cuddalore coastal waters, South east cost of India. **Fig.2B** – Head region of the Chilean devilray and **Fig.2C** – Tail region of Chilean devilray without presence of spine.