

THE ELECTRIC RAYS OF THE GENUS *TORPEDO* HOUTTUYN
(RAJIFORMES : TORPEDINIDAE) OF INDIAN SEAS

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ABSTRACT

Torpedo fairchildi Hutton and *Torpedo macneilli* (Whitley) are noted from the Indian Ocean on the basis of two specimens trawled off Quilon (India) in the Arabian Sea at a depth of 300 m. Further, the occurrence of *Torpedo fuscomaculata* Peters in Indian Seas is also reported on the basis of a specimen collected at Calicut (Kerala). The morphology of the new specimens is described. In addition, the specific status of the three earlier reported species of *Torpedo* is reviewed and notes are given on the taxonomy and distribution of the four species of our region, and characters for their separation are keyed.

INTRODUCTION

The genus *Torpedo* Houttuyn, 1764, with its fourteen species, is the largest in the family Torpedinidae. Whereas in other regions these torpedinoids are the commonest members of this family, they are most uncommon in the Indian region. The flesh is edible but generally not eaten.

In 1909 the first *Torpedo* from Indian waters was reported (Annandale, 1909) on the basis of a single specimen of *T. marmorata* Risso from the Puri coast (Orissa). Subsequently Englehardt (1912) described a new species, *Torpedo zugmayeri* from Gwadar (Pakistan). Fowler (1926) reported *T. sinus-persici* Olfers on the basis of two examples, 140 mm and 143 mm in length, from Bombay. Misra (1969) recognised only two species of *Torpedo* in the Indian region: *T. panthera* Olfers and *T. sinus-persici* Olfers.

As a result of trawling in the upper continental slope of the south-west coast of India,

one specimen each of *Torpedo fairchildi* Hutton and *T. macneilli* (Whitley) were collected, hitherto known only from the Western Pacific Ocean. Further, a specimen of *Torpedo fuscomaculata* Peters was also collected from the local catches at Calicut (Kerala), a species hitherto reported only from the Western Indian Ocean.

The purpose of this paper is to document these three new distributional records and further to review the status of the earlier recorded species of *Torpedo* of our region. This paper gives notes and a key to the four recognised species of the Indian region.

SYSTEMATIC ACCOUNT

Torpedo Houttuyn, 1764

Torpedo Houttuyn, 1764, *Nat. Hist. Dieren, Planten en Mineral*, 6: 453 (type species: *Raja torpedo* Linnaeus).

These electric rays have a well-rounded disc, broader than long, its anterior margin

truncate or emarginate, an arcuate mouth, extremely slender jaws, two well-developed dorsal fins, and the tail and caudal fin reasonably well-developed.

Key to the Species

- | | | | | |
|-------|--|-----|-----|-------------------------|
| 1 (a) | Edges of spiracles with a row of papillae or knobs (Sub-genus <i>Torpedo</i>) | ... | ... | 2 |
| (b) | Edges of spiracles smooth (Sub-genus <i>Tetronarce</i>) | ... | ... | 3 |
| 2 (a) | Rear end of base of first dorsal fin slightly anterior to rear ends of pelvic fin bases. | ... | | |
| | | | | <i>T. fuscomaculata</i> |
| (b) | Rear end of base of first dorsal fin considerably posterior to rear ends of pelvic fin bases. | ... | | |
| | | | | <i>T. sinus-persici</i> |
| 3 (a) | Rear end of base of first dorsal fin considerably posterior to rear ends of pelvic fin bases | ... | | |
| | | | | <i>T. macneilli</i> |
| (b) | Rear end of base of first dorsal fin level with or slightly anterior to rear ends of pelvic fin bases. | ... | | |
| | | | | <i>T. fairchildi</i> |

Torpedo fuscomaculata Peters

Torpedo fuscomaculata Peters, 1855, *Arch. Naturgesch.*, **21** : 278 (type locality : Mozambique); Fraser-Brunner, 1949, *Ann. Mag. nat. Hist.*, (12) **2** : 943; Bigelow and Schroeder, 1953, *Mem. Sears Fdn. mar. Res.*, (1) (pt. 2) : 97; Wallace, 1967, *Invest. Rep. Oceanogr. Res. Inst.*, (17) : 49, figs. 25 & 26.

Material : 1 ex, 297 mm in total length, Calicut (Kerala), 5 March 1975, coll. P. K. Talwar ; ZSI regd. no. F 7647/2.

DESCRIPTION

Disc 1.1 times wider than long, its anterior margin with a slight median bulge. Eyes small, much nearer to spiracles than to anterior margin of disc; spiracles with 7 papillate knobs on its edges. Mouth wide;

nostrils close together, the nasal curtain with a convex posterior margin and slightly overlaps the mouth.

Two dorsal fins, rear end of base of first dorsal fin slightly anterior to rear ends of pelvic fin bases; interdorsal space longer than distance between second dorsal fin and caudal fin. Caudal fin large, its posterior margin weakly truncate, its height less than distance from its own upper origin to origin of first dorsal fin.

Colour : in alcohol, upper surface dark brown with numerous pale or dark brown spots.

Distribution : This species has been reported earlier only from the western Indian Ocean (Zanzibar, Seychelles, Mauritius, Madagascar and Mozambique) and hence the present record from south-western India is of interest.

2. *Torpedo sinus-persici* Olfers

Torpedo sinus-persici Olfers, 1831, *Torpedo* : 15, 17 (type locality : not given); Fowler, 1926, *J. Bombay nat. Hist. Soc.*, **31** (3) : 770; Fraser-Brunner, 1949, *Ann. Mag. nat. Hist.*, (12) **2** : 945; Bigelow and Schroeder, 1953, *Mem. Sears Fdn. mar. Res.*, (1) (pt. 2) : 95; Wallace, 1967, *Invest. Rep. Oceanogr. Res. Inst.*, (17) : 53, fig. 27; Misra, 1969, *Fauna of India*, Pisces (2nd ed), **1** : 221.

Torpedo marmorata Annandale (nec Risso), 1909, *Mem. Indian Mus.*, **2** : 41, pl. 3a, fig. 4 and pl. 5, fig. 3; Prashad, 1920, *Rec. Indian Mus.*, **19** : 98; Rama-Rao, Chakrapany and Chatterjee, 1978, *Indian J. Zootomy*, **16** (3) : 234.

Torpedo zugmayeri Englehardt, 1912, *Zool. Anz.*, **39** : 647 (type locality : Gwadar, Baluchistan).

Torpedo panthera Misra (nec Olfers), 1969, *Fauna of India*, Pisces (2nd ed.), **1** : 219, pl. 19.

Material : 1 ex (♂), 114 mm in total length, Vizagapatnam (Andhra Pradesh), coll. Moti Ram ; ZSI regd no 11397 (as *Torpedo*

marmorata); 1 ex (♀), 378 mm in total length, Puri (Orissa), December 1980, coll. *T. Jenkins*, ZSI regd. no. F 2354/1 (as *T. marmorata*); 2 ex, 112-133 mm in total length, Vizagapatnam, 10 July 1963, coll. *A Daniel*, ZSI regd. no. F 6924/2 (as *T. marmorata*).

DESCRIPTION

Disc subcircular, 1.1-1.2 times wider than long, its anterior margin slightly truncate, the remainder of its perimeter uniformly rounded. Eyes small, much closer to spiracles than to anterior margin of disc; margin of spiracles with 9 or 10 papillae. Nostrils close together; nasal curtain with a convex posterior margin, part of which overlaps the mouth. A wide muscular fold overlaps each corner of mouth and makes it appear small superficially, but it does in fact have a wide gap.

Two dorsal fins, rear end of base of first dorsal fin considerably posterior to rear ends of pelvic fin bases; interspace between first and second dorsal fins shorter than distance between second dorsal and caudal fins. Caudal fin large, its posterior margin slightly convex in juveniles and truncate in adults, its height less than distance from its own upper origin to origin of first dorsal fin.

Colour : in alcohol, dorsal surface brownish, densely marbled with short tortuous cream coloured lines. Circular markings often present and irregularly shaped spots occur near the margins of the disc, on the pelvic and caudal fins.

Distribution : Pakistan, coasts of India Sri Lanka, the Gulf of Aden and the east coast of Africa.

Remarks : The colour and pattern of this species is most distinctive. Study of Annandale's (1909), Prashad's (1920) and Rama-Rao *et al* (1978) study material of *Torpedo marmor-*

ata clearly shows it to be identical with *T. sinus-persici* Olfers as the eyes are much nearer to the spiracles than to the anterior margin of the disc and the spiracles are with 9 or 10 (vs 7) papillae. Fraser-Brunner (1949) followed by Bigelow and Schroeder (1953), has shown that *T. marmorata* is restricted to the Atlantic Ocean. Misra (1969) treated Annandale's (1909) (nec Risso) *marmorata* identical with *T. panthera* Olfers without any basis, a species restricted to the Red Sea (Fraser-Brunner, 1949; Bigelow and Schroeder, 1953).

Torpedo zugmayeri Engelhardt, 1912, was considered conspecific with *T. marmorata* Risso by Fowler (1941) and identical with *T. panthera* Olfers by Misra (1969). Fraser-Brunner (1949) overlooked the species in his revision of the genus *Torpedo*. Two specimens of *Torpedo*, 288 mm and 340 mm in total length, in our collections earlier determined as *T. zugmayeri* Engelhardt and without any apparent history, defy identification. These have now been incorporated in our collections (regd no. F. 7649/2) under the latter name. The status of *T. zugmayeri* needs further study.

3. *Torpedo fairchildi* Hutton

Torpedo fairchildi Hutton, 1872, *Colonial Mus. Geol. Surv. N. Z.* : 83, pl. 12, fig. 134 (type locality : Napier Harbour, New Zealand); Bigelow and Schroeder, 1953, *Mem. Sears Fdn. mar. Res.*, (1) (pt. 2) : 97.

Torpedo panthera Talwar (nec Olfers), 1974, *J. mar. biol. Ass. India*, 14 (2) : 779 (name only).

Material : One female, 188 mm in total length, off Quilon (approx. 09°N., 76°E), otter trawl haul, 300 m, 3 March, 1971, coll. *P. K. Talwar*; ZSI regd. no. F 7648/2.

DESCRIPTION

Disc subcircular, about 1.1 times as broad as long, its edge fleshy and thick in front but

thinning progressively rearward to posterior parts of pectoral fins, where it is exceedingly thin. Eyes small, very much closer to spiracles than to anterior margin of disc. Edges of spiracles smooth (without papillae), equal eyes, head anterior to spiracles about 2.2 times as long as distance between inner ends of spiracles. Nostrils small; nasal curtain distantly placed from upper jaw.

Two dorsal fins, rear end of base of first dorsal fin level with rear ends of pelvic fin bases; interspace between second dorsal fin about 1.25 times as long as base of first dorsal fin. Caudal fin large, its posterior margin weakly emarginate, its height less than distance from its own upper origin to origin of first dorsal fin.

Colour: in alcohol, dorsal surface brownish, ventral surface white with the outer edges of the pelvic fins blackish.

Distribution: New Zealand and the present record from south-western India extends its range to the Indian Ocean.

Torpedo macneilli (Whitley)

Notastrape macneilli Whitley, 1932, *Rec. Australian Mus.*, 18 : 327 (type locality: Off Green Cape, New South Wales, 88 m).

Torpedo macneilli Bigelow and Schroeder, 1953, *Mem. Sears Fdn. mar. Res.*, (1) (pt. 2) : 95; Andrews, 1972, *Papers Proc. Roy. Soc. Tasm.*, 106 : 2.

Material: One male, 204 mm in total length, trawled off Quilon (Kerala), 300 m, 5 February, 1977, coll. P. K. Talwar; ZSI regd. no. F 7559/2.

DESCRIPTION

Disc broad and subcircular, about 1.25 times as broad as long, its edge fleshy and thick. Eyes small, much closer to spiracles than to anterior margin of disc. Spiracles

smooth (with no papillae); head anterior to spiracles about 2 times as long as distance between inner ends of spiracles. Nostrils small and close together; nasal curtain widely placed from upper jaw.

Two dorsal fins, rear end of base of first dorsal fin considerably posterior to rear ends of pelvic fin bases, about half of first dorsal fin-base over pelvic fin-base. Interspace between second dorsal fin and caudal fin slightly less than base of first dorsal fin. Caudal fin large, its outer edge weakly convex, its height considerably greater than distance from its upper origin to the origin of first dorsal fin.

Colour: in alcohol, dorsal surface uniformly brown with scattered minute chocolate brown spots, ventral surface creamy white.

Distribution: New South Wales, Victoria, South Australia, Southern Western Australia, Tasmania (Munro, 1956; Mc Kay, 1966; Andrews, 1972) and present record from south-western India extends its range to the Indian Ocean.

Remarks: This species is considered by some authors, notably Whitley (1940) and Fowler (1941), to be doubtfully distinct from the evidently closely allied *T. fairchildi* Hutton, from New Zealand. According to Bigelow and Schroeder (1953) and Mc Kay (1966) the principal difference separating the two species appears to be the point of termination of the base of the first dorsal fin which is stated to be posterior to the end of the pelvic fin base in *T. macneilli* and level with this point in *T. fairchildi*.

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