



Note

First record of the pelagic stingray *Pteroplatytrygon violacea* (Bonaparte, 1832) (Family: Dasyatidae) from the east coast of India

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ABSTRACT

Pelagic stingray, *Pteroplatytrygon violacea*, (Bonaparte, 1832) was recorded for the first time from the east coast of India. The female specimen measuring 91 cm in TL was collected from the hooks and line landings from Tuticorin on 9th July 2009. The morphometric measurements of the specimen were compared with the specimens previously recorded from west coast of India and from the North Sea. The present specimen agrees with most of the characters of earlier specimens, but variation was observed in the disc width, disc length, eye length, inter-space first gill slits, snout to cloaca length and cloaca to tail length as compared to the paratypes, which may be variations owing to sex-specific differences. The present specimen might have migrated from the populations available in the equator, along with the monsoon currents.

Keywords: East coast of India, First record, Pelagic stingray, *Pteroplatytrygon violacea*

Pelagic stingrays of the genus *Pteroplatytrygon* (Bonaparte, 1832) has been recorded from Atlantic Ocean, Pacific Ocean, Indian Ocean, South China Sea, south-west Australian shelf, Tasman Sea, New Zealand shelf (Muller and Henle, 1841; Gunther, 1870; Last, 1979; Nakayak, 1982; McEachran and Capape, 1984; Mollet, 2002; Domingo *et al.*, 2005; Ellis, 2007; Froese and Pauly, 2008). This species has been reported from the west coast of India by Jayaprakash *et al.* (2006) and Akhilesh *et al.* (2008). Hitherto, this species has not been reported anywhere from the east coast of India. Although this species was recorded from different oceans, knowledge on biology, migration and its exact taxonomic position is lacking. The stingrays are represented by more than 60 extant species of which two genera are poorly defined and needs critical assessment to determine their monophyly and which may not represent a single family (Last and Compagno, 2001). As this is the first report of *P. violacea* from the east coast of India, a detailed description is given.

A single ray specimen was landed by hooks and line fishermen who operated at a depth of 140 m north of Tuticorin coast of the Gulf of Mannar (GOM) on 9th July, 2009. The specimen was identified as pelagic stingray *Pteroplatytrygon violacea* (Bonaparte, 1832). The specimen measured 91 cm in TL and weighed 2.5 kg. Morphometric measurements were taken as per method given by Mollet (2002) with a Mitutoyo digital vernier caliper with an accuracy of 0.5 mm. Morphometric data of the present specimen was compared with the data of

paratype of TL 152 cm (GA. 7.1.3.1 of Designated National Repository of CMFRI), Kochi from south-west coast (Akhilesh *et al.*, 2008) and paratype from North Sea (Ellis, 2007). The specimen was dissected out and internal anatomy was noted. The specimen was preserved in formalin and kept in the museum of Tuticorin Regional Centre of CMFRI.

Pteroplatytrygon violacea (Bonaparte, 1832)

(Fig. 1 and 2)

Synonyms

Trygon violacea Bonaparte, 1832, *Iconografia*, v.3, fasc.1, punt. 6, pl. 155 (type locality: Italy)

Trygon purpurea Muller and Henle (ex-Smith), 1841, *Palgistomen*, p. 160, pl. 52. (type locality: No locality).

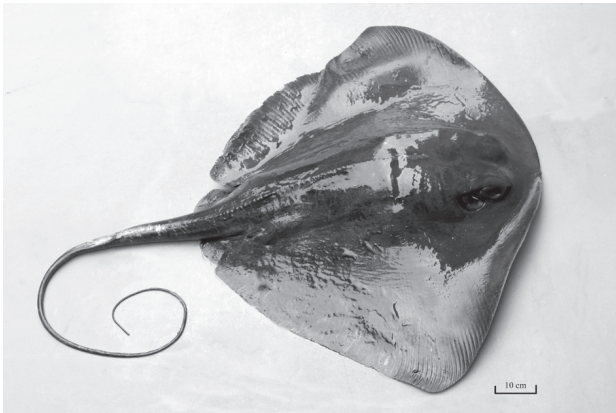
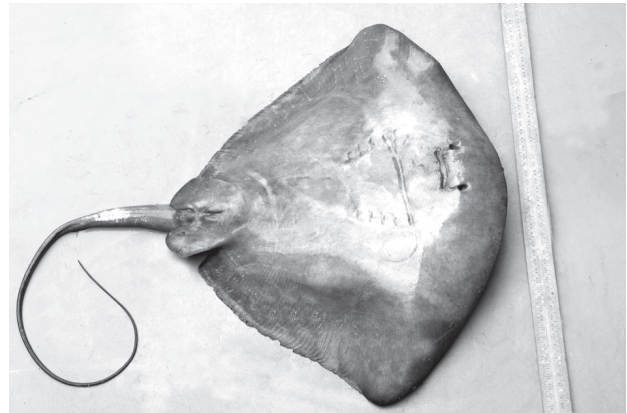
Dasyatis atratus Ishiyama & Okada, 1955, *J. Shimonoseki Coll. Fish.*, v. 4 (2), p. 211, figs. 1-2 (type locality: North of Mariana Island).

Dasyatis guileri Last, 1979, *Pap. Proc. of the Royal Society of Tasmania*, v. 113, p. 172, fig. 1 (type locality: Tasmania, Australia).

Material examined

Colour in fresh condition: Dorsal surface was black and ventral side light brown.

Description: Dorsal surface is characterised by clearly marked head with well developed opercular and stomach

Fig. 1. Dorsal view of *P. violacea* (91 cm TL, female)Fig. 2. Ventral view of *P. violacea*

regions which is unique to this species (Fig. 1). Body is covered with slimy mucous with single spine in the tail. Single row of 47 tubercles facing downward runs through the middle of the body. Eyes with thick eyelid, eye width measured 2.9 cm and eye diameter 2.3 cm. Body broad and disc wedge shaped. The upper side of the disc measures 26 cm and lower 27 cm. Snout is more or less rudimentary in nature. Two spiracles with 2.5 cm width and 3.0 cm length separated by 3.8 cm. Second dorsal fin small and oar shaped

with a base length of 5 cm and height of 5.5 cm. Mouth transverse, narrow, slightly arched and with labial fold. The length of the labial fold is 4.3 cm and its height 1.7 cm. Several rows of teeth present in the mouth. Overall width of the mouth is 5.5 cm. Ventral spiracle opens 0.8 cm above mouth, each one with width of 0.4 cm separated by a distance of 3.8 cm. Five pairs of gill slits and the inner space between first, second, third, fourth and fifth gill slits are 10.1, 9.7, 9.3, 8.6, and 7.9 cm respectively. The length from snout to

Table 1. Morphometric measurements as the percentage of TL of the present specimen and the partatypes

Dimension (cm)	Arabian Sea off Cochin (Akhilesh <i>et al.</i> , 2008) (Male)	North Sea (Ellis, 2007) (Male)	Gulf of mannar of Tuticorin (Present study) (Female)
Total length	102.00	99.50	91.00
Disc width	46.08	42.20	51.43
Disc length	34.31	33.70	41.43
Pre-orbital length	5.49	5.30	4.51
Length of the eye	1.57	1.60	3.14
Inter-orbital distance	6.57	4.10	5.27
Pre-spiracular distance	7.35	6.90	6.59
length of the spiracle	2.55	2.20	3.19
Inter-spiracular distance	7.65	7.70	8.02
Pre-narial length	5.10	4.80	4.51
Inter-narial distance	4.41	4.20	4.29
Pre-oral distance	6.27	6.30	6.03
Mouth width	5.39	4.90	5.38
Interspace first gill slits	8.82	8.50	11.10
Interspace fifth gill slits	6.47	6.00	8.68
Snout to first gill opening	11.37	10.80	10.77
Snout to fifth gill opening	16.57	15.70	16.26
Snout to cloaca (anterior) distance	29.90	29.60	32.09
Cloaca (anterior) to end of the tail	70.10	71.40	57.14
External clasper length	6.18	5.50	n.a

Note: Except total length all other measurements are given as % of TL

first, second, third, fourth and fifth gill slits are 9.8, 11.1, 12.2, 13.4 and 14.8 cm respectively.

Specimen was a female as noticed by the absence of claspers and presence of small young ones in the uterus. Specimen had single uterus with two mature eggs and seven developing ones. Diameter of the mature eggs was 0.9 cm. The stomach was empty continued by a long intestine. The length of alimentary canal was 32 cm with 3 cm width in the foregut region and 2.5 cm at the anal region. Liver massive which almost fills 70% of the body cavity. Certain morphometric measurements (as percentage to total length) of the present specimen compared with the paratypes are given in Table 1.

The present specimen was identified as *P. violacea* due to its body symmetry, dark colouration of the dorsal and ventral surface, well developed dorsal fin suitable for pelagic life and broad wedge shaped disc (Last and Stevensen, 1994; Mollet, 2002). The morphometric characteristic of the present female specimen agrees in most of the characters with the male representatives described from North Sea (Ellis, 2007) and Arabian Sea (Akhilesh *et al.*, 2008). But variation was observed in the case of disc width (+7) and disc length (+7), eye length (+1.5) inter-space of first gill slits (+2.5), snout to cloaca length (+2.4) and cloaca to tail length (-14) as compared to the paratypes, which are attributed to variations owing to sex-specific differences. This shows that there exists considerable morphometric variation between sexes of *P. violacea* especially in disc width, disc length, distance from cloaca to end of tail. The species being ovoviviparous in nature females need to have more space in body cavity in order to accommodate female reproductive organs as well as accessory organs associated with ovo-viviparity. Embryos initially feed on yolk and later obtain additional nourishment from the mother by indirect absorption of uterine fluid enriched with mucus, fat and protein through specialised structures (Breder and Rosen, 1966). Fecundity is generally 2-9 and youngones are born at 15-25 cm DW after gestation period of 4 months. The variation in morphometric characteristics observed from that of the earlier specimens recorded may be due to the variation owing to different sexes as this is the first female specimen recorded from Indian waters.

Two populations of *P. violacea* are present in the Indian Ocean, one along the equator between Africa and Australia (Wallace, 1967) and another along the south-east coast of Australia (Last, 1979). The present specimen recorded from the Gulf of Mannar (GOM), might have dispersed or migrated either from the equator or from south Australian waters. The most probable reason for the presence of *P. violacea* along the GOM area of the Indian coast can be attributed to the migration of this species from the equator population. The west-wardly flowing South Equatorial

current meets with Somali current and continues as monsoon currents. This monsoon current reaches along the Indian coast during June-July. The occurrence of *P. violacea* reported by Akhilesh *et al.* (2008) during August in the west coast of India supports this argument. The present specimen might have migrated from the equator along with the monsoon currents and reached the Gulf of Mannar coast in July as the current flows in an eastwardly direction during south-west monsoon.

P. violacea shows characters of the family Rajidae and Dasyatidae such as rhomboidal disc, depressed and flattened trunk, short snout, five gill opening and very large pectoral fin (Last and Compagno, 2001). It differs from rays of the family Rajidae by presence of medium whip like tail, single row of tubercles, tail without lateral folds and presence of sting on tail and absence of dorsal and caudal fins. It also shows difference from Dasyatidae in having medium whip like tail smaller than disc length, one row of tubercles and smooth body surface (Last and Compagno, 2001). Although it shows more similarities toward the family characteristics of Dasyatidae, its pelagic habitat and long migration pattern triggered the development of some of the characters which was otherwise modifications suitable for its habitat. These similarities and differences have to be thoroughly investigated before arriving at meaningful decision on the issue of the taxonomic status of *Pteroplatytrygon*, such that whether it belong to Dasyatidae or is it needed to be treated independently in a new family.

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