

Short Communication

The first report on the occurrence of *Dactyloptena peterseni* (Nyström, 1887) (Dactylopteriformes; Dactylopteridae) in the northern Arabian Sea

Farooq S.^{1*}; Muhammad A.A.²

Received: October 2021

Accepted: January 2022

1-Marine Science Division, Department of Zoology, University of Karachi, Pakistan
2-Coastal Development and Fisheries Department, Government of Balochistan, Pakistan
Corresponding author's Email: sfarooqu@uok.edu.pk

Keywords: New report, *Dactyloptena peterseni*, Western Indian Ocean, Arabian Sea, Pakistan

Introduction

The Family Dactylopteridae consists of beautifully colored flying and helmet gurnards. Their enlarged pectoral fins are weak and used as a defense display or as a warning behavior (Breder, 1963). The anterior part of the large pectoral fin is used to pursue food (Poss and Eschmeyer, 1999). The Dactylopterids are distributed widely on sandy bottoms in tropical, sub-tropical, and warm-temperate waters (Hubbs, 1933; Eschmeyer, 1986; 1990; Nelson, 1994; Owfi, 2021). These are non-commercial fishes, which mostly caught as by-catch during commercial trawling operations.

The Family Dactylopteridae currently contains two genera, *Dactylopterus* and *Dactyloptena*. The genus *Dactylopterus* comprised of one species *Dactylopterus volitans* (Linnaeus, 1758), whereas the genus

Dactyloptena comprised of six species *Dactyloptena orientalis* (Cuvier, 1829; Jordan and Richardson, 1908; Froese and Pauly, 2020), *D. gilberti* (Snyder, 1909), *D. papilio* (Ogilby, 1910), *D. tiltoni* (Eschmeyer, 1997), *D. macracantha* (Bleeker, 1855) and *D. peterseni* (Nyström, 1887).

The genus *Dactyloptena* is widely distributed in Pacific and Indian Ocean (Eschmeyer, 1986, 1990). *D. orientalis* is the most widely distributed species in Indian Ocean and Indo-Pacific from Japan to Australia (Fischer and Bianchi, 1984; Poss and Eschmeyer, 1999). *Dactyloptena gilberti* is reported from Red Sea, Arabian Sea, south Japan, Thailand and India (Poss and Eschmeyer, 1999; Bogorodsky *et al.*, 2014). *D. papilio* is known to occur in Arafura Sea, northern and western Australia (Sainsbury *et al.*, 1984). The

D. tiltoni is reported from Philippines and western Australian waters (Eschmeyer, 1997). *D. macracantha* is distributed in the eastern Indian Ocean, Sri Lanka, western Pacific Ocean, north Australia and Papua New Guinea (Kailola, 1987; Poss and Eschmeyer, 1999). The *D. peterseni* (Starry flying gurnard) was frequently recorded from southern Japan (Nakabo, 2013), South China Sea and Yellow Sea in Pacific Ocean (Yamada *et al.*, 1995; Fujiyama, 2004), from South Africa (Smith, 1961), Gulf of Aqaba, Red Sea and Saudi Arabia (Randall *et al.*, 1994; Golani and Bogorodsky, 2010), and from Indian waters (Salvi and Deshmukh, 1965; Silas, 1965; Karuppasamy *et al.*, 2018). In addition to north-western Arabian Sea, this species have not been recorded from the Persian Gulf and Hormoz Strait (Eagderi *et al.*, 2019; Owfi, 2021).

Out of the six reported species of Genus *Dactyloptena* only two species *D. gilberti* and *D. orientalis* were reported from Pakistan (Psomadakis *et al.*, 2015). This is the first report on the occurrence of third species *D. peterseni* in the coastal waters of Pakistan (northern Arabian Sea). Although the *D. peterseni* is reported from the Indian waters but never been recorded from the coastal waters of Pakistan. *D. peterseni* can easily be distinguished from *Dactyloptena orientalis* and *D. macracanthus* by lacking the second free spine in the first dorsal fin (Jones, 1965; Fisher and Bianchi, 1984).

Materials and methods

Two specimens of *Dactyloptena peterseni* (26.8 and 27 cm in total length) were collected from the commercial trawl landing at Karachi fish harbor (24.84°N 66.98°E) in January 2017 during the study of diversity of by-catch fishes in commercial trawl landings. The fishes were brought to the laboratory for detailed examination and identification. The fishes were identified by using identification keys (Fisher and Bianchi, 1984; Eschmeyer, 1986; Poss and Eschmeyer, 1999). The fresh specimen of fish was photographed, and the meristic counts and morphometric parameters of one specimen were recorded. The second specimen was slightly damaged due to which only length was measured. The morphometric measurements were taken on the left side of the specimen by a digital caliper to a nearest cm. Total length (TL, cm), standard length (SL, cm), and total weight (TW, gm) were measured. The eye diameter and inter-orbital length were also obtained.

Results and discussion

Family *Dactylopteridae*

Dactyloptena peterseni (Nyström, 1887) The morphometric characters and measurements of *Dactyloptena peterseni* is given in Table 1. The detail of characters is are as follows: Dorsal fin spine 1+ 6, dorsal fin rays 8, pectoral fin 32 rays, ventral fin 6, anal fin 6, and caudal fin with 10 rays. Total length 27cm; Total weight 209 g; Standard length 22cm.

Table 1: Morphometric characters and measurements of *Dactyloptena peterseni* in present study.

No.	Parameter	Size
1	Total length	27 cm
2	Standard length	22 cm
3	Eye diameter	2 cm
4	Inter-orbital length	3 cm
5	Caudal fin length	5.4 cm
6	Anal fin length	2.3 cm
7	Ventral fin length	4.5 cm
8	Pectoral fin length	14.5 cm
9	Head length	6 cm
10	Total weight	209 gm

Body is reddish and orange in color (Fig. 1a-d). Ventral side is white in color. Head is broad with prominent keeled post-temporal spine. Eyes are large and orangish in color. Snout is round (Fig. 1d). Pectoral fins are wing-like and

divided into short and long sections; the long section reached to the base of caudal fin. The spinous and soft dorsal fins separated by a deep notch. The first dorsal fin with a single long filamentous spine separated from the rest of the spinous dorsal fin (Fig. 1c). The gap between the first filamentous spine and the rest of the continuous spines was 4 cm. The Last spine is small and separated from the rest of the spines. The gap between 5th and 6th spine was 2 cm. The soft dorsal fin has 8 soft rays. Three pairs of large keel-like scales present at the ventro-caudal edge. This fish is identified by having a characteristic single elongate separate dorsal spine.

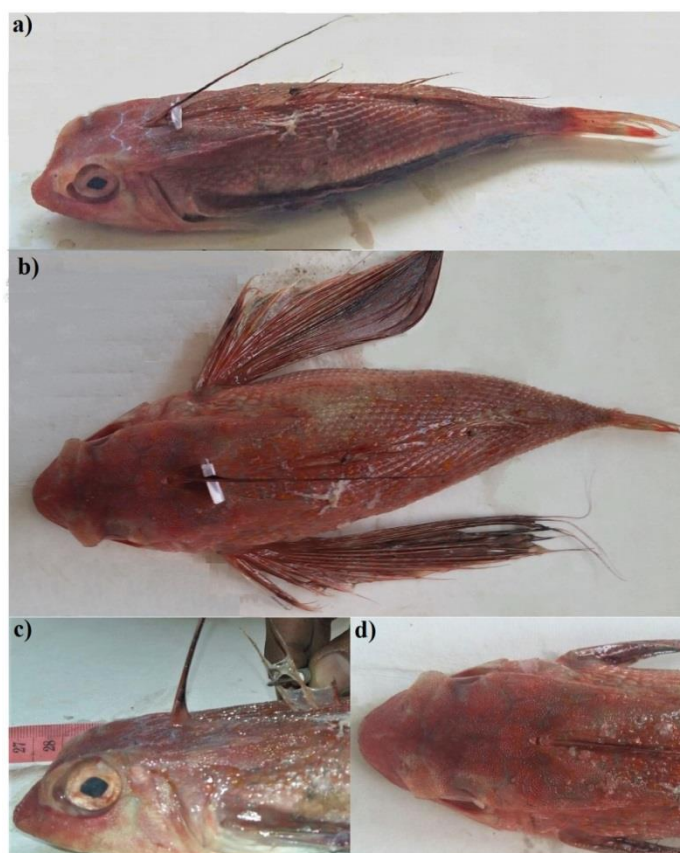


Figure 1: *Dactyloptena peterseni* collected from Karachi fish harbour in January 2017. (a) Lateral view; (b) dorsal view; (c) lateral view of head showing single filamentous dorsal spine; (d) dorsal view of head showing snout.

Comparison of meristic characters of *D. peterseni* with other studies is given in Table 2. The present specimen is closed to the specimens described from Persian Gulf and India (Randall *et al.*, 1994; Karuppasamy *et al.*, 2018) except in having 6 ventral fin rays. The present specimen of *D. peterseni* differs from the Australian specimen in anal fin

(Eschmeyer, 1997) and in pectoral and ventral fin of Japan specimen (Jordan and Richardson, 1908). The collected specimens of *D. peterseni* were comparatively smaller in length. The maximum length of *D. peterseni* (36 cm) was reported by Novikov *et al.* (2002) from Russian waters.

Table 2: Comparison of meristic characters of *Dactyloptena peterseni* with other studies.

Locality	Dorsal fin	Anal Fin	Pectoral fin	Caudal fin	Ventral fin	Length (TL)	Author
Pakistan (Arabian Sea)	VII, 8	6	32	10	6	27 cm	Present study
India (Wadge Bank, Southwest coast)	VII, 8	6	32	-	4	28.5 cm	Karuppasamy, <i>et al.</i> , 2018
Philippines and Australia	VII, 8	4	-	-	-	-	Eschmeyer, 1997
Saudi Arabia (Persian Gulf)	VII, 8	6	32	10	5	29.7 cm	Randall <i>et al.</i> , 1994
Japan	VI, 8	6	33	-	5	28 cm	Jordan and Richardson, 1908

The dactylopterid fishes were occasionally observed in the landings of commercial trawlers at the harbors of Sindh. This is the first report on the occurrence of *Dactyloptena peterseni* in the coastal waters of Pakistan. The fish is caught along with the *Dactyloptena orientalis* in commercial trawling operation.

References

- Bogorodsky, S.V., Alpermann, T.J., Mal, A.O. and Gabr, M.H., 2014.** Survey of demersal fishes from southern Saudi Arabia, with five new records for the Red Sea. *Zootaxa*, 18, 3852 (4), 401-37. DOI: 10.11646/zootaxa.3852.4.1.
- Breder, C.M. Jr., 1963.** Defense behavior and venom in *Scorpaena* and *Dactylopterus*. *Copeia*, 698-700. <http://doi.org/10.2307/1440974>
- Eagderi, S., Fricke, R., Esmaeili, h. R. and Jalili, P., 2019.** Annotated checklist of the fishes of the Persian Gulf: Diversity and conservation status. *Iranian Journal of Ichthyology*, 6 (Suppl.1), 1-171. DOI: 10.22034/iji.v6i0.454
- Eschmeyer, W.N., 1986.** Family no. 149: Scorpaenidae. In: M.M. Smith, P.C. Heemstra, (eds.) *Smiths, Sea Fishes*. Johannesburg. Macmillan South Africa, 463-478 P.
- Eschmeyer, W.N., 1990.** Catalog of the genera of recent fishes. California

- Academy of Sciences San Francisco 697 P.
- Eschmeyer, W.N., 1997.** A new species of dactylopteridae (Pisces) from the Philippines and Australia, with a brief synopsis of the family. *Bulletin of Marine Science*, 60(3), 727-738.
- Fischer, W., and Bianchi, G., 1984.** FAO species identification sheets for fishery purpose: Western Indian Ocean (Fishing area 51). Food and Agricultural Organization of the United Nations, Rome, Italy.
- Froese, R. and Pauly, D., 2020.** Fish base. In: World Wide Web electronic publication. <http://www.fishbase.org>.
- Fujiyama, M., 2004.** Privately printed book: Fishes collected with hook and line from Amami-oshima Island [Shihon amami no chogyo]. 180 P. Self-publishing (Manta Fujiyama), Naze. (In Japanese).
- Golani, D. and Bogorodsky, S. V., 2010.** The Fishes of the Red Sea- Reappraisal and updated checklist. *Zootaxa*, 2463(1), 1-135. DOI:org/10.11646/zootaxa.2463.1.1
- Hubbs, C.L., 1933.** Observations on the flight of fishes, with a statistical study of the flight of the Cypselurinae and remarks on the evolution of the flight fishes. *Papers of the Michigan Academy of Science, Arts and Letter*, 17, 575-611.
- Jones, S., 1965.** Comments on the so-called rare marine fishes of the genera *Dactyloptena* Jordan and Richardson and *Lepidotrigla* Gunther recently reported from Madras. *Mar Biol Assoc India*, 7(1), 124-126.
- Jordan, D.S. and Richardson, R.E., 1908.** A review of the flat-heads, gurnards, and other mail-cheeked fishes of the waters of Japan. *Proceedings of the United States National Museum*, 33, 629-670.
- Kailola, P.J., 1987.** The fishes of Papua New Guinea: a revised and annotated checklist. Vol. II Scorpaenidae to Callionymidae. Research Bulletin No. 41, Research Section, Dept. of Fisheries and Marine Resources, Papua New Guinea.
- Karuppasamy, K.K., David Kingston, S., Jawahar, P., Ranjhit, L., Kathirvelpandian, A. and Aanand, S., 2018.** New record of the starry flying gurnard, *Dactyloptena peterseni* (Scorpaeniformes; Dactyloperidae); from Wadge Bank, Southwest coast of India. *National Academy Science Letters*, pp. 1-5. <http://doi.org/10.1007/s40009-018-0726-y>.
- Nakabo, T., 2013.** Platycephalidae. In: Nakabo, T. (ed.), Fishes of Japan with pictorial keys to the species. Tokai University Press, Tokyo.
- Nelson, J.S., 1994.** Fishes of the world. 3rd edition. John Wiley & Sons Inc. 600 P.
- Novikov, N.P., Sokolovsky, A.S., Sokolovskaya, T.G. and Yakovlev, Y.M., 2002.** The fishes of Primorye. Vladivostok, Far Eastern State Tech. Fish. Univ., 552
- Owfi, F., 2021.** Checklist of approved fish species based on the International Zoological Nomenclature (Persian Gulf, Hormoz Strait, and Gulf of Oman). *Iranian Scientific Fisheries*

- Journal*, 30 (3), 65-94. DOI: 10.22092/ISFJ.2021.124812
- Poss, S.G. and Eschmeyer, W.N., 1999.** Family Dactylopteridae. In: Carpenter, K. E. and Niem, V. H. (eds), The Living Marine Resources of the Western Central Pacific. FAO Species Identification Guide for Fisheries Purposes. Volume 4. Bony Fishes Part 2 (Mugilidae to Carangidae). Rome, FAO, pp. 2283–2290.
- Psomadakis, P.N., Osmany, H.B. and Moazzam, M., 2015.** Field identification guide to the living marine resources of Pakistan. FAO Species Identification Guide for Fishery Purposes. Published by Food and Agricultural Organization of the United Nations and Marine Fisheries Department, Ministry of Ports and Shipping, Government of Pakistan.
- Randall, J.E., Downing, N., McCarthy, L.J., Stanaland, B.E. and Tarr, A.B., 1994.** Fifty-one new records of fishes from the Persian Gulf. Fauna of Saudi Arabia, 14, 220-258.
- Sainsbury, K.J., Kailola, P.J. and Leyland, G.G., 1984.** Continental Shelf Fishes of Northern and Northwestern Australia. Canberra, Fisheries Information Service, 375 P.
- Salvi, P.S. and Deshmukh, V.D., 1965.** Landings of flying gurnard in Mumbai. Marine Fisheries Information Service; Technical and Extension Series 205, 20 P.
- Silas, E.G., 1965.** Exploratory fishing by R.V. Varuna. *Cent Mar Fish Res Inst Bull*, 12, 1–86.
- Smith, J.L.B., 1961.** The sea fishes of Southern Africa, 4th Edition. Central News Agency Ltd., Cape Town.
- Yamada, U., Shirai, S., Irie, T., Tokimura, M., Deng, S., Zheng, Y., Li, C., Kim, Y.U. and Kim, Y. S., 1995.** Names and illustrations of fishes from the East China Sea and the Yellow Sea. Overseas Fishery Cooperation Foundation, Tokyo, Japan.