

## REVIEW OF STONEFISHES OF FAMILY SYNANCEIDAE FROM PAKISTAN WITH A NEW RECORD OF *SYNANCEIA NANA* ESCHMEYER AND RAMA-RAO, 1973

Hamid Badar Osmany<sup>1</sup> and Muhammad Moazzam<sup>2</sup>

<sup>1</sup>Marine Fisheries Department, Government of Pakistan, Fish Harbour, West Wharf, Karachi 74000, Pakistan and

<sup>2</sup>WWF-Pakistan, 46-K, Block 6, PECHS, Karachi 75400, Pakistan ([mmoazzamkhan@gmail.com](mailto:mmoazzamkhan@gmail.com))

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### ABSTRACT

Stonefishes belonging to Family Synanceidae are represented by many species in Pakistan, however, no comprehensive account of the known species of the area is ever published. Present study reports details of stonefishes occurring in Pakistan based on published literature as well as through the collection of specimens from various parts of Pakistan. A total of 11 species belonging to 5 genera of this family are reported. *Synanceia nana* Eschmeyer and Rama-Rao, 1973 is reported for the first time from Pakistan. Genera *Minous* and *Synanceia* were observed to be the most diversified represented by 5 and 3 species, respectively whereas genera *Choridactylus*, *Inimicus* and *Pseudosynanceia* were represented by one species each.

**Keywords:** Stonefishes, Synanceidae, *Synanceia nana*, Genus *Minous*, Genus *Synanceia*, Genus *Choridactylus*, Genus *Inimicus* and Genus *Pseudosynanceia*

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### INTRODUCTION

Fishes belonging to family Synanceidae are commonly known as stonefishes. They belong to order Scorpaeniformes and are known to have potent neurotoxin. The members of this family are regarded as most deadly among fishes and their venom can be fatal to humans. The venom glands are present on these fishes near base of dorsal fin spines and contain a neurotoxin known to have both cardiovascular and neuromuscular toxicity (Ghadessy *et al.*, 1996). Stone fishes are capable to camouflage themselves on the bottom of the sea because of their grey and mottled color making them indistinguishable from stone. In most cases, human beings cannot notice them and may step on them which trigger them to sting.

Stonefishes belonging to family Synanceidae were not separately described from Pakistan, however, the members of this order are included in many checklists including Hoda (1985, 1988), Hussain (2003) and Jalil and Khaliluddin (1971, 1982). Recently Psomadakis *et al.* (2015) have reported 5 species of family Synanceidae from Pakistan. The present paper reviews the species of stonefishes from Pakistan with a new record of occurrence of Red Sea stonefish (*Synanceia nana*).

### MATERIAL AND METHODS

Published scientific literature was examined for the records of various stonefish species from Pakistan coast. In addition, specimens of family Synanceidae collected between 2005 and 2017 from Karachi Fish Harbour. Samples collected from the harbour, were photographed and salient features and measurement were recorded, before, their preservation in 5 % neutralized formalin.

### RESULTS

Locally known as “serin” (scorpion) in Sindhi and “bheel-alari (oscillating tides), the stonefishes area dread fishermen and divers. These species, if caught in fishing gears, are immediately discarded. Of these species, *Pseudosynanceia melanostigma* seems to be most common species found in coastal waters including creek system of the Indus River.

*Choridactylus multibarbus* Richardson, 1848  
(Fig. 1)



Fig.1. *Choridactylus multibarbus* collected from Karachi Fish Harbour on May 7, 2014 (14 cm)

This species is commonly known as orangebanded stingfish. It characteristically have 13-14 dorsal fin spine and its lowermost 3 pectoral fin ray are free. Its eyes are small to moderate (about 7 to 11% head length), and are positioned laterally on head. This species occurs in coastal areas upto a depth of 50 m and is reported from Pakistan by Ahmed and Qureshi (1970), Anonymous (1955), Eschmeyer *et al* (1979b), Froese and Pauly (2017), Hoda (1985, 1988), Hussain (2003), Jalil and Khaliluddin (1972, 1981), Poss and Rama Rao (1984) and Psomadakis *et al.* (2015). This species was originally described from Sea of China, western North Pacific by Richardson (1848). Its holotype (1977.4.22.7) is housed in Museum of Natural History, London, U. K. (Eschmeyer, 1979b, 1998). This species is widely distributed in the Indo-West Pacific area including Red Sea and the Persian Gulf, eastwards to the Philippines.

#### Material Examined:

— One specimen -Station No.64 (22°59.51'N; 67°25.36'E) on November14, 2010 (depth 34 m) onboard R/V Dr. Fridtjof Nansen Cruise -2010 (13.5 cm).

— One Specimen – Karachi Fish harbor, commercial catch collected on May 14, 2014 (14 cm)

— One Specimen – Karachi Fish harbor, commercial catch collected on May 25, 2014 (14.6 cm)

#### *Inimicus didactylus* (Pallas, 1769)

This species is commonly known as bearded ghouland is reported from Pakistan by Ahmed and Qureshi (1970) and Hoda (1985, 1988). It was originally described as *Scorpaena didactyla* from Indian Ocean by Pallas (1769). Its holotype (RMNH 669) is housed in Rijksmuseum van Natuulijke Histoire, Leiden (Eschmeyer, 1998). This species characteristically have 14-18 dorsal fin spine and lowermost 2 pectoral fin ray are free. Its eyes are small (about 4 to 7% head length), positioned on top of head. Elsewhere this species is known only from Thailand to Vanuatu, north to the Ryukyu Islands and southeast China, south to Australia (Froese and Pauly, 2017). There are no record of this species from India or from the Arabian sea, therefore, its presence in Pakistan is doubtful.

#### *Minous coccineus* Alcock, 1890

Fig. 2



Fig. 2 *Minous coccineus* collected from Station No.24 on November 07, 2010) onboard R/V Dr. Fridtjof Nansen Cruise -2010 (12.4 cm)

This species is commonly known as onestick stingfish. There is no previous record of occurrence of this species in the waters of Pakistan except Eschmeyer (1986) and Froese and Pauly (2017) who have shown distribution of this species in Pakistani waters. During the present study two specimens of this species collected from offshore waters of Pakistan were examined. Its posterior lacrimal spine much longer than anterior lacrimal spine whereas soft portion of dorsal fin has 11 to 13 rays. Its caudal fin is pale, without dark markings. According to Alcock (1890), in this species the first dorsal spine is very small, the second and third are of nearly equal length and are isolated from each other and from the rest of the fin. Its pectorals are very thick and rigid and reaches to the second anal ray. It has characteristic black spots on inside of pectorals and which are dark brown, with broad canary yellow lines forming a hexagonal pattern. This species was described from off Ganjam coast, Kalingapatnam, India, Investigator station 90, by Alcock (1890). No holotype is known, however, syntypes are housed in Zoological Survey of India, Kolkata (Eschmeyer, 1998). The species is distributed in the northern Indian Ocean from the southern Red Sea and Somalia east to the Andaman Sea (Matsunuma *et al.*, 2017)

#### Material Examined:

— One specimen -Station No.24 ( 25°02.34'N; 65°04.11'E) on November 07, 2010 (depth 28 m) onboard R/V Dr.Fridtjof Nansen Cruise -2010 (12.4 cm).

— One specimen -Station No.40 (24°50.91'N; 66°20.79'E) on November 10, 2010 (depth 61 m) onboard R/V Dr. Fridtjof Nansen Cruise -2010 (14.1 cm).

*Minous dempsterae* Eschmeyer, Hallacher and Rama-Rao, 1979

Fig. 3



Fig. 3. *Minous dempsterae* collected from Karachi Fish Harbour on November 11, 2013 (15 cm)

Commonly known as obliquebanded stingfish, this species is reported from Pakistan by Anonymous (1993), Eschmeyer *et al.* (1979a), Froese and Pauly (2017), Psomadakis *et al.* (2015) and Randall (1995). According to Psomadakis *et al.* (2015) it inhabits mud or clay bottoms down to a depth of 117 m. It is known to be endemic to Arabian Sea and reported from Gulf of Oman, Pakistan, and northwestern India (Randall, 1995; Froese and Pauly, 2017). Its lacrimal spines extend over maxilla and anterior lacrimal spine about half of the posterior one. Pectoral fins of this species reach at most to above middle of anal fin. Its colour is grey dorsally with oblique pale bands in dorsal fin which extends onto upper two third of body (Randall, 1995). This species was described from off western India (21°11'-08'N, 69°16'-13'E) by Eschmeyer *et al.* (1979a). Its holotype (USNM 218417) is housed in National Museum of Natural History, Washington D.C., U.S.A. (Eschmeyer, 1998).

#### Material Examined:

- \_ One Specimen – Karachi Fish harbor, commercial catch collected on October 9, 2010 (11 cm)
- \_ One Specimen – Karachi Fish harbor, commercial catch collected on November 11, 2013 (15 cm)
- \_ One specimen -Station No.12(25°06.10'N; 62°11.13'E) on November 5, 2010 (depth 21 m) onboard R/V Dr. Fridtjof Nansen Cruise -2010 (13.6 cm).
- \_ One specimen -Station No.32 (24°57.84'N; 66°18.39'E) on November 8, 2010 (depth 76 m) onboard R/V Dr. Fridtjof Nansen Cruise -2010 (14.3 cm).

*Minous inermis* Alcock, 1889

Fig. 4



Fig. 4 *Minous inermis* collected from Karachi Fish Harbour on February 2, 2015 (10 cm)

Alcock's scorpionfish, as it is commonly known, is reported from Pakistan by Anonymous (1993), Eschmeyer (1998), Eschmeyer (1986), Froese and Pauly (2017) and Psomadakis *et al.* (2015). This species is reported from Somalia, Gulf of Oman, India, Myanmar, and western Thailand (Froese and Pauly, 2017). Its lacrimal spines are about equal length and extend over maxilla. The posterior lacrimal spine project backward as well as downward. According to Matsunuma *et al.*, (2017), *M. inermis* can be distinguished from its congeners in having first and second dorsal-fin spines close together, the former much shorter than the latter. Whereas its pectoral is fin relatively long (51.1–51.4% SL) and tip of free pectoral-fin ray extending beyond a vertical through posterior tip of pelvic fin.

This species was described from east of the Sacramento Shoal on the Godavari coast, Bay of Bengal, Investigator station 46 by Alcock (1889). No holotype is known, however, syntypes are housed in Zoological Survey of India, Kolkata (Eschmeyer, 1998).

**Material Examined:**

- \_ One Specimen – Karachi Fish harbor, commercial catch collected on February 2, 2015 (10 cm)

*Minous monodactylus* (Bloch and Schneider, 1801)

Fig.5



Fig. 5. *Minous monodactylus* collected from Karachi Fish Harbour on July 1, 2015 (11.0 cm)

It is commonly known as grey stingfish. It is reported from Pakistan by Ahmad *et al* (1973), Ahmed and Qureshi (1970), Anonymous, (1993, 1999), Bloch and Schneider (1801), Eschmeyer (1998), Eschmeyer *et al* (1979a), Hoda (1985, 1988), Hussain (2003), Jalil and Khaliluddin (1972, 1981), Poss and Rama Rao (1984), Psomadakis *et al.* (2015), Sorley (1932), Murray (1880) as *Scorpaena monodactyla*), Niazi, (2001) and Regan (1905). Soft portion of its dorsal fin is black anteriorly and caudal fin has transverse dark bars. Its posterior lacrimal spine is long and bayonet shaped. According to Matsunuma *et al.*, (2017) the first dorsal-fin spine of *M. monodactylus* is about one fourth of the second dorsal-fin spine length and the inner pectoral-fin surface whitish with numerous, variously shaped and sized brown spots. This species is known from Red Sea and East Africa to Indonesia, north to southern Japan. It is one of the commonly occurring stonefish especially in the nearshore waters along Pakistan coast. This species was originally described as *Scorpaena monodactyla* by Bloch and Schneider (1801). Information about its types is lacking (Eschmeyer, 1998).

**Material Examined:**

- \_ One Specimen – Karachi Fish harbor, commercial catch collected on October 11, 2010 (9.5 cm)
- \_ One Specimen – Karachi Fish harbor, commercial catch collected on March 26, 2015 (9.0 cm)
- \_ One Specimen – Karachi Fish harbor, commercial catch collected on July 1, 2015 (11.0 cm)
- \_ One specimen -Station No.9 (25°11.07'N; 63°39.59'E) on November 4, 2010 (depth 17 m) onboard R/V Dr. Fridtjof Nansen Cruise -2010 (11.2 cm).

*Minous trachycephalus* (Bleeker, 1854)

This species is commonly known as striped stingfish and reported from Pakistan by Eschmeyer (1986), Hoda (1985, 1988) and Hussain (2003), however, no specimen was examined during the present study. According to Matsunuma *et al.*, (2017), the species is distributed in the Red Sea and Gulf of Aden eastwards throughout Sri Lanka

to the Philippines and New Caledonia. Matsunuma *et al.*, (2017) pointed out that *M. trachycephalus* can be separated from other species of the genus *Minous* in having the first and second dorsal-fin spines close together, the former clearly shorter than the latter. Its dorsal-fin has 8 to 10 soft rays whereas anal-fin spine and soft rays totaling 10 or 11. In addition its lacrimal spines are of approximately equal length and the inner pectoral-fin surface has numerous pale yellow blotches, forming a hexagonal pattern. During the present study no specimen of this species was examined. It was originally described as *Aploactis trachycephalus* from Manado, Sulawesi, Indonesia by Bleeker (1854). Its holotype (RMNH 5901) is housed in Rijksmuseum van Natuurlijke Historie, Leiden (Eschmeyer, 1998).

*Pseudosynanceia melanostigma* Day, 1875

Fig. 5-9



Fig. 6. *Pseudosynanceia melanostigma* collected from Karachi Fish Harbour on 17 January, 2017 (18.0 cm)



Fig. 7. *Pseudosynanceia melanostigma* collected from Baba Island (mudflat) on August 7, 2000 (9.3 cm)(dorsal view)

This species is known as blackfin stonefish and reported from Pakistan by Ahmed and Qureshi (1970), Anonymous (1955, 1993, 2000, 2001), Day(1875, 1889),Hoda (1985, 1988), Hussain (2003), Jalil and Khaliluddin (1972, 1981) and .Zugmayer (1913). Ahmed and Qureshi (1970), Day (1889), Hoda (1985, 1988), Hussain (2003), Jalil and Khaliluddin (1972, 1981), Psomadakis *et al.* (2015) and Zugmayer (1913) reported this species as *Leptosynanceia melanostigma*. Its lacrimal spines extend over maxilla whereas the posterior spine at least twice the length of the anterior spine. Its pectoral fins reach at most to above middle of anal fin. The stonefish is mottled grey above and pale ventrally. It has a large black spot distally on anterior part of soft dorsal fins whereas its caudal fin has two broad dark bars (Randall, 1995). This species is distributed along western Indian Ocean including, India, Pakistan, Iran, Persian Gulf countries. This species was described from Karachi, Sindh, Pakistan by Day (1875). Its holotype (ZSI 1761) is housed in Zoological Survey of India, Kolkata (Eschmeyer, 1998). This is most common stonefish which is found in Pakistan commonly found in creek areas and along shallow coastal waters with muddy bottom. Known to inflict painful and possibly fatal sting.



Fig. 8. *Pseudosynanceia melanostigma* collected from Baba Island (front view).



Fig. 9. *Pseudosynanceia melanostigma* entangled in the gillnet at Keti Bundar

**Material Examined:**

- \_ One Specimen – Karachi Fish harbor, collected from Baba Island (mudflat) on August 7, 2000 (9.3 cm)
- \_ One Specimen – from Isaro Creek caught in trawl net towed at a depth of 4 m collected on March 12, 2013 (8.7 cm)
- \_ One Specimen – Karachi Fish harbor, commercial catch collected on April 23, 2013 (10.5 cm)
- \_ One Specimen – Karachi Fish harbor, commercial catch collected on January 17, 2017 (18.0 cm)

*Synanceia horrida* (Linnaeus, 1766)

Estuarine stonefish is reported from Pakistan by Ahmed and Qureshi (1970), Hoda (1985, 1988), Hussain (2003) and Jalil and Khaliluddin (1972, 1981). No specimen of this species was examined during the present study. It can be distinguished from other species reported from Pakistan in having 15 to 17 pectoral fin rays and presence of bony crest above eyes. This species is known to be distributed from India to China, Philippines, Papua New Guinea, Australia and Vanuatu (Froese and Pauly, 2017). It was originally described as *Scorpaena horrid* from "in India orientali" (=Bengal?) by Linnaeus (1766), however, no type is known (Eschmeyer, 1998).

*Synanceia nana* Eschmeyer and Rama-Rao, 1973  
(Fig. 10-13)

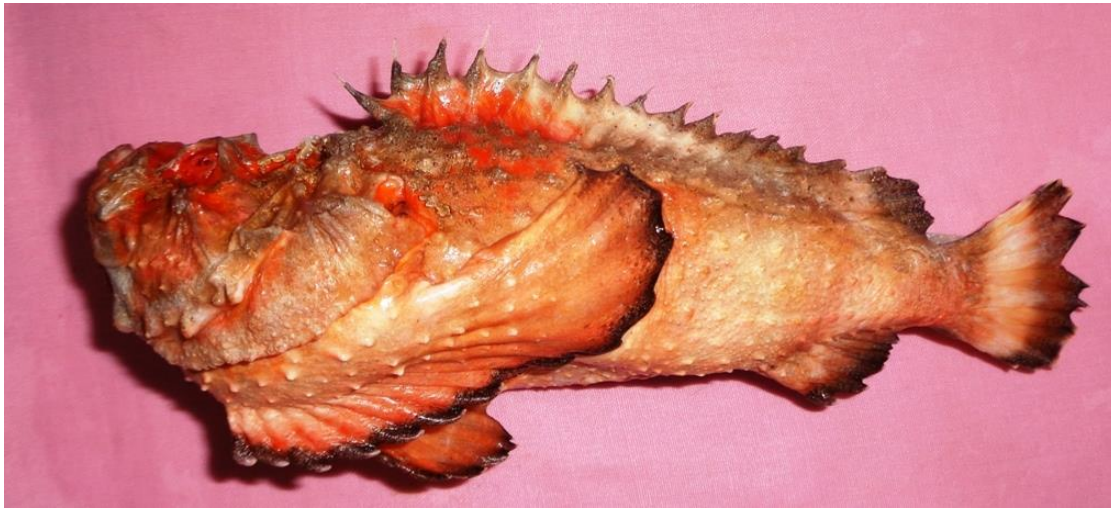


Fig.10. *Synanceia nana* collected from Karachi Fish harbor, commercial catch collected on February 20, 2017 (20.0 cm)lateral view.



Fig. 11. *Synanceia nana* Karachi Fish harbor, commercial catch collected on December 19, 2016 (18.0 cm) (dorsal view).



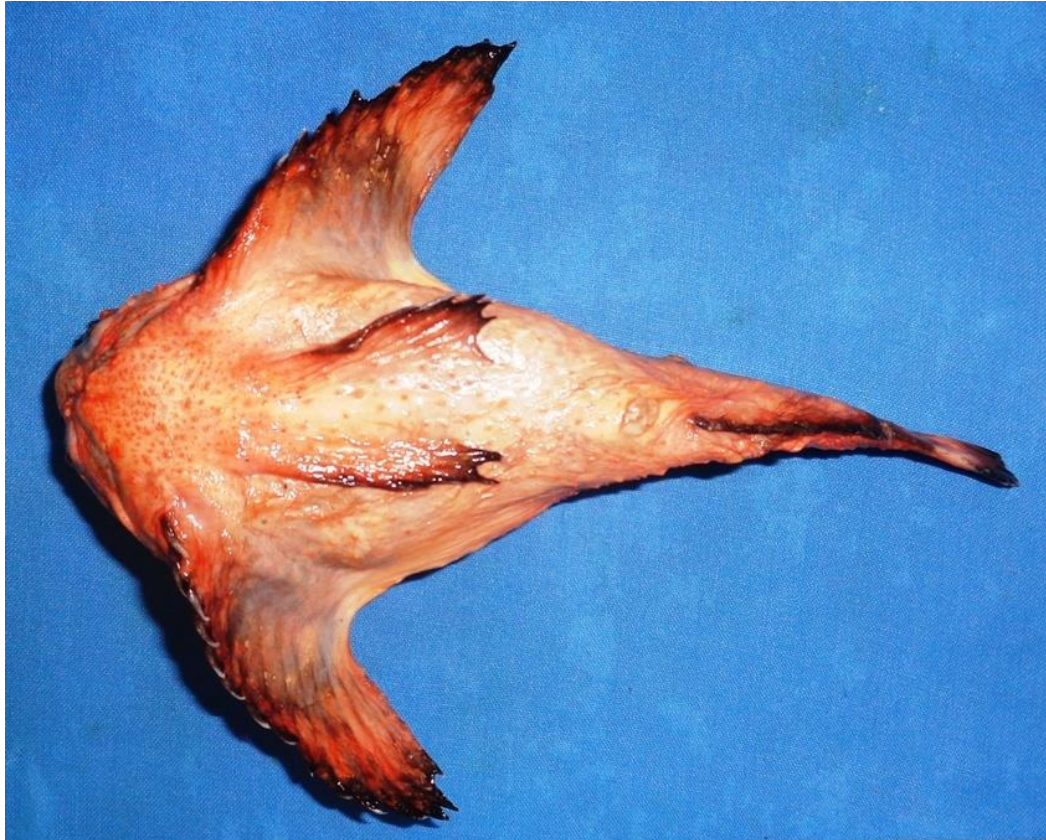


Fig. 12. *Synanceia nana* (ventral view).



Fig. 13. *Synanceia nana* (frontal view).

This species which is commonly known as Red Sea stonefish is described from Bay at El Himeira, Gulf of Aqaba, Red Sea, by Eschmeyer and Rama-Rao (1973). Its holotype (USNM 209417) is housed in National Museum of Natural History, Washington D.C., U.S.A. (Eschmeyer, 1998). This species is known in Red Sea, Persian Gulf

and Mozambique (Froese and Pauly, 2017), however, it was first time collected from Pakistan coast. This species is characterized by having no scale on body which has wart like protuberances. Typically it has flat surface of head with elevated eyes located dorsally. It has superior mouth and posterior interorbital space with a deep depression, bordered behind by a ridge which is the anterior edge of a shallow rectangular occipital depression. Dorsal spines are short, sub-equal and thick skin covering venom glands. Its pectoral fin has 14 rays (rarely 15). Two specimens of this species was examined which were collected from Karachi Fish Harbour and caught by commercial trawlers from offshore waters of Pakistan (exact location not known).

#### Material Examined:

- \_ One Specimen – Karachi Fish harbor, commercial catch collected on December 19, 2016 (18.0 cm)
- \_ One Specimen – Karachi Fish harbor, commercial catch collected on February 20, 2017 (20.0 cm)

*Synanceia verrucosa* Bloch and Schneider, 1801

The most dread fish commonly known as stone fish is reported from Pakistan by Ahmed and Qureshi (1970), Hoda (1985, 1988), Hussain (2003) and Jalil and Khaliluddin (1972, 1981). However, no specimen of this species was examined during the present study. It was described from Indian Ocean by Bloch and Schneider (1801). Holotype (ZMB 821) is housed in Zoologisches Museum, Humboldt Universitat, Berlin (Eschmeyer, 1998). This species is known from Red Sea and East Africa to French Polynesia, north to the Ryukyu and Ogasawara islands, and south to Queensland, Australia (Froese and Pauly, 2017). Its dorsal fin has two grooves serving as syringes of venom which if inflicted can cause excruciatingly painful and can occasionally be fatal. It is considered to be most venomous fish of the world. It can be distinguished from other species reported from Pakistan in having 18 to 19 pectoral fin rays and absence of bony crest above eyes.

#### DISCUSSIONS

Stonefishes are commonly found in the shallow coastal waters to the continental shelf areas. Blackfin stonefish (*Pseudosynanceia melanostigma*) is commonly found in coastal waters especially in the mangroves, creek systems, lagoons and in the bays along the Pakistan coast. Dread to fishermen, this fish is carefully removed from the fishing nets and discarded. *Minous dempsterae*, *M. monodactylus* and *Choridactylus multibarbus* are commonly found on the continental shelf area upto a depth of about 125 m. These are mainly caught by bottom trawl nets, however, since these have no commercial value, they are discarded. *M. dempsterae* seems to be the most common whereas other stonefishes are of rare occurrence.

SCUBA diving or snorkeling are not very common activities along the coast of Pakistan. Presently, such activities are mainly restricted to Churna Island, therefore, the reported cases of sting by stonefishes are very rare. Fishermen sometimes get inflicted by stonefishes mainly of *P. melanostigma*, *M. dempsterae* and *M. monodactylus* during fishing operations but traditionally the wound is treated with hot water and onion juice which are known to provide relief. Fishermen believes that pain from stonefish sting fluctuate with rising and ebbing of tides, therefore, these fishes are known as bheel-alari (bheel = high tide; alari = low tides) in Balochi language.

Red Sea stonefish (*Synanceia nana*) is reported for the first time from Pakistan and it is the first record of occurrence of this species from outside Red Sea and Persian Gulf, therefore, it is of immense interest. This species may inflict painful sting comparable to *S. verrucosa* which may be fatal. However, no record of fatality is ever reported from Pakistan. More research is needed with regards the toxins of this new record from Pakistan.

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