

OCCURRENCE OF SAWFISH (FAMILY: PRISTIDAE) IN PAKISTAN

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ABSTRACT

Sawfishes which are important elasmobranchs occurring in Pakistan has been reviewed. Three species belonging to two genera are reported to occur in Pakistan. Of these, there are recent records of occurrence of pointed or knifetooth sawfish (*Anoxypristis cuspidatus*) and common sawfish (*Pristis pristis*) from Pakistan, however, there is no report of largecomb sawfish (*Pristis zijsron*) in past many years. Of these, pointed or knifetooth sawfish (*Anoxypristis cuspidatus*) is considered to be locally extinct whereas there are a few record of recent occurrence of common sawfish (*Pristis pristis*) and largecomb sawfish (*P. zijsron*) from Pakistan. A key for identification to known species of sawfish occurring in Pakistan is also given

Keywords: Sawfishes, Pakistan, *Anoxypristis cuspidatus*, *Pristis pristis*, *P. zijsron*

INTRODUCTION

Sawfishes, belonging to family Pristidae, are considered to be critically endangered mainly because of habitat loss and overfishing. Being resident of Atlantic, Indian, and Pacific Oceans, these important elasmobranchs are found in coastal waters, entering estuaries and ascending large rivers for great distances. Sawfish population in most part of their distribution range has declined substantially rather some species are under the threat of extinction (Faria *et al.* 2013; Thorburn, and Morgan, 2005; Thorburn, *et al.*, 2007). This is mainly because of presence of saw like rostrum which makes them prone to entanglement in the fishing gears.

There was confusion about the identification of the sawfish species globally. Based on historical taxonomy, external morphology, and mitochondrial DNA sequences, Faria *et al.* (2013) demonstrated that the sawfish comprise five species belonging to two genera: *Pristis pristis* (with circumtropical distribution), *P. clavata* (found in east Indo-West Pacific area), *P. pectinata* (widely distributed in Atlantic Ocean), *P. zijsron* (distributed Indo-West Pacific area), and *Anoxypristis cuspidatus* (found in Indo-West Pacific area except for East Africa and the Red Sea). Confusion on the identification of sawfish also prevailed in Pakistan.

Moore (2014) recently assessed the information about 176 sawfishes from Persian Gulf and adjacent areas and observed that *Pristis zijsron* was the most frequently occurring species in the area. He further observed that *Anoxypristis cuspidata* records were limited to the coasts of Iran, Pakistan, and Masirah Island (Oman) and provided first substantiated record of occurrence of *Pristis pristis* from the Arabian Peninsula. Moore (1994) also suggested possibility of occurrence of *Pristis clavata* in the region.

The species that have previously been reported from Pakistan include *Anoxypristis cuspidatus*, *Pristis pristis*, *P. pectinata*, *P. zijsron* and *P. perotteti*. Although many authors have reported sawfish from Pakistan but these records are more repetition of the names from previously published lists of sawfish species. In the present paper a review of the published literature on the occurrence of sawfishes in Pakistan is presented including some additional information from recent reports.

MATERIAL AND METHODS

Published scientific literature was examined for the record the occurrence of various species of sawfish of family Pristidae from Pakistan. There occurrence record was separated for two maritime provinces of Pakistan i.e. Sindh and Balochistan, A few unpublished records of recent occurrence of sawfish from Pakistan were also included and comments on their status and fisheries is made.

RESULTS

Sawfishes are locally known as “liara” in Sindh and “blundo” or “suddo” in Balochi. The status of the species previously reported from Pakistan is discussed which indicates that only three valid species known to occur in Pakistan whereas other records are either synonym or wrong identification.

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Species Records:

Anoxypristis cuspidatus (Latham, 1794)-Pointed or knifetooth sawfish

Anoxypristis cuspidatus can be distinguished from other species of sawfish in absence of rostral teeth from basal quarter of saw. These rostral teeth are blade-like and barbed on posterior edge with sharp margins in young whereas in adults rostral teeth are falci form with sharp margins (Fig. 1). Origin of first dorsal fin in this species is posterior to the origin of the pelvic fins (above the end of the base of the pelvic fin) and having narrow pectoral fin bases. Its caudal fin is lunate with distinctive subterminal projection on upper lobe and in having well developed lower lobe.

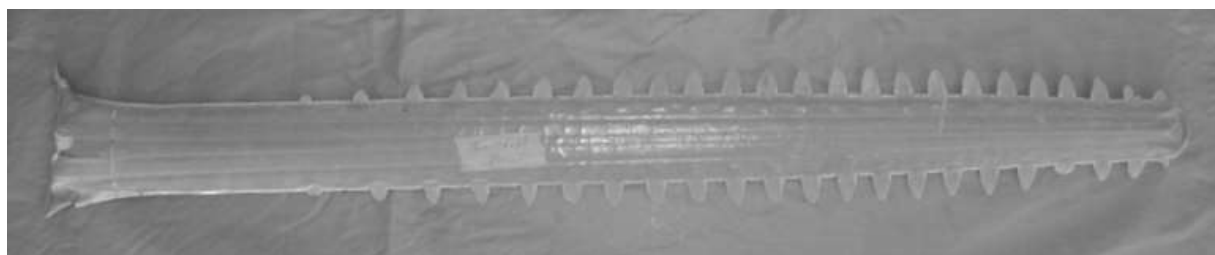


Fig. 1. *Anoxypristis cuspidatus*- teeth on rostrum-Specimen collected from Jiwani, Balochistan and housed in Marine Fisheries department, Karachi

This species was reported from Pakistan by Ahmad and Niazi (1975), Bianchi (1985), Compagno and Last (1999), Froese and Pauly (2014), Hoda (1985, 1988), Hussain (2003), Jalil and Khaliluddin (1972, 1981), Khan and Quadri (1986), Misra (1962, 1969), Murray (1880), Qureshi (1953, 1972) and Siddiqi (1956), however, no specific location along the Pakistan coast was mentioned in these studies. However, from Balochistan province it was reported by Anonymous (1953, 1955), Misra (1962) and Qureshi (1952).

Pristis pristis (Linnaeus, 1758) - Common sawfish

This species can be distinguished from its congener in having origin of first dorsal fin anterior to pelvic fin origins and on the pattern of dental adoration on the rostrum. It was described from Pakistan as *Pristis pristis*, *P. microdon* and *P. pectinata*. Faria *et al.*, (2013) while reviewing the sawfish from around various part of the globe, opined that there is confusion in the identification of this species and included *P. microdon* in the synonym of *P. pristis*. In addition *P. pectinata* was considered to be species found in Atlantic Ocean (Faria *et al.*, 2013), therefore, all records of *P. pectinata* from Pakistan may also be considered as *P. pristis*.



Fig. 2. *Pristis pristis* landed at Gwadar, Balochistan Fish harbor on September 11, 2009 (total length 1.4 m) – Photo courtesy Abdul Rahim, Gwadar.

Bianchi (1985), Faria *et al.* (2013), Froese and Pauly (2014) and Hussain (2003) reported this species from Pakistan without mentioning any specific location. It was reported from Sonmiani, Balochistan by Anonymous (1999). This species was also reported as *P. microdon* by Ahmad and Niazi (1975), Hoda (1985, 1988), Hussain (2003), Jalil and Khaliluddin (1972, 1981), Khan and Quadri (1986), Mirza and Alam (1994), Misra (1969) and Qureshi (1953, 1972), however, no specific location along Pakistan coast was reported. It was also reported as *P. microdon* from Sindh Province by Ahmad *et al.*, (1976), Misra (1962) and Rafique (2000). Sorley (1933) reported this species from Sindh as *Pristis perrotteti*.

In addition to coastal and estuarine waters, this species is also found in turbid channels of large rivers. It was recorded by Sajid (1962) as *P. microdon* from the River Indus at Ghulam Mohammad Barrage, Hyderabad which is about 170 km from Arabian Sea. Hussain (1973) and Mirza (1975) also mentioned its distribution in the lower River Indus Basin. There have been a few record of occurrence of this species in Pakistan.

***Pristis zijsron* Bleeker, 1851- Largecomb sawfish**

From Pakistan coast this species was reported by Ahmad and Niazi (1975), Bianchi (1985), Compagno and Last (1999), Faria *et al.* (2013), Froese and Pauly (2014), Hoda (1985, 1988), Hussain (2003), Jalil and Khaliluddin (1972, 1981), Khan Quadri (1986) and Qureshi (1953, 1972), however, no specific location was identified. It was reported from Sindh by Anonymous (1955), Day (1878) and Punwani (1934). From Balochistan it was reported by Anonymous (1953, 1955), Day (1876) and by Qureshi (1952).

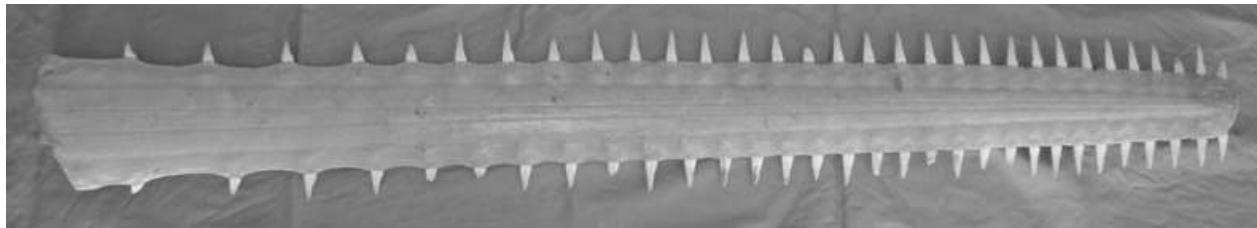


Fig. 3. *Pristis zijsron*-teeth on rostrum-Specimen collected from Pakistan (specific location not mentioned) and housed in Marine Fisheries department, Karachi

This species differs from other species of sawfishes in having rostral teeth of basal pairs distinctly more spaced than anterior pairs (Fig. 3). Since origin of first dorsal fin in *P. zijsron* and *P. pectinata* are located above or posterior to pelvic fin origin, therefore, all records of the latter are referred to as *P. zijsron*. Ahmad and Niazi (1975), Bianchi (1985), Compagno and Last (1999), Froese and Pauly (2014), Hoda (1985, 1988), Hussain (2003), Khan and Quadri (1986) and Misra (1969),) reported *P. pectinata* from Pakistan, however, no specific location was mentioned.

Recent Records

Although sawfishes used to be quite common along the Pakistan coast till early 1970's but since then their landings reduced to the extent that they were regarded as locally extinct. In the FAO fisheries statistics databank, landings of sawfishes have been reported between 1987 and 1995 (Sibeni and Calderini, 2012) which may be misidentification and misreporting. There was no report of their occurrence in Pakistan. However, in the recent past a few records of occurrence of sawfishes have been reported. It may be mentioned that it is not reappearance of sawfish in Pakistan but it is mainly because of improvement of fisheries data collection and monitoring system in Pakistan.

There are only a few records of occurrence of sawfishes from Pakistan in recent years. On September 11, 2009, a 1.4 m long *Pristis pristis* (inclusive of rostrum) was landed at Gwader Fish Harbour along Balochistan coast. Two more specimens of this species were landed in Karachi Fish Harbour on May 21, 2013 - these could not be photographed or measured. In June 2013 a large specimen of *Anoxypristis cuspidates* was caught at Khajr Creek near the mouth of the River Indus. Its saw was removed by fishermen and carcass was landed in Ibrahim Hyderi Fish Harbour (Fig. 4). Fishermen also mentioned capture of a few more specimens during October, 2012 and June, 2013 along Balochistan coast but no authentic information about these specimens could be obtained.



Fig. 4. *Anoxypristis cuspidatus* caught at Khajar Creek near the River Indus mouth in June, 2013.

Key to known Species occurring in Pakistan

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| <p>1. Rostral teeth absent from basal quarter of saw; rostral teeth blade-like and barbed on posterior edge with sharp margins in young; rostral teeth falciform with sharp margins in adults; origin of first dorsal fin posterior to the origin of the pelvic fins (above the end of the base of the pelvic fin); pectoral fin bases narrow; caudal fin lunate with distinctive subterminal projection on upper lobe, and lower lobe well developed</p> | <p><i>Anoxypristis cuspidatus</i></p> |
| <p>- Rostral teeth present on basal quarter of the saw (along all rostrum); rostral teeth awl-like, with rounded anterior and flattened posterior margins, the posterior margin occasionally grooved in the young; rostral teeth with flattened and grooved posterior margin in adults; dermal denticles present on entire body; nostrils relatively broad, with large nasal flaps, without groove connecting the incurrent aperture of the nares to the side of the head; origin of first dorsal fin varies from anterior, above, to posterior to the origin of pectoral fins (up to above half of the base of the pelvic fin); pectoral fin bases broad; caudal fin posterior margin straight or slightly convex, with upper lobe without distinctive subterminal projection and lower lobe absent or small, but prominent</p> | <p>2
<i>Pristis</i></p> |
| <p>2. First dorsal fin origin anterior to pelvic fin origins</p> | <p><i>Pristis pristis</i></p> |
| <p>First dorsal fin origin above or posterior to pelvic fin origin</p> | <p><i>Pristis zijsron</i></p> |

DISCUSSION

Rarity of occurrence of the sawfishes in Pakistan is indicative that these important elasmobranchs are seriously threatened or possibly locally extinct in Pakistan. Moore (2014) observed that sawfishes can now be considered extinct in Persian Gulf and Arabian Sea as a functional component of coastal ecosystems and may be close to being regionally extinct.

There is a need to establish a monitoring system to observe any catch of sawfishes in Pakistan and to collect biological information including mitochondrial DNA sequences. For the purpose a key of the species occurring in Pakistan is provided.

REFERENCES

- Ahmad, M. F. and M. S. Niazi (1975). A checklist of elasmobranch fishes of Pakistan. *Rec. Zool. Surv. Pakistan*, 7: 35-69.
- Ahmad, M. F., S. A. Khan and M. R. Mirza (1976). A checklist of freshwater fishes of Indus Plains, Pakistan. *Biologia* (Lahore). 22: 229-259.
- Anonymous (1953). *Fisheries of the Makran coast* (Investigation Report No. 4). Government of Pakistan Publication, 28p.
- Anonymous (1955). *Marine Fishes of Karachi and the coast of Sind and Mekran*. Government of Pakistan, Ministry of Food and Agriculture (Central Fisheries Department), Karachi. 80p (Most workers cite Qureshi, 1955 as author, but there is no evidence that he was the author).
- Anonymous (1999). *Fish collection of the Natural History Museum, London* (formerly British Museum of Natural History (BMNH)). Natural History Museum, London (formerly British Museum of Natural History (BMNH)).
- Bianchi, G. (1985). *FAO species identification sheets for fishery purposes. Field guide to the commercial marine and brackish-water species of Pakistan*. Prepared with the support of PAK/77/033/ and FAO (FIRM) Regular Programme. FAO, Rome. 200 p
- Compagno, L.J.V. and P.R. Last (1999). *Pristidae* sawfishes. p. 1410-1417. In: K.E. Carpenter and V. Niem (eds.) *FAO identification guide for fishery purposes. The Living Marine Resources of the Western Central Pacific*. FAO, Rome.
- Day, F. (1876). *The fishes of India; being a natural history of the fishes known to inhabit the seas and fresh waters of India, Burma, and Ceylon*. Fishes India 169-368.
- Day, F. (1878). *The fishes of India; being a natural history of the fishes known to inhabit the seas and fresh waters of India, Burma, and Ceylon*. Fishes India 553-779.
- Faria, V. V., M. T. McDavitt, P. Charvet, T.R. Wiley, C.A. Simpfendorfer and G. J. P. Naylor (2013). Species delineation and global population structure of critically endangered sawfishes (Pristidae). *Zool. J. Linn. Soc.*, 167: 1096-3642.
- Froese, R. and D. Pauly (Eds.). (2014). *Fish Base. World Wide Web electronic publication*. www.fishbase.org, version (04/2013).
- Hoda, S. M. S. (1985). Identification of coastal fish varieties of Pakistan. *Pakistan Agric.*, 7: 38-44.
- Hoda, S. M. S. (1988). Fishes from the coast of Pakistan. *Biologia* (Lahore) 34: 1-38.
- Hussain, S. M. (2003). *Brief Report on Biodiversity in the Coastal Areas of Pakistan*. Reg. Tech. Assist. (RETA) ADB/IUCN. 113p (Draft).
- Hussain, S. Z. (1973). Fish and fisheries of the lower Indus basin (1966-67). *Agric. Pakistan*, 24: 297-322.
- Jalil, S. A. and M. Khaliluddin (1972). *A checklist of marine fishes of Pakistan*. Government of Pakistan: 1-16.
- Jalil, S. A. and M. Khaliluddin (1981). *A checklist of marine fishes of Pakistan*, Government of Pakistan: 1-18.
- Khan, M. A. and S. M. A. Quadri (1986). A checklist of elasmobranch fishes of Pakistan. *Tehqique*, 4: 15-34 (in Urdu).
- Mirza, M. R. (1975). Freshwater fishes and zoogeography of Pakistan. *Bijdr. Dierk.*, 45: 143-180.
- Mirza, M. R. and M. K. Alam (1994). A checklist of freshwater fishes of Pakistan and Azad Kashmir. *Sci. Int.* 6: 187-189.
- Misra, K. S. (1962) (1959). An aid to the identification of the common commercial fishes of India and Pakistan. *Rec. Ind. Mus.*, 57: 1-320.
- Misra, K. S. (1969). *The Fauna of India and Adjacent Countries. Pisces* (Vol. 1), Elasmobranchii and Holocephali. Zoological Survey of India. Delhi. 276p.

- Moore, A. B. M. (2014). A review of sawfishes (Pristidae) in the Arabian region: diversity, distribution, and functional extinction of large and historically abundant marine vertebrates. *Aquatic Conserv: Mar. Freshw. Ecosyst.* doi: 10.1002/aqc.2441
- Murray, J. A. (1880). *A Hand-book to the Geology, Botany and Zoology of Sind*. Beacon Press, Kurruchee 310p.
- Punwani, M. G. (1934). Karachi Fish. Jour. *Sind Nat. His. Soc.*, 2: 44-47.
- Qureshi, M. R. (1952). Fishes of Makran coast. *Agric. Pakistan*, 3: 237-256.
- Qureshi, M. R. (1953). A field-key to the identification of fishes. 2. Elasmobranchii (Batoidei). *Agric. Pakistan*. 4:216-234.
- Qureshi, M. R. (1972). Sharks, skates and rays of the Arabian sea. *Pak. Jour. Sci. Indust. Res.*, 15: 294-311.
- Rafique, M. (2000). Fish diversity and distribution in Indus River and its drainage system. *Pakistan Jour. Zool.*, 32: 321-332,
- Sibeni, F. and F. Calderini (2012). Fish Stat J., A tool for fishery statistics analysis. *Release: 2.0.0* (<http://www.fao.org/fishery/statistics/software/fishstatj/en>)
- Sajid, A. S. (1962). Occurrence of the fish *Pristismic rodon* Latham in river Indus, near Hyderabad, West Pakistan. *Agri. Pak.*, 13: 547-548.
- Siddiqi, M. I. (1956). The fishermen's settlements on the coast of West Pakistan. *Sch. Grogr. Inst. Univ. Kiel.*, 14: 1-92.
- Sorley, H. T. (1932). *Marine Fisheries of the Bombay Presidency*. Govt. Press, Bombay.
- Thorburn, D. C. and D. L. Morgan (2005). Threatened fishes of the world: *Pristis microdon* Latham 1794 (Pristidae). *Environ. Biol. Fishes*, 72: 465-466.
- Thorburn, D. C., D.L. Morgan, A.J. Rowland and H. S. Gill (2007). Freshwater Sawfish *Pristis microdon* Latham, 1794 (Chondrichthyes : Pristidae) in the Kimberley region of Western Australia. *Zootaxa*, 1471: 27-41.

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