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EELS OF ORDER ANGUILLIFORMES OCCURRING IN THE COASTAL AND OFFSHORE WATERS OF PAKISTAN

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ABSTRACT

Fishes belonging to order Anguiliformes includes eels are represented by many species in Pakistan, however, there is no comprehensive account of all the known species of the area. Present study reports details of eels occurring in Pakistan based on published literature as well as through the collection of specimens from various parts of Pakistan. A total of 45species belonging to 8 families of this order were reported from Pakistan. Three species belonging to family Congridae i.e. *Ariosoma gnanadossi* Talwar & Mukherjee 1977, *Bathymyrus echinorhynchus* Alcock, 1889a and *Rhynchoconger squaliceps* (Alcock 1894); 4 species belonging to family Muraenidae i.e. *Gymnothorax meleagris* (Shaw, 1795), *G. phasmatodes* (Smith, 1962), *Gymnothorax prolatus* Sasaki & Amaoka, 1991 and *G. reticularis* Bloch, 1795 andone species belonging to family Muraneosocidae *Gavialiceps arabicus* (D'Ancona, 1928) are reported for the first time from Pakistan. Previous records of occurrence of two species in Pakistan i.e. *Conger conger* (Linnaeus, 1758) and *Muraena helena* Linnaeus, 1758 are possibly based on misidentification, therefore, their presence in Pakistan is considered to be doubtful. Muranidae is considered to be most diversified family occurring in Pakistan consisting of 17 species followed by family Congridae is represented by 6 and Ophichthidae represented by 7 species. Family Synaphobranchidaeis least diversified represented by only one species.

Keywords: Eels, Anguilliformes, *Ariosoma gnanadossi*, *Bathymyrus echinorhynchus Rhynchoconger squaliceps, Gymnothorax meleagris, G. prolatus G. phasmatodes, G.reticularis, Gavialicepsarabicus*

INTRODUCTION

The Order Anguilliformes include fishes commonly known as true eels with most species having long and slender bodies. They have long-based dorsal and anal fins that are continuous with the caudal fin and lack pelvic fins. Scales are usually absent, or if present, are embedded in skin. Most species of this order have fused vomer, premaxillae and ethoid toothed maxillae are included in the gape. All fishes of Order Anguilliformes have a compressed and transparent larval form known as leptocephalous larvae (Hureau *et al.*, 1986). There are 20 known families of this order (Inoue *et al.*, 2010). Of these, eels belonging to 8 families are represented in Pakistan.

Order Anguilliformes was studied in Pakistan by Qureshi (1958) whereas the members of this order are included in many checklists including Bianchi (1985), Hoda (1985b, 1988), Hussain (2003) and Jalil and Khaliluddin (1972, 1981). Some members of this order was described by Ajazuddin *et al.*, (1985), Hussain and Khatoon (2000) and Khatoon and Hussain (2000).Present paper reviews the species of eels belonging to the order Anguilliformes known from Pakistan with new records of 45 species from Pakistan. Eight families of this order including Nettastomatidae, Congridae, Ophichthidae, Muraenidae, Anguillidae, Muraneosocidae, Nemichthyidae, Synaphobranchidae are reported from Pakistan through this paper.

MATERIAL AND METHODS

Published scientific literature was examined for the records of various eel species occurrence from Pakistan coast (Fig.1). In addition, specimens of order Anguilliformes collected between 2005 and 2014 from Karachi Fish Harbour which is the largest fish landing centre for domestic fleet operating along coastal and offshore waters of Pakistan. No foreign vessel is allowed to land their catch at this fish harbour. Samples collected from the harbour, were photographed and salient features and measurement are recorded, before, their preservation in 5 % neutralized formalin. Some species of eels identified from the photographs taken by Scuba divers at Churna Island near Karachi.

RESULTS

An enumeration of the species belonging to order Anguilliformes already reported from Pakistan is made in this paper which indicates that 36 species were previously reported from Pakistan. The paper reviews the status of

previously species as well as reports of eight new records from Pakistan. The species are arranged according to the families.

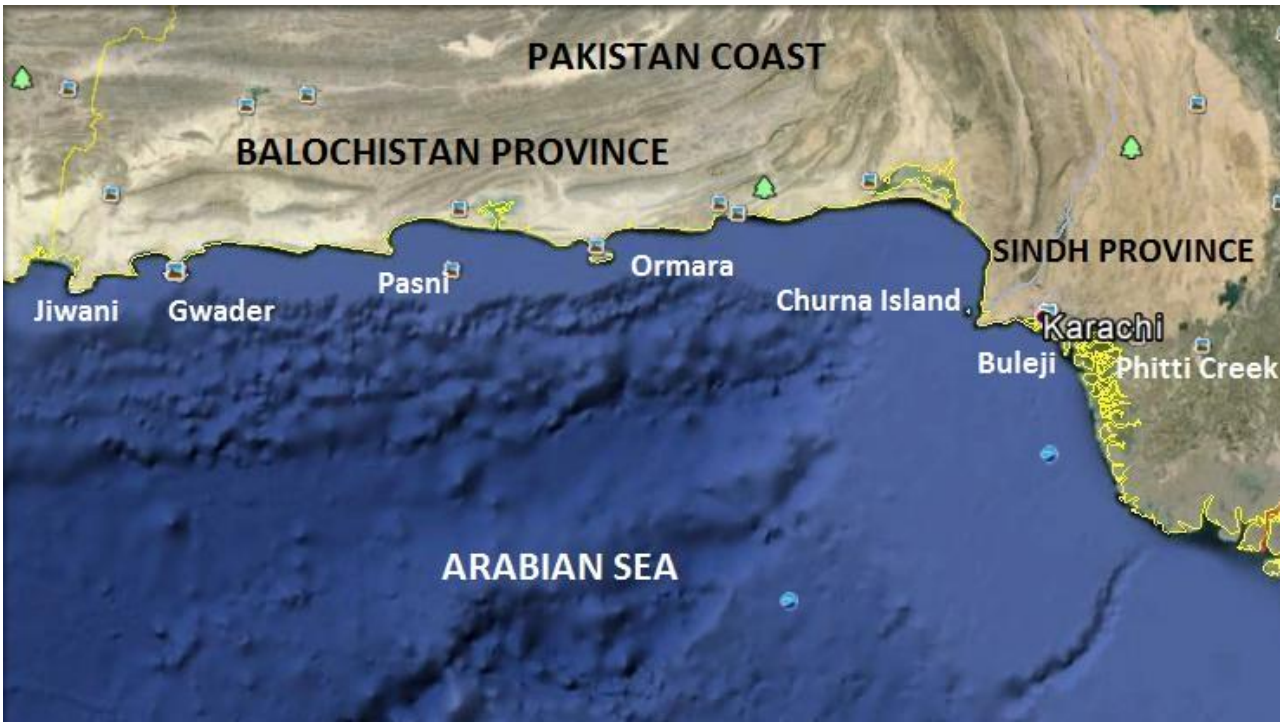

Fig. 1..Pakistan coast showing the major locations from where eels were collected.

Family Nettastomatidae

Family Nettastomidae includes duckbill eels and are known to be widely distributed in tropical and warm temperate waters of Atlantic, Pacific and Indian Oceans. The eels of this family have elongated and narrow head and snout whereas mouth is large and tail is sharply tapering. Two species of the family Nettastomidae were recorded from Pakistan coast.

Nettastoma parviceps Gunther, 1877

Commonly known as duckbilled eel is reported from Pakistan by Hoda (1985b, 1988), Hussain (2003) and Jalil and Khaliluddin (1972, 1981). This species was originally described from South of Tokyo, Japan, collected during Challenger Expedition (Station 232), by Gunther (1877).Its holotype (BMNH 1879.5.14.440) is housed in British Museum of Natural History, London, U. K. (Eschmeyer, 1998). There is no recent record of its occurrence in Pakistan.

Venefica proboscidea (Vaillant, 1888)

This species was reported from off Jiwani, Balochistan coast by Khatoon and Hussain (2000) and from Arabian Sea (St. 62-John Murray Expedition; 1893m) by Norman (1939) whereas Hussain (2003)) reported this species without specifically mentioning any particular location along Pakistan coast. Whipsnout sorcerer, as it is commonly known, was described from off Coast of Morocco (30°08'N, 11°42'W) by Vaillant (1888). Its holotype (MNHN 1884-1069) is housed in Museum National d'Historie Naturelle, Paris, France (Eschmeyer, 1998).

Family Congridae

Conger and garden eels which are placed under family Congridae are known to be distributed inshore and offshore waters of Atlantic, Pacific and Indian Oceans. They are bottom living forms and inhabit soft bottoms in shallow coastal waters up to the depth of 100-meter on shelf and slope. Body of conger eel which is without scales is

elongated, cylindrical in cross section towards head becoming compressed towards tail. They have sub-terminal mouth and have pointed snouts. Five species were previously reported from Pakistan whereas; of which one species i.e. *Conger conger* is erroneously reported from Pakistan. Distribution of three additional species is now extended to Pakistani waters through this paper.

Ariosoma gnanadossi Talwar & Mukherjee 1977
(Fig. 2)

This congrid eel has moderately stout body which is not extremely elongate. Its dorsal fin origin is approximately over gill opening. Diameter of eye is equal to the length of snout. The tip of tail blunt and stiff and snout rounded, projecting slightly beyond lower jaw. Its upper and lower lips have well-developed flanges. It is of light brown colour above and paler below. Its dorsal and anal fins have a narrow blackish border whereas pectoral fins are dusky. It was originally described from Off Madras, India, depth 250 meters by Talwar and Mukherjee (1977). Its holotype (ZSI F.7146/2) is housed in Zoological Survey of Indian, Kolkata, India. This species is reported for the first time from Pakistan coast. Two specimens were examined; one of which was collected from Karachi Fish Harbour (Fig. 2) whereas other was collected during cruises of Research Vessel "Dr, Fridtjof Nansen from offshore waters of Pakistan.

Material Examined:

- One Specimen – Karachi Fish harbor, commercial catch collected on June 18, 2015 (31 cm)
- One specimen -Station No.51($23^{o}49.32'$N; $67^{o14.25'}$E) on November11, 2010 (depth 25 m) onboard R/V Dr. Fridtjof Nansen Cruise -2010 (27cm).

Bathymyrus echinorhynchus Alcock, 1889a
(Fig. 3)

This species was reported from the area by Alcock (1889a). Its distribution in Pakistani waters is also shown in Froese and Pauly (2015). Its holotype (ZSI F12440) was collected from 16 miles east of Devi River mouth in Mahanadi Delta and is housed in Zoological Survey of India, Kolkata, India (Eschmeyer, 1998). During the present study one specimen collected from Karachi was examined which resembles in all characters especially the presence of flange on upper lip (Fig. 3b) confirms its identification.

Material Examined:

- One specimen –Off Karachi landed at Karachi Fish Harbour on October 24, 2013 (27 cm).

Conger cinereus Ruppell, 1830

Commonly known as longfin African conger, this species is reported from Pakistan by Bianchi (1985) and Hussain (2003). Its distribution in Pakistani waters is also shown in Froese and Pauly (2015). It was originally described from Red Sea by Ruppell (1830) and its holotype (SMF 766) is housed in Forshungs Institut und Natur Museum Senckenberg, Frankfurt, Germany (Eschmeyer, 1998). During the present study no specimen of this species was collected.

Conger conger (Linnaeus, 1758)

European conger, as it is commonly known is reported from Pakistan by Hoda (1985b, 1988), Hussain (2003) andJalil and Khaliluddin (1972, 1981). This species has known distribution in Europe only therefore, it is safe to presume that the record from Pakistan is certainly erroneous.

Rhynchoconger squaliceps (Alcock 1894)
(Fig. 4)

This species has head nearly equal in length to the trunk and tail nearly twice as long as the head and trunk combined. Its snout broad and bluntly pointed and one-fifth the length of the head. The cleft of the mouth extends

much beyond the middle of the eye. Its pectoral fins are large, much longer than the snout. Its dorsal side of head and body is olive-grey and ventral side is white whereas edges of dorsal and anal fins are black. The peritoneum is whitish. It was originally described as *Congromuraena squaliceps* from Bay of Bengal (15°04'07"N, 80°25'07"E, Investigator station 137) by Alcock (1894). Its holotype (ZSI F13450) is housed in Zoological Survey of Indian, Kolkata, India (Eschmeyer, 1998). Castle (1995) and Ben-Tuvia (1993) have discussed the taxonomy of *Rhynchoconger* covering this species as well.This is reported for the first time from Pakistan. A 60 cm long specimen collected from Balochistan coast in October 2013 was examined during the present study.

Material Examined:

- One specimen – Collected from Balochistan coast on October 10, 2013- 60 cm.

Uroconger lepturus (Richardson, 1845)
(Fig. 5)

Slender conger, as it is commonly known is reported from Pakistani by Bianchi (1985), Hoda (1985b, 1988), Hussain (2003) and Qureshi (1958).Its distribution in Pakistani waters is also shown in Froese and Pauly (2015). It was originally described as *Congrus lepturus* from Canton, China by Richardson (1845) and its holotype (BMNH 1978.3.1.1) is housed in British Museum of Natural History, London, U. K. (Eschmeyer, 1998). During the present study, two specimens (34 and 28cm) collected from commercial catches at Karachi Fish harbor collected in October 2013 and June, 2015 were examined. Both specimens were observed to meet the description of the species given by Smith and Heemstra (1986).

Material Examined:

- One specimen – Collected from off Karachi landed at Karachi Fish Harbour on October 14, 2013- 34 cm.
- One specimen collected from off Karachi landed at Karachi Fish Harbour on June 25, 2015 -28 cm

Family Ophichthidae

This family includes snake eels, snapper eels and worm eels are found in coastal waters of tropical to warm temperate area.They are characterized in having nostrils lying within or piercing the upper lip and opening into mouth. Most species spend their time buried in sand and hunt small fishes and crustaceans. Seven species of this family is already known from Pakistani waters. Locally this species is known as “alla-lainduk” and “laindak” in Balochi and Sindh languages respectively.

Cirrhimuraena playfairii (Günther, 1870)

Fringelip snake eel, as it is commonly known is reported from Karachi by Niazi(2001). This species is originally described as *Ophichthys playfairii* from Zanzibar by Günther (1870. Its holotype (BMNH 1864.11.15.44) is housed in British Museum Natural History, London, U. K. (Eschmeyer, 1998). This species has known from Zanzibar, Tanzania to Kosi Bay, South Africa, including Aldabra Island (McCosker and Castle, 1986). It is also reported from Hawaiian Island (Mundy, 2005).

Lamnostoma orientalis (McClelland, 1844)

Commonly known as oriental worm eel, this species is reported from Pakistani waters by Castle (1984d) and Hoda (1985b, 1988). This species was originally described as *Dalophis orientalis* from Coromandel coast, India by McClelland (1844), however, no type is known (Eschmeyer, 1998). No recent collection of this species has been made from Pakistan.

Muraenichthys schultzei Bleeker, 1857

Maimed snake eel is reported from Pakistan by Castle (1984d) and Hoda (1985b, 1988). Whereas a specimen from Goth Jafar, Karachi is housed in California Academy of Sciences, San Francisco, California (Anonymous, 1993). This species is originally described from Karangbollong, south Java, Indonesia by Bleeker (1857) and its

holotype (BMNH 1867.11.28.331) is housed in British Museum Natural History, London, U. K. (Eschmeyer, 1998).

Fig. 2.*Ariosoma gnanadossi* Karachi Fish Harbour on June 18, 2015 (31 cm)

(a) (b)

Fig. 3. *Bathymyrus echinorhynchus*- collected from off Karachi landed at Karachi Fish Harbour on October 24, 2013; (a) lateral view – 27 cm; (b) teeth on anterior.

Fig. 4. *Rhynchoconger squaliceps* Collected from Balochistan coast on October 10, 2013 (60 cm).

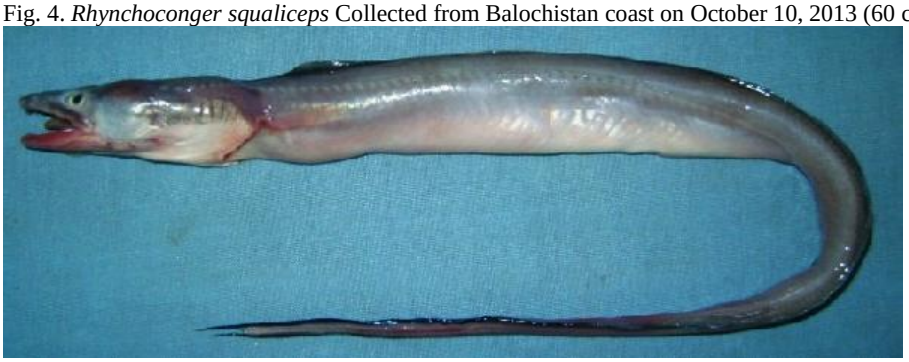

Fig.5. *Uroconger lepturus* Collected from off Karachi landed at Karachi Fish Harbour on October 14, 2013- 34 cm.

Fig. 6. *Pisodonophis boro*collected from Leth Nullah landed at Karachi Fish Harbour, Pakistan on 10-12-2014 60 cm

Fig. 7. *Pisodonophis cancrivorus* collected from Karachi (Sandspit backwater), Pakistan105cm.

Fig. 8. *Gymnothorax dorsalis* Collected from off Karachi landed at Karachi Fish Harbour on November 16, 2014 (170 cm).

Myrichthys colubrinus (Boddaert, 1781)

It is commonly known as harlequin snake eel and reported as *Ophichthys colubrinus* from Sindh, Pakistan by Sorley (1932). This species is originally described as *Muraena colubrina* from Ambon Island, Moluccas Islands, Indonesia by Boddaert (1781) and its type is not known (Eschmeyer, 1998). No recent collection of this species has been made from Pakistan.

Neenchelys buitendijki Weberand de Beaufort, 1916

This species is commonly known as fantail serpent eel and is reported from Pakistan by Hoda (1988). Its distribution in waters of Sindh is depicted by Castle (1984d) whereas its distribution in Pakistani waters is also shown in Froese and Pauly (2015). It was originally described from Bay of Jakarta, Java; Moluccas, Indonesia. by Weber and de Beaufort (1916) and holotype is housed in Universiteit van Amsterdam, Zoologisch Museum, Amsterdam, The Netherlands (Eschmeyer, 1998).

Fig. 9-*Gymnothorax favagineus* photographed at Churna Island by Divers Reef, Karachi on 15 November 2013.

Fig. 10.*Gymnothorax meleagris* Specimen collected from Karachi Fish Harbour on January 22, 2010 (65 cm).

Pisodonophis boro (Hamilton-Buchanan, 1822)
(Fig. 6)

Rice paddy eel as it is commonly known, is reported fromTidal Link Canal, Badin District by Hussain and Khatoon(2000) and Jafri *et al*.(2000).Hussain (2003) has included this species in the list of fish species known from Pakistan. It was originally described as *Ophisurus boro* from Gangetic River estuary near Kolkata, India by Hamillton-Buchanan (1822). Its possible type (MCZ 4266) is housed in the Louis Agassiz Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA. (Eschmeyer, 1998).This species is considered as estuarine species and occurs in lagoons and estuaries sometime entering freshwater and paddy fields (Castle, 1984d). Its distribution in Pakistan is also reported from areas located at the confluence of river and sea.

Material Examined:
One specimen - collected from Leth Nullah landed at Karachi Fish Harbour, Pakistan December10, 2014 (60 cm).

Fig. 11- *Gymnothorax phasmatodes*- photographed at Churna Island by Divers Reef, Karachi on 15 November 2013.


Fig. 12.*Gymnothorax pictus*- collected onboard RV Fridtjof Nanson, October16, 2010 (69 cm).

Pisodonophis cancrivorus (Richardson, 1848)
(Fig. 7)

This species is commonly known as longfin snake eel and is reported from Karachi by Niazi(2001) whereas Hussain and Khatoon (2000) collected its specimens from commercial catches landed at Karachi Fish Harbour. Ajazuddin *et al.* (1985) reported this species from Phitti Creek in Sindh and Pasni in Balochistan. Hoda (1985b, 1988) and Hussain (2003) have included this species in their lists of fish species known from Pakistan. It was originally described as *Ophisurus cancrivorus* from Port Essington, Northern Terr., Australia by Richardson (1848). No holotype is known, however, syntypes are housed in British Museum of Natural History, London, U. K. (Eschmeyer, 1998).

Pisodonophis cancrivorus is known to occur in lagoons and estuaries, sometime entering freshwater (Castle, 1984d). Along Pakistan coast it is mainly known from lagoon, mudflats and in the creek areas of the Indus Delta, however, it is also found in the sandy beaches in sheltered bays along Balochistan coast. Sometime fishermen catch them during ebb tides using sticks that baited hooks and use it as bait mainly catching demersal species such as seabreams and croakers in shallow coastal waters.

Material Examined:

_ One specimen - collected from Sandspit backwateron September18, 2013 (105 cm)
One specimen - collected from Karachi Fish Harbor (commercial landings) on May 16, 2013 (99 cm).

Family Muraenidae

Family Muraenidae is a diverse group of eels that have large mouths with numerous teeth; often with fanglike (canine) teeth. It has worldwide distribution in tropical and temperate seas mostly inhabiting shallow water among rocks and coral heads. Most morays are aggressive and savage and happen to attack without provocation.

Body of morays is firm, cylindrical in cross section and somewhat compressed along the tail. Dorsal profile of head above and behind eyes is steep. Moray eels are known as "riami sang" and "karran" in local Balochi and Sindhi languages respectively. There are thirteen species of moray eels are already known from Pakistan whereas five species have been added to this list through this paper.

Echidna nebulosa (Ahl, 1789)

It is commonly known as snowflake moray and reported from Pakistan coast by Bianchi (1985), Castle (1984b), Hoda (1985b, 1988) and Hussain (2003). This species is originally described as *Muraena nebulosa* from East Indies by Ahl (1789), however, no type is known (Eschmeyer, 1998). No recent collection of this species has been made from Pakistan.

Echidna polyzona (Richardson, 1845)

This species which is commonly known as barred moray is reported from Pakistan as *Muraena polyzona* byHoda (1985b, 1988) and Qureshi (1958). It was originally described as *Muraena polyzona*by Richardson (1845), however, no type locality is known. Its holotype is not known, however, lectotype (BMNH 1977.4.22.3) is housed in Natural History Museum, London, U. K. (Eschmeyer, 1998). No recent collection of this species has been made from Pakistan.

Gymnothorax dorsalis Seale, 1917
(Fig. 8)

The moray eel has an elongated plain tan brown body with fins slightly darker posteriorly. Its anus is located before mid-body. *G.dorsalis* differs from most other species of the genus in possessing only three infraorbital pores. It differs from *Strophidon sathete* (which is also found in Pakistan) in having a typical moray like body with tapering tail whereas *S. sathete* has head, body and fins medium to dark brown and extremely long and cylindrical body. This species was originally described by Seale (1917) from Hong Kong. Its holotype (MCZ 31060) is housed in the Louis Agassiz Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA. This species is previously known from Hong Kong, Straits of Malacca, Malaysia and Taiwan. Present paper reports this species for the first time from Pakistan coast and extends its distribution further west to Arabian Sea.

Material Examined:

- One specimen – Collected from off Karachi landed at Karachi Fish Harbour on November 16, 2014 (170 cm)

Gymnothorax favagineus Bloch and Schneider, 1801
(Fig. 9)

Laced moray , as it is commonly known is reported from Sindh by Sorley (1932) as *Muraena tessellata.* Hoda (1985a) reported from Buleji Karachi. Hoda (1985b, 1988) included this species in his checklist of fishes from Pakistan without mentioning any specific location. Hoda (1985a, 1985b, 1988) listed it as *Lycodontis tessellata*. This species was originally described from Tranquebar, India by Bloch and Schneider (1801). Holotype (ZMB 7782) is housed in Zoologisches Museum, Humboldt Universitat, Berlin (Eschmeyer, 1998). This species has been photographed at subtidal habitat at Churna Island on many occasions. The one photographed by Diver Reef, Karachi in November, 2013 is depicted in the present paper.

Material Examined:

- One specimen photographed at Churna Island by Divers Reef, Karachi on 15 November 2013.

Gymnothorax meleagris (Shaw, 1795)
(Fig. 10)

This species which is commonly known as turkey or white-mouth moray was collected from Ormara, West Bay in April (1983) and subsequently from commercial landings at Karachi Fish Harbour in January 2010. This moray eel is brown to yellow-brown with numerous dark-edged white spots on the head and body. The inside of the mouth and the tip of the tail are white. A black blotch surrounds the gill opening. There are enlarged canine teeth at the front of the upper jaw. It was originally described as *Muraena meleagris* from Southern Oceans by Shaw (1795). Its holotype (BMNH 1977.4.22.2) is housed in Natural History Museum, London, U. K. (Eschmeyer, 1998).

Hatooka (2002) pointed out that the holotype of *Muraena meleagris* actually belongs to the species currently recognized as *Gymnothorax eurostus*; the species currently treated as *Gymnothorax meleagris* may take the next available name i.e. *Gymnothorax chlorostigma*. Smith (2012) examined the holotype and noted some disputed characters, therefore, has opined to retain the *Gymnothorax meleagris*.

This species is widely distributed in the Indo-Pacific area from South Africa (Castle and McCosker, 1986) to Pitcairn Island (Irving *et al.* 1995). In the area it is known from India (Kapoor *et al.*, 2002), the Maldives (Randall and Anderson, 1993) and Yemen (Zajonz *et al.*, 2000). It is not known from Persian Gulf and Oman (Randall, 1995).This species is reported for the first time from Pakistan coast.

Material Examined:

- One specimen - collected from Karachi Fish Harbour on January 22, 2010 (65 cm)

Gymnothorax phasmatodes (Smith, 1962)
(Fig.11)

Ghost moray, as it is commonly known is reported from Churna Island (Diver Reef-Karachi) and identified from underground photograph. This moray has an elongated body with a blunt overhanging snout and a smooth dorsal head profile. Body has shading white ventrally. Edge of fin white and iris yellow. Margin of dorsal fin appear blue. It was reported from Indo-West Pacific including Mozambique and Mauritius, Oman to the Philippines south to Australia, east to Papua New Guinea.. It was originally described as *Lycodontis phasmatodes* by Smith (1962) from Inhaca Island, Mozambique, western Indian Ocean. Its holotype (SAIAB 108) is housed at South African Institute for Aquatic Biodiversity, Grahamstown, South Africa (Eschmeyer, 1998). This species is reported for the first time from the coast of Pakistan.

Material Examined:

One specimen photographed at Churna Island by Divers Reef, Karachi on 15 November 2013.

Gymnothorax pictus (Ahl, 1789)
(Fig. 12)

Peppered moray, as it is commonly known, is reported as *Muraena picta* from Karachi by (Khan, 1924). It was originally described as *Muraena picta* from East Indies by Ahl (1789), however, no type is known (Eschmeyer, 1998). It is widely distributed in Indo-Pacific area to islands in tropical Pacific Ocean (Randall, 1995).

It has been collected from Station No. 73 (23°48.23'N; 67°01.24'E) on November 16, 2010 onboard R/V Dr. Fridtj of Nansen Cruise -2010. From Karachi Fish Harbour, it was also collected on January 21, 2010.

Material Examined:

- One specimen -Station No. 73 (23°48.23'N; 67°01.24'E) on November 16, 2010 onboard R/V Dr. Fridtjof Nansen Cruise -2010.
- One specimen - Karachi Fish Harbour, collected on January 21, 2010 (62 cm)

Gymnothorax prolatus Sasaki & Amaoka, 1991
(Fig. 9)

This species has a bluntly rounded snout and moderate eyes which is closer to corner of mouth than to snout tip. It has a brown body with dark fins with prominent white unpigmented spots surrounding supraorbital, infraorbital and mandibular pores and posterior nostril. Originally this species was described by Sasaki and Amaoka (1991) based on specimen collected from Suao fish market, northeastern Taiwan. Its holotype (HUMZ 107775) is housed at Hokkaido University Museum, Hokkaido, Japan. It is only known from off the east coast of northern Taiwan whereas Mohapatra*et al*. (2015) extended its distribution to Bay of Bengal and to Pakistan (Northern Arabian Sea).

Material Examined:

- One specimen - collected from off Karachi landed at Karachi Fish Harbour on January 7, 2015 (124 cm).

Gymnothorax reticularis Bloch, 1795
(Fig. 10)

This moray eels is characterized by having anus located slightly before mid-body. Its eyes are located closer to the corner of mouth than snout tip. It body behind gill opening have 15 to 19 continuous bars extending onto head and chin with closely spaced brown spots separated by a narrow pale inter-space giving the impression of horizontal lines. Spotting on its body is restricted to the dorsal half of the body. It was described Coromandel coast, India by Bloch (1795). Its holotype (ZMB 3986) is housed in Zoologisches Museum, Humboldt Universitat, Berlin (Eschmeyer, 1998). This species is known to be distributed in the Indo-West Pacific extending from Mauritius and Seychelles to southern Japan and Indonesia. It has also been reported from the northern coast of Israel in the Mediterranean (Stern and Goren, 2013). Present paper extends its distribution to further north to the coast of Pakistan.

Material Examined:

- One specimen -Station No. 74 (23°50.37'N; 67°01.29'E; 71m) on November 17, 2010 onboard R/V Dr. Fridtjof Nansen Cruise -2010-59 cm
- One specimen - Karachi Fish Harbour commercial landings, collected on October 15, 2004 (65 cm)
- One specimen - Karachi Fish Harbour commercial landings, collected on October 27, 2004 (49 cm)

Gymnothorax pseudothyrsoideus (Bleeker, 1853)
(Fig. 11)

This species which is commonly known is highfin moray is considered to be most common moray eels inhabiting intertidal and shallow subtidal rocky and reef areas along the coast of Pakistan. It was reported by Sindh by Day (1878, 1889), Misra (1962) and Sorley (1932).It was also reported by Bal and Mohamed (1957), Hoda

(1985b, 1988) and Qureshi (1958) from Pakistan without mentioning any specific location. There is a specimen that is housed in the Natural History Museum, London which was collected from Karachi (Anonymous, 1999). This species was originally described from Makasar, Sulawesi, Indonesia by Bleeker (1853). Its holotype (BMNH 1867.11.28.246) is housed in Natural History Museum, London, U. K. (Eschmeyer, 1998).Anonymous (1999), Bal and Mohamed (1957), Day (1878, 1889), Hoda (1985b, 1988) Misra (1962), and Qureshi (1958), Sorley (1932), reported this species as *Muraena pseudothyrsoidea.*

This moray eel is commonly found in the intertidal pools on rocky platforms especially at Buleji, Pasha Bundar, Cape Monz, and Goth Mubbarak on Karachi coast and Ormara, Taq, Sakoni, Asola Island, Ras Juddi, Gwader (Pedi Zur), Jiwani and Daran along Balochistan coast. They inflict severe bite especially to shell collectors who comb rock pools. Five specimens of this species were examined during the present study which all meet the description given by Chen *et al.* (1994).

Material Examined:

a. Three specimens - Karachi Fish Harbour, collected on August 8, 2004 (67, 61, 73 cm)
b. One specimen – From Buleji, Karachi, collected on June 2, 2004 (72 cm)
c. One specimen - Karachi Fish Harbour, collected on December 30, 2014 (82 cm)

Gymnothorax punctatofasciatus Bleeker, 1863

Bars'n spots moray, as it is commonly known is reported from Sindh coast by Anonymous (1955), Sorley (1932) and fromMakran coast by Anonymous(1955) and Qureshi(1952). It was also reported from Pakistan without mentioning any specific location byHoda (1985b, 1988), Mujib (1985) and Qureshi (1958). This species was described from Ambon Island, Moluccas Islands, Indonesia by Bleeker (1863). Holotype (BMNH 1867.11.28.280) is housed in Natural History Museum,London, U. K. (Eschmeyer, 1998). Sorley (1932), Hoda (1985b, 1988), Mujib (1985), Qureshi (1958) reported this species as *Muraena punctatofasiata* whereas Anonymous (1955) and Qureshi (1952) as *Muraena (Gymnothorax) punctatofasiatus.* According to Smith (2012) this species has distribution in western Pacific. Kapoor *et al.* (2002) listed among the species known from India.No recent collection of this species has been made from Pakistan.

Gymnothorax rueppellii (McClelland, 1844)

Banded or Ruppel'smoray, as it is commonly known, was reported from Pakistan by Kapoor*et al* (2002). It was originally described as *Dalophis rueppelliae* by McClelland (1844) from Red Sea. Its holotype is not known, however lectotype (SMF 151) is housed in Naturmuseum Senkenberg (Eschmeyer, 1998). Its coloration makes it distinguishable from other species of the genus occurring in the area. It has pale grayish brown colour with 16-21 dark bars. Top of head is yellow while corner of mouth with a dark brown spot. No recent collection of this species has been made from Pakistan.

Gymnothoraxthyrsoideus (Richardson, 1845)

This species which is commonly known as grayface moray is reported as *Muraena (Gymnothorax) thyrsoidea* by Anonymous (1955) from Karachi and Mekran coast whereas Mujib (1985) and Qureshi (1958) reported this species from Pakistan as *Muraena thyrsoidea* without mentioning any specific locality. This species was originally described as *Muraena thyrsoides* from Canton, China Seas by Richardson (1845), however, no type is known (Eschmeyer, 1998). In the Arabian Sea, this species was reported from India by Kapoor*et al.*, (2002) and from the Maldives by Randall and Anderson (1993). Pakistan is possibly its western limit of distribution, as this species is known mainly from eastern Indian Ocean extending Tuamotu Island in the eastern Pacific (Myers, 1991). No recent collection of this species has been made from Pakistan.

Gymnothorax tile (Hamilton-Buchanon, 1822)

Indian mud moray, as it is commonly known is from Pakistan by Anonymous(1955), Hoda (1985b, 1988), Mujib (1985), Misra (1962) and Qureshi (1958). Qureshi(1952) reported it from Mekran coast. This species was originally described as *Muraenophis tile* from Ganges River estuary near Kolkata, India by Hamilton-Buchanan (1822), however, no type is known (Eschmeyer, 1998).Hoda (1985b, 1988), Misra (1962) and Qureshi (1958)

referred this species as *Muraena tile* and Anonymous (1955), Mujib (1985) and Qureshi (1952)listed it *as Muraena (Gymnothorax) tile.* This species occurs in estuaries and river mouths (Talwar and Jhingran, 1991). This species is mainly reported from eastern Indian Ocean extending from Bay of Bengal to the Philippines. No specimen of this species was collected during the present study, as well as during extensive surveys that have been conducted in estuarine areas of the River Indus by Jafri *et al.*(2000).

Gymnothorax undulatus (Lacepede, 1803)

Undulated moray is reported from Sindh by Sorley (1932) and from Balochistan by Zugmayer (1913). It was also reported from Pakistan without mentioning any specific location by Halstead *et al* (1990). All three authors have reported this species as *Muraenaundulata.* It was originally described as *Muraenophis undulates* by Lacepede (1803), however, no type locality or types are known (Eschmeyer, 1998). This species is widely distributed in Indo-Pacific area extending from East African coast to Pacific Island. Its distribution is extended to eastern central Pacific. No recent collection of this species has been made from Pakistan.

Muraena helena Linnaeus, 1758

Mediterranean moray was reported from Thandi Sarak, Buleji, and Pasha Bunder by Ahmed (1996) and Ahmed and Wazarat(1993), however, presence in Pakistani areas is doubtful, because the species is known only from Eastern Atlantic and Mediterranean areas. It is definitely a misidentification.

Strophidonsathete (Hamilton-Buchanan, 1822)
(Fig. 12)

Slender giant moray is reported from Karachi by Anonymous(1999) and Paradise Point, Karachi by Moazzam and Rizvi(1980). It was also reported from Pakistan byBianchi (1985), Hoda (1985b, 1988), Hussain (2003) and Jalil and Khaliluddin (1972, 1981) without mentioning any specific location. Bianchi (1985), Hoda (1985b, 1988), Hussain (2003), Jalil and Khaliluddin (1972, 1981) and Moazzam & Rizvi (1980) reported this species as *Thyrsoidesmacrura* whereas Anonymous (1999) listed it as *Muraenamacrura*. This species was originally described as *Muraenophissathete* from Ganges estuaries near Calcutta, India by Hamilton-Buchanan (1822), however, no type is known (Eschmeyer, 1998).

It is known to inhabits muddy ocean bottoms and estuarine areas and sometimes found in rivers and inner bays, creeks and lagoon. It lives in a burrow and known to extend itself vertically from a burrow with its head held horizontally beneath the surface, rising and falling with the tide. Two specimens collected from Phitti Creek and Miani Hor were examined which meets the description of the species given by Chen *et al.* (1994).

Material Examined:

- One specimen –off Phitti Creek, collected on January 14, 2008 (285 cm)
- One specimen – MianiHor lagoon collected on September 27, 2012 (246 cm)

Uropterygiusmarmoratus (Lacepede, 1803)

Marbled reef eel is reported as *Gymnomuraenamarmorata.* from Pakistan by Qureshi (1958) and Hoda (1985b, 1988). It was originally described from New Britain Island, Bismarck Archipelago by Lacepede (1803), however, no type is known (Eschmeyer, 1998). No recent collection of this species has been made from Pakistan.

Family Anguillidae

Members of family Anguillidae are generally known as freshwater eels. These are usually catadromous fishes in tropical and temperate waters. Their eel like body has well developed pectorals but no pelvic fins All spend their juvenile and adult life in freshwater, returning to the ocean to spawn and die. There is some doubt as to the validity of some of the fifteen species currently recognized; of which two are reported from Pakistan.

Fig. 9 *Gymnothorax prolatus*collected from off Karachi landed at Karachi Fish Harbour on January 7, 2015 (124 cm).

Fig. 10.*Gymnothorax reticularis* collectedon November 17, 2010 onboard R/V Dr. Fridtjof Nansen (59 cm)

Anguilla bengalensis Gray, 1831)

Indian mottled eel is reported from Pakistan by Castle (1984a), Hoda (1985b, 1988), Jayaram (1981, 1999), Misra (1962), Murray (1880),Qureshi (1958), Talwar and Jhingran (1991).Murray (1880) reported this species as *Muraenamaculata.* This species is reported to be occurring in Pakistan, India, Sri Lanka, Burma, the East Indies and the Philippines (Talwar and Jhingran, 1991). It is also known from Nepal but considered to be threatened (Shrestha, 1994). In India it is also regarded as threatened (Menon, 1999). It is reported from Hadhramout, Yemen (Attaala and Rubaia, 2005). It was originally described as *Muraenabengalensis* from India by Gray (1831), however, no type is known (Eschmeyer, 1998). No specimen of this species was collected during the present study, as well as during extensive surveys that have been conducted in estuarine areas of the River Indus by Jafri *et al.*(2000).As there is no recent authentic record of occurrence of this species in Pakistan, therefore, it is presumed that it is extremely rareor may already be extinct. However, further studies are required to verify this.

Anguilla bicolor bicolor McClelland, 1844

Indonesian short fineel is reported from Pakistan by Castle (1984a) and Talwar and Jhingran (1991). This species was described from Sandoway, Malay coast, India by McClelland (1844). Its holotype is not known, however, syntypes are housed in Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt-am-Main, Germany (Eschmeyer, 1998). It is widely distributed in Indo-West Pacific between South Africa to Japan and Australia. Considered to be a catadromous fish which spends its adult life in fresh water and migrate to sea for breeding. There is no authentic record of occurrence of this species in Pakistan.

Family Muraneosocidae

This family which includes pike congers is found in tropical waters of Atlantic, Indian and Pacific Oceans. They are characterized in having well developed teeth, especially on vomer. Their pectorals are well developed and eyes are large covered with skin. The origin of dorsal fin in these fishes is over or slightly before pectoral base. Of the 15 known species of this family, six are reported from Pakistan.

Congresox talabon (Cuvier, 1829)

Yellow pike conger, as it is commonly known is reported from waters of Sindh by Misra (1962) and Sorley (1932) as *Muraenosox talabon* whereas Murray (1880) reported it as *Conger talabon.* It was originally described as *Conger talabon* from Vizagapatnam, India by Cuvier (1829), however, no type is known (Eschmeyer, 1998). It is mainly known in the eastern Indian Ocean from Sri Lanka to the Philippines. It was also reported from Iran (Assadi and Dehghani, 1997). There is no recent record of occurrence of this species in Pakistan.

Congresox talabonoides (Bleeker, 1853)

Indian pike conger is reported from Sindh by Sorley (1932). It was reported from Makran coast by Anonymous (1955) and Qureshi (1952). It was also listed among the fishes found in Pakistan by Bianchi (1985), Hoda (1985b, 1988), Hussain (2003), Jalil and Khaliluddin (1972, 1981), Mujib (1985), Qureshi (1958) and Siddiqi (1956). This species was described as *Conger talabonoides* from Jakarta, Java, Indonesia by Bleeker (1853). Whereaboutof its holotype is not known, however, Bleeker's specimens are housed in Natural History Museum, London, U. K. and National Museum of Victoria, Melbourne, Victoria, Australia (Eschmeyer, 1998). Anonymous (1955), Hoda (1988), Hussain (2003), Jalil and Khaliluddin (1972, 1981), Mujib (1985), Qureshi (1952, 1958), Siddiqi (1956) and Sorley (1932) referred this species as *Muraenosoxtalabonoides*. This species is mainly known from Bay of Bangal and further east to China and Philippines. It is also reported from Somalia (Sommer, *et al.*, 1996). There is no recent record of occurrence of this species in Pakistan.

Gavialiceps taeniola Alcock, 1889b

This species is reported from offshore waters of Pakistan by Norman (1939). It was originally described from Arakan coast, Myanmar (19°35'N, 92°24'E) and Andaman Sea southeast by south of Ross Islands by Alcock (1889b). Its holotype is not known, however, syntypes are housed in Natural History Museum, U. K. (Eschmeyer, 1998). This species is known from Arabian Sea, Bay of Bengal extending further east to the Philippines (Karmovskaya, 1994).

Castle (1977) has pointed out that this species is readily recognizable in having elongate jaws, prominent dentation and conspicuous cephalic pores. Its maxilla is attached to the neurocranium some distance behind the tip of the snout, the dentition on the and jaw is triserial, the brachial aperture is relatively large and the external interbrachancial distance is very small.

Color of this species is brown whereas head is black. Its gill chamber is dark but it does not show through the skin. The peritoneum is pigmented, the stomach is bright and long, but does not reach above the anus.

Gavialiceps arabicus (D'Ancona, 1928)
(Fig.13)

This is a new record from Pakistan as its specimen was also collected during recent cruises of Dr. Fridtjof Nansen in the offshore waters of Pakistan in 2010. It was originally described from Gulf of Aden, near the Bab-el-Mandeb Strait by D'Ancona (1928). Whereabout of its holotype is not known (Eschmeyer, 1998). This species is known from Western Indian Ocean including Gulf of Aden, southeastern Arabian Sea from Socotra, Yemen to Maldives.

Muraenosox bagio (Hamilton-Buchanan, 1822)
(Fig. 14)

Common pike conger is reported from off Karachi waters, Pakistan by Anonymous(1993, 2001) and Niazi (2001). It was also reported by Bianchi (1985) and Hussain (2003) from Pakistan without mentioning any specific location. It was originally described as *Muraenabagio* from Ganges River estuaries, India by Hamilton-Buchanan (1822), however, no type is known (Eschmeyer, 1998). This commercially important species which is locally known as baam and sang in Sindhi and Balochi languages respectively is widely distributed in the Indo-Pacific area extending from South Africa to Fiji (Castle, 1984c). It is also known as kallow in Jiwani area of Balochistan.

Fig. 11.*Gymnothorax pseudothyrsoideus*-specimen collected from Buleji, Karachi, on June 2, 2004 (72 cm)

Fig.12.*Strophidonsathete*-off Phitti Creek, collected on January 14, 2008 (285 cm)

Material Examined:

- One specimen –collected from Karachi Fish harbour on November 5, 2005 (38 cm)
- One specimen – collected from Karachi Fish harbour on January 16, 2014 (47 cm)

Fig. 13. a. *Gavialiceps arabicus* collected from Station No. 20 (24°49.04'N; 66°46.31'E; 938m) on October 10, 2010 onboard R/V Dr. Fridtjof Nansen Cruise -2010; b- head showing eyes and dentation.

Fig.14. *Muraenosox bagio* collected from Karachi Fish Harbour on November 5, 2005 (38 cm)

Muraenesoxcinereus (Forsskal, 1775)
(Fig. 15)

This species which is commonly known as dagger tooth pike conger , is a commercially important species. It is locally known as baam and sang in Sindhi and Balochi languages respectively and also known as kallow in Jiwani area of Balochistan. It is reported from waters of Sindh by Ahmad *et al* (1973), Anonymous (1955), Castle (1984c),

Misra (1962), Sorley (1932), whereas it was reported from Dabbo Creek by Mirza and Baquer (1994) and from Karachi by Ahmad *et al*. (1973), Anonymous(1955), Hureau(1991), Mujib(1985) and Niazi (2001). It was also collected from Korangi Creek (Ahmed and Abbas, 1999a, 1999b, 2000) and Paradise Point, Karachi (Moazzam and Rizvi, 1980). From Balochistan it was reported by Castle (1984c), Zugmayer (1913), Ahmad *et al*.(1973), Anonymous(1955) and Qureshi (1952). From Miani Hor, Balochistan it was reported by Ahmed and Abbas(1999a, 2000). This species was also reported from Pakistan without mentioning any specific location by Bianchi (1985), Froese and Pauly (2015), Hoda (1985b, 1988), Hussain (2003), Jalil and Khaliluddin (1972, 1981), Majid *et al* (1992), Mujib (1985) and Qureshi (1958).

Fig. 15.*Muraenesoxcinereus*collected from Karachi Fish Harbour on September 16, 2013 (47 cm)

Fig. 16.*Avocettina infans* collected from offshore waters of Balochistan onboard Dr. Frodtjof Nansen Cruise, 1975 (43 cm)

This species was originally described as *Muraenacinerea* from Jeddah, Saudi Arabia, Red Sea by Forsskal (1775). Its holotype (ZMUC P31250) is housed in Zoological Museum – University of Copenhagen (Eschmeyer,

1998). It is widely distributed in the Indo-Pacific area from south Africa to Fiji. It has also migrated to Mediterranean Sea through Suez Canal (Bauchot and Saldanha, 1986). This species can be distinguished from *Muraenosox bagio* in having the head broader with interorbital about 8 times in head (head narrower, interorbital width about 10 times in head in *M. bagio*).

Material Examined:

- One specimen –collected from Karachi Fish harbour on September 16, 2013 (47 cm)
- One specimen – collected from Karachi Fish harbour on December 10, 2013 (67 cm)

Family Nemichthyidae

Members of family Nemichthyidae are known as Snipe eels and are found in bathypelagic and mesopelagic zones of Atlantic, Indian, and Pacific Oceans. These eels have extremely long jaws; the lower jaw shorter than the upper making the jaws nonocclusible. Sexually mature males undergo distinct changes, like the radical shortening of the jaws and tooth loss. There are nine species of family Nemichthyidae of which three are reported from Pakistan.

Avocettina infans (Gunther, 1878)
(Fig. 16)

Avocet snipe eel, as it is commonly known is reported from southwest of Karachi (Anonymous, 2000). It was **o**riginally described as *Nemichthys infans* from Mid-Atlantic (05°48'N, 14°20'W), Challenger station 101 by Gunther (1878). Its holotype (BMNH 1887.12.7.259) is housed in Natural History Museum, London, U. K. (Eschmeyer, 1998).This is circumglobal species found in meso- and bathypelagic zone. During the present study, one specimen of this species collected from offshore waters of Balochistan * exact location not recorded) on board Dr. Frodtj of Nansen Cruise, 1975 which has a total length of 43 cm was examined.

Material Examined:

- One specimen –collected from offshore waters of Balochistan onboard Dr. Frodtj of Nansen Cruise, 1975 (43 cm)

Nemichthys curvirostris (Stromman, 1896)

Boxer snipe eel was reported from off Pasni, Balochistan by Khatoon and Hussain(2000) and Hussain (2003). It was originally described as *Leptocephalus curvirostris* from Western Atlantic, north of Puerto Rico (22°N, 65°W) by Stromman (1896). Its holotype (ZMUU 410) is housed in Zoologische Museum, University of Upsala (Eschmeyer, 1998). It has a worldwide in tropical and temperate waters inhabiting in in meso- and bathypelagic zone.

Nemichthys scolopaceus Richardson, 1848

Slender snipe eel was reported from off Pasni, Balochistan by Khatoon and Hussain (2000). Hoda (1985b, 1988), Hussain (2003) and Jalil and Khaliluddin (1972, 1981). It was originally described from South Atlantic, off Brazil by Richardson (1848). Its holotype (BMNH 1871.7.16.1) is housed in Natural History Museum, London, U. K. (Eschmeyer, 1998). It has worldwide in tropical and temperate seas, Occur in midwater, usually below 400 m and occasionally in shallow water in the northern part of its range (Nielsen and Smith, 1978).

Family Synaphobranchidae

Members of the family Synaphobranchidae commonly known as cutthroat eels are found in Atlantic, Indian and Pacific Oceans. The species of this family have opening of gills low on body, below or at the insertion of pectoral fin.

Ilyophis brunneus Gilbert, 1891

It is commonly known as muddy arrowtooth eel and known to be circumtropical species which is found along the slope and upper abyssal zone (Sulak and Shcherbachev, 1997). Froese and Pauly (2015) has distribution of this species in Pakistani waters. Further studies are required to ascertain its occurrence in offshore waters of Pakistan.

DISCUSSION

Order Anguiliformes includes eels which are found in freshwater, estuarine, reefs, rock pool, shallow coastal offshore waters, mesopelagic, bathypelagic and abyssal areas. Some of the eels are known for striking coloration especially moray eels which usually inhabits coral reefs and rocky areas. Eels are commercially important at least two species i.e. *Muraenesox cinereus* and *M. bagio* are commercially harvested in Pakistan. These area caught with gillnets, trawl and line gears in coastal and offshore waters. Annual landings of these two species is estimated to be about 4,500 m. tons representing mainly by *M. cinereus* (about 90 %). Other species of eels are not commercially important because these are not found in abundance.

Order Anguiliformes is considered to be highly diversified group consisting of 20 families. Of these eight families are represented in Pakistan. Family Nettastomidae includes duckbill eels represented by 2 species. Family Congridae which contains conger and garden eels is represented by 6 species from Pakistan; of these *Conger conger*is reported from Pakistan by Hoda (1985b, 1988), Hussain (2003) and Jalil and Khaliluddin (1972, 1981). However, this species is known from European waters only, therefore, its records from Pakistan are considered erroneous. Two species *Ariosoma gnanadossi, Bathymyrus echinorhynchus* and *Rhynchoconger squalicep*sare recorded from Pakistan coast for the first time.

Snake eels belonging to family Ophichthidae are represented by 7 species; of these, *Pisodonophis boro* and *P. cancrivorus* are found on the mudflats and sandy areas in the creek area as well as in the open coastal waters. *P. boro* is also found in the rice fields in lower Sindh. According to farmers who used to cultivate red variety of rice in the Indus Delta area, used to have this species commonly found in their fields, however, rice is not cultivated in the deltaic areas, therefore, this species is seldom seen. Along Balochistan coast *P. cancrivorus* is harvested by fishermen from sandy-cum-muddy intertidal area and use them as bait for catching a variety of food fishes.

Moray eels belong to family Muraenidae which is most diversified group of eels found in Pakistan represented by 17 species. An additional species *Muraena helena* Linnaeus, 1758was reported from Pakistan by Ahmed (1996) and Ahmed and Wazarat (1993). This species is known only from Eastern Atlantic and Mediterranean, therefore, its record from Pakistan is based on misidentification, and therefore, it was not included in the list of eels from Pakistan.Four species belonging to genus *Gymnothorax* i.e. *G. meleagris, G. phasmatodes, G. prolatus* and *G. reticularis* are recorded for the first time from Pakistan. No specimen of *G. phasmatodes* and *G. favagineus* was examined and their presence is confirmed from the photographs taken by scuba diver at Churna Island near Karachi.

Family Anguillidae includes freshwater eels. Two species i.e. *Anguilla bengalensis* and *A bicolor bicoilor* have been mentioned in the scientific literature, however, no specimen of these two species was observed in past four decades, therefore, it seems that these two species, if occurring in Pakistan are already extinct. However, it requires further studies to ascertain this. Pike congers belonging to family Muraneosocidae is represented by six species; of which two species i.e. *Muraenosox bagio* and *M. cinereus* are commercially harvested and exported from Pakistan. *Gavialiceps arabicus* is recorded for the first time from Pakistan coast.

Family Nemichthyidae includes snipe eels represented by three species which are found in comparatively deeper waters. No specimen of cutthroat eel belonging to family Synaphobranchidae was collected during the present studies, however, Froese and Pauly (2015) have shown distribution of one species *Ilyophis brunneus* into Pakistani waters, therefore, it is included in the list of eels found in Pakistan.

The study revealed that Order Anguiliformesis a highly diversified group represented by a total of 45 species of eels in Pakistan; of which 8species are recorded for the first time. Muranidae is considered to be most diversified family consisting of 17 species followed by families Congridae and Ophichthidae each represented by 6 and 7 species respectively. Family Synaphobranchidaeis least diversified represented by only one species.

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