A REVIEW OF GLASSFISHES (FAMILY AMBASSIDAE) FROM PAKISTAN

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ABSTRACT

Glassfihes belonging to Family Ambassidae are known to inhabit freshwater, estuarine and marine habitat. From Pakistan, 7 species belong to 4 genera are reported which includes 2 marine and 5 freshwater species. *Ambassis gymnocephalis* seems to be common in shallow coastal waters, intertidal areas and rockbools on sandy and muddy areas. *Chanda nama* and *Parambassis ranga* are of frequent occurrence in freshwater habitats of Sindh, Balochistan and Punjab. All members of family Ambassidae are considered to be important in aquarium trade because of their transparent body and high survival rate. A number of other species of this family is imported from southeast Asian countries, however, none of them is known to establish in natural water bodies that have accidentally or intentionally released.

Key-words: Ambassiade, Ambassis, Chanda, Parambassis, glassfishes, aquarium trade.

INTRODUCTION

Glassfishes or glassy perchlets belong to family Ambassidae (formerly known as Channidae) are found in both marine and inland waters of Asia and Oceania (Menon, 1999; Nelson, 1994; Roberts, 1994). Most species are small having semi-transparent body and are inhabitant of freshwater bodies as well as estuarine and coastal waters. Glassy perchlets are not of much economic significance except some species are kept in aquaria as ornamental fishes and few others are consumed by poor classes in India, Bangladesh, Sri Lanka and Myanmar. Members of family Ambassidae are locally known in Pakistan by a variety of names. It is generally known as 'shisha machi', however it is also called 'photani', 'motar' 'phud', 'peeda' 'put-to-lah' or 'mittho' in Sindhi and 'kasha' in Balochi and 'makhni' 'phed-du-ah', 'kangee', or 'ched-du-ah' in Punjabi and 'chnada' (Bangali) in Karachi market.

Although members of this family are reported both from freshwater and marine environment in Pakistan, however, no work exclusively cover this family. In the present paper, a review of the species found in Pakistan and distributional record of each known species is given. Members of family Ambassidae is widely distributed in coastal, brackish as well freshwater habitat in Pakistan and their presence has been mentioned in a large of papers published on various aspects of fish biology, distribution and other aspects related to fisheries. In the present paper an attempt was made to refer to the publications that mention species of family Ambassidae. If any published paper is not mentioned in this study, it may not be intentional but missed because of availability or access to the said paper.

MATERIALS AND METHODS

In addition to the literature review samples of family Ambassidae were collected from commercial landings as well as from the coastal and inland areas of Pakistan. The specimens were photographed and later on preserved in 5 % neutralized formalin and kept in the Museum of Marine Fisheries Department for future reference.

RESULTS AND DISCUSSION

A total of seven species belonging to four genera were reported from Pakistan. Of these two species i.e. *Ambassis ambassis and Ambassis gymnocephalus* were reported from marine and estuarine areas whereas four species i.e. *Chnada nama, Parambassis thomassi, Parambassis ranga, Parambassis lala* and *Pseudambassis baculis* were reported from freshwater habitat. Of these, *Chanda nama* and *Parambassis ranga* seems to be most dominating species which is landed in commercial quantities and mostly utilized locally by the immigrant Bangladeshi and Burmese population settled in Karachi and its vicinity. All members of family Ambassidae are considered to be important in aquarium trade because of their transparent body and high survival rate. In

addition, a number of other species of this family is imported mainly from southeast Asian countries, however, none of them is known to establish in natural water bodies that have accidentally or intentionally released.



Ambassis ambassis (Lacepède, 1802) (Fig. 1)

Fig. 1. Ambassis ambassis collected from Buleji on 31 December, 2009 (9 cm TL)

This species is commonly known as Commerson's glassy perchlet and is reported from coastal areas of Sindh and Balochistan inhabiting coastal creeks and sheltered waters. From Balochistan, this species was reported by Ahmed (1996) and Zugmayer (1913) whereas Sindh it was reported by Sorley (1932). Additionally this species was reported from Baba Island, Bhit Island, and Port Qasim by Ahmed and Wazarat (1993) and from Sandspit, Karachi, Bambhore, Keti Bunder, and Korangi Creek (Ahmed *et al.*, 1999). In all of these studies it was reported as *Ambassis commersonii* Cuvier and Valenciennes, 1828 which is considered as a synonym of this species (Frickle *et al.*, 2022).

This species was originally described as *Centropomis ambassis* from Réunion Islands by Lacepade (1802), however, no holotype is known. Syntypes are housed in Museum National d'Historie Naturelle, Paris, France (Frickle *et al.*, 2022). *Ambassis commersonii* described from Réunion, Pondicherry (India), Mahé (Seychelles) and Java (Indonesia) by Cuvier and Valenciennes (1828) is considered to be a synonym of this species. No holotype of this taxa is known, however, syntypes are housed in the Muséum d'histoire naturelle de la Ville de Genève (MHNG) and Museum National d'Historie Naturelle, Paris, France (Frickle *et al.*, 2022).

Ambassis ambassis is known to be widely distributed in Western Indian Ocean from East Africa, South Africa, Persian Gulf, Madagascar, Réunion and Mauritius (western Mascarenes) east to western India (Frickle *et al.*, 2022). During the present study, a number of samples collected from Pakistan (both Sindh and Balochistan) were examined. The photograph of specimen given in this paper was collected from sandy shore at Buleji on 31 December, 2009 using cast net.



Ambassis gymnocephalus (Lacepede, 1802) (Fig. 2)

Fig. 2. Ambassis gymnocephalus collected from Damb, Balochistan on 11 November, 2014 (13.4 cm TL)

It is commonly known as bald glassy perchlet. It is found in marine, brackish and freshwater along Sindh and Balochistan coast. This species reported from Pakistan by Hoda (1985, 1988), Hussain (2003) and Jalil and Khaliluddin (1972, 1981) whereas it is also reported from Sindh coast by Anonymous (1999) and Jayaram (1981, 1999). It was originally described as *Lutjanus gymnocephalus* from Indo-Pacific Ocean (le grand Océan équinoxal or dans les parties de ce grand Océan voisines des tropiques") by Lacepede (1802), however, no type is known (Frickle, *et al.*, 2022). This species is known to be widely distributed in the Indo-West Pacific area including East Africa and South Africa east to Philippines and New Guinea, north to Taiwan, south to Queensland, Australia (Frickle *et al.*, 2022). Detailed description of the species is given in Allen and Burgess (1990). This is species is distinguished from its congeners on the basis that its lateral line is interrupted and its preorbital bone has exposed and posteriorly directed rostral spine below anterior nostril.

This is most common glassfish found along the coast of Pakistan including in the intertidal water along open sea, bays, lagoons and estuaries. It is also found in lower reaches of the River Indus in almost freshwater. The photograph of specimen given in this paper was collected from Damb, Balochistan on 11 November, 2014 using bottom set gillnet.

Ambassis natalensis Gilchrist and Thompson, 1908

This species is commonly known as slender glassy and was originally described from Inner harbour, Durban, KwaZulu-Natal, South Africa, southwestern Indian Ocean by Gilchrist and Thompson (1908). Its holotype is not known, however, its syntypes are housed in Australian Museum at Sydney (AMS IA.6944-45), Natural History Museum, London (BMNH 1927.12.6.26-29) and South African Museum at Cape Town (SAM 9887 + 11665). It was reported from Pakistan by Shaikh and Panhwar (2021). This species is reported Indo-West Pacific area including South Africa, East Africa, Madagascar and western Mascarenes, Red Sea east to Philippines, north to China and Taiwan, south to northern Australia (Frickle *et al.*, 2022). According to Shaikh and Panhwar (2021) this species, the pre-opercular spine, predorsal scales, and teeth on the vomer and palatines are the key identification characters based on Martin and Heemstra (1988).

Examination of the photograph published in Shaikh and Panhwar (2021) shows that hind margin of preopercle is entire whereas in general morphology it seems to be more close of *Ambassis ambassis*. The colour given in the photograph seems to be adjusted as all fins appears to be pinkish. No specimen of this species was examined during the present study.



Chanda nama Hamilton-Buchanan, 1822 (Fig. 3)

Fig. 3. Chanda nama collected from Karachi Fish Harbour on 31 May, 2013 (8.0 cm TL)

It is commonly known as elongate glassy perchlet. It is commonly found fresh and brackish waters almost throughout Pakistan except for cold waters of Khyber Pakhtunkhwa, Azad Kashmir, and Northern Areas. This species was reported from Pakistan by Ahmad (1963y, 1963z, 1979), Ahmad and Khamis (1969), Ahmad *et al* (1980), Ahmed (1996), Butt and Nawaz (1978), Froese and Pauly (2022), Iqbal (1993), Kehar *et al* (1987), Mirza

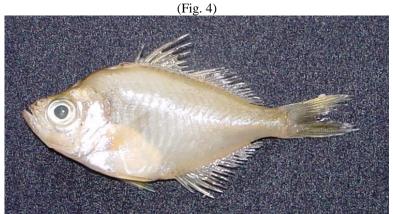
(1990), Mirza and Alam (1994), Mirza and Bhatti (1993, 1999), Qureshi (1965), Sheri and Saied (1975) and Zaman (1980), however, no specific location was identified. It was also reported from zoogeographic area Indus Balochistan by Rafique (2000), Indus plain and adjoining hills by Mirza (1974, 1975a) and Roberts (1994) and northern mountane and submountane regions by Mirza (1976).

It was reported from Sindh without identifying any specific location by Ahmad (1949-50), Ahmad et al (1976), Day (1875, 1889), Jayaram (1981), Lone (1983), Mirza (1970, 1972, 2003), Mirza and Omar (1984), Mirza and Sharif (1996), Murray (1880), Rafique (2000) and Sorley (1933). It was also reported from Dadu (Ahmad, 1963c), G. M. Barrage, Sunhari Canal, Ghulamullah, Pir Pattho, Wir, Mirpur Sakro, Ghorabari, Gharo and Dhabeji (Khatoon and Baqai, 1972, Haleji Lake (Baqai et al, 1974; Kehar et al, 1995, Khatoon and Baqai, 1972), Habibkot, Rohri Sukkur District (Ahmad et al, 1976), Hyderabad (Ahmad, 1963h; Ali and Jafri, 1984), Jhangi Sir and Kharo Chan (Ahmed et al, 1999), Khairpur (Ahmad, 1963k; Khatoon and Baqai, 1972), Khairpur Nathan Shah, Kahirpur District (Ahmad and Khan, 1974; Ahmad et al, 1976), Kharo Chan (Abro et al., 2020), Kinjhar Lake (Ahmad and Khan, 1974; Ahmad et al, 1976; Kehar et al, 1995, Khatoon and Bagai, 1972; Korai et al., 2008; Siddiqui et al, 1973; Sufi, 1957), Larkana (Ahmad, 1963m), Leth Nullah, Mirpur Sakro (Ahmad et al, 1984, 1985; Niazi and Moazzam, 1999), Lower Indus Basin (Husain, 1973), Lower Indus Plain (Mirza and Mirza, 2014), Manchar Lake (Baig and Khan, 1976; Khatoon and Baqai, 1972; Prashad and Mukerji, 1930; Sufi, 1962), Manjhand (Abro et al., 2020), Nara Game Reserve (Khan, 2004), Rapp Lake, Gouspur, Jacobabad District (Ahmad et al, 1976), Ring Dam, Kotri Barrage (Kehar et al, 1995), Sanghar (Ahmed, 1963s), Rohri, Sukkur District (Ahmad and Khan, 1974), South-West hills (Mirza, 1975a), Sukkur (Ahmad, 1963v; Anonymous, 1993) and Thatta (Ahmad, 1963x; Khatoon and Baqai, 1972).

From province of Punjab, this species was reported without specifying any location by Ahmad et al (1976), Anonymous (1999), Day (1875, 1889), Jayaram (1981), Lone (1983), Mirza (1970, 1972, 2003), Mirza and Alam (2002), Mirza and Omar (1984), Mirza and Sharif (1996), Rafique (2000). It is also reported from Attock (Ahmad, 1963b), Bajwat Area, District Sailkot (Qazi et al, 2000), Chenab River, Manha Canal (Roberts, 1994), Dera Ghazi Khan (Ahmad, 1963d), Failsalabad (Ahmad, 1963n), Gujranwala (Ahmad, 1963f; Lincoln, 1936), Gujrat (Ahmad, 1963g; Naik, 1977), Haro River (Rafique, 2001; Razaq and Mirza, 1992), Head Khanki, River Chanab (Latif et al., 2016a), Head Marala, Chenab River (Latif et al., 2016b), Head Qadirabad, River Chenab (Latif, et al., 2016c, Altaf et al., 2011), Indus River at Taunsa Barrage (Iqbal and Saleemi, 2017), Jhang (Ahmad, 1963i), Jehlum (Ahmad, 1963j), Jehlum Bridge (Mirza, et al., 2006), Jelum near Khewra, Dharyala Japalppond, Salt Range (Anonymous, 2001), Jinnah Barrage (Rafique et al, 2003), Kalabagh (Mirza and Jan, 1993), Lahore (Ahmad, 1943, 1963); Ahmad et al, 1976; Anonymous, 1916, 1999; Khamis, 1963; Mirza, 1970, 1975a, 1982), Link Canal No. 1, Dera Ghazi Khan (Ahmad et al, 1976), Multan (Ahmad, 1963o), Muzaffargarh Canal, Magasson Drain, Muzaffargarh District (Ahmad et al, 1976), Nullah Aik and Palku (Qadir, 2010), Potohar Plateau and Salt Range (Mirza, 1975a), Rahimyar Khan (Ahmad, 1963q), Rawalpindi (Ahmad, 1963r), Rawalpindi, Islamabad and Wah area (Akhtar et al, 1990), River Chenab (Altaf et al., 2015), River Chenab between Khanki and Oadirabad (Javed et al., 1997), River Chenab in District Jhang (Afzal et al, 1995), River Indus near Taunsa, Dera Ghazi Khan District (Oureshi and Ali, 1975), River Jehlum (Mirza and Sulehria, 2011), River Ravi (Pervaiz et al., 2018), Sang Jani, tributary of Haro River (Qureshi et al, 1988), Sargodha (Ahmad, 1963t), Sheikhupura (Ahmad, 1963u), Sailkot (Ahmad, 1963v), Shrakpur, Sheikhupura District (Ahmad et al, 1976), Soan River (Rafique, 2001) and Sutlej River in Lahore District (Bashir and Mirza, 1975).

Mirza (2003) and Mirza and Sharif (1996) reported this species from, Balochistan and by Mirza (1974, 1975a) from south-southeastern Balochistan and adjoining areas. It is also reported from Nulli-ni near Kota Meer Muhammad by Day (1880), Mirza (1972) and Mirza and Omar, 1984). From the province of Khyber Pakhtunkhwa it was reported by Ahmad *et al* (1976), Lone (1983), Mirza (2003), Mirza and Omar (1984) and Mirza and Sharif (1996) without identifying any specific location. It was however, reported from Bannu (Ahmad, 1963a), Bunair Valley (Butt *et al*, 2005), Dera Ismail Khan (Ahmad, 1963e; Ahmad *et al*, 1976; Butt, 1986; Mirza and Ahmad, 1974), Indus River in Dera Ismail Khan (Butt and Nawaz, 1978), Hazara (Rafique, 2000), Kohat hills (Mirza, 1975a), Kohat Toi Stream (Shahjehan and Khan, 1997), Nowshera, Peshawar District (Butt, 1986; Butt and Mirza, 1981), Peshawar (Ahmad, 1963p), Rafique, 2000), River Indus near Kalinger, Mian Dehri, Haripur (Mirza *et al*, 1995) and Spur No. 1, Chasma Road, Dera Ismail Khan District (Ahmad *et al*, 1976; Butt and Nawaz, 1978). This species was also reported from Azad Kashmir (Mirza, 2003; Rafique, 2000) and Mangla Lake (Mirza *et al* (1989).

This species was originally described from ponds throughout Bengal by Hamillton-Buchanan (1822), however, no type is known (Frickle *et al.*, 2022). During the present study, a number of samples collected from Pakistan (both Sindh and Balochistan) were examined. The photograph of specimen given in this paper was collected from Karachi Fish Harbour on 31 May, 2013 possibly using gillnet.



Parambassis baculis (Hamilton-Buchanan, 1822)

Fig. 4. Parambassis baculis collected from River Hub at Karachi-Quetta Bridge on 17 March, 2017. (4.3 cm TL)

This species is known as Himalayan glassy perchlet and known to inhabit fresh and brackish waters. It is widely distributed in Pakistan and Azad Kashmir. It is reported by Ahmad (1963y, 1963z, 1979), Ahmad *et al* (1980), Ahmed (1996), Froese and Pauly (2022), Iqbal (1993), Jayaram (1999), Mirza (1990), Mirza and Alam (1994), Mirza and Bhatti (1993, 1999), Qureshi (1965) and Sheri and Saied (1975) without specifying any specific location. It was also reported from zoogeograpohic area Indus plain and adjoining hills by Mirza, (1974, 1975a) and Roberts (1994).

From province of Sindh, this species was reported by Ahmad *et al* (1976), Jayaram (1981), Lone (1983), Mirza (1970, 2003), Mirza and Sharif (1996), Misra (1962), Rafique (2000) and Sorley (1933) but no specific area was identified. It was also reported from Daro, Thatta District (Ahmad and Khan, 1974; Ahmad *et al*, 1976), Jhangi Sir and Kharo Chan (Ahmed *et al*, 1999), Kalri Lake, Sunhari Canal, Ghulamullah, Pir Pattho, Wir, Mirpur Sakro, Ghorabari, Gharo, Thatta (Khatoon and Baqai, 1972), Leth Nullah, Mirpur Sakro (Ahmad *et al*, 1984, 1985; Niazi and Moazzam, 1999), Lower Indus Basin (Husain, 1973), Manchar Lake (Prashad and Mukerji, 1930) and Sukkur (Anonymous, 1993; Roberts, 1994).

From Punjab, it was reported by Ahmad *et al* (1976), Day (1875, 1889), Jayaram (1981), Khan (1943), Lone (1983), Mirza (1970, 2003), Mirza and Alam (2002), Mirza and Sharif (1996), Misra (1962), Rafique (2000) and Zaman (1980) without identifying any specific location. It is, however, reported from Haro River (Rafique, 2001), Indus River at Taunsa Barrage (Iqbal and Saleemi, 2017), Jinnah Barrage (Rafique *et al*, 2003), Kalabagh (Mirza and Jan, 1993), Lahore (Ahmad, 1943; Ahmad *et al*, 1976; Mirza, 1970, 1975b, 1982; Misra, 1962), Muzaffargarh (Lincoln, 1930), Rangla Wetland Complex, Muzaffargarh (Sheikh *et al*, 1997), River Chenab in District Jhang (Afzal *et al*, 1995), River Chenab in Multan District (Khan *et al*, 1991; Mahmood and Salam, 1997), River Indus, Dera Ghazi Khan District (Qureshi and Ali, 1975), River Jehlum at Bhera (Mirza and Ahmad, 1987), River Ravi (Pervaiz *et al.*, 2018), Soan River (Rafique, 2001) and Sutlej River in Lahore District (Bashir and Mirza, 1975).

This species was reported from Khyber Pakhtunkhwa by Mirza (2003) and from Peshawer by Rafique (2000). It was also reported from Azad Kashmir (Mirza, 2003), Mangla Lake (Mirza *et al* (1989) and River Punch at Kotli, Azad Kashmir (Mirza and Waheed-ud-din, 1976; Waheed-ud-din, 1979).

This species was originally described as *Ambassis baculis* from northeastern Bengal by Hamillton-Buchanan (1822), however, no type is known (Frickle *et al.*, 2022). Himalayan and Indo-Gangetic plains. Bangladesh, Cambodia, India, Mynamar, India, Nepal, Thailand and Pakistan. During the present study, a number of samples collected from Pakistan (both Sindh and Balochistan) were examined. The photograph of specimen given in this paper was collected from River Hub at Karachi-Quetta Bridge on 17 March, 2017 using castnet.

Parambassis lala (Hamilton-Buchanan, 1822)

This species is known as highfin glassy perchlet and reported by Roberts (1994) from Thatta collected through Peabody Museum Expedition in 1955. The collected specimens were housed in Museum of Comparative Zoology, Cambridge and was 25.3 mm long. There is no other/subsequent record of this species from Pakistan. This species is known from lowlands of Ganges-Brahmaputra and Mahanadi basin in India and Nepal, Irrawaddy basin in Myanmar and Indus basin in Pakistan (Froese and Pauly, 2022, Roberts, 1994; Talwar and Jhingran, 1991). Originally it was

described as *Chanda lala* from freshwaters of Gangetic province by Hamilton Buchanan, however, no holotype is known. Syntypes are housed Muséum National d'Histoire Naturelle, Paris, France (Frickle *et al.*, 2022). Its presence in Pakistan is considered to be doubtful. During present study no specimen of this species was examined.



Parambassis ranga (Hamilton-Buchanan, 1822). (Fig. 5)

Fig. 5. Parambassis ranga collected from Chilya Hatchery, Thatta on 24 September 2022. (5.2 cm TL)

This species is also known to inhabit fresh and brackish waters. It is widely distributed in Pakistan and Azad Kashmir. It is reported by Ahmad (1963y, 1979), Ahmad *et al* (1980), Ahmed (1996), Butt and Nawaz (1978), Froese and Pauly (2022), Iqbal (1993), Jayaram (1999), Kehar *et al* (1987), Mirza (1990), Mirza and Alam (1994), Mirza and Bhatti (1993, 1999), Qureshi (1965)and Sheri and Saied (1975) without specifying any specific location.

This species was reported from Sindh by Ahmad *et al* (1976), Day (1875, 1889), Jayaram (1981), Lone (1983), Mirza (1970, 2003), Mirza and Sharif (1996), Murray (1880), Qureshi and Ali (1975), Rafique (2000) and Sorley (1932). In addition this fish was also reported from Dadu District (UBC, 1996), Deh Abro Kota, Larkana District and Habibkot, Rohri, Sukkur District (Ahmad *et al*, 1976), Ghulamullah, G. M. Barrage, Sunhari Canal, Pir Pattho, Wir, Mirpur Sakro, Ghorabari, Gharo, Dhabeji (Khatoon and Baqai, 1972), Haleji Lake (Baqai *et al*, 1974; Kehar *et al*, 1995; Khatoon and Baqai, 1972), Hyderabad (Ahmad, 1963h; Kehar *et al*, 1992), Jacobabad (Ahmad, 1949-50), Jhangi Sir (Ahmed *et al*, 1999), Jugul Kumb, Kasmore, Jacobabad District (Ahmad and Khan, 1974), Kotri (Kehar *et al*, 1992), Khairpur (Ahmad, 1963k; Khatoon and Baqai, 1972), Kinjhar Lake (Kehar *et al*, 1995, Khatoon and Baqai, 1972; Korai *et al.*, 2008;Siddiqui *et al*, 1973; Sufi, 1957), Larkana (Ahmad, 1963l), Leth Nullah, Lower Indus Basin (Husain, 1973), Manchar Lake (Ahmad, 1949-50; Baig and Khan, 1976; Jafri, 2004; Jafri *et al*, 1999; Khatoon and Baqai, 1972; Prashad and Mukerji, 1930; Sufi, 1962), Mirpur Sakro (Ahmad *et al*, 1985; Niazi and Moazzam, 1999), Nara Game Reserve (Khan, 2004), Rapp Lake, Kashmore, Jacobabad District (Ahmad *et al*, 1976), Ring Dam, Kotri Barrage (Kehar *et al*, 1995), Rohri, Sukkur District (Ahmad and Khan, 1974), Sanghar (Ahmed, 1963s), Sehwan, Dadu District (Ahmad *et al*, 1976), Sukkur (Ahmad, 1963w), Thatta (Ahmad, 1949-50, 1963x) and Khatoon and Baqai, 1972).

This species was reported from Punjab by Ahmad *et al* (1976), Jayaram (1981), Lone (1983), Mirza (1970, 2003), Mirza and Alam (2002), Mirza and Sharif (1996), Qureshi and Ali (1975) and Rafique (2000). It is also reported from Attock (Ahmad, 1963b), Bajwat Area, District Sailkot (Qazi *et al*, 2000), Dera Ghazi Khan (Ahmad, 1963d), Head Qadirabad, Gujranwala (Altaf *et al.*, 2011; Latif, *et al.*, 2016c), Failsalabad (Ahmad, 1963n), Gujranwala (Ahmad, 1963g), Head Baloki, Trimmu (Khan *et al.*, 2011), Head Khanki, River Chanab (Latif *et al.*, 2016a), Head Marala, Chenab River (Latif *et al.*, 2016b), Indus River at Taunsa Barrage (Iqbal and Saleemi, 2017), Jhang (Ahmad, 1963i), Jehlum (Ahmad, 1963j), Jinnah Barrage (Rafique *et al*, 2003), Kalabagh (Mirza and Jan, 1993), Kasur District (Roberts, 1994); Khanpur Dam, Hard Bridge near Lawrencepur (Qureshi *et al.*, 1988), Lahore (Ahmad, 1943, 1963I; Ahmad *et al.*, 1976; Anonymous, 1999; Mirza, 1970, 1975b, 1982), Marala, Sailkot District (Mirza and Khan, 1988), Multan (Ahmad, 1963o), Muzaffargarh Canal, Magasson Drain, Muzaffargarh District (Ahmad *et al.*, 1976), Nullah Aik and Palku (Qadir, 2010), Rahimyar Khan (Ahmad, 1963q), Rawalpindi (Ahmad, 1963r), Rawalpindi, Islamabad and Wah area (Akhtar *et al.*, 1990), River Chenab in District (Altaf *et al.*, 2015), River Chenab between Khanki and Qadirabad (Javed *et al.*, 1997), River Chenab in District

Jhang (Afzal *et al*, 1995), River Indus near Taunsa, Dera Ghazi Khan District (Qureshi and Ali, 1975), River Ravi (Pervaiz *et al.*, 2018), Sargodha (Ahmad, 1963t), Sheikhupura (Ahmad, 1963u), Sailkot (Ahmad, 1963v), Soan River basin (Rafique, 2001), Sutlej River in Lahore District (Bashir and Mirza, 1975) and Trimu, Jhang District (Ahmad *et al*, 1976).

From Khyber Pakhtunkhwa it is reported by Ahmad *et al* (1976), Mirza (2003), Bannu (Ahmad, 1963a) and Qureshi and Ali, 1975). It was reported from Charsada (Butt and Mirza, 1981; Khattak *et al.*, 2015), Dera Ismail Khan (Ahmad, 1963e; Butt, 1986; Mirza and Ahmad, 1974; Qureshi and Ali, 1975), Indus River in Dera Ismail Khan District (V), Hazara (Rafique, 2000), Mardan (Butt and Mirza, 1981; Khattak *et al.*, 2015), Nizampur (Butt and Mirza, 1981; Khattak *et al.*, 2015), Nizampur (Butt and Mirza, 1981; Khattak *et al.*, 2015), Nowshera (Butt, 1986; Butt and Mirza, 1981; Khattak *et al.*, 2015), Peshawer (Butt and Mirza, 1981; Qureshi and Ali, 1975; Rafique, 2000), Risalpur, Peshawar District (Butt and Mirza, 1981), River Indus near Mian Dehri (Mirza *et al.*, 1995) and Spur No. 15 Chasma Road, Dera Ismail Khan District (Ahmad *et al.*, 1976; Butt and Nawaz, 1978). It is also reported from southeastern Balochistan (27° N, 67° E) Dak bunglow (UBC, 1996), Azad Kashmir (Mirza, 2003; Mirza and Sharif, 1996; Rafique, 2000) and Mangla Lake (Mirza *et al.* (1989),

This species is also known from zoogeographic areas Indus Balochistan (Rafique, 2000), Indus plain and adjoining hills (Mirza, 1974, 1975a) and northern mountane and submountane regions of Pakistan (Mirza, 1976). Originally this species was described as *Chanda ranga* from Gangetic provinces, India by Hamillton-Buchanan (1822), however, no type is known (Frickle *et al.*, 2022). This species is known to occur in Pakistan, India, Bangladesh, Myanmar, Thailand, Malaysia and Nepal (Froese and Pauly, 2022). This species is found in sluggish and standing water. During the present study, a number of samples collected from Pakistan (both Sindh and Balochistan) were examined. The photograph of specimen given in this paper was collected from Chilya Hatchery, Thatta by scoop net on 24 September 2022.

Parambassis thomasi (Day, 1870)

This species is commonly known as Western Ghat glassy perchlet. It was reported by Misra (1962) and Sorley (1932) from Sindh. Originally it is described as *Ambassis thomassi* from Calicut and Manglore, India by Day (1870). No holotype is known, however, syntypes are housed in Australian Museum, Sydney, N. S. W., Australia, British Museum of Natural History, London, U. K., MCZ, Muséum National d'Histoire Naturelle, Paris, France, Zoologisches Museum, Humboldt University, Berlin, Germany Zoological Survey of India, Kolkata (Frickle *et al.*, 2022). This species is known to be distributed in Western Ghats of Kerala and Karnataka in India and Mynamar (Froese and Pauly, 2022; Talwar and Jhingran, 1992). Its presence in Pakistan is considered to be doubtful. During present study no specimen of this species was examined.

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REFERENCES

- Abro, N. A., B. Waryani, N. T. Narejo, S.] Ferrando, S. A. Abro, A. R. Abbasi, P. K. Lashari, M. Y. Laghari, G. Q. Jamali, G. Naz, M. Hussain and Habib-ul-Hassan (2020). Diversity of freshwater fish in the lower reach of Indus River, Sindh province section, Pakistan. *Egyptian Journal of Aquatic Biology and Fisheries* 24:243-265.
- Afzal, M., M. N. Javed, and M. R. Mirza (1995). Fishes of River Chenab in District Jhang. *Biologia (Lahore)* 41: 133-137.
- Ahmad, M. (1949-50). The utility of fish as larvicides in Sind. Agriculture Pakistan 1:109-114.
- Ahmad, M. F., and S. A. Khan (1974). A checklist of the freshwater fishes of Sind, Pakistan. *Biologia (Lahore)* 20: 119-131.
- Ahmad, M. F., M.S. Niazi and S. A. Khan (1984). Fishes of Leth Nullah, a brackish channel near Mirpur Sakro, Distt. Thatta (Sind). *Records of Zoological Survey of Pakistan* 10: 1-24.
- Ahmad, M. F., M.S. Niazi and S. A. Khan (1985). Fishes of Leth Nullah. A brackish channel near Mirpur Sakro, District Thatta (Sind). *Records of Zoological Survey of Pakistan* 10: 1-23.
- 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.
- Ahmad, N. (1943). Fauna of Lahore, 5-Fishes of Lahore, Bulletin Department of Zoology, Punjab University 1:253-374.

Ahmad, N. (1963a). Fishery Gazetteer of District Bannu. Government Printing West Pakistan, Lahore: 1-2.

- Ahmad, N. (1963b). Fishery Gazetteer of District Campbellpur. Government Printing West Pakistan, Lahore: 1-2.
- Ahmad, N. (1963c). Fishery Gazetteer of District Dadu. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963d). Fishery Gazetteer of District Dera Ghazi Khan. Government Printing West Pakistan, Lahore: 1-3.
- Ahmad, N. (1963e). *Fishery Gazetteer of District Dera Ismail Khan*. Government Printing West Pakistan, Lahore: 1-2.
- Ahmad, N. (1963f). Fishery Gazetteer of District Gujranwala. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963g). Fishery Gazetteer of District Gujrat. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963h). Fishery Gazetteer of District Hyderabad. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963i). Fishery Gazetteer of District Jhang. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963j). Fishery Gazetteer of District Jhelum. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963k). Fishery Gazetteer of District Khairpur. Government Printing West Pakistan, Lahore: 1-2.
- Ahmad, N. (19631). Fishery Gazetteer of District Lahore. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963m). Fishery Gazetteer of District Larkana. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963n). Fishery Gazetteer of District Lyallpur. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (19630). Fishery Gazetteer of District Multan. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963p). Fishery Gazetteer of District Peshawar. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963q). *Fishery Gazetteer of District Rahimyar Khan*. Government Printing West Pakistan, Lahore: 1-3.
- Ahmad, N. (1963r). Fishery Gazetteer of District Rawalpindi. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963s). Fishery Gazetteer of District Sanghar. Government Printing West Pakistan, Lahore: 1-3.
- Ahmad, N. (1963t). Fishery Gazetteer of District Sargodha. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963u). Fishery Gazetteer of District Sheikhupua. Government Printing West Pakistan, Lahore: 1-3.
- Ahmad, N. (1963v). Fishery Gazetteer of District Sialkot. Government Printing West Pakistan, Lahore: 1-4.
- Ahmad, N. (1963w). Fishery Gazetteer of District Sukkur. Government Printing West Pakistan, Lahore: 1-3.
- Ahmad, N. (1963x). Fishery Gazetteer of District Mianwali. Government Printing West Pakistan, Lahore: 1-3.
- Ahmad, N. (1963y). Freshwater fish-fauna of West Pakistan. Agriculture Pakistan 14: 77-82.
- Ahmad, N. (1963z). *Fish Fauna of West Pakistan*. Governmet of West Pakistan, Directorate of Fisheries, Lahore 5 pp.
- Ahmad, N. (1979). Freshwater fisheries. Pakistan Journal of Science 31: 179-183.
- Ahmad, N. D., and K. H. Khamis, (1969). Food and feeding of common ornamental fishes. *Pakistan Journal of Science* 21: 117-120.
- Ahmad, N., S. S. Tirmazi S., Akhtar and M. Younus (1980). On plants and animals found in hyacinth infested waters. *Pakistan Journal of Science* 32: 156-162.
- Ahmed, M., Z. Ayub and Zaib-un-Nisa, (1999). Distribution and abundance of juvenile and subadult fishes in Sindh creeks and backwaters (Pakistan). *Pakistan Journal of Zoology* 31:327-338.
- Ahmed, N. (1996). Extraction, exploration and demand forecasting for aquarium fishes from Pakistan. Ph. D. Dissertation, Department of Economics, University of Karachi, 242p.
- Ahmed, N. and S. Wazarat (1993). Seawater aquarium fishes of Pakistan. In: Proceedings of a National Seminar on Study and Management in Coastal Zones in Pakistan (N. M. Tirmizi and Q. B. Kazmi eds.). Marine Reference Collection and Resource Centre, University of Karachi, Karachi, pp. 73-119.
- Akhtar, N., M. Afzal and A. Rab (1990). Evaluation of algal utilization as dietary component in freshwater fishes. *Pakistan Journal of Zoology* 22:279-287.
- Ali, S. S., and S. I. H. Jafri (1984). Length weight relationship, condition factor and food habits of the tiger perch Nandus nandus (Hamilton, 1822) from backwaters of River Indus. Sind University Research Journal (Science Series) 16: 41-50.
- Allen, G. R. and W. E. Burgess (1990). A review of the glassfishes (Chandidae) of Australia and New Guinea. *Records of the Western Australian Museum* Suppl. No. 34: 139-206.
- Altaf, M., A. Javid, A. M. Khan, A. Hussain, M. Umair and Z. Ali (2015). The status of fish diversity of River Chenab, Pakistan. *The Journal of Animal and Plant Sciences*, 25: 564-569.
- Altaf, M., A. M. Khan, M. Umair, M. Irfan, M. A. Munir and Z. Ahmed (2011). Ecology and diversity of freshwater fishes of Head Qadirabad, Gujranwala. *Punjab University Journal of Zoology* 26: 1-7.
- Anonymous (1916). Punjab District Gazetteers. XXX. A, Lahore District. (List of species given in Ahmad, 1943)
- Anonymous (1993). Computerized catalog of the fish collection. California Academy of Sciences, San Francisco, California.

- 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)).
- Anonymous (2001). Fish collection database of the National Museum of Natural History (Smithsonian Institution). Smithsonian Institution - Division of Fishes
- Baig, N. A. and M. Y. Khan (1976). Biological and chemical conditions of Manchar Lake, District Dadu (Sind). *Pakistan Journal of Science* 28: 33-39.
- Baqai, I. U., P. A. Siddiqui and M. Iqbal (1974). Limnological studies of Haleji Lake. Agriculture Pakistan 25: 321-344.
- Bashir, K. A. and M. R. Mirza (1975). Fishes of the River Sutlej in Lahore district, Pakistan, with the description of a new species. *Bulletin of Hydrobiological Research, Gordon College*. 1: 91-104.
- Butt, J. A. (1986). Fish and fisheries of North West Frontier Province (N. W. F. P.). Pakistan. *Biologia (Lahore)* 32: 21-34.
- Butt, J. A. and M. R. Mirza (1981). Fishes of the vale of Peshawar, North-West Frontier Province, Pakistan. *Biologia (Lahore)* 27: 145-163.
- Butt, J. A., and M. Nawaz (1978). Fishes of North Waziristan and Dera Ismail Khan Division, North West Frontier Province, Pakistan. *Biologia (Lahore)* 24: 281-296.
- Butt, M. Z. R., M. R. Mirza, and T. Umer (2005). *Fish and fisheries of Bunair Valley*. 3rd Symp. Fisheries. 25-26 April, 2005. Pakistan Fisheries Society, Government College University, Lahore and Department of Fisheries, Punjab. 69 (Abstract).
- Cuvier, G. and A. Valenciennes (1828). Histoire naturelle des poissons. Tome second. Livre Troisième. Des poissons de la famille des perches, ou des percoïdes. *Histoire naturelle des poissons* 2: 1-490
- Day, F. (1880). On the fishes of Afghanistan. Proceedings of Zoological Society of London 1880. 224-232.
- Day, F. (1875). The fishes of India; being a natural history of the fishes known to inhabit the seas and fresh waters of India, Burma, and Ceylon. London. Fishes India 1-168
- Day, F. (1889). The Fauna of British India, including Ceylon and Burma. Fishes 1, London, Taylor and Francis.
- Day, F. (1870). Notes on some fishes from the western coast of India. *Proceeding of Zoological Society of London* (1870): 369-374.
- Fricke, R., Eschmeyer, W. N. and R. Van der Laan (eds). (2022). ECoF. Eschmeyer's Catalog of Fishes: Genera, Species, References. *California Academy of Sciences. San Francisco*. Electronic version accessed 11/10/ 2022.

Froese, R. and Pauly, D. (eds). (2022). FishBase. World Wide Web electronic publication. www.fishbase.org (10/22)

- Gilchrist, J. D. F. and W. W. Thompson (1908). Descriptions of fishes from the coast of Natal. Annals of the South African Museum 6: 145-206.
- Hamilton-Buchanan, F. (1822). An account of the fishes found in the river Ganges and its branches. Edinburgh and London.
- Hoda, S. M. S. (1985). Identification of coastal fish varieties of Pakistan. Pakistan Agriculture 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. Regional Technical Assistance. (RETA) ADB/IUCN.113p (Draft).
- Hussain, S. Z. (1973). Fish and fisheries of the lower Indus basin (1966-67). Agriculture Pakistan 24: 297-322.
- Iqbal, H. M. Z. and S. Saleemi (2017). Diversity and Distribution of Fish Fauna of Indus River at Taunsa Barrage in Punjab, Pakistan. *Pakistan Journal of Zoology* 49: 155-161.
- Iqbal, M. (1993). Computer coded checklist of freshwater fishes of Pakistan. Zoologica Pakistan 3: 25-32.
- Jafri, S. I. H. (2004). An overview of inland and brackish water fish of lower Sindh. In: *Proceedings of Consultative Workshop on Indus Delta Eco-region (IDER)*. Dec. 16-19, 2002, Karachi (E. Ahmad, S. Omar and F. Rasool eds.): WWF-Pakistan. pp.69-86.
- Jafri, S. I. H., S. S. Ali, M. A. Mahar and S. M. Laghari (1999). Diversity of fish and plankton in Manchar Lake (Distt: Dadu), Sindh, Pakistan In: *Proceedings of Seminar on Aquatic Biodiversity of Pakistan*. (Q. B. Kazmi and M. A. Kazmi eds.) Marine Reference Collection and Resource Center and Department of Zoology, University of Karachi. pp. 63-70.
- 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.
- Javed, M. N., A. Zafar, M. Shahbaz and M. R. Mirza (1997). Biodiversity of the fishes of the River Chenab between Khanki and Qadirabad in Pakistan. *Biologia (Lahore)* 43: 149-156.
- Jayaram, K. C. (1981). Freshwater Fishes of India, Pakistan, Bangaldesh, Burma and Sri Lanka- A Handbook. Zoological Survey of India.

- Jayaram, K. C. (1999). The freshwater fishes of the Indian region. Narendra Publishing House, Delhi 110006, India.
- Kehar, A. A., S. I. H. Jafri and Ahmed, S. S., 1992. Laboratory evaluation of some freshwater fishes of Sindh as mosquito larvivore in waste water. *Proceedings of Pakistan Congress of Zoology* 12: 277-279.
- Kehar, A. A., S. I. H. Jafri and S. S. Ahmed (1995). Laboratory evaluation and rating of some freshwater fishes of Pakistan for the biological control of mosquito Culex quinquefaciatus. Pakistan Journal of Zoology 27:157-159.
- Kehar, A. A., S. S. Ahmed and S. I. H. Jafri (1987). Laboratory evaluation of indigenous small freshwater fish as predators of mosquito larvae of *Culex quinquefaciatus (Cules fatigans)*. 7th Pakistan Congress of Zoology. FEWFM-13: 176-177.
- Khamis, K. H. (1963). Food and feeding habits of ornamental fishes of Lahore, *Proceeding of 15th Pakistan Science Conference Lahore*. Part-III. Abstracts: B-45.
- Khan, A., Z. Ali, S. Shelly, Z. Ahmad and M. Mirza (2011). Aliens; a catastrophe for native freshwater fish diversity in Pakistan. *Journal of Animal and Plant Sciences* 21:435-440.
- Khan, H., (1943). On the relative value of certain larvivorous fishes from the Punjab, with notes on their habits and habitats. *Indian Journal of Veterinary Sciences* 13: 315-325.
- Khan, M. I., R. Irshad and F. H. Saga (1991(. Fishes of River Chenab in Multan Distt., Biologia (Lahore) 37: 23-25.
- Khan, S. A. (2004). A checklist of freshwater fishes of Nara Game Reserve. *Records Zoological Survey of Pakistan* 15: 45-48.
- Khatoon, S., and I. U. Baqai (1972). A preliminary report on freshwater aquarium fishes of Sind with a new record from Pakistan. *Biologia (Lahore)* 18: 135-141.
- Khattak, R. H., F. Aziz, Ejaz-Ur-Rahman and F. Zaidi (2015). Ichthyofauna of river Kabul at Nowshera, Khyber Pakhtunkhwa, Pakistan. *International Journal of Fauna and Biological Studies* 2: 57-61.
- Korai, A. L., G. A. Sahato, K. H. Lashari, S. N. Arbani (2008). Biodiversity in relation to physicochemical properties of Keenjhar Lake, Thatta District, Sindh, Pakistan. *Turkish Journal of Fisheries and Aquatic Sciences* 8: 259-268.
- Lacepède, B. G. E. (1802). Histoire naturelle des poissons. Histoire naturelle des poissons. 4: 1-728
- Latif, B., K. Pervaiz, I. B. Minhas and S. Latif (2016a). Current status of fish fauna at head Khanki, river Chenab, Pakistan. *Journal of Biodiversity and Environmental Sciences* 9: 279-285.
- Latif, M., S. Siddiqui, I. B. Minhas and S. Latif (2016b). Diversity and abundance of fish fauna at Head Marala, Chenab River, Punjab, Pakistan. *Canadian Journal of Pure and Applied Sciences* 10: 3971-3979.
- Latif, M., S. Siddiqui, I. K. Minhas and S. Latif (2016c). Studies on ichthyofaunal diversity of Head Qadirabad, River Chenab, Punjab, Pakistan. *International Journal of Fisheries and Aquatic Studies* 4: 25-29.
- Lincoln, E. H. (1930). Punjab District Gazetteer. Vol. XXXIV.-A. Muzaffargarh District. Lahore 315p.
- Lone, K. P. (1983). Inland Fisheries and Aquaculture in Pakistan: A review. Pakistan Agricultural Research Council, Islamabad
- Mahmood, J. A., and Salam, A., 1997. Fish diversity of River Chenab in district Multan. In: *Biodiversity of Pakistan* (S. A. Mufti, C. A. Woods and S. A. Hasan eds.) Pakistan Museum of Natural History, Islamabad and Florida Museum of Natatural History. Florida pp. 345-350.
- Martin, T. J. and P. C. Heemstra (1988). Identification of *Ambassis* species (Pisces: Perciformes, Ambassidae) from South Africa. *South African Journal of Zoology* 23: 7-12.
- Menon, A. G. K. (1999). Check list fresh water fishes of India. Records Zoological Survey of India, Miscellaneous Publication. Occasional Papers 1-366.
- Mirza, M. and A. Sulehria (2011). Ichthyofaunal diversity of the River Jhelum, Pakistan. *Biologia Pakistan* 57: 23-32.
- Mirza, M. R. (1975a). Freshwater fishes and zoogeography of Pakistan. Bijdragen tot de dierkunde 45: 143-180.
- Mirza, M. R. (1970). A contribution to the fishes of Lahore including revision of classification and addition of new records. *Biologia*. (*Lahore*) 16: 71-118.
- Mirza, M. R. (1972). Freshwater fishes of Baluchistan province, Pakistan. Biologia (Lahore) 18: 153-190.
- Mirza, M. R. (1974). Freshwater fishes and ichthyogeography of Baluchistan and adjoining areas of the Indus plain, Pakistan. *Biologia (Lahore)* 20: 67-82.
- Mirza, M. R. (1975b). Some corrections and additions to the fish fauna of Lahore. Pakistan Journal of Zoology 7: 217-218.
- Mirza, M. R. (1976). Fish and fisheries of the northern montane and submontane region of Pakistan. *Biologia* (*Lahore*) 22:107-120.
- Mirza, M. R. (1982). A contribution to the fishes of Lahore. Polymer Publication, Lahore.

- Mirza, M. R. (1990). Freshwater Fishes of Pakistan (Pakistan main taza pani ki macchalian). Urdu Science Board, Lahore 128 p. (In Urdu).
- Mirza, M. R. (2003). Checklist of freshwater fishes of Pakistan. *Pakistan Journal of Zoology Supplement Series* 3: 1-30.
- Mirza, M. R. and I. Ahmad (1987). Fishes of River Jhelum in Sarghoda District. Biologia (Lahore) 33: 253-263.

Mirza, M. R. and M. A. Jan (1993). Fish fauna of Kalabagh, Pakistan. Biologia (Lahore) 38: 17-22.

- Mirza, M. R. and M. K. Alam (1994). A checklist of freshwater fishes of Pakistan and Azad Kashmir. *Scientific International* 6: 187-189.
- Mirza, M. R. and M. K. Alam (2002). A checklist of the Punjab, Pakistan. *Records Zoological Survey of Pakistan* 14: 31-35.
- Mirza, M. R. and Z. S. Mirza (2014). Longitudinal Zonation in the Fish Fauna of the Indus River in Pakistan. *Biologia (Pakistan)* 60: 149-152.
- Mirza, M. R., and A. J. Khan (1988). Fishes of Marala, Silakot District, Pakistan. Biologia (Lahore) 34: 151-153.
- Mirza, M. R., and H. M. Sharif (1996). A key to the fishes of the Punjab. Ilmi Kitab Khana, Lahore. 32p.
- Mirza, M. R., and M. N. Bhatti (1993). Fishes of Pakistan and Fish Culture (Pakistan ki Machlian aur Mahi Parwari). Part-I (Urdu). Ferozsons (Pvt.) Ltd. Lahore. 184p.
- Mirza, M. R., and Waheed-ud-Din (1976). A note on the fishes of the River Punch in Azad Kashmir. *Pakistan Journal of Zoology*. 8: 98-99.
- Mirza, M. R., S. F. Adil, W. George and M. B. Chohan (1995). Systematic list of fishes of the river Indus at Ghazi and adjoining areas of NWFP, Pakistan with a note on their parasites. *Proceedings of Parasitology* 19: 69-74.
- Mirza, M. R., T. B. Saeed and S. Hussain (1989). A checklist of the fishes of Mangla Lake, Pakistan. *Science Khyber* 2: 287-293.
- Mirza, M.R. and E. Ahmad (1974). Fishes of Dera Ismail Khan District N. W. F. P., Pakistan. *Biologia (Lahore)* 20:99-101.
- Mirza, M.R. and N. A. Bhatti (1999). Biodiversity of freshwater fishes of Pakistan and Azad Kashmir. In: Proceedings of Seminar on Aquatic Biodiversity of Pakistan (Q. B. Kazmi and M. A. Kazmieds.) Marine Reference Collection and Resource Center and Department of Zoology, University of Karachi. pp. 177-184.
- Mirza, M.R. and T. Omar (1984). A key to the identification of the freshwater fishes of Baluchistan. *Biologia* (*Lahore*) 30:73-91.
- Mirza, Z., M. Javed and M. Mirza (2006). Fishes of the river Jhelum from Mangla to Jalalpur near Head Rasool. *Biologia Pakistan*, 52: 215-227.
- Misra, K. S., (1962). An aid to the identification of the common commercial fishes of India and Pakistan. *Records of Indian Museum* 57: 1-320.
- Murray, J. A. (1880). A Hand-book to the Geology, Botany and Zoology of Sind. Beacon Press, Kurruchee.
- Naik, I. U., (1977). Fishes of Gujrat District. Pakistan Journal of Science. 29:9-13.
- Nelson, J. S. (1994). Fishes of the world. Third edition. John Wiley & Sons, Inc., New York. 600 p.
- Niazi, M. S., and M. Moazzam, (1999). Spatial variations in the fish faunal composition in the Indus estuarine area. *In: Proceedings of the National Seminar on Mangrove Ecosystem Dynamics of the Indus Delta* (Anonymous ed.) Sindh Forest and Wildlife Department and the World Bank, Karachi. pp. 170-180.
- Pervaiz, K., Z. S. Mirza, S. Siddiqui, K. N. Waheed, S. Hayat and K. Usman (2018). Studies on the fish biodiversity of River Ravi in Punjab Pakistan. *Journal of Entomology and Zoology Studies* 6: 1442-1448.
- Prashad, B., and D. D. Mukerji (1930). On the fishes of the Manchar Lake (Sind). *Journal of Bombay Natural History Society* 34: 164-169.
- Qadir, A. (2010). Effect of anthropogenic activities on water quality and fish fauna of Nullah Aik and Nullah Palkhu tributaries of River Chenab, Pakistan. Ph.D. Thesis (unpublished). Quad-e-Azam University, Islamabad. 262.
- Qazi, M. B., M. R. Mirza and M. N. Javed (2000). Fishes of Bajwat area, district Sailkot, Pakistan. *Pakistan Journal* of Fisheries 1: 41-48.
- Qureshi, A. H. and M. A. Ali (1975). A contribution to the fishes of Dera Ghazi Khan District. *Biologia (Lahore)* 21: 185-190.
- Qureshi, M. R. (1965). *Common freshwater fishes of Pakistan*. Government of Pakistan, Food and Agriculture Council, Karachi 61 pp.
- Qureshi, N. A., M. Rafique, F. A. Awan and M. R. Mirza (1988). Fishes of the River Haro, Pakistan. *Biologia* (*Lahore*) 34: 179-191.
- Rafique, M. (2000). Fish diversity and distribution in Indus River and its drainage system. *Pakistan Journal of Zoology* 32: 321-332,

- Rafique, M. (2001). Fish fauna of the Himalayas in Pakistan with comments on the origin and dispersal of its high Asian elements. *Pakistan Journal of Zoology* 33: 279-288.
- Rafique, M., S. Akhtar and M. H. K. Niazi (2003). Fish fauna of Jinnah Barrage and adjoining areas. *Pakistan Journal of Zoology* 35: 95-98.
- Razaq, A. and M. R. Mirza (1992). Some new records of fishes from River Soan. *Proceedings of Pakistan Congress* of Zoology 12: 291-294.
- Roberts, T. R. (1994). Systematic revision of tropical Asian freshwater galssperches (Ambassidae), with descriptions of thee new species. *Natural History Bulletin, Siam Society* 42: 263-290.
- Shahjehan, I. A., and N. W. D. Khan (1997). Fish fauna of River Kurrum at Bannu and Toi Stream Kohat, N. W.F.P. Pakistan. Journal of Science and Technology, University of Peshawar 21: 63-65.
- Shaikh, W. and S. K. Panhwar (2021). First record of six marine fish species caught occasionally in the northern Arabian Sea in Pakistan. *Fisheries and Aquatic Life* 29: 158-163.
- Sheikh, K. M., J. A. Mahmood and M. S. Nadeem (1997). Conservation: a must to safeguard the biodiversity of Rangla Wetland Complex. In: *Biodiversity of Pakistan* (S. A. Mufti, C. A. Woods and S. A. Hasan eds.) Pakistan Museum of Natural History, Islamabad and Florida Museum of Natatural History. Florida, pp 127-131.
- Sheri, A. N. and T. Saied (1975). Revised list of freshwater fish fauna of Pakistan. Pakistan Journal of Agriculture Sciences 12: 69-76.
- Siddiqui, P.A., I. U. Baqai and M. Iqbal (1973). Check list of fishes of Kinjher (Kalri) Lake with notes on environmental conditions and fisheries potential. *Agriculture Pakistan* 24: 201-220.
- Sorley, H. T. (1932). Marine Fisheries of the Bombay Presidency. Government Press, Bombay.
- Sufi, S. M. K. (1957). Fish fauna of Kinjer Lake (West Pakistan) with an account of the major fishing implements employed by the local fishermen. *Agriculture Pakistan* 8: 208-229.
- Sufi, S. M. K. (1962). Checklist of the fishes of the Manchar Lake (West Pakistan) with a note of the effect of Sukkur Barrage and the canaliaation of the feeding channels on the fish fauna of the lake. Agriculture Pakistan 13: 499-503.
- Talwar, P. K. and A.G. Jhingran (1991). *Inland fishes of India and adjacent countries*. Volume 1-2. A.A. Balkema, Rotterdam.
- UBC (1996). University of British Columbia, Fish Collection. Fisheries Centre, University of British Columbia, Vancouver, Canada.
- Waheed-ud-Din (1979). A report on the fishes of the Poonch River, Azad Kashmir. *Pakistan Journal of Scientific Studies* 1: 9-21.
- Zaman, M. S. (1980). Malaria control through fish. Pakistan Journal of Science 32:163-168.
- Zugmayer, E. (1913). Die Fische von Balutschistan. Abhandlungen der königlich Bayerischen Akademie der Wissenschaften (mathematisch-physikalische Klasse) 26: 1-35.

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