An Overview of Etymology of Freshwater Fish Fauna of Pakistan

ABSTRACT

Despite extensive work on species descriptions and taxonomic revisions, the etymology of scientific names in ichthyology has been largely neglected in Pakistan, leaving the origins and meanings of fish names poorly understood. The main objective of this study was to make it easy for the students and researchers to remember the otherwise obliviate and hard-Latinized scientific names of species. The manuscript provides an understanding of roots, meanings, and, in many cases, the associated morphological characteristics helpful in the identification of species. The collection of fish samples has been a lifelong activity that has used multiple fishing methods like cast nets, gill nets, electrofisher, and scoop nets in accordance with the recommended standard techniques. Pakistan has three main zoo-geographical components of fish fauna: the Oriental, West Asian, and the High Asian, which show its affinities with other countries of Asia. For etymological analysis, online dictionaries, relevant archives, books, and published material have been consulted. The river systems and watersheds of neighboring countries of Pakistan have remained connected in the geological past, which has facilitated the dispersal and distribution of fish fauna in these countries. Moreover, in the post-Tethyan period and before the orogeny of the Himalayas, the watershed of Pakistan remained connected with the river systems of Central Asia and China. Consequently, Pakistan has, to a variable extent, a commonality of fish fauna with neighboring countries like India, Bangladesh, Nepal, and Bhutan in the East and North East and with Afghanistan in the West as well as with the Central Asian states and China. Pakistan also shares its Western Asian component of the fish fauna with Iran, especially in the province of Baluchistan, which is adjacent to Iran. This article, therefore, will not only be beneficial for students, field workers and fish biologists of Pakistan but will also be advantageous for the concerned in almost all countries of South Asia.

Keywords: Etymology, words-roots, zoogeography, affinity, dispersal, connectivity

1. INTRODUCTION

The history of explorative research on the freshwater fish fauna of Pakistan, a part of erstwhile Indian Sub-continent, spreads almost over two centuries. Accumulation of works of different ichthyologists have now resulted in an approximate number of 194 freshwater fish species. Moreover, there has been a rigorous exercise on the description of new species, revision of different scientific names and shifting of different taxon from one taxonomic category to another. One important component of these studies, the etymology of scientific names, has, however, always remained unattended throughout the long history of ichthyological explorations in Pakistan, and as such, the origin and accurate meanings of scientific names of fishes are almost not known. The subject of etymology encompasses the knowledge on the languages and study the origin and roots of words. In biological research, it specifies to comprehend as to why a specific name has been given to a taxon in question and what are its meanings and specificity.

Most of the scientific names of fish fauna of Pakistan are in Latin or Greek languages or in latinized forms of vernacular names uttered in hundreds of regional languages. These names are mainly based on shape, color, anatomical features, diet, habitat, breeding behavior, phylogenetic relationships, people, country, river, town, geographic areas or derived from historical, local or indigenous vernaculars. It is obviously more important to know the scientific names along with its meanings to have a clear understanding of the species in question. The root names of taxa originated from the languages of Latin and Geek names is difficult to understand for most of the researchers working in this field and hence most of the researchers remain unaware of the explicit characteristics and uniqueness shaping the scientific name of the species. This knowledge attached to every species helps to easily remember the scientific name while knowing the meaning of inbuilt distinguishing characteristics and haul marks. It can also provide the students and field and laboratory workers a tool for learning and remembering the scientific names and open a new venue of research not only in the field of ichthyology but also for other groups of animals and plants.

A sizeable number of fish fauna of this region has been described by prominent ichthyologists like Hamilton (1762-1829) [1], Day (1829-1889) [2] and Hora (1896–1955) [3]. Although all these scientists did not hail from Pakistan, a sizeable number of species described by them also have an extent in the present-day areas of Pakistan. The scientific names given to these species, however, are in languages not familiar and understandable in the country. Mirza (1936-2023) [4] was the only major scientist who described 34 fish species exclusively from Pakistan. Nomenclature of all these species might be a subject of great interest for students, academia, field and laboratory workers involved in study of fish and fisheries in Pakistan in general and in other countries in particular sharing the similar fish fauna.

2. METHODOLOGY

The present work is based on the field studies conducted by the first author for the last 40 years in different parts of the country and the available published literature. The collection of fish samples has been a lifelong activity that has used multiple fishing methods like cast nets, gill nets, electrofisher, and scoop nets in accordance with the recommended standard techniques. The gill nets of variable mesh sizes were used in pools, lakes, or stagnant waters for a specific period of time. The electrofisher was used in wadable waters only, while cast nets were mainly used in running waters. The scoop nets were utilized in small pools, spring waters, and very shallow water bodies. The morphological characters which were used as a base for the naming of the species were critically analyzed. A comprehensive account of freshwater fish fauna is available in Mirza (1978) [5], Mirza (2003) [6], and Rafique & Mian (2014) [7]. The original descriptions of species were examined to find out if the nomenclature of the taxon is explained in there for example Mirza et. Al., (1981) [8] have explained the etymology of the names of new described species. Similarly, original descriptions of species by Hamilton (1822) [9] have been carefully looked into to find out their etymology and for exploring Latin derivatives of local vernacular Bengali, Assamese and Indian names of fishes. Various scientific sources like books, published papers, and online etymological dictionaries were consulted for searching the meanings of Latin and Greek words making the names of species. Moreover, origins and roots of different words matching with the essence of the given scientific name were explored from these sources. Specific online references are Etymonline-online Etymology Dictionary (https://www.etymonline.com) and ETYFish Project (https://etyfish.org/). The book on the composition of scientific words by Brown (2000) [10]was also consulted for extracting the roots of scientific names.

3. RESULTS AND DISCUSSION

The freshwater fish fauna of Pakistan includes a total of 194 species (**Table 1**). These species belong to 13 orders, 30 families, and 86 genera and also include the exotic and culturable fish species. Out of 30 families of fishes represented in Pakistan, Salmonidae, Poecilidae and Cichlidae are exotic. The family Cyprinidae has the most species, having 72 species, followed by Cobitidae, Sisoridae, and Bagridae, which are represented by 38, 14, and 9 species, respectively. Among the other 26 families, 13 are represented by only a single species, 4 by two species, 4 by three species, 3 by five, and one by six species. The families Clupeidae, Belonidae, Chandidae, Mugilidae, and Gobiidae are primarily marine in origin, but some of their representative species are vicarious and have adapted freshwater mode of life. The freshwater fish fauna of Pakistan has a high proportion of endemics. A total of 33 (17%) species are completely endemic to Pakistan. From the zoogeographical point of view, the freshwater fish fauna of Pakistan has affinities with three zoogeographical regions viz, Oriental, West Asian, and High Asian [11].

Table 1. Etymology of the freshwater fish fauna of Pakistan

Sr. No.	Species	Common Names	Etymology
1.	*Gonialosamanmina*(Hamilton, 1822)	Ganges River gizzard shad	**Gonio** (G)= Angle, referring to how mouth cleft forms an angle; **Alosa** (L)= Shad, old Saxon name for Shad **Man**(G)=wide**, Maena**(G)=Herring; referring to wide body depth
2.	*Gudusiachapra*(Hamilton, 1822)	Indian river shad	**Gudua**= name of fish in Orissa; **Gudusa**= a native name in India, **Chapila**= Bengali name of fish **Chapra**= referring to type locality, Chapra, which is a city and headquarters of the Saran *district* in the Indian state of Bihar also **Chapra**= Sanskrit word denotes short or small, probably referring to the small size scales of the fish.
3.	*Tenualosailisha* (Hamilton, 1822)	Hilsa Shad	**Tenuis** (L): thin, slender; **Alosa** (L)=Shad, referring to narrow parietal ridges **Ilish**= Bengali name of fish, latinized as ilisha (**hilsa**) meaning miracle worker referring to amazing migratory capability
4.	*Dayellamalabarica* (Day, 1873)	Day's round herring	**Dayella**= after Day, the renowned ichthyologist; **Ella**: (Suffix) Little **Malabarica**= from type locality, Malabar India

5.	*Notopterusnotopterus* (Pallas, 1769)	Grey featheback	**Noton** (G) = back **Pteron** (G) = wing, fin (also called feather back), referring to small, quill-like dorsal fin
6.	*Chitalachitala*(Hamilton, 1822)	Humped featherback	**Chitala**, Chital= comes from the Bengali word Chitra which means "spotted", referring to Bengali vernacular name for the fish which is variegated or spotted
7.	*Oncorhynchus mykiss* (Walbuam, 1792)	Rainbow trout	**Oncorhynchus**= hooked snout, referring to the hooked jaw of a breeding male.; **mykiss**= a vernacular name for the species in Kamchatka, Russia.
8.	*Salmo trutta fario*(Linnaeus, 1758)	Brown trout	**Salmo**= the Latin name for salmon of the Atlantic, **trutta**= the Latin name for trout. ***Fario***= Latin word for trout
9.	*Chela cachius*(Hamilton, 1822)	Silver hatchet Chela	**Chela**: Bangladesh and west Bengal local name of fish meaning a prehensile structure on the limb referring to elongated pelvic rays; **Cachius=** Latinization of *Kachhi*, local Bengali name for this species
10.	*Chela laubuca*(Hamilton, 1822)	Indian glass barb	**Laubuca**= Latinization of *Layubuka*, the local Bengali name for the species
11.	Salmostomabacaila(Ha	Large,	**Salmo** (L)= trout; **Stoma** (G)= mouth; **Bacali= jaw (lower jaw): referring to mouth and**

	milton, 1822)	Razorbelly minnow	**lower jaw looking like trout**
12.	*Salmostomapunjabensis* (Day, 1872)	Punjab razorbelly minnow	**Punjabensis**= from Punjab
13.	*Securiculagora*(Hamilton, 1822)	Gora chela	**Secures** (L)= hatchet, an axe; **Cula**=little; **Ghora** *Chela*= local Bengali name for this species, referring to knife- or blade-like shape of body
14.	*Cabdiomorar*(Hamilton, 1822)	Carplet	**Cabdio**= derived from *Kavdi*, one of many names along the Ganges River given to the most common species; **Morar**= variant of *morur, local name*of fish in West Bengal
15.	*Amblypharyngodon mola*(Hamilton, 1822)	Mola carplet	**Amblys**= blunt; **Pharynx**= throat; **Odon**= tooth, referring to molar-like pharyngeal teeth, with flat or concave crowns **Mola**= A local Bengali name of fish
16.	*Bariliusbendelisis*(Hamilton, 1822)	Hamiltons' baril	**Barilius**=Latinization of *barila*, local Bengali name for *B. barila*; also,fromBhareli: fish name in Himachal Pradesh*;* **Bendelisis**=Latinization of Telugu name for this fish
17.	*Barilius modestus* (Day, 1872)	Indus baril	**Modestus**= Moderate, less. referring to less-vivid coloration compared to *Bariliusvagra*.

18.	*Bariliusnaseeri* Mirza, Rafique and Awan, 1986	Naseeribaril	**Naseeri**:in memory of Khan Naseerud-Din Ahmad, former head of the Department of Zoology, Government College University, Lahore, Pakistan
19.	*BariliusPakistanicus* Mirza and Sadiq, 1978	Pakistani baril	**Pakistanicus**= Named after the country, Pakistan
20.	*Bariliusvagra*(Hamilton, 1822)	Vagrabaril	**Vagra**; Local Bengali name for this species
21.	*Danio rerio*(Hamilton, 1822)	Zebra fish	***Danio***= From the Bengali name dhani, *meaning*the rice field (fish found in rice fields); **Rerio**= Local Bengali name for fish
22.	*Devario devario*(Hamilton, 1822)	Sind danio	**Devario**= Latinization of Debari, the local Bengali name for this species
23.	*Esomusdanricus*(Hamilton, 1822)	Flying barb	**E=** out of or from; Soma= body, referring to long maxillary barbels, which reach ventral fin and thus can be described as extending out from the body **Danrika**: Bengali name of the fish meaning single striped.
24.	*Rasbora daniconius*(Hamilton, 1822)	Slender barb	**Rasbora**= an Indian word for the fish **Danikoni**= Latinization of *Danikoni*, local Bengali vernacular name for this species

25.	*Rasbora rasbora*(Hamilton, 1822)	Gangetic scissortail rasbora	**Rasbora**= an Indian word for a fish, also used in Malay peninsula
26.	*Megarasboraelanga* (Hamilton, 1822)	Bengala barb	**Mega**= Large: referring to comparatively big size of fish as compared to other species in the genus. **Alonga**= Latinized Bengali name Along
27.	*Cirrhinusmrigala*(Hamilton, 1822)	Mrigal	**Cirrhinus**= Latinization of cirrus meaning fringed, refereeing to fringed upper lip of fish*;* **Mrigala**:local Sanskrit name for this species
28.	*Cirrhinusreba*(Hamilton, 1822)	Reba Carp	**Reba**: From Rewah, the local name of fish in Bihar
29.	*Cyprinionmicrophthalmum* (Day, 1880)	Small eyed kingfish	**Cyprinion**= Diminutive of Latin, cyprinus = carp **Micro** (G): small; Phthalm (G)= eye, Referring to small eyes of fish.
30.	*Cyprinionwatsoni* (Day, 1872)	Watsons' kingfish	**Watsoni**= After H. E. Watson, who assisted Day in collecting natural history specimens from Sind Hills, Pakistan
31.	*Cyprinionmilesi* (Day, 1880)	Miles' kingfish	Milesi= After the name of Col. Samuel Barrett Miles (1838-1914) who sent the specimens to Day taken from the river near Gwadar and Afghanistan.

32.	*Gibelioncatla*(Hamilton, 1822)	Catla	**Gibelion**= Gibel (G), having remarkably large skull or head referring to large head of the fish.; **Catla**: Local Bengali name of fish
33.	*Labeoangara*(Hamilton, 1822)	Angara labeo	**Labeo**= one with large lips, referring to remarkably thick, fleshy lips of fishes in the genus; **Angara**=local Bengali name of the fish
34.	*Labeo bata*(Hamilton, 1822)	Minor carp	**Bata**= Local Bengali name of the fish; **Bata**= young, juvenile, referring to compact and compressed body of mature individuals to younger individuals of other species under the genus.
35.	*Labeoboga*(Hamilton, 1822)	Boga labeo	**Boga**= Local Bengali name of the fish
36.	*Labeoboggut* (Sykes, 1838)	Boggutlabeo	**Boggut**= from Bogabata, the West Bengal Marathi vernacular for this species in India.
37.	*Labeo caeruleus* Day, 1877	Blue rahu	**Caeruleus**: Sky blue, referring to bluish body coloration
38.	*Labeocalbasu*(Hamilton, 1822)	Karnataka labeo	**Calbasu**= Local Bengali name derived from *Kalbosu,kalibaush,* for its black body color.
39.	*Labeodero*(Hamilton, 1822)	Kalabans	**Dero**= Local Bengali name of the fish

40.	*Labeodyocheilus*pakistanicus Mirza and Awan, 1976	Thickliplabeo	**Dyo**(G): double; **Cheilus** (G): Lip, referring to pendulous structure of the snout descending so as to form the appearance of a second lip
41.	*Banganadiplostomus* (Heckel, 1838)	Sindh labeo	**Diplo**(G): two-fold; **Stoma** (G): mouth, referring to how lower lip lays flat behind the edge of the lower jaw, so at first sight, its finely serrated bow seems to be the real mouth opening when mouth is closed
42.	*Labeofimbriatus* (Bloch, 1785)	Fringed-lipped carp	**Fimbriatus** (L): fringed, referring to its thick lips, deeply fringed around the margin
43.	*Labeogedrosicus*Zugmayer, 1912	Balochistanlabeo	**Gedrosia**: area that corresponds to today's Balochistan
44.	*Labeomacmahoni*Zugmayer, 1912	Macmahons' labeo	**Macmahoni**: in honor of British diplomat and Indian Army officer Arthur Henry McMahon (1862-1949), who asked Zugmayer to establish a collection of marine fishes for a national museum in Quetta, Pakistan (Latinization of "Mc" to "Mac")
45.	*Labeogonius*(Hamilton, 1822)	Kuria labeo	**Gonius**= Latinization of *Goni*, local Bengali name for this species
46.	*Labeonigripinnis* Day, 1877	Days' labeo	Nigri (L): black dark; Pinna (L): Fin, referring to black fins in adult fish.

47.	*Labeopangusia*(Hamilton, 1822)	Pangusialabeo	**Pangusia**= Latinization of *Pangusiya*, local Bengali name for this species
48.	*Labeorohita*(Hamilton, 1822)	Rohu	**Rohita**= Sanskrit word meaning red, copper, saffron, probably referring to red ting of scales in adult fish. Also, local Bengali name of fish
49.	*Naziritorzhobensis*(Mirza, 1967)	Zhob mahasher	Naziritor= in honor of the eminent ichthyologist, Nazir Ahmad, Director of Fisheries, East Pakistan (1955-1960) and West Pakistan (1960-1969) **Zhobensis**= After type locality, the Zhob River, Baluchistan.; ***Ensis***= suffix denoting place
50.	*Osteobramacotio*(Hamilton, 1822)	Cotio	**Osteo** (G): bone, presumably referring to dorsal-fin spine;**Abramis** (G)= Genus of European freshwater cyprinid fishes, also Greek for bream or mullet **Cotio**= Latinization of Koti, local Bengali name for this species
51.	*Pethiaconchonius*(Hamilton, 1822)	Rosy barb	**Pethia**= Generic vernacular name for small cyprinids in Sinhala, Srilanka. **Conchonius** = Latinization of Kongchon (=gold), local Bengali vernacular for this species referring to golden color of the fish.
52.	*Pethiagelius*(Hamilton, 1822)	Golden dwarf barb	**Gelius**= Latinization of *Geli*, from *Geli pungti*, Bengali vernacular for this species
53.	*Pethiaphutunio*(Hamilto	Spottedsail	**Phutunio**= Latinization of *Phutini*, from *Phutunipungti*, Bengali vernacular for this species

	n, 1822)	barb	
54.	*Pethiaticto*(Hamilton, 1822)	Scarlet barb	**Ticto**= derived from *Tikto*Bengali vernacular for this species
55.	*Puntius chola*(Hamilton, 1822)	Chola barb	**Puntius**=Latinization of *Pungti (pronounced puti)*, Bengali vernacular for cyprinids of a small size, and marked by a few large deep coloured spots. **Chola**= Bengali vernacular for this species
56.	*Puntius punjabensis* (Day, 1871)	Punjab barb	**Punjabensis**= *–ensis*, suffix denoting place: Punjab, Pakistan, type locality
57.	*Puntius sophore*(Hamilton, 1822)	Spotfin swamp barb	**Puntius**= Derived from Latin word punctum means point; the point of the sword, probably referring to the fish's pointed snout or pointed dorsal spine; **Sophore**= Derived from Sanskrit word Safhara denoting scale of a fish. The fish resembles to carp in reference to its scales. Also, Sophore in Sanskrit means a beautiful little fish,
58.	*Puntius terio*(Hamilton, 1822)	Onespot barb	**Terio**= Latinization of *Teri*, from *Teri pungti*, Bengali vernacular for this species.
59.	*Puntius vittatus* Day, 1865	Greenstripe barb	**Vittatus**: banded, referring to vertical black stripe on posterior third of dorsal fin when specimens reach 4/5 of an inch long
60.	*Puntius waageni* (Day,	Saltrange	**Waageni**= in honor of geologist and paleontologist Wilhelm Heinrich Waagen (1841-1900),

	1872)	barb	who collected the type specimens for Day.
61.	*Systomussarana*(Hamilton, 1822)	Olive barb	**Systomus**=From *Systomos*, that has a narrow mouth **Sarana**=From Tyrian word sarranus for anything noble or splendid, referring to handsome length and width proportion of the species and splendid look of olive-green shadow on its upper back portion
62.	*Tor putitora*(Hamilton, 1822)	Golden mahasher	**Tor**: derived from *tora*, a generic name considered among the natives for large river cyprinids of the Ganges River system; also**Tora**= Tiger (Japanese origin) **Puti**: for small fish in Bangla language, probably referring to comparatively smaller size of fish as compared to two monster sized fishes of Ganges, like Ganges *shark* (*Glyphis gangeticus*) and Goonch catfish (*Bagariusyarrelli*)
63.	*Crossocheilusdiplocheilus*(Heckel, 1838)	Gangetic latia	**Crosso** (G): fringe; **Cheilos** (G): lip, rim, jaw **Diplo**: Two-fold, referring to fringed upper lip which consists of two fleshy folds that cover mouth when it is closed
64.	*Tariqilabeolatius*(Hamilton, 1822)	Stone roller	**Tarqilabeo**= in honour of Zafarullah Khan Tariq who collected specimens of *T.macmahoni for the author of the genus* ***Latuis***= Latinization of *Lati*, native Bengali name from this species

65.	*Garragotyla* (Gray, 1832)	Sucker head	**Garra**= big nose; the rhino horn fish from Myanmar, referring to proboscis of the fish **Gotyla**: local Gangetic name for “sand-digger,” species which Hamilton applied as a generic name for bottom-dwelling cyprinids
66.	*Garrarossica* (Nikolsky, 1900)	Stone fish	**Rossica**= Latinization of *Russia* in the Russian language, referring to type locality in Turkmenistan, which at the time was part of the Russian Empire
67.	*Garrawanae* (Regan, 1914)	Wana garra	**Wanae**: from type locality, Wana Toi, a tributary of Gomal River, Southwestern Waziristan, Pakistan
68.	*Diptychus maculatus* Steindachner, 1866	Scaly osman	**Di** (G)= two; **Ptychos** (G)= fold, referring to lower jaw with a cutting anterior edge covered with a horny sheath, behind which is a distinct, uninterrupted labial fold, continuous with upper lip **Maculatus**= spotted, referring to two rows of dark speckles on abdomen and lower portion of head
69.	*Ptychobarbusconirostris* Steindachner, 1866	Indus snowtrout	**Ptycho**= folded, referring to broad, uninterrupted labial fold on mouth of species; **Barbus**= barb, used as a general suffix for a barbeled cyprinid ***Conus***= cone; ***Rostris***= snout, referring to conical snout

70.	*Schizocypris brucei* Regan, 1914	Waziristan snowtrout	**Schizo**= from Greek Schizein meaning split, divide, referring to membranous fold in front of anal fin, slightly separating scales on both sides of vent; **Cypris**= a small carp, a common suffix for cyprinid genera **Brucei**= in honor of Major G. E. Bruce, who collected type and presented it to the British Museum of Natural History
71.	*Schizopygecurvifrons* (Heckel, 1838)	Sattar snowtrout	***Schizo***= split; ***pyge***= rump (back end of animal), referring to membranous fold in front of anal fin, slightly separating scales on both sides of vent **Curvi**= from curvus meaning bent; **Frons**=forehead, face, referring to rounded or convex forehead
72.	*Oreinusdainellii*(Vincigu erra, 1930)	Dainelliis' snowtout	**Oreinus=** *oreinos*, mountain-dwelling, referring to high-elevation Mountain Barbels. **Dainelli** = in honor of geographer Giotto Dainelli (1878-1968), who lovingly cared for the preservation of central Asian fishes collected by and/or under the auspices of Filippo De Filippi (1814-1867), including type of this one.
73.	*Schizopygopsisstoliczk ai*Steindachner, 1866	Ladakh snowtrout	**Opsis**= appearance, referring to similarity to *Schizopyge* **Stoliczkai**= in honor of paleontologist Ferdinand Stoliczka (1838-1874), who collected type.
74.	*Schizothoraxplagiostom*	Himalayan	**Schizo**=, split; **thorax**= shield' referring to membranous fold in front of anal fin, slightly

	us(Heckel, 1838)	snow trout	separating scales on both sides of vent **Plagio**= oblique; **Stoma**= mouth, referring to transverse mouth
75.	*Schizothoraxlabiatus* McClelland and Griffith, 1842	Kunar snowtrout	**Labiatus**= large-lipped, probably referring to enlargement of the lips
76.	*Schizothoraxesocinus*(Heckel, 1838)	Chirruhsnowtrout	**Esocinus** (L)= relating to *Esox* (Genus of pike fishes), referring to shape of head similar to that of pikes
77.	*Schizothoraxrichardsonii*(Heckel, 1838)	Himalayan snow trout	**Richardsonii**= in honor of surgeon-naturalist John Richardson (1787-1865), a leading authority on fishes in Britain
78.	*Schizothoraxskurduensis* Mirza and Awan, 1978	Skardu snow trout	**Skarduensis**: from the type locality Skardu, Pakistan;**ensis** = suffix denoting place
79.	*Schizothoraxniger*(Heckel, 1838)	Alghadsnowtrout	**Niger** (L) = black, dark, referring to black tinge of the body coloration or black spots on the body.
80.	*Schizothorax nasus* Heckel 1838	Dongu Snow trout	**Nasus**= nose, referring to snout projecting beyond axis of body
81.	*Carassius auratus*	Goldfish	**Carassius**= Latinized form of the French vernacular *carassin* or German *karuse*, for the

	Linnaeus, 1758		European carp **Auratus**= gold or golden, referring to gold color of the species
82.	*Cyprinus carpio* Linnaeus, 1758	Common carp	**Cyprinus**= from*kyprinos*, Greek for carp, possibly derived from Kypris, the goddess of love, referring to fecundity of species.*;* **Carpio**= Latinization of the old French carpe.
83.	*Ctenopharyngodonidellus*(Valenciennes, 1844)	Grass carp	**Cteno**= comb; **Pharynx**= throat;**Odon**= tooth, referring to comb-like pharyngeal teeth **Idella**= presumably derived from the Greek "idios", distinctive or peculiar, referring to the only species of the genus.
84.	*Hypophthalmichthys nobilis (*Richordson, 1844)	Bighead carp	**Hypo**= under; **Ophthalmus**, eye, referring to downward-looking ventrolateral eye; **ichthys**= fish; **Nobilis**= well known, alluding to eminent fish.
85.	*Hypophthalmichthys molitrix* (Valenciennes,1844)	Silver carp	**Molitrix=** miller or grinder, referring to teeth that grind vegetation
86.	*Botiabirdi* Chaudhuri, 1909	Birdi loach	**Botia**= possibly derived from *"potiah*" an Assamese name for these species.; **Botia**= Indonesian word used for warrior or soldier perhaps an allusion to suborbital sharp spines of the species; **Birdi**= in honor of W. J. A. Bird, Superintending Engineer (irrigation), Sirhind

			Circle, Rupar, Punjab, India, who collected the type
87.	*Botiaalmorhae* Gray, 1831	Almorha loach	**Almorhae=** from Almorha, Uttar Pradesh, northern India, type locality
88.	*Botialohachata*Chaudhuri, 1912	Reticulate loach	**Lohachata=** Latinization of *Lohachat*, local name for this loach in Bihar, India
89.	*Botia rostrata* Chaudhuri, 1912	Reticulate loach	**Rostrata=** beaked, referring to long, pointed snout, longer than remaining part of the head.
90.	*Lepidocephalichthysguntea*(Hamilton, 1822)	Guntea loach	**Lepido**= scaled**, cephalus**= head, **ichthys**= fish, referring to head covered with fine scales **Guntea**= Latinization of *Gunté*, local Bengali name for this loach guntea which is derived from gunt, a protruding sack of fat which extends from the lower abdomen to the upper genital area.
91.	*Paracanthocobitisbotia*(Hamilton, 1822)	Mottled loach	***Para***= alongside or besides, originally proposed as a subgenus of *Acanthocobitis***; Acanthus**= spine, referring to prominent spine under eyes***;*** **Cobitis**= Kobitis (G)- a kind of Sardine
92.	*Nemacheiluscorica*(Hamilton, 1822)	Kosi loach	**Noema**= nema=thread **cheilos**= lip, referring to six filamentous barbels around the mouth; **Corica**= Latinization of *Khorika*, Bengali vernacular for this species
93.	*Schisturaafasciata*(Mirz	Havelian	**Schist**= *schistos*= split or divided; **Oura**= tail, referring to forked caudal fin;

	a and Banarescu, 1981)	loach	**a**= without; **fascia**= bar, referring to absence of crossbars on uniformly brownish-gray body
94.	*Paraschisturaalepidota*(Mirza and Banarescu, 1981)	Swat loach	**Para**=, near, referring to similarity with *Schistura*; **a**= without; **Lepidotus**= scaly, referring to scaleless body
95.	*Paraschisturakessleri* (Gunther, 1889)	Pishin loach	**Kessleri**= in honour of Karl Fedorovich Kessler (1815-1881), a German-Russian zoologist and ichthyologist.
96.	*Paraschisturalepidocaul is* Mirza and Nalbant, 1981	Parachinar loach	**Lepido**= scale; **caulis**= peduncle, referring to a few isolated scales on caudal peduncle on an otherwise scaleless fish
97.	*Paraschistura lindbergi* (Banarescu and Mirza, 1965)	Lindbergs' loach	**Lindbergi**= in honor of the K. Lindberg, a Swedish physician with strong interests in tropical medicine and zoology, who collected the type
98.	*Paraschisturanaseeri* (Ahmad and Mirza, 1963)	Naseers' loach	**Naseeri=** in honor ofprofessor Khan Naseerud-Din Ahmad (Government College, Lahore, Pakistan).
99.	*Paraschisturapunjabens is*(Hora, 1923)	Punjab Loach	**Punjabensis**= from Punjab, Pakistan, the province of the type locality; **ensis**= suffix denoting place.

100.	*Schisturaanambarensis* (Mirza and Banarescu, 1970)	Anambar loach	**Anambar**= a river near Loralai, eastern Balochistan, Pakistan, type locality;**ensis**= suffix denoting to place
101.	*Schisturaarifi*(Mirza and Banarescu, 1981)	Arifs' loach	**Arifi=** in honor of M. Arif who collected the type
102.	*Schisturabaluchiorum*(Zugmayer, 1912)	Panjgur loach	**Baluchiorum**= referring to Baluchistan, Pakistan, the province of type locality
103.	*Schisturacurtistigma* Mirza and Nalbant, 1981	Kurram loach	**Curti**=*curtus*=short; **stigma**= spot, referring to shorter crossbars compared to the related *S. arifi*
104.	*Schisturafascimaculata* Mirza and Nalbant, 1981	Hangu loach	**Fasci=***fascia*=bar; **maculata**= spotted, referring to 11-15 crossbars and numerous blackish dots on body
105.	*Schisturaharnaiensis* Mirza and Nalbant, 1969	Harnai loach	**Harnai**= from Harnai, a city in Balochistan, Pakistan close to Kaman-Beji River, the type locality.;**ensis**= suffix denoting place
106.	*Schisturahorai* (Menon,	Horas' loach	**horai=** in honor of ichthyologist Sunder Lal Hora (1896-1955), former Director, Zoological

	1951)		Survey of India, who collected type in 1926
107.	*Schisturakohatensis* Mirza and Banarescu, 1981	Kohat loach	**Kohat**= a district of *Khyber* Pakhtunkhwa, Pakistan having the type locality; **ensis**= suffix denoting place
108.	*Schistura machensis* (Mirza and Nalbant, 1970)	Mach loach	**Mach**= from Mach River, tributary of Bolan River, Pakistan, type locality; **ensis**= suffix denoting place
109.	*Schisturamacrolepis* Mirza and Banarescu, 1981	Dera loach	**Macro**= large; **lepis**= scale, referring to large scales covering entire body
110.	*Schisturamicrolabra*Mirza and Nalbant, 1981	Khyber loach	**Micro**= small; **labra**= *labrum*= lip, referring to small mouth opening, small than other species in genus *Schistura*
111.	*Schisturanalbanti*(Banarescu and Mirza, 1972)	Rawlakot loach	**Nalbanti**= in honor of Teodor T. Nalbant (1933–2011), a famous Romanian ichthyologist.
112.	*Schisturapakistanica*(Mirza and Banarescu, 1969)	Zhob loach	**Pakistanica**= referring to Pakistan where the species is endemic

113.	*Schisturaparashari* (Hora, 1933)	*Pakhtunkhwa loach*	**Parashari**= in honor of Hora's friend Mr. Prashar Bhatia, who collected type in 1919
114.	*Schisturashadiwalensis* Mirza and Nalbant, 1981	Chenab loach	**Shadiwalensis**= from Shadiwal, Pakistan, the type locality*;* **ensis**= suffix denoting place
115.	*Schisturazonata*McClell and, 1839	Assam loach	**Zonata**= girdled or banded, referring to green rings that completely encircle body
116.	*Triplophysabrahui*(Zug mayer, 1912)	Kelat loach	**Triplos**= thrice, **physa**= bladder, referring to swim bladder consisting of three parts. **Brahui**= an ethnic group of people found in Kalat area of Baluchistan, Pakistan, type locality
117.	*Triplophysachoprai*(Hor a, 1934)	Chitral loach	**Choprai=** in honor of Dr. B. N. Chopra, who led expedition that collected type
118.	*Triplophysahazaraensis* (Omer and Mirza, 1975)	Hazara loach	**Hazarensis**= from Hazara, a north eastern region of Khyber Pakhtunkhawa having the type locality.
119.	*Triplophysakashmirensi s*(Hora, 1922)	Verinag Triplophysa loach	**Kashmirensis**= from Kashmir having the type locality
120.	*Triplophysa marmorata*	Kashmir	**Marmorata**= marbled, referring to brown undulations and mottles on body

	(Heckel, 1838)	triplophysaloach	
121.	*Triplophysa micros* (Steindachner, 1866)	Leh triplophysaloach	**Micro**= small; **ops**= eye, referring to minute eyes, their length two or more times in interorbital space
122.	*Triplophysanaziri*(Ahmad and Mirza, 1963)	Nazir triplophysa loach	**Naziri**= in honor of the most eminent ichthyologist of Pakistan, Nazir Ahmad, Director of Fisheries, East Pakistan (1955-1960) and West Pakistan (1960-1969)
123.	*Triplophysastoliczkai*(Steindachner, 1866)	Stoliczkatriplophysa loach	**Stoliczkai**= in honor of paleontologist Ferdinand Stoliczka (1838-1874), who collected type
124.	*Triplophysatenuicauda*(Steindachner, 1866)	Tibetan triplophysa loach	**Tenui**= *tenuis*= thin or slender; **cauda**= tail, referring to narrower caudal peduncle compared to *Triplophysastoliczkai*
125.	*Triplophysatrewavasae* Mirza and Ahmad, 1990	Trewavase triplophysaloach	**Trewavasae**= in honor of one of the most eminent ichthyologists, Ethelwynn Trewavas (1900-1993), British Museum of Natural History
126.	*Triplophysayasinensis*	Yasin	**Yasin**= from Yasin River, Gilgit Valley-Pakistan;**ensis**= suffix denoting place

	(Alcock, 1898)	triplophysaloach	
127.	*Sperataseenghala***(**Sykes, 1839)	Giant river-catfish	**Sperata**= after Maria Adolfine Sperat, late mother-in-law of Holly (1939), the author of the genus. She had supported Holly's studie **Seenghala**= singhata, signifying "Horn-fish," applied in Maharashtra to several catfish with long barbels.
128.	*Batasiopakistanicus* Mirza and Jan, 1989	Pakistans' batasio	**Batasio**= local Bengali name of the fish (batasio or batashi) **Pakistanicus**= from Pakistan where the fish is endemic.
129.	*Mystusbleekeri*(Day, 1878)	Day's mystus	**Mystus**= Latinization of *mystax* (G) meaning whiskered, referring to long bristles (barbels) of species included in the genus; **Bleekri**= in honor of Dutch medical doctor and ichthyologist Pieter Bleeker (1819-1878).
130.	*Mystustengara*(Hamilton, 1822)	Tengaramystus	**Tengara**= local Bengali name for this species
131.	*Mystuscavasius*(Hamilton, 1822)	Gangetic mystus	**Cavasius**= *kavasi*, the local Bengali name of the fish.
132.	*Mystusgulio*(Hamilton, 1822)	Long-whiskered	**Gulio**= *guli*, the local Bengali name of the fish (guli). **Gullio**= associated with youthful (red), referring to reddish pectoral, pelvic and anal fins' base of the fish

		catfish	
133.	*Mystushorai*Jayaram, 1955	Horas' mystus	**Horai**= in honor of ichthyologist Sunder Lal Hora (1896-1955), former Director, Zoological Survey of India
134.	*Mystus vittatus* (Bloch, 1797)	Striped dwarf catfish	**Vittatus**= *vittatus* (L), meaning banded or decorated with a ribbon, referring to light-blue stripes on sides of the fish.
135.	*Rita rita* (Hamilton, 1822)	Rita catfish	**Rita**= *Ritha*, Bengali name of fish
136.	*Bagariusbagarius*(Hamilton, 1822)	Gangetic goonch	**Bagarius**= Vaghari, Bengali name of the fish (Vaghari)
137.	*Gagatacenia*(Hamilton, 1822)	Indian gagata	**Gagata**= *keyakatta*, the local name of the fish. **Cenia**=sinia, local name of the fish
138.	*Gagatapakistanica*Mirza, Perveen and Javed, 1999	Pakistani gagata	**Pakistanica**= From Pakistan
139.	*Glyptosternumreticulatu*	Turkestan	***Glyptos***= engraved; ***Sternon***= chest or breast, referring to transverse striations on pectoral

	m McClelland and Griffith, 1842	catfish	and ventral fins that form an adhesive surface; **Reticulatum**= netlike, in reference to the color pattern
140.	*Glyptothoraxcavia*(Hamilton, 1822)	Cavia catfish	**Glyptos**= carved, engraved; **thorax**= breastplate, in reference to the folds of skin comprising the thoracic adhesive apparatus; **Cavia**= a local Bengali name for this species in India
141.	*Glyptothoraxkashmirensis* Hora, 1923	Kashmir catfish	**Kashmir**= Kashmir Valley, type locality; ***ensis***= suffix denoting place
142.	*Glyptothoraxnaziri* Mirza and Naik, 1969	Naziri catfish	**Naziri**= in honor of Nazir Ahmad (1910-1985), Director of Fisheries, East Pakistan (1955-1960) and West Pakistan (1960-1969)
143.	*Glyptothoraxpectinopterus*(McClelland, 1842)	Sticking catfish	***Pectin***= raked or combed; ***Pterus***= fin, referring to transverse striations on pectoral and ventral fins
144.	*Glyptothorax punjabensis* Mirza and Kashmiri, 1971	Punjab catfish	**Punjab**= Punjab, Pakistan***ensis***=suffix denoting place
145.	*Glyptothoraxstocki* Mirza and Nijssen, 1978	Bhed catfish	**Stocki=** in honor of J. H. Stock, Institute of Taxonomic Ecology, University of Amsterdam

146.	*Glyptothoraxsufii* Bashir and Mirza, 1975	Sutlej catfish	**Sufii=** in honor of S. M. K. Sufi, one of the pioneer ichthyologists of Pakistan.
147.	*Nangranangra*(Hamilton, 1822)	Kosi nangra	**Nangra**= a local Bengali name for this fish along the Kosi River in India
148.	*Nangra robusta* Mirza and Awan, 1973	Kalabaghnangra	**Robusta**= stout or vigorous, probably referring to swiftness of the fish
149.	*Sisorrabdophorus*(Hamilton, 1822)	Sisor catfish	**Sisor**= Bengali name of the fish, **Rhabdos** (G)= a walking stick, a twig, rod, branch, **phoreus**= bearer, in reference to the long filamentous extension of the uppermost caudal fin ray in the form of a whip or rod.
150.	*Ompokbimaculatus*(Bloch, 1794)	Butter catfish	**Ompok**= a corruption of Indonesian name *limpok* used for mid-sized silurid catfishes, **bi**= two, **macula**= meaning spot, referring to blackish blotch above pectoral fin and spot on caudal peduncle.
151.	*Ompokpabda*(Hamilton, 1822)	Pabdah catfish	**Pabda**= Bengali name for this and related catfishes in India
152.	*Ompoksindensis* (Day, 1877)	Sindh catfish	**Sindensis**= From Sindh, the type locality
153.	*Wallago attu*(Bloch and	Freshwater	***Wallago***= *Walaga*, Telugu and Tamil names of fish, ***attu***= *Attu Vaalay,* south Indian

	Schneider, 1801)	shark	Malayalam name of the fish.
154.	*Heteropneustesfossilis*(Bloch, 1794)	Stinging catfish	**Hetero**= different, other **pneustikos**= of breathing, referring to long air sac that serves as lungs extending from gill chamber to utilize atmospheric oxygen **Fossilis**= mud, digging or dug up, excavate, ditch, in reference to behavior of the fish to inhabit trench made in the muddy bottom of the ponds.
155.	*Amblycepsmangois*(Ha milton, 1822)	Torrent catfish	**Amblys** (G) =blunt **kephale**= head, in reference to the blunt snout, **Mangois=** Latinization of *Manggoi*, local Gangetic name for this catfish
156.	*Ailia coila*(Hamilton, 1822)	Gangetic ailia	**Ailia**= local Bengali name for the fish, ***Coila***= Latinization of Kajoli (pronounced “kway-la”), Assamese name for this catfish in Rangbur, Bangladesh
157.	*Ailiichthys punctata* (Day, 1871)	Jamuna ailia	**Ailia**= local Bengali name for the fish, **ichthys**= fish; **Punctata**= spotted, referring to large black spot before base of caudal fin
158.	*Clupisomagarua*(Hamilt on, 1822)	Garuabachch a	***Clupea***= herring, **Soma=**body, referring to herring-shaped body **Garua**= local Bengali name for this catfish in India and the name derived from gerua meaning

			yellowish orange denoting to color of fins
159.	*Clupisomanaziri (*Mirza and Awan, 1973)	Naziri bachcha	**Naziri**= in honor of the most eminent ichthyologist of Pakistan, Nazir Ahmad, Director of Fisheries, East Pakistan (1955-1960) and West Pakistan (1960-1969)
160.	*Eutropiichthysvacha* (Hamilton, 1822)	Batchwavach a	**Eutropheia** = well fed, **ichthys** = fish**,** probably referring to high value sizeable fish; **Vacha=** local Gangetic name for schilbeid catfishes in India, including this one
161.	*Pachypterusatherinoide s*(Bloch, 1794)	Indian potasi	**Patchy**= thick, **Pterus**= fin, probably referring to considerably more lengthened tail and/or long anal fin **Atherine**= *Atherina*= genus of fishes commonly known as smelts, **oides**= having the form of, in reference to the resemblance to *Atherina* species (smelts) having silvery sides.
162.	*Clarias batrachus*Linnaeus, 1758	Walking Catfish	**Clarius**= *chlaros* (G), meaning lively; in reference to the ability of the fish to live for long periods out of water. **Batrachus** (G)=frog, probably referring to frog-like ability to leave the water and move across land
163.	*Xenentodoncancila*(Ha milton, 1822)	Freshwater garfish	**Xenentodon** (G)= ancient Greek, means "with disconcerting teeth", referring to the lower pharyngeal plate with elongated teeth. **cancila**= after an indigenous name ‘kangkila’ for the fish in Bengal.

164.	*Aplocheilus panchax* (Hamilton, 1822)	Blue panchax	**Aplo**(G): simple, single, **cheilus** (G): lip, referring to upper jaw, instead of both jaws, bordered by premaxilla **Panchax**= *Pangchak* = local name of the fish
165.	*Aplocheilusblockii*(Arnold, 1911)	Green Panchax	**blockii**= in honor of Captain Block, who collected and imported this species to Germany as an aquarium fish
166.	*Aphanius dispar* (Ruppell, 1828)	Arabian killifish	**Aphannes**(G)= unseen, invisible, obscure, secret; Probably referring to small size **dispar** (L)= dissimilar, referring to different coloration between the sexes
167.	*Gambusia affinis*(Baird and Girard, 1853)	Mosquitofish	**Gambusia**= Latinization of the Cuban gambusino, signifying “nothing,” referring to their inconsequential size **Affinis**= related, probably referring to its close relationship with closely related species G.*holbrooki*.
168.	*Channa gachua*(Hamilton, 1822)	Dwarf snakehead	**Channa**= ancient Greek, means “snapper fish”, probably referring to the air breathing. **Channa**= kanna, Dutch pronunciation of *Channa* used for this group in Sri Lanka which has remained a Duch colony. **Gachua**= after the common name of the species in Bengal.
169.	*Channa*	Great	**Marulia**= Latinization of marul, local name for this snakehead in Andhra Pradesh, India

	marulia(Hamilton, 1822)	snakehead	
170.	*Channa punctata* (Bloch, 1793)	Spotted snakehead	**Punctata** (L)=, “spotted", referring to black spots on body and dorsal, anal, and caudal fins.
171.	*Channa striata* (Bloch, 1793)	Banded snakehead	**Striata**= striped, referring to brown stripes on body and dorsal and anal fins of the young specimens.
172.	*Chanda nama*(Hamilton, 1822)	Elongate glass perchlet	**Chanda**= local name for glassfishes in India **Nama**= from Namchanda, Assamese name for this glassfish in India
173.	*Parambassisbaculis* (Hamilton, 1822)	Himalayan glassy perchlet	**Para**= near, similar to Ambasis; **Ambasis=** Latinization of *l'ambasse,* used for a cheap or worthless thing, referring to abundance and very small size of fish**.** **Baculis** (L)=bacula,bacula, meaning small berry, possibly referring to berrylike eyes or too small size of the fish.
174.	*Parambassisranga* (Hamilton, 1822)	Glassy fish	**Ranga**= from Ranga-chanda, local Bengali name for this glassfish in India, **Ranga**= meaning colorful in Bengali referring to freckles (a small patch of brown color impression into the skin, often becoming more pronounced through exposure to the sun) and pale skin.
175.	*Nandus*	Gangetic leaf	**Nandus**= *Nadosh*, *Nadus* Bengali names for the species. **Nandus**= Word Nandu used for

	nandus(Hamilton, 1822)	fish	flightless birds in America taken so because of the apparent motionless behavior of the fish.
176.	*Badis badis*(Hamilton, 1822)	Chameleon fish	**Badis**= from *bhedo* or *bheda,* local Bengali name of the fish.
177.	*Boleophthalmusdussumieri* Valenciennes, 1837	Mud skipper	***Bole*** =throw, ***ophthalmus***= eye, referring to their ability to rapidly raise their eyes above the level of their orbital cavities; **Dussumieri** = the species is named after the French voyager and merchant Jean Jacques Dussumier, who collected the type material
178.	*Glossogobiusgiuris*(Hamilton, 1822)	Bar eyed goby	**Glossa** (G): tongue, **gobius**= from *Goby* fishes, referring to deeply emarginated tongue of the Goby species in the genus **Giurus**=Latinization of ghiyuri, one of its local Gangetic names in India
179.	*Trichogaster fasciata*Bloch and Schneider, 1801	Giant gourami	***Trichos***= hair or ray, ***gaster***= belly, referring to their pelvic fins, each one a single, long, thread-like ray (feelers) **Fasciata** (L)=banded, referring to 14 or more orange bands on body
180.	*Trichogasterlalius*(Hamilton, 1822)	Dwarf gourami	**Lalius**= Latinization of *Lali*, the native Gangetic name of the fish in India meaning red referring to reddish bands on the body
181.	*Oreochromis*		***Oreos***= mountains, referring to Mt. Kilimanjaro (Tanzania), type locality of the type species,

	aureus(Steindachner, 1864)		***chromis***= *chroemo*= to neigh, referring to groups of fishes with ability to produce repetitive croaking sounds. **Aureus** (L) = *aurum* = golden, referring to golden-yellow body color
182.	*Oreochromis mossambicus*(Peters, 1852)	Mozambique tilapia	**Mossamb**= from Mozambique, where type locality (Zambezi River) is situated*,* ***icus***= belonging to
183.	*Oreochromis niloticus*(Linnaeus, 1758)	Nile tilapia	**Niloticus**: referring to River Nile having native distribution of species.
184.	*Terapon puta* (Cuvier and Valenciennes, 1829)	Smallscaleter apon	**Terapon** (G) = servant or slave, referring to holding these fishes in such a low esteem that it was considered fit only for slaves **Puta**= local name of fish in parts of India
185.	*Lutjanus johnii*(Bloch, 1792)	John's snapper	**Lutjanus**= *lutjang*, local Indonesian name for snapper fishes. **johnii**= in honor of Christoph Samuel John (1747-1813), a German missionary in the Danish colony of in India, who collected natural history specimens for Bloch, including type of this snapper
186.	*Acanthopagrusberda*(F	River bream	***Acanthus***= thorn or spine, referring to strong dorsal-fin spines in some species included in

	orsskål, 1775)		genus, ***pagrus***= *phagros (G)*, ancient Greek name for sea breams and porgies **Berda**= Arabic name for this species along the Red Sea of Yemen (type locality)
187.	*Lates calcarifer* (Bloch, 1790)	Barramundi	**Lates**= *lates*, *latos*, local name for Nile Perch, *L. niloticu* ***Calcar***= spur; ***fero***= to bear, referring to four spines on operculum
188.	*Monopteruscuchia*(Hamilton, 1822)	Gangetic mud eel	**Mono**:one, **pterus**: fin, referring to confluent dorsal, caudal and anal fins, and lack of pectoral and pelvic fins. **Cuchia**: Bengali name of fish.
189.	*Macrognathusaral*(Bloch and Schneider, 1801)	One-stripe spiny eel	**Macro**= long or large, **gnathu**s= jaw, referring to very advanced and horn-shaped upper jaw **Aral**: Tamil name of fish. **Aral**: derived from ariel meaning windy or prompt probably taken so because of the fish robust movement.
190.	*Macrognathuspancalus*(Hamilton, 1822)	Striped spiny eel	**Pancalus**= Latinization of Pangkal, Assamese name for this spiny eel in India. **Pancalus**= means covered by a bar or a set of bars referring to having bands or stripes of different color
191.	*Mastacembelus armatus* (Lacepede, 1800)	Zig-zag eel	***Mastax***= mouth or jaw ***embolus***= arrow or spear, possibly referring to sharp or pointed jaws of equal length **Armatus**= armed with a weapon, referring to 33 spines in front of dorsal fin

192.	*Mugil cephalus*Linnaeus, 1758	Striped mullet	**Mugil**= Latin for mullet, possibly derived from *mulgeo*, to suck, referring to how *fish* feeds by sucking up sediment. **Cephalus**= head, referring to large, round head
193.	*Sicamugilcascasia*(Hamilton, 1822)	Yellowtail mullet	***Sica***= dagger, referring to strongly spinate preorbital spine, ***mugil***= mullet **Cascasia**= a local Gangetic name for this mullet
194.	*Elopsmachnata*(Forsskål, 1775)	Ladyfish	**Elops**= Greek for a large sea fish **Machanta**= Latinization of *machnat*, Arabic vernacular for this species

*G= Greek, L= Latin, The name of the author who first described and assigned the scientific name is given along with the scientific name. If the scientific name (genus name which has changed for several species) is still the same, authors name is written without parenthesis, however, if it has assigned a new genus, then the author's name is given within parenthesis.

4. DISCUSSION

An etymological analysis of generic as well as specific names of 194 species of freshwater fishes recorded from Pakistan has been undertaken in the present work. The **Table-1** shows that 71 species have been described by Hamilton (1822) [12] and out of these specific names of 67 species are based on Latinization of local Bengali, Assamese or Gangetic names of fishes. Names of only our species, viz., *Gonialosamanmina, Salmostomabacaila, Systomussarana,* and *Parambassisbaculis* have been derived from morphological characteristics. Mirza and different associate authors have described 34 species from different areas of Pakistan. Out of these species, majority are named after eminent scholars especially in the field of ichthyology or after the collectors of the specimens. These species are, *Bariliusnaseeri, Glyptothoraxnaziri, Glyptothoraxsufii, Glyptothoraxstocki, Clupisomanaziri, Paraschisturanaseeri, Paraschisturalindbergi, Schisturaarifi, Schisturanalbanti, Schisturaparashari, Triplophysanaziri,* and *Triplophysatrewavasae*. The species named after country, cities or type localities are L*abeodyocheiluspakistanicus, Gagatapakistanica, Bariliuspakistanicus, Schizothoraxskurduensis, Batasiopakistanicus, Naziritorzhobensis, Schisturaanambarensis, Schisturaharnaiensis, Schisturakohatensis, Schisturamachensis, Schisturapakistanica, Schisturashadiwalensis, Glyptothoraxpunjabensis,* and*Triplophysahazaraensis*. Fish species having their names after the morphological characters include *Nangra robusta, Schisturaafasciata, Paraschisturaalepidota, Paraschisturalepidocaulis, Schisturacurtistigma, Schisturafascimaculata, Schisturamacrolepis*, and *Schisturamicrolabra*. Similarly, the 14 species described by Day (1877-79) [13] have species names on the basis of morphological characters, type localities or eminent scholars in the field of ichthyology. Description of rest of the species is distributed among various authors and are likewise derived from morphological characteristics, vernacular names, type localities and after the names of eminent ichthyologists of those times.

While comparing the number of fish species described by various authors, it is evident that maximum number of species found in Pakistan have been described by Hamilton (1822) [14]. Interestingly, the type specimens of all these species were collected from river Ganges and its different tributaries. The freshwater fish fauna described from the Ganges River is somewhat shared with the fish fauna the Pakistan and so the etymological analysis of Pakistani freshwater fishes cannot be taken into account unless a historical perspective to this enigma is not provided. The Ganges drainage in India and Indus drainage in Pakistan are totally separate river systems having almost 200 kilometer stretch of land between them but they have enormous similarity of fish fauna. This high similarity of fish fauna between these river systems is apparently not understandable as both these river systems are far away, disjunctive and without any present-day connectivity. The past hydrography of the region, however, explains the secret behind this similarity and is based on the fact that in the past Indus drainage has remained connected with the Ganges River system through the River Yamuna. The river Yamuna belonged to Indus basin in the Pleistocene, Tertiary and even till the recent past [15]. Only some 4,000 years ago, the watershed divide between the Indus and the Ganges was determined by the rivers Sutlej and Yamuna, both draining into the Indus. Yamuna was a twin stream with Saraswati, which had a catchment area between Yamuna and Sutlej. The two twin streams combined to form river Ghaggara (Hakra), which passed through Cholistan area of Pakistan to join the Indus. Due to subsidence in the Ganges delta; a pre-Yamuna tributary of the Ganges began working upstream actively to catch the stream of Yamuna. Later on, as a result of tilting uplift of the Sutlej-Yamuna divide, it became a tributary of the Ganges [16]. The fish fauna of both these river systems was therefore shared through the connectivity provided by River Yamuna in the past connections.

The fish dispersal through past connectivity of Indus-Ganges River system has not restricted only to similarity of fish fauna between these two river systems but it has further channeled to east, north and west through various connecting river systems. The Ganges drainage has the connectivity with Brahmaputra River system in the east draining the areas of Eastern and North Eastern India and Bangladesh and with river Koshi, Gandaki and Karnali basins draining almost whole area of Nepal. All the rivers of Bhutan also drain into Brahmaputra River at different places after entering into India. In the west, the Indus River is connected with Kabul drainage in Afghanistan.

Pakistan also shares its Western Asian component of the fish fauna with Iran, especially in the province of Baluchistan which is adjacent to Iran. Besides the neighboring countries, cold water fish fauna of Himalayan, Hindukush and Karakoram regions of Pakistan has many species and genera common with at least 15 major river systems and numerous small closed basins the High Asian Region (Central Asia, China and Tibetan Plateau and adjacent areas). These species belong to the genera Schizothorax, Schizopyge, Schizopygopsis, Diptychus, Racoma, Ptychobarbus, Triplophysa and Glyptosternum. This connectivity has been in the post-tethyan period and in response to the orogeny of Himalayas and Karakoram Mountain ranges, mass scale flooding after the last ice age, and capturing the basins of different rivers with their erosion power. This knowledge of fish etymology, therefore, will not only be useful for students, researchers, and academia in Pakistan but will also be useful for ichthyologists and zoologists of India, Bangladesh, Nepal, Bhutan, Afghanistan, central Asian states and China [17].

The fish fauna of many Asian countries, therefore, have similarities with Pakistan and with each other to variable extant due to present and past connectivity. This paper, therefore, will be beneficial for researchers, natural history museums, academia, field workers, and people working in the field of fish and fisheries in almost all Asian countries.

5. CONCLUSION

The paper reveals the roots and origins of scientific names of freshwater fish fauna of Pakistan. It will help the line departments, students, and researchers of Pakistan, in particular, and of many Asian countries in general, to remember and understand the names of freshwater fishes in conjunction with their associated characteristics.

CONSENT (WHERE EVER APPLICABLE)

Not applicable.

ETHICAL APPROVAL (WHERE EVER APPLICABLE)

Not applicable.

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